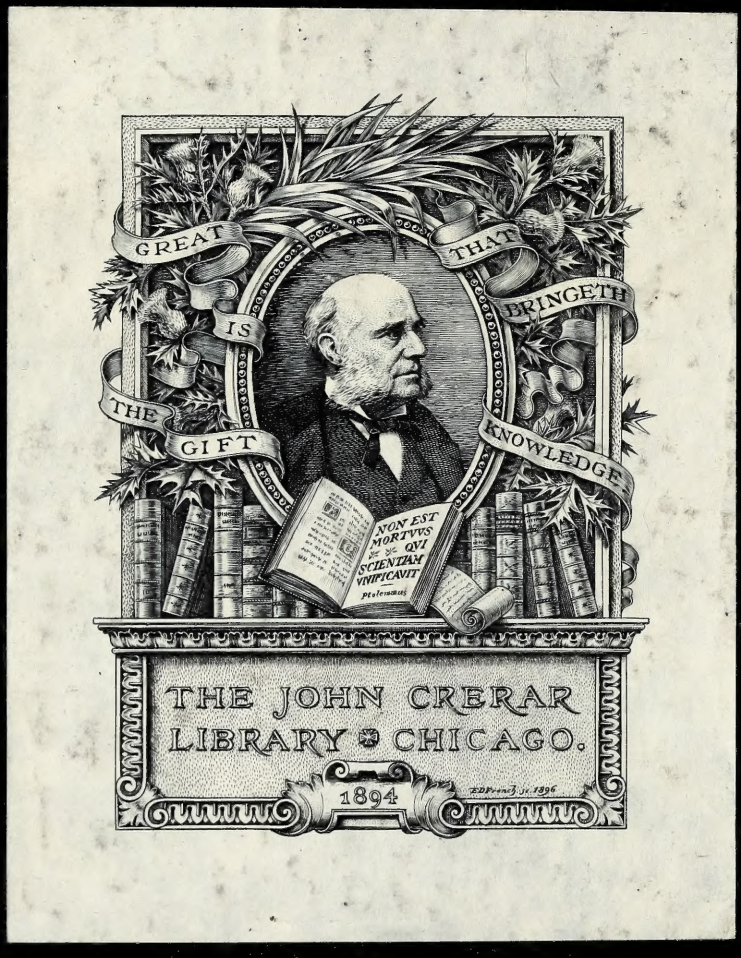



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TO OUR READERS.—ENLARGEMENT OF THE JOURNAL.

In wishing the readers and supporters of The British Journal of Photography a Happy and Prosperous New Year, we desire to direct attention to some changes which we are introducing with this issue. Instead of 16 pages as at present, the Journal will in future consist of 20 pages of text matter weekly, and will be printed by the most modern machinery on paper of improved quality. For the convenience of the reader, both advertisements and text matter will be wire-stitched.

The monthly supplement will no longer be given; but the permanent enlargement of the paper to 20 pages weekly will provide facilities for the publication of a considerably greater volume of matter than it has hitherto been possible to print.

It is intended by the additional pages that will be at command to take advantage of the opportunity for widening the scope of the journal; and, in conformity with the requirements of all classes of its readers at home and abroad, to vary the nature of its contents so as to make it fully responsive to the many interests with which it concerns itself.

EX CATHEDRA.

Stereoscopic Röntgen-Ray Skiagraphs. Some time ago we referred to Dr. Mackenzie Davidson's arrangement for taking Röntgen-ray photos with stereoscopic effect. His plan involved the use of two tubes, but this has been improved upon by Mr. E. W. Caldwell, who describes his method of stereoscopically viewing in the fluoroscope in a recent number of the New York "Electrical Review." A single tube with two anti-cathodes is made use of. It is excited by an alternating current by connecting it to the secondary coil of a transformer, the primary of which is connected to the street mains through the well-known Caldwell interruptor. If no alternating current is available, the direct current is passed through a small rotary converter. To obtain the stereoscopic effect, the image being superposed, a rotating shutter is placed before the eyes, each of which is thus made to see alternately 3,600 impressions per minute. The due presentation of the image in correct alternation is assured by the rotator being synchronously actuated by the same apparatus that gives the alternation in the original current. It will be seen that Mr. Caldwell's idea is an adaptation of a method invented years ago for stereoscopically viewing two superposed projected pictures on the lantern screen.

* * *

Albumenised Paper Prints. The paper, by Mr. G. T. Harris, read at a recent meeting of the London and Provincial Photographic Association, on albumenised paper-printing, is well worth the attention of all modern professional, if not amateur, photographers—many of whom have had no practical experience with its working. This process to an extent has become an obsolete one, though to the higher-class professionals, who still produce silver prints, it has not; it is still worked by them in the ordinary course of business. We happen to know of several high class professionals who gave up albumen for gelatine on account of its greater convenience, but after a time went back to their old love, simply because their *clientèle* did not appreciate the work so well, and there is no question that a gelatine picture, with its highly-glazed surface, does not appeal to the present refined taste of a large proportion of the public. As the author of the paper pointed out, many of the thin and poor flat negatives now made would not yield good prints on albumen paper. That is perhaps why it is so largely used by amateurs and inexperienced professionals who, possibly, are unable to produce such negatives as are necessary for the best results on albumen. But with any of the commercial plates now on the market

there should be no such difficulty, as they are capable of giving any amount of "pluck," if rightly used, and a "plucky" negative is what is required for an albumen print.

* * *

The Question of Permanency What has probably conduced to the popularity of gelatine papers in England—they are not so largely used abroad—is that they may be bought ready for the printing frame, they require but little skill to use, they will give presentable prints from inferior negatives, and their highly glazed surface is not objected to by a certain proportion of the public. But there is no question that albumen prints would be much preferred by another proportion if they could obtain them, and, as a rule, they are now only supplied by the higher class professionals, who have always adhered to them. There is a point touched upon by Mr. Harris in his paper that calls for special attention, which is that of the permanence of the results when the prints are conscientiously produced. Prints on albumen paper thirty or forty years old are in evidence by the thousand. Will a correspondingly large number of gelatine prints be in existence that time hence? With some, if a print has been made for only two or three years, and it shows but little sign of change, it is considered permanent, or at least as permanent as a silver print can be expected to be. But surely so brief a period is no test of permanency, particularly in the face of albumen pictures, unchanged, ten times that age. We are not assuming that gelatine prints cannot be made as stable as albumen prints, but we unhesitatingly say that the larger proportion of those turned out by amateurs, and by some professionals, will not prove so.

* * *

Albumen Paper. Apropos of the above, the manufacture of albumen paper seems to have become practically a lost industry in this country. Most of the albumenised paper used here is prepared in Germany—chiefly in Dresden—where the trade is mostly confined to a few concerns, more or less as a "combine." At one time the paper used here was also albumenised here, and the albumen used was from fresh eggs. It was also much more highly salted than is the modern production—conditions which might well be considered more conducive to the permanency of the prints made upon it than in the case of light salting, and the use of more or less putrid albumen. Albumen in this state is found to be more easy of application than when it is from fresh eggs, and it also gives a higher gloss. Here is a point in connection with albumen paper that may now be referred to, which is that many who use it—and those who have essayed to do so, as some amateurs have—buy it ready sensitised. This paper is in an acid condition, and is by no means so easy to tone as the old which used to be sensitised at home on a neutral silver bath. Neither does it take the same deep rich tones. The home sensitised paper, however, has the disadvantage that it will not keep more than two or three days unless it is preserved between sheets of paper that have been treated with a solution of carbonate of soda and dried. Then it will keep for weeks in good condition.

* * *

A New. Arc Lamp. Improvements of lighting appliances are evidently in the air, for we read that the electric arc lamp is proposed to be radically altered in principle. The intense heat at the focus of this light, reaching about 3,000deg., is well known, and would have to be an integral quality of the arrangement; but Dr. Bung, a Danish physician, has devised an arc light which it is claimed has the temperature so reduced as to permit the carbon to be touched without danger by the fingers at their apex when the light is in action. The effect is brought about by making the carbon rods hollow, and when the lamp is working, passing a strong current of cold water through the carbons. It is said that by this means the whole energy of the current is confined to the light arc itself, that the result is such a slow consumption of the rods that the usual automatic adjustment becomes unnecessary. Further, it is not needful to confine the manufacture of the rods to carbon only, as the basis of the electrodes can be chosen from a long list of substances according to the purpose for which it is required.

* * *

Seeing Telephones. If we are to believe the account of the latest achievement in telephony, the problem of photographing distant unseen objects is brought within measurable distance of solution. The Brussels correspondent of the "Daily Mail" is the authority for this most marvellous story. According to him, Dr. Sylvestre, an American physician naturalised in France, has on the authority of the "Indépendance Belge," invented an arrangement of a spectroscope and a telephone combined, which enables the speaker at the instrument to see what is going on at the other end of the wire. He can see not only the other speaker, but likewise all his surroundings. All this is brought about by the intervention of a little tube, into which drops of a certain chemical—secret, of course—are allowed to fall. The word marvellous fails to convey a sufficient sense of the wonderful action of the new machine. For example, Dr. Sylvestre was using his "seeing telephone," and the man at the other end was incredulous. "There is a bust in your room," he said, "and it is very dusty." His telephonic interlocutor looked, and lo! there was a bust, and it was dusty. To show that this is no canard, we are informed that experiments were made in the presence of M. Mougeot, the French Under-Secretary of Posts and Telegraphs, and that the King of the Belgians has granted to the inventor Dr. Sylvestre an interview for the purpose of exhibiting the action of the new instrument. Naturally, considerations of £ s. d. connect themselves with this as with most inventions. Dr. Sylvestre's price is a million pounds; we desire to express the hope that he may obtain it.

* * *

Improvements in Incandescent Gas Burners. It is stated that an important invention relating to the construction of the mantle for the Welsbach light has been made by an Austrian engineer. The well-known fragility of this essential part of the burner stands in the way of its adoption in many cases, and the new burner is said to remedy this difficulty. In lieu of the slight frail network we are familiar with, the inventor makes what might be termed an elastic glass mantle by adding to the usual thorium-cerium constituents a chemical compound which brings about the desired result. The product is rather more than a mere addition, for it is claimed that it brings about true chemical union among the constituents, and not merely a mechanical mixture. Then, again, at the Crystal Palace exhibition of gas burners and appliances, there is actually on view an entirely new departure in the Welsbach burners, which appears to possess all the advantages of the Wenham light with those peculiar to the incandescent mantles. The shadow cast by the ordinary form is well-known, and although it can be almost eliminated by the use of a suitable reflector, it still is a great disadvantage. In the new form the cone is reversed, and points downwards, the burner being inverted. Experiments previously made in this direction have been unsuccessful on account of the liability of the gas to strike back; but that difficulty is now overcome. There is a Bunsen burner, provided with a regulator, for the supply of gas, and at-

tached to a cone of white china, which acts both as radiator and reflector. When lighted up the appearance is almost that of an electric arc lamp with its shadowless effect.

* * *

Weighing Out. We are indebted to Mr. C. H. Bothamley, F.I.C., F.C.S., for the following note on this subject, which unfortunately reached us too late for the Almanac:—The ordinary and indispensable operation of "weighing out" often presents difficulties to the inexperienced, and is also carried out in anything but a neat and cleanly way by those who ought to know better. I am not referring to the handling of the balance and weights, but to the manipulation of the substance that is being weighed, and it is about the latter that I wish to make one or two suggestions. The first rule is that the substance to be weighed should never be put directly into the pan of the balance unless this pan is of glass and is detachable and removable, as it is in the small quadrant balances now so well known. If the ordinary scales in which the glass pans are attached to strings are used it is a thousand to one that some of the substance will adhere to the strings. With this one exception, something should always be placed in the pan of the balance to receive the substance and facilitate its removal afterwards. A piece of clean, moderately stiff glazed paper will do; a small ebonite scoop such as can easily be obtained from the better photographic dealers is still better. Whatever is used must of course be counterpoised, and here is one of the disadvantages of paper, since each fresh piece has to be counterpoised. With an ebonite scoop, a counterpoise can be made from a pill-box filled with sand or small shot, and the two can be kept together. Little inferior to the scoops, and obtainable almost anywhere, are the little circular horn or celluloid boxes sold as "watch protectors." One can be used for containing the substance, whilst the other, with addition of a few shot if necessary, can serve as the counterpoise. For weighing-out larger quantities of material the celluloid boxes used for containing a cake of soap will answer quite well, and can be used in the same way as the watch-protectors. Ebonite, horn, and celluloid are practically impervious to water, and hence any of the receptacles recommended can, if necessary, be rinsed with water, to remove any traces of the substance that may adhere to them.

* * *

Ancient Processes. In a paper read before the Photographic Club by Mr. Thorne Baker (see page 827 last week), reference was made to a "raspberry syrup process" mentioned in a letter in the "Photographic News" in 1859. Mr. Baker asked if anyone present could explain what the process was, adding, jocosely, that if a raspberry syrup can be both a thirst-quencher and a sensitising agent at the same time it is an excellent re-agent to have in one's dark room. We will here supply the desired information, inasmuch as these old processes, from their names, would seem really ludicrous to many modern photographers. This process was introduced by the Rev. J. Lawson Sisson in 1858, and was worked in this way: A collodion plate was sensitised in the usual manner, washed in two or three dishes of water, and drained. It was then coated with the syrup, diluted with three parts of water, and dried. After exposure, the plates were washed with water, and then developed with the usual pyrogallic acid developer, to which a few drops of nitrate of silver solution had been added. The process was capable of yielding excellent results, and had many followers. The raspberry syrup was not a sensitising agent; it was simply a preservative. Although the raspberry syrup and other processes may strike present day workers, from their titles, as being strange, there were many others that were similarly curious. For example, there was the "golden syrup process," the "beer process," the "tea process," the "coffee process," the "morphine process," the "sugar process," the "malt process," all of which were claimed by their introducers as being better than any other. As a matter of fact, they were all capable of yielding capital negatives. The late Mr. J. Traill Taylor, at one time, was an advocate of the coffee process, which he worked very successfully. Now in all these processes the different substances acted as much mechanically as chemically, by preventing the collodion film, in drying, from assuming a horny and impermeable condition to the developer when it was applied. Some of them, however, which contained tannin and other substances of a like character acted also as organifiers, and aided in obtaining density and other advantages. Although some of these ancient processes, in the present day, may be held up to ridicule, they were very serviceable in their time, and, what is more, negatives were taken with them that would compare well with modern ones for quality, though not with sensitiveness or with convenience in working.

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The Making of Enlarged Negatives. So much misconception prevails with regard to the amount and cost of apparatus requisite for the making of enlarged negatives that any hints and ideas tending to simplify matters are always to be welcomed. In this connection a short description of a simple arrangement erected by an amateur may catch the eye of, and be of service to, several readers of these columns. The degree of enlargement is only moderate, being from half, and an occasional whole, plate to 15 x 12; the arrangement of apparatus is briefly as follows, premising that an upstairs room is available, a room not habitually devoted to the purpose, but which may on occasions be darkened. The owner's one and only camera, a taper bellows front focussing camera, was set up in reverse direction opposite an opening in the window, its lens pointed into a plain deal box; so far, of course, we have the usual thing, or, at any rate, a state of things which often occurs. The plain wood box, heavy and cumbersome-looking, has been cut, altered and shaped to resemble a camera, being $19\frac{1}{2}$ x $16\frac{1}{2}$ at the back, with a length of 16 inches tapering to 10 x 8. This camera, as we may term it, is set up on one of its narrow sides, the front supported by a wedge of wood corresponding in thickness to the body of the camera, the whole set up on, and screwed to, an equally stout base board. The apparatus being placed on a level table, the back of the large camera and the focussing screen of the field camera are parallel. To revert to the box camera, the front edge of this has a fillet of wood running all round it, and there is provided a trebly thick black twill sleeve, one end of which is made large enough to stretch over the fillet or collar afore-mentioned, the other end being drawn up to embrace the lens body. Two points in the arrangement remain to be mentioned. These are that the black sleeve is provided with a supplementary sleeve let in at one side, the object of which is to admit the hand for the regulation of the diaphragms or the removal of the cap during an exposure; and with regard to the second point, this relates to the plate-holder. Dark slides are costly articles, particularly when of large size, but printing frames are within reach of most pockets, and our amateur has a 15 x 12 frame, neatly fitted with a pull-out shutter, which after serving its purpose in the enlarging apparatus, turns afterwards to its legitimate purpose as a holder for the negative during the printing process. Now it seems to be a very easy thing to do to make this alteration; fretwork wood, three-ply in panels, 18 inches wide, suit the work

admirably. A shutter can be made, running in deep wide grooves, which will most effectually prevent light entering, the dry plate is protected at the back by being covered with a carefully cut piece of black pilot cloth, but of course the frame is not intended to be exposed unduly to strong daylight. The stout build of the box camera is also a safeguard; the frame is buttoned up in a recess against a broad shoulder, covered with velvet, and the aperture at top through which the shutter is drawn, is also deep, slightly V-shaped, and covered in black velvet, and every precaution taken against fog from light entering.

CHRISTMAS AT THE ROYAL INSTITUTION.

It has been the laudable custom at the old Institution in Albemarle Street to mark the Christmas season by a series of lectures "adapted to a juvenile auditory." If we mistake not, it was Faraday who initiated these Christmas lectures, and they have been continued year by year by Tyndall and other well-known scientific men. The task, and it must be a pleasant one, has fallen this year into the very capable hands of Professor J. A. Fleming, who gave to a large and delighted audience on Saturday last the first of a series of six lectures on "Waves and Ripples, in Water, Air, and Æther." Although the discourse was ostensibly for the benefit of the juveniles, the theatre of the Institution contained a preponderance of "children of larger growth," and grey heads were not scarce among them. It is natural that it should be so, for the subject treated of by the lecturer covers a vast field of information, and is one with which the average well-educated man or woman is not very familiar. Besides, there is always the common excuse that the elders are obliged to go to look after the youngsters.

At once it became evident, when the lecturer opened the subject, that he intended to make extensive use of photography to illustrate his remarks. He reminded his hearers how, season after season, they were taken to the seaside, and had opportunities of watching the effects of natural phenomena, which should teach them much that was both interesting and useful. And while he was speaking a series of seascape photographs were thrown on the screen, showing the ocean in its various moods, at first with the waves idly breaking on the beach, and afterwards throwing up mighty clouds of spray as they dashed violently on a rocky shore. These pictures well demonstrated the difference between a calm, a fresh breeze, and a tempest, and formed a suitable introduction to a very clear exposition as to the formation of a wave, its height, velocity, and so on. The experimental illustrations were very happily conceived, and the lecturer had evidently spared no pains to put matters before his audience in the most convincing way possible. Take, for instance, the demonstration that a wave travels faster in deep water than it does in shallow water. To prove this, there were two long troughs, one containing two inches of water, and the other four inches. At the end of each was a floating cylinder bearing a tiny flag. A wave was initiated at the other end of each trough simultaneously, and the quicker-travelling one announced its arrival by the bobbing of the flag on the cylinder, previous to the other flag making its bow. Incidentally, we were told that the height of Atlantic waves, judged from trough to crest, was often much exaggerated. Forty feet in height was certainly the maximum, and this height was most rare. The average would be something more like twenty-five feet in height. Ripples on water were shown in a very beautiful manner by employing a small tank, with a glass bottom, upon which drops of water were thrown from a small pipe, the image of the entire contrivance being thrown upon the screen. In this way, by altering the position of the pipe, the phenomena of reflection, refraction, and interference of waves were very finely illustrated.

Of course, the well-worn illustration of a stone thrown into a pond and the resulting disturbance of the water could not be avoided, but the action was analysed. And here again recourse was had to photography as being the only means by which such analysis was possible. These pictures were taken by the aid of an electric spark which was supposed to have a duration of not more than the one-hundred-thousandth of a second. In the first of these the stone is seen just entering the water, a small dark mass in the centre of a rosette with puckered edges. In the next picture the stone has disappeared, but the rosette of water has taken a more cup-like form, and is edged with little knobs like a coronet. This coronet is still more accentuated in the third photograph, for the knobs are on the point of breaking off into vagrant drops of water. The next photograph revealed a new wonder. Owing to the persistence, as well as to the resistance of the water, a stem shoots out from the centre of the rosette, which in the succeeding picture waxes so thick that the lecturer likens the form to that of a bedroom candlestick, of which the rosette forms the base. Next we see how this stem is broken up into fragmentary drops, until only a single drop is seen in the centre of the rosette—a bird's nest with one egg in it. This drop, in the next picture, altogether disappears, and there is nothing left but a scar in the water, from which the familiar concentric, expanding waves in a pond proceed. Another series of photographs were of the snapshot order, taken with a hand camera from a boat, showing the disturbance caused by throwing a brick into water.

But Professor Fleming had not yet done with photographs, for he showed a very beautiful series, representing ripples on a tank of mercury; ripples caused by a tiny stylus affixed to one prong of a vibrating tuning fork. Here photography gives the very finest results, for the rippled quicksilver is broken up into scintillating lines which reflect the light with generosity. Two tuning forks, each armed with a stylus, give rise to capillary ripples which are antagonistic to one another, and we have once more the phenomenon of interference most beautifully depicted. It will thus be seen that photography is once more in evidence as the handmaid of science, although in the case before us she takes a minor position as illustrator. The syllabus of the future lectures of the series, the last of which will be given on the 9th instant, holds out anticipations that photography will be again largely resorted to for purposes of demonstration.

Croydon Camera Club.—Direct enlarging on bromide paper by artificial light was the subject matter of the demonstration given on Wednesday, December 18, and no better exponent among the members than Councillor Noaks could have been found for this popular process. Using the club lantern, Mr. Noaks clearly described the various steps required to produce the finished print, and practically demonstrated the process from start to finish in a manner that the veriest tyro could understand. The president (Mr. Hector Maclean, F.R.P.S.) alluded to the appropriateness of the demonstration, having regard to the forthcoming exhibition, and the demonstration on enlarged negatives which had preceded it, and moved a vote of thanks to Mr. Noaks for an instructive evening, which was carried amidst general applause. Mention must also be made of a series of photographs by Mr. L. Kough, exhibited on the walls of the club-room, and which attracted much attention. The above formed the third of the one-man shows of members' works which have been held this season, and comprised a tasteful series of pictorial prints embracing landscape figures and still life. Most of the examples were executed in carbon and none were below the standard of what may be termed exhibition mark, while of the thirty or forty prints, several were of marked excellence. Mr. Kough never allows his "Art" to disguise the medium in which he works. The results are none the less happy on this account, and amply prove that the limitation need be no deterrent to a true artistic expression.

SOME SOUTH AFRICAN JOTTINGS.

NEAR the end of the first year of the twentieth century seems a fitting time to take a glance at the state and condition of photography. Here, in South Africa, we see in a circumscribed space all the developments which are taking place throughout the rest of the world. Circumscribed space, the military will tell you, is anything but the right term to use in reference to this country, but it is quite correct so far as photography is concerned. In and around the seaports, of which Cape Town is the principal, all our civilisation, art, science, and commerce are centred. American and foreign enterprise are on the *qui vive* for the inevitable opening up, and meantime the military, with their friends and relations, bring us into touch with the outer world, more especially the British part of it, in a way that it has not hitherto experienced. The latest wares of the European market are brought to us; we no longer have to wait until we hear of them and ask for them. Roused by the war fever, the artist looks towards this country as an hitherto unexplored field for the exercise of his talents. The commercial man introduces to us all the latest tricks of trade to assimilate with our own native "verneuckery."

After such a termination to my opening paragraph, it is only just that the hand camera business should receive first attention, although whether it is most cheater or cheated is debateable. The kodak furore during the last year or so has been irresistible. Not only every newspaper correspondent, but nearly every officer in the army (*pace*, Mr. Censor, I am a loyal subject, and I may surely comment on one of your most amiable weaknesses?) has brought out with him some form or another of hand camera, not merely for the pastime of himself and friends, for each and every one of them is going, sooner or later, to write a book and give his enemy a chance, and each one of them is going to illustrate his own book with his own photos plus a little trifling help from the professional artist who has to stay at home. I have seen some of them—the original foundation illustrations, I mean. I trust some day I may compare them with the completed article. How interesting that will be! The demand for cameras here has been very brisk, and the demand was added to by the civilian population on the visit of the then Duke and Duchess of York. On the eve of their arrival nearly every camera on the market had been bought up. Then a panic set in, which might have terminated in a riot on the part of our most loyal citizens. It had been announced that no cameras, not even kodaks, were to be introduced into the enclosed areas without special permission—a very reasonable edict, as three-parts of those who attended, and only wanted to see, objected to the obstructions which would be created, even by the snapshotter, on the part of the remaining fourth. But on the eve of the arrival, lying Rumour—if, indeed, she lied—said that all hand cameras were to be suppressed, even in the streets, during Royalty's visit. Some of the leading firms went to Government House to inquire, and protest if necessary, for, after all, the hand camera is not a handier vehicle for dynamite and infernal machines than a luncheon basket. If there had been prohibition of snapshotting contemplated—which is most unlikely, considering the interest which the Royal Family take in photography and photographers—the reply from headquarters was reassuring. God bless the Prince of Wales, and the Princess, too! But on Sunday, August 18th, photographers were in full force, taking the arches and decorations of the city. It was then apparent how popular photography as a pastime had become. The dealer in plates, chemicals, and cameras reaped the profit. The professionals lost rather than gained, so far as the taking of the decorations went. The older firms, who knew their Cape Town best, let that part rest. The gain to the professionals lay in the additional sittings they got from their clients, who donned what were probably the most expensive costumes in which they were ever enrobed. The Royal visit is now ancient history here, but, seeing that the home photographic papers occasionally seize on some scrap concerning it, I may be pardoned for these few words on the subject.

From the hand camera to the photographic exhibition opened to-day at the Y.M.C.A. Hall is a far cry; yet the transition is a natural one; in fact, it is the main reason why the present words are being penned. The question I would put, in all seriousness, is: Is the hand camera really killing serious work amongst amateurs? I know this question is not a new one, but never has it been brought so forcibly before me as it has to-day. It is a long time since we had an exhibition here, so that the condition that old pictures were not to be entered for competition does not enter into any explanation of the undoubted fact that the exhibition is not an eminent success. Judging only from the number of exhibits, it is decidedly a poor one. Nor can the "conscience scruple" bring us any help, for though the South African amateur is not averse to flooding the statoners' shops with Christmas cards, that fact does not deter him from claiming amateur status. The exhibition in question was well organised and well advertised. The prizes and medals were valuable, and though presented by Cape Town tradesmen, a perfectly open hand was given the committee. The shop was not thrust unduly forward; in fact, the only mistake made was in advertising that there was a chance of additional prizes if the favoured pictures were taken on a certain brand of plate and the same duly notified on the frame

As for the quality of the exhibits, the work is decidedly good, though not, on the whole, up to English standpoint. Here and there a little gem which would make a prominent point on any wall in any part of the world, the majority of the exhibits showing serious, painstaking labour of the mediocre order, the actually bad exhibits very few in number. Yet what a disappointing exhibition on the whole when considered with the number of amateurs here, and, more remarkable still, the honours having been carried away mostly by old names such as Edwards, Steer, and Fuller. A brilliant exception is Mr. G. Campbell-Dickson, comparatively a newcomer here, who will be heartily welcomed. In the opinion of the judges, he bears off the palm, and few will, on the whole, be prepared to dispute the judges' decision on examination of the work. Of the classes—for the awards were given for various classes—the instantaneous, the enlargement and the panoramic appealed to the hand camera holder. This individual, although not absent, does not show to any conspicuous advantage. As for the panoramic exhibit, it is all of the joined-on order; a bit faulty, maybe, as all such work is apt to be, but not uncreditable on the whole. The work of the panoramic hand camera is absent, although there are a number of these instruments in South Africa. Their mechanism, however, is all, more or less, out of gear, and that may account for it. Speaking of panoramic pictures, the photographic world here has been enjoying a rare laugh at one of its prominent professionals. Take two pictures with a railway line in the foreground, for instance, and join them. You will get an angle at the junction instead of what should be a straight line. Take a building, or a line of soldiers, or a street pavement, or the shadow of a lampost, etc., etc., on the joined-up-panoramic system, and the effect may be bizarre. The professional is often placed in an unfortunate position. He cannot refuse a job, and often has to accomplish it by a *tour de force*. There is nothing, however, to compel him to put it in his showcase.

The weak point about this exhibition, and, in fact, the weak point about most South African photo exhibitions, is the small amount of attention given to the formation of pictures in which figures appear. Two valuable prizes offered by the local papers elicited but a small number of competitors, and their

work was very weak in quality. In single figures the Cape Town amateur is capable of turning out some very fine work. One very favourite subject is to pourtray some good-looking Malay woman with her picturesque costume.

One would think that, with so many snapshotters and more serious amateur workers, the professional would have little to do. Such is far from being the case. The times are not piping ones for the assistant, the artisan of the craft, as it were. There are too many of them crowded down to the seaports, and they practically pay the high rents which their employers have to disburse. But trade is booming. Although one-half of the white inhabitants of the country are hard up, and even in distress, there are a large number rolling in prosperity, due to the war and the money the British taxpayer has brought into the country; hence they can afford to pay for luxuries. The influx of photographers from the Transvaal and Free State has led to no cutting of prices. They brought a considerable *clientèle* with them, and khaki did the rest. The principal firm started with Johannesburg prices, and has since even raised them. Competition with new firms has helped rather than hindered the old-established firms, some of whom were complaining of poor business a few years ago. The work turned out is of a better character all round. The platinotype picture is making great headway here. The price charged is greater than could be got for the old silver print, although the expense cannot be much greater. The initial cost of material may be greater, but the process being as simple to work, even simpler, than that despised iron process, the blue print, the saving in time and wages must be credited against the cost of the paper. Carbon never has made any headway here; climatic conditions have been very much against it. That good work may be accomplished by its means was shown by Mr. E. J. Steer at the exhibition aforementioned. It is doubtful, however, whether any Cape professional will ever take it up seriously. The process requires more highly skilled labour than any photographer here will be willing to pay for. A hard negative from which may be turned out the biggest pile of prints under the blazing South African sun is what appears to be striven after.

Photographic business here may be said to be flourishing all round. What its condition will be when the ferment subsides and the affairs of the country take their normal course we shall see when that time comes. Doubtless, prosperity will continue. What we want badly is steadier improvement in the amateur ranks and a greater interest in the purely pictorial. That must come very soon, for the present slackness is probably due to the diversion of the interests of the camera holder into the depicting of scenes of incident and excitement.

C. Ray Woods.

Cape Town, December, 1901.

Liverpool Amateur Photographic Association.—The eighth ordinary meeting of the present session was held on Thursday, December 19, at the rooms, Eberle-street. There was a large attendance of members, with Mr. P. Lange in the chair. The business included the election of several new members. Mr. F. W. Saxby gave a most interesting lecture on "Microscopic Photography." In the first part of his lecture Mr. Saxby gave the history of a spider's web, showing, by means of numerous very fine lantern slides, the methods employed by the spider in the weaving of the web, its repair in case of damage, and in dealing with its prey when caught in the meshes. The second part of the lecture dealt with the marvels revealed by the micro-polariscope, Mr. Saxby showing a number of slides of crystals seen through the instrument. The forms taken by the crystals were of the most beautiful nature, many of them calling forth enthusiastic applause from the audience. Mr. Saxby prefaced his remarks on the polariscope with a description of the instrument, and by means of a diagram on the screen placed before his audience in the most lucid manner possible one of the most difficult to explain of all optical problems.

Thomas Illingworth & Co., Limited, registered by Helliwell & Co., 51, Aldermanbury, E.C., with a capital of £20,000 in £5 shares (1,600 preference). Object: To acquire and carry on the business of a manufacturer of photographic papers, dealer in photographic materials and utensils photographic enlarger and printer, &c., carried on by T. Illingworth as Thomas Illingworth & Co. No initial public issue. T. Illingworth is permanent managing director. Remuneration, £500 per annum.

THE USE OF THE STEREOSCOPE IN MEDICINE.

[Abstract of a paper read before the New York State Medical Society, October, 1901, and reprinted from "The Stereoscopic Photograph" for December.]

The most important use of the stereoscope in the practice of medicine is that in connection with squint or "cross-eye." In such eyes the faculty of single binocular vision is in abeyance, due to the fact that the eyes are not used together, and also to weak or poor vision which usually obtains in the squinting eye. Even in cases where there is not a manifest squint, but only weak muscles, and in cases where the vision is much weaker in one eye than the other, from whatever cause—an error of refraction, opacities of the media, etc.—where binocular vision is difficult, the stereoscope is of the greatest help in strengthening such eyes and maintaining single vision with the two eyes at once. Again, in cases of squint where the eyes have been operated upon but not quite straightened, the stereoscope is of much service in completing the cure and developing true binocular vision. Although the stereoscope was invented in 1833 by Wheatstone, and its use explained more or less fully by him, Brewster, Carpenter, and others, it was not taken in a serious way at all by the public, who considered it simply as a toy for amusement. The medical profession held the instrument in about the same esteem as did the public at large. The laity, or many of them, at least, got the mistaken idea that the stereoscope was often injurious to the eyes; especially was this so if the eyes became tired after using the instrument for a little while. They did not stop to consider that the fault might be in their own eyes, due to a lack of proper adjustment of the focus in one or both eyes, or to maladjustment in the movement of the eyes, or to faulty direction of them. It was not until Javal, of Paris, began to investigate the causes and cure of squint, in 1871, and brought the stereoscope to his aid in the correction of this deformity and the restoration of true binocular single vision in these cases, that the stereoscope was appreciated for its true worth in medicine. Von Grafe, also, was one of the earliest investigators to appreciate the value of the stereoscope in such cases, and he regarded stereoscopic vision as the crucial test in a successful cure of squint. In squint, but one eye is used at a time, the other being turned inward towards the nose, convergent or outward, towards the temple, divergent, respectively, as the case may be. At times the eyes may also deviate in a vertical direction. Inasmuch as the condition in squint is that one eye only is brought into use at a time, binocular vision is, of course, impossible, since binocular vision necessarily means the use of both eyes at once. Furthermore, in almost every case of squint there is some error of refraction in one or both eyes, with the error usually more pronounced in the squinting eye. In convergent squint, we have, as a rule, far sight or hypermetropia present, with astigmatism often also as a complication. In divergent squint, where the eyes turn towards the temple, near-sightedness or myopia is usually present, and astigmatism also in addition. It is altogether essential, therefore, in the treatment of squint, first to fit the patient with the correct glasses. In so doing the focus in each eye is made more nearly equal, the images on each retina made brighter and more nearly equal, and the strain taken off of the focusing muscle.

Three steps are necessary in bringing about single binocular vision: first, a *simultaneous* perception of the images of the object in the two eyes; second, *fusion* of these two images into one; third, perception of *relief*, that is, true *form perception*. For all three purposes the stereoscope is of the greatest service. Special stereoscopes have been made for training the eyes afflicted with squint; also special pictures or views made to be used in such cases. Javal, George J. Bull, Prestly Smith, R. H. Derby, C. Worth, and several others have invented special stereoscopes. Some of these stereoscopes are so constructed

that the distance between the eye-pieces can be easily changed so as to fit the eyes of any observer; also in some of them the eye-pieces can be set to suit the varying degrees of squint; and in some of them the illumination on the two sides can be varied. Javal and Bull, of Paris, have invented a stereoscope which has as many as five movements, while the Derby stereoscope is so arranged that the half-views on the card, by a simple screw arrangement, can be moved both in a lateral and vertical direction. In regard to the distance between the eye-pieces, it is essential that it should correspond closely with the distance between the centre of the pupils of the eyes. If the eye-pieces of the stereoscope are wider apart than the eyes, the rays of light pass nearer the edges of the refracting prisms and are more strongly refracted than when passing through the centre of them, with the result that the images of the pictures on the card are too widely displaced, so that the eyes cannot bring them back to their place of union and fuse them into one, half-way between the two pictures on the slide. Or, if the eyes do succeed in fusing the pictures, it is by a great strain on the convergence, and this is painful and, besides, injurious to the eyes. Again, if the eye-pieces of the stereoscope are closer together than the eyes, the two pictures are not displaced or separated widely enough; and, again, the fusion of the two pictures into one at their proper place of union, half-way between the two pictures on the card, is made difficult or impossible. The average distance between the pupilary centres in the adult is 2½in., and this should be the distance between the eye-pieces of the stereoscope where they are stationary. For ordinary stereoscopic views this is accurate enough, but for special practice a chargeable distance between the eye-pieces is desirable. The object in having the stereoscope so arranged that the illumination of the two sides can be varied is to make the images in the two eyes more nearly equal in brightness and definition, when the eyes themselves are unequal in visual perception. For instance, if one eye has poor vision and, consequently, dim images, while the other eye has good vision and bright images, it is difficult to fuse these two images of different intensity into one and have single vision, whereas, if by dimming the illumination in front of the better eye until its image is more nearly equal to that in the poor one, it is much easier to fuse these images, which are more nearly alike.

Concerning the change in the angle of the eye-piece, it is desirable to have such an arrangement where the eye squints and the images for the two eyes are thrown wide apart and cannot be fused unaided. However, if the angle of the eye-piece can be changed so as to bring the images of the object on the macula of each eye at once, often the images are fused as one, and afterwards the eye-pieces can be gradually turned back to a correct position, as for eyes that are straight, encouraging the eyes to turn with them. With much practice single binocular vision is greatly stimulated in this way. Sometimes, instead of having the eye-pieces change their direction, the card with the double picture on it is divided vertically in the middle, and so arranged that the two pictures can be approached nearer to and further apart than for normal eyes, and in this way fusion of the two images can be effected. As a rule, the first card we place in front of the eyes in squint cases is one with simply a round black dot on each side of the card. The card is a sliding one, or the angle of the eye-piece of the stereoscope must be one that can be changed, so that the dot can be placed in the visual line of each eye. If the patient succeeds in fusing these simple round dots, especially after varying the distance between them slightly, we then substitute more varied figures, as truncated cones or pyramids, and let him fuse these. To be sure that the patient is really fusing the images of the two eyes, and not suppressing the image in one eye, it is necessary to add small distinguishing marks to the right and left picture respectively. If the patient sees the object as one, with both distinguishing marks present, we know he is fusing the images; but if with only one of the distinguishing marks present, then we know he has suppressed one of the images.

Many people use but one eye at a time, and are totally unaware of the fact, thinking that they are using both eyes together. They see, but do not see perfectly. A striking example of this occurred in my practice this past winter. A young minister, thirty years of age, had a cross-eye which was operated on when he was eight years of age and almost straightened, but not quite so. The eye was so nearly straightened that no one could ordinarily detect the cast in it; and he himself thought he was using his eyes together until I put the stereoscope before them, when he discovered he saw double. After one week's practice with the stereoscope he saw objects singly, perceiving for the first time the correct form of objects in their third dimension distinctly. It is unnecessary to say he was highly gratified with the result. While this is a striking case of its kind, it is not an uncommon one. Another use for the stereoscope in medicine is for the illustration of pathological specimens. By means of the stereoscope these specimens can be made to stand out in relief, and in this way a much better idea of their nature and true form can be obtained. An instrument called the verascope is used for this purpose also, which is, in fact, a stereoscope in which the views or specimens are seen by transmitted light rather than by reflected light as in the usual stereoscope. In prescribing stereoscopic exercises in cases of squint, care should be taken that the patient gets a suitable stereoscope. The special stereoscopes in which the distance between the eye-pieces can be changed and the angle varied to suit different degrees of squint are the best. Unfortunately, because of their high price, they are many times beyond the reach of patients who need them most. Where the special stereoscope cannot be had, the ordinary stereoscope with the sliding views, in which the distance between the two pictures on the stereoscopic view can be varied, is the next best thing. For ordinary stereoscopic exercises, in cases where there is no actual squint, the ordinary stereoscope, in which both the special views and the ordinary views can be used, answers all purposes.

In conclusion, it is important to notice that, as medical practitioners, we have, in the stereoscope and its accompanying views, most valuable auxiliaries. If we were called upon to prescribe for our patients an optical exercise which was irksome or mechanical merely, or even one that was devoid of any special interest to them, they would not be inclined to use it with the persistency and faithfulness the conditions might require, and hence we might despair of effecting a cure, at least, in a large number of instances. But the case is far different, since in the stereoscope and views we have one of the most fascinating and instructive methods conceivable, a method of representation that is marvellously realistic, since it shows objects life-size and in three dimensions. Whatever the patient's intellectual bent, be it history, art, travel, or science, we have here a means of gratifying it, since special sets of stereoscopic photographs have been prepared representing all the leading countries of the world, and an interesting guide-book accompanies each set, which furnishes a vast deal of valuable information in regard to the views. To be asked to view such remarkable representations of famous persons and places cannot fail to be a source of pleasure as well as of profit to our patients. You may not be aware of the fact that the stereoscope is used to teach history, physical geography, and the sciences. For instance, classes in history are given certain subjects, city or country, to read up on, and at the same time stereoscopic views representing historical places, as temples, palaces, courts, cities, etc., of such countries, and of distinguished persons who have helped to make its history, together with different types of its population and its animal life, are placed before them. So in the study of physical

geography, the different formations of the land's surface and strata can be shown better by means of stereoscopic views than in any other way, except by actual visits and direct inspection. The stereoscope is also used to advantage in the study of natural history, in architecture, in engineering, and in sculpture, specimen stereoscopic views being given to the students to study in connection with the reading matter. In this way the class-room work is rendered wonderfully interesting, and the subject becomes a live one, a present reality. The Government uses stereoscopic photographs for purposes of instruction in the military academy at West Point. What is being done so largely elsewhere should be utilised even more generally than heretofore in the medical colleges of our land, for there is no better way of giving the students a knowledge of anatomical and pathological conditions, apart from the realities themselves, than by the realistic representations which are afforded us in the use of the stereograph. A library of medical stereographs should be in every medical college. I have simply attempted to give an outline of a subject which in itself is so vast and inexhaustible that to do more would require a large volume. If I have intimated, even in a very vague and general way, the boundless possibilities that are wrapped up in the stereoscope and stereograph, and especially if I have brought to your notice, as physicians, a method that has proved invaluable in my own practice, and shall in any measure be instrumental in bringing you to utilise the same, the purpose of this paper shall have been accomplished.

A. Edward Davis, A.M., M.D.

PHOTOGRAPHS OF GEOLOGICAL INTEREST IN THE UNITED KINGDOM.

[*Twelfth Report of the Committee, consisting of* Professor James Geikie (*Chairman*), Dr. T. G. Bonney, Professor E. J. Garwood, Dr. Tempest Anderson, Mr. Godfrey Bingley, Mr. H. Coates, Mr. C. V. Crook, Mr. J. G. Goodchild, Mr. William Gray, Mr. Robert Kidston, Mr. A. S. Reid, Mr. J. J. H. Teall, Mr. R. Welch, Mr. H. B. Woodward, Mr. F. Woolnough, *and* Professor W. W. Watts (*Secretary*). (*Drawn up by the Secretary.*)

The committee have the honour to report that during the year 241 new photographs have been received, bringing up the total number in the collection to 2,896. In addition to this, three prints and three slides have been given to the duplicate collection, making a total of 247 photographs received during the year. A scheme showing the geographical distribution of the photographs is appended. There are no new counties on the list, but the following counties are now much better represented than hitherto:—Cumberland, Derby, Durham, Lincoln, Norfolk, Northumberland, Wiltshire, and Pembroke. Cambridgeshire continues to share with Rutland and Huntingdon the distinction of being unrepresented in the collection. There are three Welsh counties unrepresented—eleven in Scotland and fourteen in Ireland. As Brecknock, Dumbarton, Rossshire, Wicklow, Kilkenny, and Waterford are amongst these counties it is evident that the work of the committee cannot yet be considered complete. To this year's collection the most noteworthy accession is Dr. G. Abbott's set of photographs of sections and specimens illustrating his study of the remarkable concretionary structures exhibited by the Magnesian Limestone of Durham. Another important contribution is a beautiful series of views illustrating problems on physical geography and geology in the Cheviots, taken by Mr. G. Bingley and Mr. Hastings. The former also sends photographs from Yorkshire. Mr. Coomára-Swámy has taken photographs in Lakeland and Wiltshire, and Mr. Monckton in Dorset, Surrey, and Berkshire. Mr. A. T. Metcalfe contributes an interesting series of glacial photographs from the Norfolk coast, and a set illustrating the volcanic vents of Derbyshire recently described by Sir Archibald Geikie. The Hull Geological Society and the Croydon Microscopical and Natural History Club send some local photographs, and the members of the North Staffordshire Field Club also continue their contributions. Mr. Jerome Harrison sends some exceptionally beautiful and interesting pictures of drift deposits and of striated boulders, of glacial phenomena about Snowdonia, and of surface creep. He also sends illustrations of Palæozoic and pre-Palæozoic rocks in the Midlands, while the Uriconian rocks of Shropshire have been photographed by Mr. Buddicom as well.

The committee notice an increasing tendency on the part of contributors to send in enlarged photographs. If the enlargement shows details not easily visible on the originals, and if they are sharp and clear, this is an excellent thing. But unless this is the case enlargements do not appear to possess any advantage over the smaller photographs; indeed, rather the reverse, while they occupy considerably more storage room. "Fuzzitypes" have no precise functions in illustrating geological phenomena. The committee would again call attention to the insertion of a scale whenever possible into the photographs; not an ordinary foot-rule, the divisions of which are invariably invisible, but something of average size which cannot be easily mistaken—the human figure, a walking-stick, camera-case, hat, pencil, or coin. The additions to the duplicate collection number only six. Several others are in hand; but it is thought advisable to hold them back for a time in order to get complete sets on certain subjects. The duplicate collection has been sent to natural history societies at the following places:—Dulwich College, Halifax, Haslemere, Highgate, Accrington, and Woking. The little set of photographs which was framed for exhibition at Paris in 1900 is now displayed in the Museum of Practical Geology at Jermyn Street. The silver medal awarded to it, or rather, the bronze copy thereof, will doubtless be received at some future time. The scheme for publishing a selection of typical geological photographs is progressing, in spite of a series of unforeseen delays. The first batch of twenty-two prints and slides will shortly be issued, and the preparation of the second and third batches will be proceeded with. Applications by local societies for the loan of the duplicate collection should be made to the secretary. Either prints or slides, or both, can be lent, with a descriptive account of the slides. The carriage and the making good of any damage to slides or prints are expenses borne by the borrowing society.

OBITUARY:

THE LATE LOUIS WERNER.

We regret to learn of the death, at Dublin, on December 12th, 1901, of Monsieur Louis Werner, in the seventy-eighth year of his age. The deceased gentleman was born in the department of the Upper Rhine, and began his art studies in Strasburg. At Paris, in 1842, he successfully competed for admission to the Ecole des Beaux Arts, where he studied under Delaroche, Horace Vernet, Ingres, and other painters.

In 1854 he settled in Dublin as a portrait painter, and although he did not himself practice photography as a profession, he eventually, in 1864, founded the well-known firm of Werner & Son, photographers, a business which he conducted until the year 1885, when he transferred it to his son, Mr. Alfred Werner. The business was carried on quite privately. A frequent exhibitor at the Royal Hibernian Academy in the fifties and sixties, the late Monsieur Werner enjoyed considerable vogue in Ireland as a portrait painter. The deceased gentleman, who was much esteemed for his high personal qualities and is regretted by a large circle of acquaintances, enjoyed the friendship of J. F. Millet, Gustave Dore, and many other renowned artists of the last century.

To Mr. and Mrs. Werner, who are so well known and respected by many of our readers, we tender our sympathies in their bereavement.

THOUGHTS ON THE NATURE OF THE LATENT IMAGE. * IV.

A NEW series of experiments concerning the action of various reagents upon the latent image in respect to silver bromide, at last gave results which seemed to promise a modification of the theory of chemical sensitizers and likewise the idea that bromide is liberated during exposure.

It is generally known that oxidizing agents, or substances used to promote the action of a halogen, either destroy the latent image or reduce it, and it is also known that these substances reduce the sensitiveness of a gelatine-bromide plate very considerably. All these substances exert action upon the plate by affecting the permeability and other qualities of the gelatine, and cannot be removed by washing. Experiments with gelatine plates as to their effect upon sensitiveness are therefore valueless, and the results must be looked upon as distinct from the action of these substances upon the latent image. This difficulty is absent in the case of collodion emulsions, as the medium is quite indifferent to many of these agents and does retain them, so far as can be ascertained.

A.—The following agents for introduction of halogen by means of oxidizing agents were used:—Chloride of iron, chloride of copper, persulphate of ammonium, permanganate of potash, ferricyanide of potassium, and chromic acid. A 1 per cent. solution of these substances was used, and the chromic acid solution was prepared by adding 10 c. c. of diluted sulphuric acid (1:5) to 200 c. c. of a 1 per cent. solution of bichromate of potash. Normal exposures were given in each case, and the baths were allowed to act for one minute upon the plate after thorough washing.

I.—Chloride of Iron.—The latent image was destroyed. If used before exposure, the sensitiveness was reduced to one-sixth or one-eighth.

II.—Persulphate of Ammonium.—(The solution was not acidified, but was allowed to stand for 24 hours. This is known to be necessary for reduction with this substance, when the preparation is quite neutral.) Persulphate was found to be much less active than chloride of iron. The latent image was not completely destroyed, but the negative looked as though it had received only one-tenth of the exposure. When used before exposure, the sensitiveness was only reduced by half.

III.—Permanganate of Potash.—This acts peculiarly, the result being the same whether used before or after exposure. In both cases only slight traces of the image remain.

IV.—Bichromate of Potash and Sulphuric Acid.—(Neutral bichromate did not exert any appreciable action either before or after exposure.) The latent image was completely destroyed. The bath reduced the sensitiveness to about one-fifth.

V.—Chloride of Copper.
VI.—Ferricyanide of Potash.
These acted much more strongly upon the latent image after, than before exposure.

B.—Halogen Absorbers.—If a plate coated with collodion emulsion is dipped for one minute in a 1 per cent. aqueous solution of hydroquinone and then thoroughly washed (the effect is the same whether the plate be washed for 10 minutes or 3 hours) the sensitiveness is doubled, and there is no trace of fog. The same effect is also produced by Adurol, which is a substituted halogen product of Hydroquinone. On the other hand, there is no observable increase of sensitiveness with pyrogallol, metol, gallic acid, and sulphate of iron. Nevertheless, it seems to be merely a question of time in the case of these substances to obtain the same effect, for by adding an alcoholic solution of pyrogallol to a certain quantity of emulsion and washing it after digestion for several hours, similar action is observable.

Precisely the same effect was observed with narcotin, concerning which Von Hubl had noticed that its action as a sensitiser does not visibly assert itself until some time after.

These facts seemed to be of considerable importance in connection with the theory of sensitizers. According to H. W. Vogel, a chemical sensitizer is understood to be a substance which absorbs bromine, and, by its predisposing affinity for that substance, facilitates its liberation during exposure.

If these experiments show that the increase in sensitiveness also occurs after these sensitizers have been for more or less time in contact with the unexposed silver bromide and then completely removed from the film, a very different conception of the nature of silver bromide, as it exists within the photographic film, seems highly probable. Before proceeding further, I must endeavour to remove certain objections.

The old theory of sensitizers would doubtless remain valid if it could be proved that traces of the bromine absorber remained in the film notwithstanding careful washing. This, for instance, is actually the case with tannin, which cannot possibly be removed from the collodion film by washing. But tannin is an exceptional substance, whose tenacious, "corrosive" properties are made use of extensively. In the same way that tannin clings obstinately to the film, ferrocyanide of potassium clings to the silver bromide, and not to the film itself. It was also used formerly as a sensitiser. It need scarcely be said that I have tested the substances used as sensitizers to ascertain if they adhere to the collodion or the silver bromide. Hydroquinone, adurol, pyrogallol, and narcotin leave no residue in the film that can be detected. With regard to the analagous action of silver nitrate used as a "sensitizer before exposure" (for it may be thus described), a collodion emulsion, which had been digested for some time with an acid silver nitrate solution, was washed until every trace of silver had been removed, and then treated with strongest nitric acid for destruction of the collodion. The filtrate did not show the slightest trace of silver.

Notwithstanding the impossibility of proving it analytically, the objection, of course, may be made that traces of bromine absorber have remained in the film. But until some kind of proof is adduced, I think this hypothesis is merely dictated by a predilection for the theory of chemical sensitisers.

Some observations concerning so-called "preservatives," dating from wet collodion times, seem to indicate that in those days it was known that the preservatives might be removed from the film without destroying their sensitizing action. Wet plates often suffered from the disadvantage of evaporation of the solvents during long exposure. The concentrated silver solution attacked the iodide of silver and produced irregularities in the film. Abney* recommended washing the sensitized plate (or removal of the sensitizer), and resensitized after exposure (for physical development). The following quotation from that goldmine of the history of photographic literature, "Eder's Handbuch" (Part II., p. 305), also bears upon this:—"Fothergill was the first to observe that preservatives might be washed off a bromo-iodide collodion plate, and that sufficient would be retained to exert action." The mere analogy of the action of substances which part with halogen or oxygen, and which easily permit very delicate chemical reactions being made, also reminds us of the possible influence of substances which have an opposite action upon silver bromide. Chloride of iron, permanganate, chromic acid, and persulphate may be readily detected in small quantities, and are not retained by the film. . . In the same way that my experiments with nitrite and sulphite showed that the sensitiveness of silver bromide suffered very considerably, although every trace of the bromine bath had been removed; so did they also show that plates treated with chloride of iron and permanganate were not affected by a bath of sulphite.

We may therefore look upon it as proved by these experiments that substances which absorb bromine may so affect SILVER BROMIDE that its sensitiveness to light is increased, and that substances which impart halogen or oxygen diminish its sensitiveness.

This contrast, which is most strongly marked on the one hand, in the best sensitizer, silver nitrate, and on the other hand, in bromine, the substance par excellence for introducing halogen, naturally directs our attention definitely to the action of these agents. I have already explained that it is not chemical, but rather physical in its nature. If we look upon silver bromide as a definite, stable substance, there is no ground whatever for the chemical action of bromine upon it, and especially for the opposite action of substances, which, like narcotin, are far from being, in the normal chemical acceptation, active absorbers of bromine. The behaviour of emulsified silver bromide appears to indicate that the substance should be regarded as an unstable, loose compound, in which Ag. and Br. are at least to some extent in a similar state to ions in a solution.

I leave it to expert electro-chemists to consider whether this conception is justified, and will merely add a few other facts, which led me under entirely different conditions to consider the theory of ions in my study of the latent image. In my paper, entitled "Researches Concerning Optical Sensitizers."† I showed that precipitates, such as silver bromide, sulphate of barium, carbonate of calcium, and oxalate of lead, when stained with dyes of the eosin group, are bleached by salts, which have the same ions as the insoluble substances to which the stain has been given.

The use, in everyday practice, of bromide of potassium in development can only be understood by examining the theory of ions. The action of bromide is very remarkable when a solution of the salt is added to silver bromide by precipitation in an aqueous solution. Although pure silver bromide is immediately reduced by the developer without the action of light, no reduction takes place in the presence of a bromide salt.

In the course of my examination of the reasons in favour of a chemical modification of silver bromide during exposure, the theory of sensitizers, which presupposes the liberation of bromine during exposure, had to be taken as the chief argument. In recognising the fact that the sensitizers may be removed from the film and yet perform their function, the assumption that the sensitizer acts as an absorber of bromine during exposure becomes superfluous. Sensitizers only act in the same manner as those agents, such as alkalies and certain alkaloids, which promote the ripening of silver bromide, and which are added to the emulsion for digestion, and then removed by washing.

In what manner these substances act upon silver bromide, it is

* Continued from vol. xlviii. p. 571.

* Eder's "Handbuch der Photographie," Part VII., p. 154.
† "Archiv für Wissenschaftliche Photographie," vol. ii., No. 2.

difficult to conceive, but since all substances which promote ripening are capable of absorbing bromine, and those which part with halogen hinder it, there seems to be reason to infer that a kind of association of the silver bromide compound is present prior to exposure, and that the impact of the rays of light so far promotes it, that the developer is enabled to effect complete reduction.

The fact, that precipitated silver bromide may be easily reduced by the developer in the absence of light, has hitherto been completely disregarded in the theory of the latent image, but it proves in a striking manner that it is quite unnecessary to assume that reduction takes place during exposure. By the comparative experiment of suspending precipitated silver bromide in a solution of gelatine, it is proved that the mere enclosure of the particles of silver bromide by the vehicle is not the cause of the normal emulsified silver bromide being unreduced in the absence of exposure to light. The developer is quite as effective in reducing the silver bromide in a very short space of time.

IT IS THEREFORE QUITE UNNECESSARY TO SET UP HYPOTHESES CONCERNING THE SUBSTANCE OF THE LATENT IMAGE, AS THERE IS NO EVIDENCE WHATEVER THAT ANYTHING BUT SILVER BROMIDE IS PRESENT.

If silver bromide is precipitated in an aqueous solution in the presence of an excess of bromide, and then exposed for three hours to diffused daylight in a flat dish, taking care to keep it moist with water and to completely expose the surface of the bromide by thorough stirring from time to time, it will assume a grey violet colour. It will be evident from the smell of the water covering the silver bromide that it contains bromine, and this may be clearly proved by addition of silver nitrate. The discoloured silver bromide does not yield any silver when boiled in strongest nitric acid, and it does not appreciably change in colour. The product of the exposed silver bromide does not give a clear solution when dissolved in thiosulphate. The greater part goes into solution, but the solution is clouded and greyish blue by transmitted light, which indicates the presence of silver in suspension. The reactions, therefore, indicate that some bromine has been liberated by prolonged exposure to light. If the action of light upon the precipitated silver bromide is watched attentively it will be observed that a perceptible change of colour takes place in a very short time. The silver bromide is at first greenish yellow, but in a few seconds turns green, and then gradually changes to greenish grey. In five minutes the colour is a pure green grey. Up to this point the altered AgBr still gives a colourless solution with this sulphate, and no bromine can be detected in the water.

It appears to follow from this that bromine is only given off after prolonged exposure, and that light is capable of so affecting the colour that it passes through a very long scale of tints in a very short time.

These facts indicate that light merely brings about a different physical modification of the silver bromide, when the exposure is not too prolonged, and that a distinctly visible change in the colour of silver bromide is not a proof that bromine has been liberated. The strongly marked difference in colour brought about by three hours' exposure to light, is likewise quite out of proportion to the minimal quantity of liberated bromine that may be detected, so that the change of colour cannot be set down to reduction alone, but more likely in the first place to molecular change.

I endeavoured to establish a connection between solarisation and the successive changes of colour through which bromide of silver passes when it is exposed to light, and made experiments to ascertain how far the visibility of the image before development went hand in hand with solarisation. For this purpose I exposed very rapid gelatine plates under a negative in a printing frame to diffuse daylight. After exposure the plates were cut in halves. One half was used to ascertain the colour, and the other was kept for development (metol-soda for six minutes).

I.—Exposure: 10 seconds. By red light no change could be detected, but with an incandescent lamp a slight tint could be seen where the plate had been exposed under the clear glass edges of the negative. Upon development a very much over exposed positive was obtained.

II.—20 seconds. By red light no change could be detected. Development produced a peculiar mongrel image, partly positive and partly negative by solarisation. The clear portions of the negative had been solarised, whilst the denser parts of the image produced a positive.

III.—1 minute. By red light there was a perceptible change, but even with this exposure solarisation was not complete.

IV.—5 minutes. The image was completely visible by red light, and a completely solarised negative was obtained.

V.—With an exposure of one hour and a quarter a perfect duplicate negative, full of vigour and almost free from fog, was obtained. It would have been impossible to obtain a better, with the same emulsion, by the usual method of preparing a negative.

VI.—With an exposure of three hours and a half and the same period of development as No. V., there was less vigour than in No. V. From the changes which occur in precipitated silver bromide on the one hand, and emulsified on the other, there would naturally be considerable risk in formulating definite conclusions concerning the chemical changes which are brought about in a solarised dry plate, merely upon the ground of the chemical reactions effected with precipitated silver bromide. Nevertheless, it should be clearly pointed out that solarisation occurs long before any liberation of bromine can be detected. It is, therefore, probable that the product of solarisation may also be regarded as a mere physical modification of silver bromide, and that liberation of bromine, and even the formation of sub-bromide, does not take place until the course of the normal photographic processes, including the beginning of solarisation, has been considerably overstepped. From the experiments I have described it may at least be inferred that the sub-bromide theory should no longer be used as an argument for the possible explanation of reversal.

The knowledge obtained as to the connection between the change in colour of bromide of silver and the reduction which is proved to have taken place, induced me to investigate the behaviour of chloride of silver under similar circumstances. The very complete study, which Scheele made concerning the change chloride of silver undergoes through the action of light, has been interpreted by various investigators in a very different manner. The discrepancies in the results may be explained by the difference in the varieties of the silver chloride, on the one hand, and the widely different quantities of light on the other. A strongly marked change in colour does not by any means imply the liberation of halogen, as we have already shown in the case of silver bromide, and this fact is much more apparent with silver chloride. Ten grammes of silver nitrate were dissolved in 50 c.c. of water, and precipitated by addition of 3.5 grammes of common salt dissolved in 30 c.c. of water. The chloride of silver was thoroughly washed and then exposed in a flat dish to diffused daylight, care being taken to keep it moist and to renew the surface by frequent stirring. In a few moments the colour changed to a blue grey, which finally turned to an intense brownish violet. After four hours' exposure the chloride of silver was collected by filtration and washed. The filtrate, when treated with silver nitrate, was so slightly clouded that it would have been useless to undertake the quantitative analysis as intended. The result agreed with Bibra's observations, that chloride of silver does not lose in weight by exposure to light, and that it "sometimes" can be dissolved in ammonia without forming any precipitate. Other investigators have observed a loss in weight of several units per cent.

I thought it would be extremely interesting to study the action of light upon precipitated silver chloride in the presence of silver nitrate, as it might at the same time throw light upon the theory of chemical sensitisers in relation to the sub-haloid theory (absorption of the liberated halogen and the consequent inception of further reduction, according to H. W. Vogel's theory), and likewise upon the chemical basis of the printing-out process. Some pure chloride of silver was again prepared, and as much silver nitrate was added to it as had been used to form the AgCl. The change in colour under the action of light was watched simultaneously with that of some pure silver chloride. It was at once apparent that the change in colour in both instances proceeded with *the same intensity*, although the shades of colour may differ slightly (pure chloride of silver turns to a brown violet colour, but in the presence of $AgNO_3$, it tends to blue violet). After the same exposure had been given the discoloured silver chloride was filtered and washed until the silver nitrate had been completely removed. Contrary to expectation, it was found that the presence of the silver nitrate had not induced any appreciable liberation of halogen, not to mention the formation of any metallic silver. Upon treatment with strongest hot nitric acid no trace of silver could be detected, and when dissolved with thiosulphate the cloudiness did not exceed that of the chloride of silver exposed without any addition of silver nitrate. I should like to add that upon exposing the $AgCl + AgNO_3$, the liberation of a small quantity of ozone could be distinctly detected by the smell, as stated by Hodgkinson.*

The supposition was shown to be incorrect, that, according to the theory of sensitisers, the liberation of halogen might probably be assisted by silver nitrate, if the silver chloride be reduced in presence of excess of silver nitrate. It may therefore be affirmed, in regard to silver chloride, *that the assumed reduction to sub-chloride, or even to the metallic state, is not promoted in the least by silver nitrate.*

Although it does not fall strictly within the scope of this paper, the question is so nearly related to it that it may not be out of place to give some explanation as to the possibility of bringing this statement into harmony with the fact that metallic silver is formed in the printing-out process.

H. W. Vogel explains the action of $Ag + AgNO_3$, in the printing-out process in the following manner:—"AgCl alone would not give a vigorous image, but the chlorine, which is liberated, immediately forms fresh silver chloride, by combining with the nitrate of silver, which is also present. This is reduced in turn, and the repeated formation and reduction of silver chloride produces a much more vigorous print in much less time upon paper, when nitrate of

* Eder's "Handbuch der Photographie," I., p. 176.

silver is present, than when pure silver chloride alone is used. Hence the use of a mixture of both for the positive process."

According to the experiment we have described above, the explanation of the printing-out process is not so simple as Vogel seemed to think.

In the ordinary printing process we have, in addition to AgCl and $AgNO_3$, the vehicle, the paper, and usually some organic acids. In the case of albumenised paper, the vehicle also contributes to the formation of the image. With gelatine papers the vehicle is also, to some extent, amenable to reduction, but with collodion papers, on the other hand, it is tolerably inactive. The simplest course seemed to be to take chloride of silver without a vehicle. To ascertain the action of citric acid and citrate, the same quantity of silver chloride was taken as above, and the reduction was made after addition of 10 grammes of silver nitrate and 3 grammes of citric acid, or citrate of potash. The mixture was exposed in the same manner as before, and after five hours it was thoroughly washed. The product of exposure was tested for metallic silver by treatment with hot concentrated nitric acid. It was found that the presence of free citric acid had promoted the reduction of metallic silver to an appreciable extent, but that the quantity was very small in comparison with the large amount of metal obtained by using the citrate.

This is quite in harmony with general experience. Printing-out papers always give flatter images if AgCl and $AgNO_3$ are used without organic substances that form silver salts. If free citric acid suffices in the case of collodion, the explanation is to be found in the fact that the free acid also forms a citrate with the silver salt in alcoholic solution.

A PARTICULAR ACTION OF THIOSULPHATE UPON THE LATENT IMAGE.

Abney and Wilde discovered simultaneously the valuable property, for photographic purposes, of thiosulphate as an addition to the oxalate of iron developer, or as a preparatory bath, by means of which development with iron might be considerably accelerated. Up to the present little attention has been paid to its theoretical importance. Both Wilde and Abney attached great weight to the fact that, with thiosulphate, the exposure of the plate might be considerably less than when oxalate alone was used. The preference of many photographers, even at the present day, for development with iron, may perhaps be accounted for by the just recognition of the fact that the iron developer, with a preparatory bath of "hypo," "brings out," from the shortest instantaneous exposures, quite as much as the most rapid organic developer, metol.

But however elegant and certain the development with iron and thiosulphate may be; after a little experience has been obtained, the theoretical explanation of its action has been very inaccurate. The behaviour of thiosulphate was quite incompatible with H. W. Vogel's theory of sensitisation, and Vogel, therefore, classified this and some other similar substances under the rubric of "Development Accelerators," stating that they merely shortened the period of development and did not permit of shorter exposures being given, when they were added to the oxalate developer.

The course of my experiments has shown that mistakes have often arisen in the theory of the production of the photographic image by development, through incorrectly locating the effect of a reaction. It could be proved that bromine and other substances conveying a halogen affected not only the latent image, but also the silver bromide previous to exposure, likewise that the so-called chemical sensitizers need not be present during exposure, but that they perform their services by a kind of ripening process before the exposure takes place. It was thus demonstrated that the theory of sensitizers was unnecessary, and with it the principal argument for the idea that bromine was liberated by exposure to light fell to the ground.

As many photographers rinse the plate after it has been immersed in the preparatory hypo bath, it seemed to me from the outset that the action of thiosulphate in iron development could not be looked upon as a mere acceleration of development.

My first experiment was for the purpose of clearly establishing the kind of action brought about by hyposulphite. By varying the exposure and period of development, and using on the one hand the ordinary oxalate of iron developer, and on the other a preliminary bath of thiosulphate of soda (1 in 1,000 with 1 minute's immersion followed by superficial washing) almost identical negatives were obtained upon dry-plates, whether the exposure was 8 seconds and development 8 minutes without the preparatory bath, or 4 seconds exposure and 6 minutes development with the preparatory bath.

The negative obtained after use of the preparatory bath appeared to be even a trifle denser, and was distinguishable by its characteristic brown colour. If 5 and 10 seconds exposure and 5 and 10 minutes development be given, respectively, the negative without the preliminary bath is rather the better, so that the previous figures may be taken as being in approximately correct proportion. From this it appears that with half the exposure the preparatory bath also reduces the period of development considerably, so that Abney's statement, to which we have referred, that thiosulphate permits us to reduce the exposure to one-third, does not seem to be exaggerated, if we develop for the same length of time. Under any circumstances, it is not a mere question of acceleration of development. In the next place, to determine if the presence of thiosulphate during development with oxalate is necessary, a plate was washed for three hours in running water after immersion in the preparatory bath. The action of the preparatory bath was almost as marked as when the plate was merely rinsed, or developed with direct addition of the thiosulphate to the developer.

As this showed that the action of the thiosulphate was a step further removed, I next tried to ascertain if it acted upon the latent image, or upon the bromide of silver even before exposure. Identical exposures were given to two plates. One was kept as a check. The other, as well as an unexposed plate coated with the same emulsion, was dipped in the preparatory bath. Both were washed for three hours. The unexposed dipped plate and a second check plate were then exposed, and developed with ferrous oxalate. By comparison of the exposures upon two check plates, it was found that the favourable action of the preparatory bath was only present *after* exposure, and therefore upon the latent image. The increased sensitiveness agreed with the figures given above. The plate treated with thiosulphate before exposure showed general fog and the image appeared to be rather less exposed than the check plate.

The result of these experiments renders the explanation of the action of thiosulphate more difficult.

We may state here that the solution of thiosulphate, even after being used several times as a preparatory bath, did not exhibit any silver (Reagent: solution of liver of sulphur). It could, therefore, be inferred that a double salt of thiosulphate of silver, difficult of solution, or that silver sulphate had been formed, remained in the film. But this neither explains the difference of behaviour before and after exposure, nor why alkaline developers do not derive any benefit for such a favourable modification of the latent image.

The one-sided nature of the action of thiosulphate, in preparing the way to some extent for the oxalate developer alone, reminds me of the observations concerning alkaline gallic acid, which I published a short time ago*. Alkaline gallic acid does not take part in the process of chemical development, unless metol is used as developer.

Various other substances containing sulphur also act upon the latent image similarly to this sulphate. The action of sulphite of soda is not quite so strong as that of hyposulphite. But that of polysulphide of soda, which was used in the form of officinal liver of sulphur, was very much stronger. A solution of liver of sulphur, in the proportion of 1 to 1,000, decomposes in a very short time, and deposits sulphur. Used in this condition, as a preparatory bath, it augments the capacity for development very considerably and produces a very appreciable amount of fog. Then reaction is so delicate that a solution of 1 in 1,000,000 produces a very marked increase of density in the negative. When the stronger solution, 1 in 1,000, is used the bromide of silver suffers a change of colour, which is distinctly visible in the dark-room, and as it is brownish yellow by daylight, the actual formation of silver sulphide appears to have taken place. Such a change of colour is not observable when sulphite and thiosulphate are used.

It seems very remarkable in using the preparatory bath of liver of sulphur, which actually causes a chemical alteration of the silver bromide, that the increased capacity for development is only observable with ferrous oxalate and not the organic developers.

Thiosinamin, which is known for its solvent action upon the silver haloids, and has even been proposed as a fixing agent, also affects exposed silver bromide when developed with oxalate, but it principally accelerates the development and increases the degree of fog without shortening the exposure. Sulpho-cyanide of ammonium also behaves in a very peculiar manner when used as a preparatory bath (for 1 minute) in the proportion of 1 to 200. In the first stage of development it lays behind the check plate considerably, but it speedily catches up and brings out more detail in the shadows, but at the same time produces a marked amount of fog.

It is worthy of notice that thiosulphate, sulphite, sulpho-cyanide of ammonium, and thiosinamin, are all solvents of silver. But a general hypothesis cannot be based upon this fact, in explanation of the action of these substances, as the polysulphides do not possess this property. The only common property of all these substances is the sulphur they contain.

THE ACCELERATION OF DEVELOPMENT.

If these experiments had shown that thiosulphate and kindred substances were not accelerators of development, but exerted their influence upon the latent image, it would have been possible to prove that ferro-cyanide of potassium, recommended by Himly† as an accelerator for alkaline development, only exerts its influence in the actual process of development. Ferrocyanide is not to be compared with thiosulphate in the extent of its action in iron development. In

* "Photographische Correspondenz," 1900, p. 161.

† "Photographische Correspondenz," 1889, p. 160.

addition to hydroquinone, I observed that ferrocyanide of potash also exerted its influence with adurol, pyrogallol and metol. 50 c.c. of a 20 per cent. solution of ferrocyanide was added to each 200 c.c. of developer ready for use.

On the other hand if the latent image is immersed for 1 minute in a 20 per cent. solution of ferrocyanide of potassium, and after thorough washing developed with hydroquinone and potash, only a very thin image is obtained, which does not strengthen with prolonged development.

* * *

After this digression, if we briefly review the results obtained, we find:—

1. That there is a complete absence of proof of any chemical change in silver bromide, consequent upon normal photographic exposure, as the nascent silver and sub-bromide hypotheses are both without sufficient support, and the theory of sensitizers, as well as the explanation of solarization, upon the assumption of a sub-haloid, both require the presupposition of a chemical change by exposure, and stand upon a weak foundation.

2. As precipitated silver bromide is easily reduced in the absence of light, it is superfluous to presuppose the existence of a chemically modified silver bromide to explain the process of development.

3. Emulsified bromide of silver appears to be in an unstable condition (dissociated, ionised). In this state it reacts upon numerous chemical substances in such a manner (ripening processes and their prevention), that the action of light is facilitated or obstructed. Actual reduction does not occur until the developer is applied.

We thus return again to the old view, that the process of normal exposure merely effects a change in molecular structure. This supposition is really the most comprehensible, if we keep in view the simple fundamental experiment, that the commonest form of silver bromide, precipitated from an aqueous solution, can be easily reduced, without exposure to light, even by substances that are not "developers" (gallic acid, aldehydes). There are numerous instances of molecular change caused by the action of light. Finely divided selenium is converted to the crystalline state by the sun's rays, and selenium is a better electrical conductor when exposed to light, than in the dark (Bell's photophone, selenium photometer). A similar influence upon the electroscope to that of selenium*, has also been observed with sulphur. Crystals of chloride, bromide, and iodide of silver are also reduced to powder by exposure to light**. The relation between photo-chemical and electro-chemical processes to which I have drawn attention, are in special agreement with the observations of Arrhenius***, that the silver halogenides become conductors of electricity when exposed to light. Bredig's**** application of Lenard and Wolf's***** observations, concerning certain substances which appear to throw off a fine dust when exposed to ultra-violet light, may serve as a guide for fresh investigations concerning the nature of the structural change caused by the action of light upon silver bromide.

In my opinion, combined electro-chemical and photo-chemical work, arranged upon a definite plan, is likely to be most successful in giving a deeper insight into the nature of the transformation of the silver halogenides, but in any case further investigation of the nature of the latent image should be more physical than chemical.

Charlottenburg, March, 1901. DR. LUPPO-CRAMER.

* Eder's "Handbuch," I., p. 155.
** Eder's "Handbuch," I., p. 157. "Photographische Mittheilungen," vol. viii., p. 60.
*** Eder's "Jahrbuch," 1885, p. 201.
**** Eder's "Jahrbuch," 1899, p. 365.
***** "Wied. Ann.," xxvii, p. 443.

Exhibitions.

GLASGOW SOUTHERN PHOTOGRAPHIC ASSOCIATION.

This association opened its annual exhibition in one of the rooms of the Y.M.C.A. Buildings at Eglington Toll on Monday. The association, it may be mentioned *en passant* is a real live institution; during the winter season it holds weekly meetings, and these are attended by on an average 60 to 70 members, wind, snow, hail, or rain has no effect; the tramcars—and Glasgow is up-to-date in that line—pass the door, and there the members are for their weekly feast of photographic nourishment. They have classes for beginners, a circulating portfolio, and all the etceteras of an up-to-date society, while we noticed in the list of classes at the Y.M.C.A. the President of the "Southern," Mr. Horn, teaches a class in photography. The exhibition itself is a tribute to the energy of Mr. John B. Haggart, the exhibition secretary, who has practically "run the show," although he promptly admits the ready assistance of the members, who show a *camaraderie* that might well be copied by some of our older societies. The exhibition consists of 504 entries, entered by, the secretary informs us, 150 exhibitors in the open sections and 90 members. The room is too small for the purpose, and unfortunately the catalogue was drawn up before the pictures were hung, as a consequence the members are "wandered" all over the show, and some difficulty is experienced in finding a "wanted" picture, in spite of the large number of tickets which the committee affixed to aid the visitor in his search. This fault, we are informed, is due to the association not obtaining possession of the room in which the exhibition was held until noon of the opening day. Then with a view to getting all the pictures hung, the walls have a rather patch-work appearance; this, we have no doubt, will all be remedied in another year, as the leading members themselves are not fully pleased with their work—but grumbling apart—the Southern have reason to congratulate themselves on the splendid display of work shown. The pictures, following the modern tendency, are inclined to the smaller sizes, there is a scarcity of those very large prints of former days. The lantern slide entries should almost constitute a record, comprising in all 363 slides, and in the open class the judges have got out of their difficulty by awarding three bronze medals (silver withheld) and six certificates. There are several stands of apparatus, etc., on show, a silver medal being awarded to the Bynoe lantern, adjustable for gas, limelight, or electricity, by Messrs. Beck, London. (Judge, Mr. G. S. Bryson.)

The following is the prize list (Judges, Messrs. Tom McEwan, R.S.W., J. Douglas Ritchie, and Wm. Goodwin):—

Open classes:—Class I.—Landscape and seascape, silver medal, H. C. Leat, "Entrance, Little Cloisters, Gloucester" (74); bronze medal, F. H. Read, "Flowery Spring" (82); certificate, J. M. Comrie, "Nibblers" (79).

Class II.—Silver medal, A. Hunter, junr., "Seeking Information" (170); bronze medal, F. Ingham, "Study of a Child" (459); certificate, W. B. Mercier "Penitence" (462).

Class III.—Lantern slides (sets of three)—Bronze medals, H. Wild, "Firelight Studies" (205); James Smith, "Openair Work" (207); F. Little, "Mist Effects" (193); certificates, W. T. Furniss, "Architecture" (197); Fred Marsh, "Gasworks" (475); Rev. E. T. Clark (214); Harry Holt, "Openair Work" (181); J. Beeby, "Snowclad Streets" (179); Thos. Kent, "Seascapes" (470)

Class IV.—Stereoscopic work (sets of two)—Silver medal, L. S. Wilks, "A Street in Robin Hood's Bay" (244); bronze medal, A. W. Westrop, "Birds and their Nests" (255); certificate, R. F. Soper "Landscape" (252).

Class V.—Lantern slide, Glasgow, 1901, Exhibition—Silver medal, J. Gray (271); bronze medal, J. Brough (267); certificate, R. C. Dalgity (262).

Class VI.—Novice (any subject)—Bronze medals, W. A. Clark, "North Choir Aisle, Beverly" (478); A. Walker, "Blackadder Crypt, Glasgow Cathedral" (521); certificate, R. Tough, junr., "West Harbour, Greenock" (282).

Members classes:—Class VII.—Landscape and seascape, silver medal, J. B. Haggart, "Towards Evening" (372); bronze medal, "The Edge of the Loch" (353); certificates, R. Lindsay, "Peaceful Waters" (379); J. Baird, "Woodland" (371).

Class VIII.—Portraiture and Genre Studies.—Certificates, J. B. Haggart, "Neebors" (413); D. Linton, "A Bashful Maid" (405).

Class IX.—Lantern slides (sets of three)—Silver medal, D. Horn, "Snow Scenes" (437); bronze medal, A. Pewit, "Woodland" (432); certificates, J. White, "Landscapes" (434); J. B. Haggart, "Figure Studies" (443).

Class X.—Outings, lantern slide.—Bronze medal, J. B. Haggart, "Figure Study" (456); certificate, D. Linton, "Woodland" (447).

In Class I the first prize is taken by that well-known "architectural" picture, "Entrance, Little Cloisters, Gloucester," by H. C. Leat; the merits of the picture are obvious, and one is particularly struck by the beautiful soft rendering of the sunlight on the building, but does "architecture" come under the heading of "landscape and seascape"? The second prize picture is really a fine foreground study of flowers, the flowers making a fine arrangement of lines; the certificated picture, a study of sheep and trees, hardly bears out its title. Amongst "known" pictures in this class we have "The Torrent," by C. E. Walmsley; "Strayed" (Geo. B. Cowen); "She'll plough the waves no more" (W. Norrie); "The Hour of Rest" (Graystone Bird); "An Old Castle Gateway" (Harry Quilter); "The Close of a Sultry Day" (J. M. Whitehead); "Calm Evening" (W. F. Slater), etc., etc.

Class II is a very strong exhibit with much excellent work, and we were not surprised to hear that the judges had some difficulty in coming to a decision. The silver medal picture is an unpretentious yet satisfying work, the title being perhaps the most unharmonious part of it, the old man, a strong model, is quite evidently "seeking information" from his intent interest in his book; the face is well lighted and the picture hangs well together; other two pictures (169—171) by the same exhibitor, show that the award is gained by no mere fluke, but the result of applied knowledge. The bronze medal is gained by a simple straightforward example of portraiture, beautifully soft and free from any harshness. The certificate is gained by a well limned head, strong rather than beautiful, and hardly bearing out its title. In this class there is also much "known" work, including, "The Mendicant," (Harry Wade); "Minnehaha," (Jas. G. Mainds); "Old Man's Head" (Jas. Drummond Shiels); "Tombs of the Kings" (Rob. Burnie);

"Goodnight, Happy Childhood," and two pictures recalling the work of the late H.P.R. (Graystone Bird). "The Whistler" (H. C. Leat); "The Wind bloweth from the Sea" (Jas. Burns); "The Visitor" (Wm. McLean); "Faith" (John Spark); "The Hon. Mazie Dundas" (E. L. Brown); "The Sahara Caravan" (G. B. Bainbridge); "Warm Work" and "Charging Retorts" (Fred Marsh); "The Soldier's Children" (C. M. Wane), etc., etc.

It is impossible to treat all the entries in Class III; the "mist effects" of F. Little look well enough in the hand, although there is evidence of "fake"; H. Wild's "firelight" effects are hardly satisfying, the screens shading the flash of the magnesium "being in the way"; James Smith's openair work shows good clean work, and almost irreproachable technique; amongst the well-known exhibitors, others than the certificated men might be mentioned:—W. Archibald, Harry Wade, John Stabb, Graystone Bird, G. S. Bryson, W. Louis Primrose, George Clelland, Jas. Burns, F. H. Read, W. McLean, G. H. Bainbridge, L. S. Wilks, E. R. Bull, etc. The stereoscopic class is a small one, the medalled pictures having the stereoscopic quality, *in excelsis*, especially the silver medal set; Dr. Stainthorpe has a "Sangar-Shepherd" process pair. The "Glasgow Exhibition" class can hardly be called a success, but the "novice" class contains some really good work. The "members" show up well, and the exhibition secretary proves that he has photographic as well as organising abilities by taking the lion's share of the awards.

THE BROWNIE COMPETITION.

An exhibition is now being held at the Kodak Company's depot, 59, Brompton-road, Knightsbridge, S.W., of the competition prints of the Brownie Camera Club, an organisation of young folks under sixteen years of age, who are doubtless preparing themselves for more serious photography by practising with the "Brownie." We must say, however, that the Brownie, though its diminutive size and its low price may cause it to be classed as a workable toy, is amply proved by the present exhibition to be capable of producing photographs of good quality.

There are on exhibition about 1,500 photographs, being direct prints from films exposed in the Brownie. These are a selection; the entire number of prints sent in being about 10,000. There are two classes. Class A consists of pictures which have been printed and the films developed by the competitors. In Class B the work, with the exception of pressing the button, has been performed by other than the competitors. It is interesting to note that the former class is not only the most numerous, but, on the whole, the better in quality. As the work in this latter class represents, probably, a fair average of work of the kind as turned out by dealers and others throughout the country whose experience should give them an advantage, it is not very satisfactory to find that their prints do not show a marked superiority over the production of boys and girls under sixteen.

Twenty-five prizes were originally offered in each class. The prizes consisted of Kodaks, varying in value from seven guineas to one guinea. The judges, Messrs. Andrew Pringle and F. M. Sutcliffe, however, found it desirable to add to the number in Class A, and eleven further prizes have therefore been awarded. It is hardly possible to criticise an exhibition of this kind as one would criticise an exhibition of the work of more mature photographers. It contains, naturally, interspersed with much that is respectable or even meritorious, specimens of nearly every kind of error the beginner is liable to fall into. In some cases the effects are most amusing, but on the whole the results are creditable to the rising generation of photographers.

The exhibition will remain open until March 31st.

CORPORATION OF GLASGOW.

Glasgow is well known as the abode of a school of artists who have made their existence a world-known fact; it is also known as the dwelling place of a municipality that is the best managed in the world; the success of the International Exhibition it promoted this year is so recent that it is needless to refer to it. It is evident that it is to take an equally high place in things photographic. The great success of the 1897 exhibition promoted by the Glasgow and West of Scotland Photographic Association is a matter of history, while the photographic section of this year's "International" has attracted the attention of the whole photographic world; and now the municipality, under the management of their Museums and Art Galleries' Committee, headed by the redoubtable Bailie Shearer, has promoted a photographic exhibition, "on its own." This is only what was to be expected in such an up-to-date city, with these previous successes before them, and the ever-present influence of men like J. Craig Annan, W. M. Warneuke, John Stuart, such a consummation was almost certain. In 1898, on the well-known Glasgow Green, was opened the People's Palace, consisting of a museum, art gallery, and winter garden. The museum and art gallery, where the present exhibition is held, is open from 11 a.m. to 10 p.m. every day except Sunday, free to all, and it is pleasing to note that it is largely taken advantage of. Each winter since the opening an exhibition, with a competitive section, has been held; the first was wood carving; the second bookbinding; the third sewed work; and this year we have photography. The catalogue contains an introductory note by Bailie Shearer, and a historical sketch of photography, brought quite up to date, and including colour photography and the X rays. The entries in the competitive class, which contains about 500 photographs, are catalogued under various mottoes, no name being given except those of the prize-winners, but many of the entries can be recognised from their previous appearance at exhibitions, or from their reproduction at some time or other in the photographic press. The judges were Messrs. J. Craig Annan, W. Young, R.S.W., and ex-Bailie Primrose.

In the Landscape Class there are no less than 160 entries, and these vary from the delightful and "new" "Early Morning" (7), of Charles Kirk, Glasgow, to the quarterplate P.O.P.'s untrimmed and unmasked, roughly mounted, nine on a card, and framed entry by "Thou shalt guide me with thy counsel"; it is to be hoped that someone will take the job, indicated by the nom-de-plume, in hand, as there is no possible probable shadow of doubt of the need of it. First prize (£2), "Early Morning" (7), by Charles Kirk, Glasgow; second prize (£1), "A Landscape" (119), by A. Allan, Ratho Station, Midlothian; Honourable Mention, "The Brook—Evening" (4), A. R. F. Evershed, Streatham, London; "Reflections, Aberdeen Harbour" (1), James Douglas, Sandyford; "Cutting Oats" (115), Charles F. Grindrod, Malvern; "A Landscape" (55), A. Allan, Ratho Station. The first prize picture is a rather new rendering of a hackneyed title; in the foreground is a pool of water, broken up by the reflections of houses silhouetted against the charming greys of the middle distance, the smoke from the chimneys of these houses blending well with the haze in the distance; it has no wild sky, but just such an unbroken sky as one might see on a misty morning. The subject is one that lies at everybody's door, and it is astonishing that it has been so seldom treated. The second prize picture is by *the* A. Allan, Edinburgh, the famous delineator of "auld wives," although he has changed his address; it is a harvest scene, and is presented with all his wonted skill; the white horse, however, is rather "ponyish" in appearance, and not in keeping with its work; his Hon. Mention picture, representing a tree-shaded pool, was medalled at Edinburgh. In this class "A. C." shows some good Alpine work, especially No. 76, "Starting by Moonlight for a Winter Climb in the Engadine," when the moonlight effect is well sustained. It would, however, be improved if printed in a dark blue green carbon, instead of black, as at present. C. Reid of Wishaw's "Horses in a Harvest Field," is passed over, as also is J. C. Warburg's "Sheep and Shepherd, Provence." In "Peel Castle, Sunset," Graystone Bird shows a wonderful sky, but the sacrifice of a good bit of it at the top of his picture would have improved it as a whole.

Class III., Portraits and Figure Subjects, has 152 entries, and the awards are:—First prize (£2), "The Gossips" (182), James Douglas, Sandyford; second prize (£1), "Day Dreams" (200), Bessie Stanford Amford, Andover, Hants; Hon. Mention: "One of the Old School" (281), A. E. Attfield, Llanelly; "Friends" (188), Andrew Hunter, junr., Beith; "A Portrait" (175), W. Watson Robertson, Pietermaritzburg, Natal. In this class it is noted that a professional has stuck his business card on his entries, probably after the judging; it detracts from the appearance of his entries, and it is not, looking at the conditions, in good taste. The first prize picture, a nicely arranged—or should we say rather caught—group of women, in neglige attire, was medalled, if we mistake not, as a lantern slide at an exhibition of the Glasgow Camera Club. Mr. Douglas has printed it in a pleasing shade of brown, and mounting it tastefully, not offensively, in the American manner. The second prize picture is a dainty treatment of a young lady seated at a window, photographed against the light, and printed in a delightful shade of red. In this class Miss Tomlinson shows "Evensong," "Matins," and others; Graystone Bird shows "Good-night" and "Happy Childhood"; Charles Kirk, Glasgow, has a splendid series of pictures of wild bird life; the first prize-winner shows "A Portrait" (292), a good study of a violinist medalled at Glasgow Camera Exhibition, but his "The Morning Tub" is not so successful, the rugged-looking bodies of the youths being jarring. Unless we mistake them, Mr. J. Peat Millar shows some very effective figure studies.

Class III.—Architecture:—This class only contains 45 entries, but some good work is shown. Glasgow Exhibition bulks largely, but none of these appear on the prize list, and they are mostly unsatisfactory, although a few showing the exhibition illuminated at night are wonderfully well done. First prize (£2), "Beverley, North Choir Aisle" (364), Wm. Archer Clarke, Birmingham; second prize (£1), "Blackadder Crypt, Glasgow Cathedral" (355), Andrew Walker, Glasgow; Hon. Mention: "Ripon Minster" (349), W. Louis Primrose, Glasgow; "The Gallery Staircase" (339), H. C. Leat, Bristol. The first prize picture is one of the "open door" series, but the distance seen through the partially open door keeps its tone well, and there is no halation, although the sunlight streams across the floor from the

doorway. The second prize-winner conveys a fine feeling of distance, and the texture of the stone is finely reproduced. "The Gallery Staircase" is an excellent bit of unostentatious work; while "Evening, Southwell" (331), by the first prize-winner, well deserves attention. "In the Days of the Normans" (359) is a good study of receding arches.

Class IV.—Instantaneous, contains 58 entries, and is a rather mixed collection—good, bad, and indifferent all finding a place. First prize (£2), "Five Animal and Bird Studies" (382); second prize (£1), "In the Harvest Field" (402), Daniel Dunlop, Motherwell; Hon. Mention, "Tramps" (411), Matthew Wilson, Glasgow; "Hurdle Race" (408), Graystone Bird, Bath. The subjects of the first prize pictures are a dog, two cats studies, farmyard fowls, and sheep. Of these the cats are the best, both being good pictures; the worst is the dog, which is decidedly awkwardly posed. The second prize picture hangs well together, and the white horse in the reaper team is not too white. "Tramps" is a rather pleasingly arranged group of wayfarers, with a satisfactory rendering of sunshine. Graystone Bird's "Hurdle Race" is a good example of rapid shutter work; he has several others in this class.

Class V.—Lantern Slides (set of six), has 27 entries, representing 162 slides. First prize (£2), "Animal Studies" (441); second prize (£1), "Wild Birds" (465), Charles Kirk, Glasgow; Hon. Mention, "Figure Studies" (4) and "Landscapes" (2) (444), James Douglas, Sandyford; "Glasgow Exhibition" (446), Andrew Hunter, junr., Beith. The first prize set are good, clean technical work; the second set are a good representative set of "nature" work—"Birds at Home" *à la* Kearton and Lodge; but in justice to Mr. Kirk, be it said, that if memory serves us aright, we saw some of his work in that direction a number of years ago, before it had such a vogue.

In the "Exhibition Only" class, Glasgow professionals have responded nobly. T. and R. Annan occupy the place of honour with a very large photograph of "The Grand Entrance, Glasgow Exhibition," a striking work that demands attention, though perhaps it is taken from too much the architects' point of view to be a picture; there is a wealth of work from J. Craig Annan, and all round the room one is coming across old friends from his camera, amongst others that are thus, as it were, resuscitated might be mentioned "S. R. Crockett, Esq.," "A Utrecht Pastoral," "On a Dutch Shore," "A Vineyard in Lombardy," "Jas. Guthrie, Esq.," "In a Garden Fair," etc., etc. W. M. Warneuke has also a representative collection on view, including so well known pictures as "Paulina," "Lady with Veil" (542), "Ready for Market," and other works. Langfier, Ltd., show a large number of portraits of people who bulk largely in the public eye, "Sir George White," "Mr. Beerbohm Tree," and others, while in the same class of work Lafayette, Ltd., has also a good show, including "Countess of Tankerville and Son," and R. Brinkley and Son show some very fine work, mostly in child portraiture, of which they have made a speciality; Turnbull and Sons have the "Song of Hiawatha" and other pictures on exhibition. George Romney shows a selection of work of the quality for which that studio is noted; Charles Reid has some of his world-famous animal and bird pictures on exhibition, including that dainty and decorative "Willow Warblers." Miss E. Hood, Glasgow's lady photographer, shows some creditable work; Valentine and Sons, Ltd., show some of their well known views, but they are printed in a rather unfortunate colour. John Weir has two portraits nearly life size, first class enlargements. J. M. Whitehead has "Fruit," and "Fruit and Glass" hung; they form a striking object lesson in this class of work. We have missed out many meritorious contributions in this brief note, but the exhibition proves that there are few towns to which Glasgow will have to play second in the work of her professional photographers. Wm. Graham has a number of what might be called "historic" photographs—i.e., photographs of historic scenes and events. J. Lizars has a large number of pictures showing the class of work that can be turned out with the cameras manufactured by the firm. Kodak, Ltd., have fully realised the importance of the exhibition, and have a monster exhibit, comprising a large number of war pictures, and also samples of different methods of photographic printing and development, etc. There are a number of microphotographs, and also lantern slides of local interest on show.

The value of such an exhibition as this in educating the vast body of the people cannot be over-estimated. On the occasion of our visit there was quite a number of visitors, mostly working people, and we were much interested in one typical working man, who was explaining to his large family the different features of the show. We congratulate the municipality of Glasgow on its latest advance.

THE Newbury Exhibition.—We would point out that the last day for entries for the important exhibition in Newbury is Tuesday next, January 7. Any photographers who care to exhibit or compete are advised to get a prospectus at once from the Hon. Secretary, Guildhall Club, Newbury, as the eight open classes share fifteen really valuable prizes. Indeed, the prizes compare favourably with any exhibition in England, and everything has been done to render the exhibition not only an attractive but a first-rate one in every particular.

BOROUGH POLYTECHNIC PHOTOGRAPHIC SOCIETY.

The Borough Polytechnic Photographic Society held its seventh annual exhibition of photographs, the work of its members, on the 27th, 28th, 30th, and 31st ult., at the Borough Polytechnic Institute, Borough-road, S.E.

We have had occasion, from time to time, to refer to the useful educational work in photography which this active society is doing, and on our visit to the annual exhibition an opportunity was afforded of viewing the studio, dark room, and other conveniences which the society possesses. The members of the society are, indeed, fortunate in their surroundings. That part of the institute which is devoted to their use is roomy and fitted with every convenience that the most exacting photographers could wish for, and recently an enlarging apparatus, with an 11-inch condensor has been installed, which is permanently ready for use. One of the most admirable features of the society's work is the opportunity given to the members of obtaining sound elementary instruction. In addition to the ordinary weekly meetings of the society, a connected series of practical lectures is given, which extends over the winter session, and embraces all that should be included in the term elementary.

Of the exhibition itself, we cannot conscientiously say that any advance was shown over that of last year. The work of the beginners, as before, bore testimony to the thoroughness of the technical instruction they had received, but novitiates' attempts are rarely inspiring enough to arouse enthusiasm. The tone of an exhibition such as this must necessarily be dependent upon the work of the more advanced members, and this year there seems to have been some lack of enterprise amongst these. We have no reason to think that there was any falling off in the quality of the work, but neither in choice of subject nor in treatment had there been any departure from the well-worn track. In architecture much of the work showed careful study of effects of light and shade. We noted particularly that of J. W. Gregg, R. R. Rawkins, and W. Page. In Fruit and Flower Studies the members of the society show more than average ability, inspired no doubt by the work of E. W. Burch, who had two fine examples. Messrs. M .A. Smart and W. W. Brewers had also notable work of this kind. We noted good landscape work by G. Hudson, H. C. Philcox, P. C. Cornford, A. J. Bullock, and F. W. Bannister. There was a regrettable absence of portraiture and figure studies.

The judges, Messrs. J. A. Hodges, W. Thomas, and J. B. B. Wellington, made the following awards:—Pictorial exhibits, E. W. Burch, F. W. Gregg, F. W. Bannister, P. C. Cornford, A. J. Bullock, and R. R. Rawkins.

Lantern slides, J. W. Hodges, F. W. Gregg, and Edgar R. Bull.

New Books.

"The American Annual of Photography for 1902." Edited by Walter E. Woodbury. Price 3s. Agents for Great Britain: George Houghton & Son, 88 and 89, High Holborn, London, W.C.

In our last issue we extracted from this annual an article on "Photography in China," which no doubt will be read with interest by photographers in this country. The other contents of the annual are pleasing and varied, and the many reproductions from photographs are extremely well done. "From the View Point of a Field Worker," by Mr. Gene Stratton-Parker, deals with a department of work that is becoming widely popular—bird photography. Dr. Shufeldt also treats of the photography of live woodcock, humming-birds, and other forms. The author adds:

"Spiders have always been favourite subjects of mine before the camera, and inasmuch as the life histories of many of them are very instructive and entertaining, one's interest in obtaining good photographs of them is greatly enhanced.

"We see our best chances of success in making these latter when the spider has built its web across some place which will take dark in the picture, and thus have the effect of not only bringing the insect out in bold relief, but its web also. Sometimes it requires considerable study to take the latter, and much depends upon the sun. When the rays of the sun light up every strand in the web, but fail to penetrate to its natural background, then is the time to make the exposure, even if some of the leaves are a little struck by the high light." The annual teems with interest throughout, and publishers and editor are to be congratulated upon the volume.

"The Art of Retouching." By Robert Johnson. Fifth Edition. 150 pp. Illustrated. Price 2s. Published by Marion & Co., Limited, 22 & 23, Soho-square, London, W.

The publication of a fifth edition of Mr. Johnson's book affords us the opportunity of indicating those of its features which have the greatest practical value for the photographic student. These are the chapters on retouching the human head and arms and the section of the book which deals with the finishing and working-up of prints and enlargements. The young photographer cannot fail to derive many useful hints from Mr. Johnson, who also gives him some sound advice on studio portraiture. We quote the following counsel to the retoucher about to commence work. "Choose a north light, as it is the least variable. Sit squarely to your work

resting the left arm on the table if you feel tired. Do not allow your desk to come to the edge of the table; have at least six or seven inches space for your elbows, which space is also useful for putting down a pencil, knife, &c. Use a mahl-stick—not the ordinary artist's mahl, with a wash-leather knob at the end, but a flat, thin piece of deal, rather less than a quarter of an inch in thickness, two inches in width, twelve or fourteen inches long, narrower at one end so that you may hold it easily; let it be rounded at the edges, so that it does not gall your hand. Do not get into the habit of bending almost double over your work, or holding your head in the position of trying to squint through a keyhole; sit upright. Your health will be better, and your work will be better also. You will not tire so easily, and will, therefore, be able to concentrate the greatest amount of energy on your work."

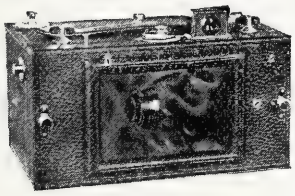
"Wellcome's Photographic Exposure Record and Diary for 1902." Price 1s. Published by Burroughs, Wellcome, & Co., Snow Hill-buildings, E.C.

This little book, which appears to have been compiled with very great care and accuracy, has won a permanent place amongst the photographic annuals. Our own opinion of its practical value as a guide to exposure data in outdoor photographic work may be gleaned from the circumstance that the book is always in our pocket for reference. The publishers thus indicate the salient features of novelty which have been added to the 1902 edition: "Additional space is devoted to the question of exposure under all its aspects and under all conditions. The exposure tables are exceedingly simple in use, but in addition all the factors which govern exposure are discussed in a crisp and explicit manner, so that the photographer is enabled to obtain a grasp of the principles which govern the subject instead of being reduced to the automatic use of sets of figures. Amongst the new figures may be noted the ready reckoner for the multiplication of fractions, and the erasable exposure tablet at the end of the book, upon which the exposures for the day may be jotted down and cleaned off after use. The illustrations are increased in number. All plates have been retested, and the list of comparative speeds will, therefore, be found reliable and up to date. Two editions are issued as before. The Northern Hemisphere edition, containing exposure tables for all countries north of the equator; the Southern Hemisphere edition with similar tables for use south of the equator." It is the most useful book of the kind that is published.

New Apparatus, &c.

"The Al Vista Panoramic Camera." Agents: George Houghton & Son, 88 & 89, High Holborn, London, W.C.

Messrs. Houghton inform us that they are introducing a form of the Al Vista Panoramic Camera which takes 4 in. spools and either half or full length pictures, viz., 5 by 4 or 10 by 4 inches. The shutter has three speeds and a lens of the rectilinear type is employed. Al Vista mounts, printing frames, &c., are also supplied. The camera retails at £3 3s. A description of the essential features of the Al Vista camera has not hitherto appeared in the JOURNAL and is here appended, premising that the original type of instrument is referred to:—



The camera is made in two principal parts: first, the lens board, or front, and lens-moving mechanism; and second, the back or box for holding the film, film spools, film punching and registering device, lens index, stop arm, finder, and level. This construction enables the operator at will to take a picture of a uniform width of 4 in. to 4 in., 6 in., 8 in., 10 in., or 12 in. long. The lens supplants the ordinary focal plane shutter by itself, rotating over a half-circle, and throwing the image 4 in. wide by 12 in. long upon the semi-circular film in the rear. It is pivoted rigidly midway between the front and rear lenses to a vertical shaft operated by clockwork mechanism in a casing below the lens, and is protected by a flexible leather front. A radial rectangular tube about 2 in. long projects rearward from the lens tube. To settle the lens, a key underneath is rotated, which in turn winds up the clock spring and turns the lens in the opposite direction until it is held by the release lever. At the rear of the lens tube is a small shutter whose projecting arm at the top is arranged to impinge against the stop-plate arm. This has an index pointer on the outside and can be quickly adjusted by rotating the knob with fingers. If an exposure 6 in. long is desired, the pointer is set at figure 6; when the lens is released, it rotates until the arm of the shutter strikes the stop arm and thus only exposes a 6-in. section of the whole film. The finder is supported upon a revolvable plate, also having an index pointer, and this is set at the figure 6, so that the image viewed in it will be parallel to that covered by the lens. Adjacent to the finder is a circular level. A shaft from the clockwork mechanism projects slightly through the bottom of the lens board, or front, and to this may be attached different sized flat pieces of metals, which act as fans and regulate the different speeds at which the lens can be made to rotate. There is also provision made for inserting different sized stops in the lens. The sensitised film spool is put in the extensible spool-holder on the left, and carried over a guide roller and on through the semi-circular channel to the other end, where it is wound up upon the winding spool, against a suitable tension plate. The thumb screw-head for operating this spool is seen on the right hand end. In its movement the film also operates an index cylinder, which tells at the top the number of inches of film reeled off. then,on the left is a punch button for punching a hole through the film after each exposure, as a guide to the separation of the pictures. The lens front is secured to the film box by two thumb-screws, one at each end. In an exposure the lens rotates from one side to the other in 1½ seconds, causing the image to travel over a space of 12 inches, thereby giving 1-6 of a second stationary exposure. Fans lengthen the exposure, ¼, ⅓, ⅜, ½ seconds, according to size used.

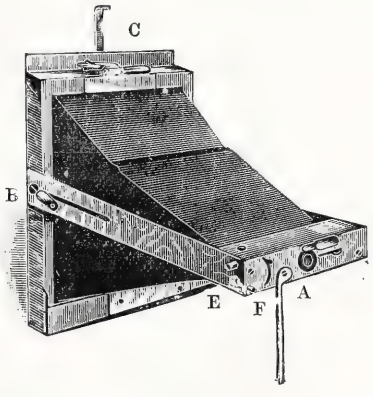
"The Folding Pocket Cyko Camera No.1." Sold by John J. Griffin & Sons Limited, 20-26, Sardinia-street, Lincoln's Inn Fields, London, W.C.

With the exception of the bellows, which is of morocco leather, this neat and ingenious pocket camera is made of aluminium. It weighs under 8 oz., and when closed up is only three-quarters of an inch thick, so that it is comfortably stowed in a side pocket. Plates of the size 3½ by 2½ are used. Messrs. Griffin send us the following interesting item of intelligence with reference to testing the camera:

"We would take this opportunity to point out a fact which many of your readers may not be aware of, *i.e.*, that every Cyko Camera sold by us is carefully tested and the resulting negative is presented with the camera to the purchaser, who has thus indisputable evidence that the camera is accurate and in good working order."

The camera takes double slides; it has two finders: a movable diaphragm plate and a lever movement controlling the exposure. A little pamphlet is issued which describes the mode of using the camera, from which we take a few extracts:—

Filling the slides: The plates or films are placed film outwards in the bottom groove of the slide and pushed down against the spring; the top of the plate can then be made to engage in the catches. Inserting slide in camera: To open the back press spring C, then insert slide under the grooves and press into place a safety catch. The shutter can then be wholly withdrawn, placed flat on the slide and the back closed again. All is then



ready for photographing. Making the exposure: The position of the object must be carefully centred in the view-finder. Set the shutter by pushing the catch running in the slot at front of camera. Then, holding the instrument firmly, button E must be pressed. This releases the shutter for instantaneous exposure. For time exposure: The camera must be used on a stand or other solid support, and when all is ready, button F must be carefully pressed, when the shutter will open and remain so until pressure on button E closes it. To close camera: After the exposure has been made, the two spring catches B should be pressed down free from the pins and the instrument slowly closed, the catch A holding all in position.

Removal Notice.—Messrs. Underwood & Underwood have removed to 3, Heddon-street, Regent-street, W.

With reference to next Monday's meeting of the Royal Photographic Society referred to in another column, the following circular has been issued: "I hope that you will make a special effort to be present at the meeting to be held at 66, Russell-square, on Monday evening, January 6. The necessary improvements in the administration of the society can only be effected by each member taking a personal and active interest. Whether the society will continue to stagnate, or whether it will take its rightful position as the focal centre of photography, depends upon the support that you, as an individual unit, lend by your presence on Monday evening."

"Penrose's Catalogue."—Messrs. A. W. Penrose & Co., of 109, Farringdon-road, E.C., write:—"We have pleasure in sending you herewith, a copy of our new catalogue, which we think will be useful to you as a book of reference. We believe it contains particulars of every appliance or material known to be used in photo-mechanical processes, and we feel justified in claiming it to be the most complete catalogue of process appliances ever issued. There are, as you will see, 272 pages of matter about 750 illustrations, and 1,260 references in the index. Many of the illustrations are by the half-tone process. The cover and title page were designed by Mr. C. E. Dawson. We may add that the catalogue is issued free to our regular customers, and will be sent to prospective customers on receipt of 2s. 6d., which will be refunded on first order for £1 or upwards." The catalogue is a handsome and useful volume.

News and Notes.

A NOVEL Address.—Among the 125,000 letters passing through the Leigh Post Office at Christmastide, one was safely delivered, although the envelope only bore a stamp photograph of one person, for whom the letter was intended.

AT the last monthly meeting of the Blairgowrie and District Photographic Association, Mr. J. W. Petrie presided. Mr. W. D. M. Falconer gave an informative and carefully-prepared paper on lenses, illustrating, his remarks with blackboard sketches. The results of the competition "Any Subject," for the President's prize, had been received from Messrs. George and W. Grant Murray as under:—1 and 3, Jas. Donaldson (figure slides); 2, D. G. Monair (seascape) The society is fortunate in its judges, and is proud of the success of Mr. George Murray in gaining the R.A.'s Travelling Studentship of £200 with his picture, "Saul and the Witch of Endor."

PHOTOGRAPHIC Classes at the Cripplegate Institute.—The photographic class at the Cripplegate Institute, Golden-lane, E.C., conducted by Mr. John H. Gear, F.R.P.S., will commence its spring course on Tuesday, January 7 next, at 7.30 p.m., and will consist of twelve lectures, demonstrations, and practical work upon the following subjects:—Bromide enlarging, enlarged negatives, transparencies, lantern slides, hand camera work, carbon printing, the optics of photography, &c. For the first time since the commencement of photographic classes at this Institute, ladies will be admitted to the class as students.

FROM the report of the City and Guilds of London Institute for 1901, it will be seen that out of the twenty-two Metropolitan schools connected with the Central Institute, six have classes in photography, viz., the Aldenham Institute, Battersea, Polytechnic, Goldsmiths' Institute, Regent-street, South-West, and Woolwh Picolytechnics. Two hundred and eighty-five members attended the classes, 81 presented themselves for examination, and 53 passed. In the local schools at 390 centres, having 34,189 pupils, 96 attending the photographic classes presented themselves for examination, and 59 passed. The total number of photographic classes was 19—a decrease of 6 from the previous year; and the total number of students 378, or a decrease of 39.

CLOUD Photography.—Amateurs will find cloud photography fascinating but difficult. In the first place, the utmost accuracy is essential, if reliable conclusions are to be drawn from the results. In scientific cloud photography each cloud is photographed from two separate points simultaneously. One of the leading authorities in this special branch of meteorology, founded by M. Hildebrandsson of the Upsal Observatory, is M. Teisserenc de Bort, and at his observatory at Trappes, near Paris, the two photographic stations are placed about three-quarters of a mile distant, and are, of course, exactly on the same level. They are connected by telephone. The cameras are so mounted that the angles at which they are inclined may be easily read off on a vertical scale. A horizontal circular scale gives the exact direction of the cloud. When the operators at the two stations have agreed, over the telephone, on a particular point of the cloud at which to direct their cameras, two photographs are taken at precisely the same instant. The length of the base line being known, and also the two angles at which the cameras are inclined, a little calculation furnishes the exact height of the cloud. After a short interval two more photographs are taken, to be carefully compared with the first. These will give the distance which the cloud has travelled in a certain time, so that the velocity of the air current which carried it is revealed. Clouds make very rapid impressions on sensitive plates, but the blue background of the sky acts almost equally quickly, so that unless precautions are taken there will be no contrasts. When the clouds are in large, dark masses on a light background of sky a very brief exposure is necessary—from one-fiftieth to one-hundredth part of a second.—From "Pearson's Magazine" for January.

INFLUENCE of Photography on Engraving Processes.—At the conclusion of his paper on the "Arts of Engraving," recently published in the JOURNAL, Mr. Craig Arran remarked: The disastrous effect which photographic processes have had upon the various crafts of engraving has already been referred to, but I think that on closer consideration this will not be found to be so serious as at first it seemed to be. In relief engraving the mechanical craftsman has certainly been forced to the wall, but we still find that blocks are being cut by artist engravers who have some definite thought or feeling to express. In the American magazines we frequently find excellent reproductions of celebrated pictures in the white line process by Timothy Cole and others. In this country original work of most interesting character and high artistic quality is being done in black line by such men as William Strang, Robert Bryden, William Nicholson, and Gordon Craig. With regard to line engraving, I am more pessimistic. The necessary mechanical skill is more difficult to acquire and the method is not readily adapted to immediate artistic expression, and I am not aware that any such plates have been recently engraved. Etching and mezzotint are in a much healthier state, however. It is true that they are not so frequently employed in the reproduction of pictures as formerly. The accuracy and comparative cheapness of photogravure has supplanted them for many purposes, but as independent arts for the production of original work, they have still many very capable professors. The weaker men of ten and twenty years ago have certainly suffered, and have been driven to seek other outlets for their talents, but the broad fact remains that the advent of photographic processes, like every industrial revolution, has been of enormous benefit to the world at large.

ROYAL Photographic Society.—An extraordinary general meeting of the members of the Royal Photographic Society will be held at 66, Russell-square, London, W.C., on Monday, January 6, 1902, at 7.30 o'clock p.m., at which meeting the resolution at foot will be proposed to be confirmed, the same having been duly passed at an extraordinary general meeting of the members of the Society held on December 9, 1901. To amend Article 37, which reads:—"All nominations must be sent to the secretary not less than twenty-five days before the annual general meeting. A balloting paper containing no names but those of the members nominated and eligible to serve and their nominators, shall be sent to every member of the society at least seven days before the annual general meeting, with instructions to erase all names of members nominated except those for whom he desires to vote. Every balloting-paper shall be invalid on which more than one name as president, four names as vice-presidents, one name as treasurer, and twenty names as ordinary members of Council are left unerased, or where there is any indication of the identity of the voter. The balloting-paper shall be placed in an envelope provided for the purpose, which shall be enclosed in another envelope bearing the voter's signature, and forwarded to reach the secretary not later than noon of the day preceding the annual general meeting. The secretary shall place such envelopes unopened in the hands of the scrutineers, who shall reject any papers received except those from members entitled to vote, and shall announce the result of the election before the close of the annual general meeting. If the votes in any case are equal, the chairman shall give a casting vote. Votes given to any member nominated in two capacities, and not elected to the higher, shall be counted to the next office, but no balloting paper shall be allowed to count as recording more than one vote for any nominee." By the omission of the words "and their nominators," on the third and fourth lines.

BRITISH Industry and the Chemical Society.—Mr. Gerald T. Moody writes from the Central Technical College to THE TIMES:—SIR,—The crisis in British industry, to which attention is again forcibly directed by the series of articles now appearing in THE TIMES, is to be deplored by thinking men of all classes. That the causes of the depression are many and that the industrial position can be improved only by the united efforts of every section of the community is obvious. During the last twenty years it has been made clear that this country is being outstripped in many fields of industry. We have rapidly fallen behind in the production of dyes and fine chemicals, and the reason has been properly attributed by our leading professors of chemistry to the persistence with which manufacturers ignore the intimate relationship of science to industry and to their failing to employ trained chemists. The indifference of our manufacturers has been notorious; but there is some evidence of an improved condition of affairs, for at the present time a large number of young chemists trained in our technical colleges are employed in industrial works in the vicinity of London. Almost without exception these men are resident Fellows of the Chemical Society; and a large proportion of them are in the habit of regularly attending its meetings, which have been held during over half a century at eight o'clock in the evening, an hour which in the past has been convenient to all and particularly to those engaged in industrial and technical work. Although no section of the society has approached the council with a request to alter the hour of meeting, that body has decided that from January next the meetings shall be held at 5.30 in the afternoon. The hour fixed is unfortunate, since it will exclude from the meetings practically all those engaged in industrial work. It is particularly inopportune at the present time, when our industries need fostering, that the council should be so shortsighted as to endeavour to dissociate the society from the general welfare of our industries. The explanation lies, no doubt, in the fact that the council is dominated by the vice-presidents, most of whom have long since passed the chair and are not alive to the conditions under which the younger men are working. A reconsideration of the council's decision is imperative if the society is to continue its proper function and to assist in binding together the interests of pure science and of industrial progress.

Commercial & Legal Intelligence.

ANOTHER Suicide by Cyanide of Potassium.—A coroner's inquiry was held at Clerkenwell one day last week concerning the suicide by poison—cyanide of potassium—of Joseph Beldam, a journeyman jeweller, lately residing at Calabria-road, Highbury. Evidence having been given as to the purchase of the poison, the coroner said, "He took enough cyanide of potassium to kill fifteen people." The verdict was suicide during temporary insanity.—"Evening News," December 24, 1901.

AN Opening in Bahia.—The United States Consul at Bahia reports on an opening for photographic apparatus and supplies in Brazil, stating that the camera that seems most popular is the smaller size of what is styled "cycle camera," with rapid rectilinear lens, bulb shutter, and single swing-back. A decided preference is shown for plate holders of metric sizes, doubtless because supplies have always been imported into Brazil in those sizes, the metric system being used there. The papers in use are gelatine printing-out paper, both plain and matte, and a quick printing developing paper. The Consul adds that, until recently, the professional photographers had for the most part been using iron developers, but now they seem to have turned to metol and hpdroquinone. Two are relying chiefly on pyro. The amateur uses metol and hydroquinone, either separate or combined, while a few are using glycin. The full report can be seen by those interested at the Commercial Intelligence Branch of the Board of Trade, 50, Parliament-street, S.W., any day between the hours of 10 a.m. and 5 p.m.

CLAIM against a Photographer.—Mr. E. G. Allsopp, honorary secretary of the Surbiton Working Men's Club, sued S. Francis, photographer, of Ewell-road, Surbiton Hill, at the last sitting of the Kingston County Court, for 15s., due in respect of the sole right of taking photographs at the fête and show held in Surbiton on August Bank Holiday. Defendant said that after his offer was accepted for taking the photographs, tenders were advertised for, and the right was let to another man, Mr. S. Davie, of the Victoria Inn. He also handed in a paper containing the advertisement alluded to, and a letter accepting his tender. Plaintiff pointed out that the advertisement was contained in a paper prior to the date of the letter accepting it. It was true that Mr. Davie was under the impression that his licence for catering included the right of taking photographs, but they pointed out to him on the day of the show that this was not so. His Honour (to defendant): Did Mr. Davie take photographs? Defendant: I can't say that, but he claimed the right to. Plaintiff stated that defendant took photographs of the committee, band, &c. Judgment for plaintiff with costs.

CLAIM against a Traveller.—At the Brighton County Court on Friday, December 20, Andrew Taylor and George Taylor, 34, King's-road, photographers, sued Thomas Martlew, 6, North-street Cottages, traveller, for £6 13s. 6d., as commission overpaid to the defendant. Mr. J. C. Buckwell, for the plaintiffs, and Mr. Louis Meaden for the defendant. The principal witness for the plaintiff was a former clerk, who said the defendant had also been in the employ of the firm as a canvasser. He canvassed for photographs, the price of which was 30s., and his commission was 5s. on each order. On receiving the order, defendant would receive a shilling on account of the commission, and when the customer paid the second instalment for the photograph defendant would be paid the other four shillings at the office. If an order turned out to be bad, the commission had to be refunded. When defendant left, witness made up his account, showing that £7 18s. 8d. was due to the firm from him in respect of overpaid commission. Defendant claimed to have something allowed off in respect to expenses and £1 5s. 2d. was allowed. This left £6 13s. 6d., the amount sued for, and the defendant offered £5 on settlement, but the plaintiffs refused to accept it. The plaintiff George Taylor gave corroborative evidence as to the arrangement to repay commission, and said that defendant regularly paid back money under it. Mr. Meaden called the defendant who stated that he was engaged by the firm about sixteen years ago to take orders for photographs, his commission being 5s. for each order. The firm took the responsibility of the orders whether they were good, bad, or indifferent. Witness had had bad orders, but during the whole of the time he was with the firm he was never asked to repay commission on bad orders, and he knew nothing of it until an account was sent to him. He denied having offered £5 to settle the matter. It was suggested by the other side that he should do that, but he declined as he did not owe anything. The Judge said that if commission had been returned as the plaintiff alleged it would appear in the accounts, and he should not decide against the defendant until plaintiff showed him that it did. Thomas Edward Bance, an insurance company's district manager and formerly in the plaintiff's employ as canvasser and collector, said there was no arrangement that he was to return commission if the order turned out to be bad. He had never been asked to return commission and as a matter of fact had not done so. On the application of Mr. Buckwell, the case was adjourned for a month to enable plaintiff to call additional evidence.

ALLEGED Photo Frauds.—T. Bradshaw, late of 9, Keppel-street, Windsor, and 1, Love-lane, Windsor, a photographer, was summoned at the Spelthorne Petty Sessions for obtaining by false pretences the sum of 5s. 6d. from Daniel East, on October 1. Prosecutor, who is a farm labourer, living at New Farm, Stanwell, said that on the day in question the defendant came to him and asked if he might be allowed to take the outside of the house. Witness and his son stood in front of the house and the defendant took the photograph. Defendant then asked prosecutor if he would like some copies of the photograph. Witness said he should like one, and Bradshaw replied that he could not take less than two or three. Prosecutor then agreed to have two pictures, for which he paid three shillings. He said if witness would pay him he would give him a receipt and send on the pictures in the course of a week or ten days. He was informed that the pictures were being taken for a land agent. Witness afterwards expressed a desire to have his wife photographed. This was done, and witness paid him half-a-crown for three. Witness produced the defendant's receipt for the same. As the pictures did not arrive according to promise, witness went to Windsor to inquire the cause of the delay. He was informed that the house had come out all right, but the picture of Mrs. East would have to be taken again. Nothing more was heard of the photographs, so on November 4 witness again interviewed the defendant at Windsor, and was told the reason of the delay was the bad weather. On November 12 he wrote to the defendant, who replied that he would call again on the first fine day. He again wrote to the defendant on the 28th ult., but receiving no supply, issued a summons. Detective-Sergeant Crutchell, who had charge of the case, called several witnesses who had paid the defendant for photographs but had never received them. The first was William Wilder, railway signalman at Coinbrook, who said that on October 4 the defendant asked permission to photograph the station. Witness gave consent and paid defendant 1s. 6d. for a copy. Not receiving the photograph he wrote a post-card to the defendant but had received no reply. Frederick Edward Dexter, a carpenter, of Moor-lane, Staines, said the defendant took a photograph of a pair of his cottages four years ago. He paid him 5s. but had not received the pictures. Similar evidence was also given by the landlord of the Swan Inn, Staines, who four years ago paid defendant 6s. for some photographs of his house, which he had never received. Detective Crutchett asked for a remand, saying he could call other witnesses who had been victimised in a similar manner. The Bench adjourned the case for a week, allowing Bradshaw out on bail in his own surety of £25.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

January	Name of Society.	Subject.
3.....	Leicester Literary	Demonstration of *Iron Printing Processes*. T. A. Scotton. Lantern Slides.
6.....	Glasgow and West of Scotland	Technical Meeting. Subject: *Enlarged Negatives*. Demonstrator—Mr. W. George Buchanan.
6	Southampton Camera Club....	Annual General Meeting.
10.....	Sutton Scientific and Literary..	Developing Snapshots, by the Members (practical).
8.....	Southsea Photographic Society	Metalotype and Self-toning Papers.
9.....	Brentford Photographic Society	Social Evening.
9.....	Liverpool Amateur.....	Open Meeting. Lantern available for testing slides.
7.....	Rotherham Photographic	Prize Slides. Lecture by Mr. Leadbeater's Friend on *The Latent Image*.
9.....	Southport Photographic	Conversazione in conjunction with the Southport Society of Natural Science.
9.....	Woolwich Photographic	*Control in Printing*. Henry W. Bennett, F.R.P.S.
8.....	Edinburgh Photographic.....	*The Bioscope*. Illustrated James Buncle.
9.....	Liverpool Amateur.....	Open Meeting. Lantern available for testing slides.
10.....	Bognor Photographic Society..	Monthly Competition. *Seascape*. A.P. Lecture.
3.....	Borough Polytechnic.....	*Exposure and Development*, by meter, Mr. H. C. Philcox.
6.....	,, ,,	Seventh Annual Exhibition.
8.....	,, ,,	*Orthochromatic Photography*. Mr. Albert T. Harris, F.S.M.C.
10.....	,, ,,	*Bromide Prints and Lantern Slides*. Mr. Geo. Fisher.
7.....	Stonehouse Camera Club	Business Night.
8.....	Croydon Camera Club	To be announced.
8.....	The Photographic Club.....	Mr. A. Barton Kent. *Photographs from Pharaohland*.
9.....	North-West London	*Films*. Demonstration by Messrs. Wellington and Ward.
3.....	West London Photographic ..	*Failures*. By H. Selby.
9.....	London and Provincial.....	Lantern Night. *The Zoo Up-to-Date*. Mr. Dando.
9.....	Woolwich Photographic	*Control in Printing*. By Mr. Henry W. Bennett.
9.....	Richmond Camera Club	Wellington S.C.P. Paper. Mr. E. Human.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

DECEMBER 19, 1901.—Mr. A. J. Brown in the chair.

Mr. Thomas Bedding reported the sad accident sustained by Mr. E. J. Wall at Foots Cray, and proposed that a letter expressing the sympathy of the members be sent to him in his misfortune. He was sure that the association would wish to identify itself with the general hope that Mr. Wall would have as speedy and complete a recovery as the nature of his accident would allow.

Mr. A. Haddon supported the motion, and the secretary was desired to draft a letter in the terms of the proposal. All the members present attached their signatures to the note.

Mr. Freshwater passed round a copy of the Annual Report of the Bolt court Technical School of the London County Council, under the supervision of Mr. C. W. Gamble, who presented it. The book was produced entirely in the school, from the preparation of blocks and original photographs and sketches, and it formed a handsome example of the work being done by the school under Mr. Gamble's able direction.

Mr. Bedding passed round a series of portrait studies by the eminent American photographer of St. Louis, Mr. J. C. Strauss. The work was not pure photography in the sense that the prints were untouched impressions from the untouched negatives, but as to the beauty and novelty of the results there could be no two opinions. Some of the prints had been reproduced in several of the American magazines, but the exact method adopted in the work had not been made known. Mr. Bedding also showed a parallax stereogram sent him by Mr. F. E. Ives, of Philadelphia. It was a single picture, which, viewed at a distance of 12 in. from the eyes, presented a marked stereoscopic effect. Inclined at slight angles the effect was pseudo-scopic. The process was outlined as one in which the plate was exposed, having before it a lined screen, with a slight separation between it and the screen. A positive viewed through a similar screen at a certain distance gave the effect seen, which was very remarkable.

The Chairman passed round a negative washing device. It was composed of a number of trays which supported the plates and which were inclined so that the water ran in turn over the whole of the plates from top to bottom.

Mr. E. T. Wright read a paper of a humorous nature in which he detailed his experiences with the beginner in photography over the counter.

PHOTOGRAPHIC CONUNDRUMS, the title of his paper, included many amusing episodes. It appeared that the beginner made a strong point of a lens being workable at F/6. He strongly objected to the presence of bubbles in the glass composing modern lenses. He made impossible exposures in drawing-rooms and wondered why there was no image on

development. He asked for 5 by 4 plates because 4 by 5 plates would not fit his camera. He asked for "graduated" hypo and other equally unknown things. Perhaps the description of the cute school boy who laid out a sovereign in photographic materials and declined a bill because he was going to tell his "old man" that they cost him 25s., was as good as any, but the paper altogether was full of instances of the woeful ignorance displayed by the raw amateur when first stumbling amongst the many pitfalls that photography so well affords.

Mr. C. B. Howdill, of Leeds, showed some interesting colour slides of stained glass windows by Sanger Shepherd's process of three superimposed and dyed films, followed by Mr. T. K. Grant with a number of brilliant effects by the Lumière colour process.

PHOTOGRAPHIC CLUB.

DECEMBER 18, 1901.—Mr. F. A. Bridge in the chair.

Mr. G. T. Harris passed round one of Mudd's original collodio albumen negatives, made about 1860, and one of Fenton's original calotype negatives of about the same date. He had made reduced lantern slides from some of these negatives a little time since, and said they were very good in quality. The calotype negative had been made with a lens that did not cover the whole of the sensitive surface, and to remedy the defect a piece of silver paper had been deeply printed and used as a mask to cover the bare corners of the negative.

Three new members were elected, and one was proposed for membership.

Mr. G. T. Harris read a paper on "Some Applications of Light Filters in Landscape Photography."

The Chairman considered orthochromatic plates to be almost indispensable for the best results. He was once photographing Greenwich Hospital from the top of the Observatory Hill, and those who knew the place would agree that it was never clear more than six times a year or thereabouts. The ordinary plate could not be made to produce a good result, but at last when an orthochromatic plate, with a deep yellow screen, made by Mr. Wellington, was used, not only was the picture generally improved, but the universal haze was entirely cleared away. London fog in particular called for the use of orthochromatic plates with a fairly deep screen, if length of exposure were not of any consequence.

Mr. J. R. Gotz said he had used colour filters for fifteen or sixteen years, and hardly ever worked without them. With or without a filter, there was no doubt that an orthochromatic plate did give a better and truer effect with almost any subject than could an ordinary plate. He named a case—that of Chichester Cathedral from a point fifteen miles away—in which the ordinary plate rendered the horizon as a blurred streak, and entirely failed to render the image of the spire, whereas an orthochromatic plate produced an excellent result.

The Chairman remarked that the greatest objection to orthochromatic plates in the past had been that they were badly made, the glass being uneven and of various thicknesses, so that the good effect obtained on the one hand was negatived on the other.

Mr. T. W. Derrington said that he had used orthochromatic plates for years without filters because they gave images without halation; therefore he did not consider the cure of halation to be entirely a function of the filter.

Mr. A. Mackie said he used orthochromatic plates for practically everything except when he had to use a very rapid plate, and there was undoubtedly a great improvement as regards absence of halation and better gradation, even with black-and-white subjects.

Mr. Harris said that the screen itself had an effect upon halation, and the mere fact that a plate was orthochromatic did not dispose of the halation question.

Mr. H. Snowden Ward referred to the use of orthochromatic plates in portraiture, and said that anybody who had studied the exhibitions of recent years, and who had an eye for colour rendering in portraiture, could perceive its value, because the colour values in portraiture were at present particularly badly rendered.

Mr. N. Luboschez spoke to the effect that he had not been convinced that orthochromatic plates were the best for all classes of work. He mentioned instances where ordinary plates had repeatedly given him better results than orthochromatic plates, instances in which painters had agreed with him that the ordinary plate gave a better colour value. He preferred to use a thickly-coated plate, well backed, and to give a full exposure.

Mr. Harris conceded that no rule could be made concerning the universal use of orthochromatic plates.

Mr. Mackie said that a large number of people refrained from using these plates because of a supposed difficulty of working them. This impression was wrong. The only care needed was in the matter of light. He always used plenty composed of a ruby glass and a golden fabric.

THE Photographic Club is to have a lecture on "Pharaohland," by Mr. A. Barton Kent, on Wednesday, January 8, at 8 p.m., at Anderton's Hotel, Fleet-street, and any of our readers are at liberty to attend at this or any other meeting.

WE are asked to remind our readers that Mr. Henry Stevens has now on exhibition at the Royal Photographic Society's house, 66, Russell-square, a fine collection of photographs, which may be seen daily from ten to four (Wednesdays ten to eight) by any who maywish to examine them.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

THE DUNDEE EXHIBITION

To the Editors.

Gentlemen,—Will you please announce in your next issue that the time for receiving entries for the above exhibition has been altered to January 15th, 1902, and that intending competitors may still have prospectus and entry forms on receipt of post card. Pictures should reach Dundee as near the 22nd January as possible. There are seven open classes (including a lecturette with lantern slides, in which the prizes are £2 2s. and £1 1s.), one class confined to professionals (portraiture) and two classes confined to amateurs. Pictures are accepted "not for competition" without entrance fee. The judges are Messrs. J. Craig Annan, Wm. Crooke, and A. Horsley Hinton.

The Board of Trade has now sanctioned the "Photographic Art Union," and we have secured the services of Sir John Leng, M.P., Lord Provost Hunter, and several of Dundee's most prominent citizens to act on its committee.—Thanking you in anticipation, very faithfully yours,

ARCHIBALD CAMPBELL.
Hon. Joint Secretary.

Rooms: 39, High-street, Dundee.
December 28th, 1901.

THE KEEPING PROPERTIES OF PLATES AND FILMS.

To the Editors.

Gentlemen,—I am in receipt of the almanac, and I am highly pleased with it, as it contains many very interesting items. I do not pretend to say that I have read them all already. I keep them for occasional pastime. My collection of them dates back to 1889, and makes quite a show in my library and very useful for reference.

I read in your Journal about the lawsuit which has been decided in favour of the Kodak, Limited, and I noticed also your satisfaction of it. This is quite right so far, but will you allow me to say, *cela dépend du point de vue*, and particularly *de celui qui est lésé*. In fact, you may be perfectly right, as it would make it a rather bad precedent for the manufacturer of films, as well as of plates for that matter. Manufacturers know very well that they are liable to mistakes, and occasionally make bad batches, or only insufficiently good. Of course, these are (so it is said at least), invariably thrown away. Is it always so? It sounds hard on human nature, though, to do it always. I once made some dry plates myself for sale, and never a single plate went out of my shops which was not perfect—I was going to say was not first tried by me or my assistant. I also had very few complaints from my numerous customers. In fact, the last complaint, it so happened was the only one I ever had in that respect. and so it is to-day with every manufacturer. It may, however, be added that most of them, when the complaint is seriously put to them, are generally ready to exchange the bad plates for others. Personally, I am sure that plates would not be so easily replaced if it was so sure that the originals were good. I have heard of several instances where travellers, who were going very far from home, and which case was explained to the dealer or manufacturer, and he was furnished with indifferent lots, and it was by mere chance that upon trial it was found to be a very bad lot and then exchanged. These were plates. But to return to films—celluloid, of course, since these are almost exclusively used at present. I remember having read in the Journal that they are the most handy, and also very safe to take all round the world, develop on return, and have all perfect negatives. In the Almanac, as well as in the Journal. many travellers have written about their experience with films, and have related their successes, and how everyone should use them. Of course, some have succeeded very well, but others, and we do not hear of all of them, have not, and I am afraid that, after having explained their troubles to the party furnishing the films, they were shown that the fault was their own, and nobody else was to blame.

My dear sir, I have been there myself, and I know what I am talking about. I cannot say for sure and certain that under certain conditions of extremes, such as heat, dampness, and foul gases, plates, as well as films, may not deteriorate, but I say that most certainly some plates and films will keep while others will not even under the most usual circumstances, and nothing is there to prove that the same would not act similarly under more trying circumstances.

Do you think now it is right that any firm should supply you with goods which, under the pretence of their good quality when passing their door, sends you thousands of miles away, spending hundreds of pounds sometimes for the principal, if not the only, purpose to bring back some fine views difficult of access, etc., and finding on your return that the plates or films were useless, and offer you to replace the films or refuse their payment, which amounts

to perhaps £5, more or less? What for your trouble and expenses? I think that it can now by an experienced man be tolerably well proven, if the plate or film was wrong at first, or it was spoiled during travel or exposure, and leave the doubt, if any be, to the benefit of the manufacturer. For over twenty years I have been using English plates and films, and I ought to have some experience with both of them. I have used some which were at first simply splendid, and I ordered then a quantity of them, and when I got them all were bad and fogged. These were films. I tried another brand of films and got a few dozens of them, but for some reasons did not get any more. When first tried about 10 years ago they proved to be very good, and I got very fine results, they being also very sensitive. About six months ago I used up the remainder of them, and they were as good as 10 years ago.—Yours very truly,

ALBERT LEVY.

Asnières (Siene).
December 20th, 1901.

COLOURING STEREOSCOPIC SLIDES.

To the Editors.

Gentlemen,—Some few months ago Mr. Herbert W. Abba, of 20, Craven-street, Hull, wrote you asking if you could give him the name of a slide painter, and you very kindly forwarded his letter to me to attend to. I wrote to him in due course, with a result that I have coloured several dozen lantern slides for him, and am glad to state that he has expressed himself as being greatly pleased, and has intimated to me that he has recently written you to that effect. I need hardly say that I am extremely obliged to you for placing me in communication with him. May I ask you to add to your previous courtesy and kindness by placing me in communication with your correspondent "Conrad," to whom you reply in your last "Answers to Correspondents," as I can undertake to colour stereoscopic slides, both on glass and paper. I enclose stamped envelope, so that you may either send on my communication to him or favour me with his name and address. I have already coloured a large number of stereoscopic slides, and have pleased all my customers.

I think this branch of photography is a very beautiful one, and I should like to see it revived, as it is one which, in my opinion, gives lasting pleasure, and is in season all the year round.—Again thanking you, and wishing you a Happy and Prosperous New Year, I remain, yours faithfully,

ALFRED UNDERHILL.

32, Clarendon-road, West Croydon.
December 27th, 1901.

[Perhaps "Conrad" will communicate with Mr. Underhill direct.—ED. B.J.P.].

TO BRITISH MANUFACTURERS, MERCHANTS, AND IMPORTERS INTERESTED IN TRADE WITH RUSSIA.

To the Editors.

Gentlemen,—Beling engaged in compiling in the Russian language an Encyclopædia Dictionary of raw stuffs and manufactured products with numerous commercial and statistical items referring to each commodity (Editors, Brokhaus-Efron, Co., Ltd., Petersburg), I should be obliged for any information concerning British manufactured products and goods mostly in stock in Great Britain, or largely imported into this country, with special reference to the following points:—

1. Kinds and varieties; their definition and difference.
2. Any trade abbreviations, signs, Nos., Marks, etc., in use with reference to each commodity.
3. Markets; their requirements; firms dealing with; payments; auctions.
4. Packing (material, quantity, etc.).
5. Prices; general statistics concerning the production of the commodity and the amount of export (import) to (from) Russia.

Information obtained in general with regard to the five above stated points through the assistance of any firm should bear the full name and address of the firm kindly communicating the information in question.

Without enlarging on the much felt need of a work of this kind, whose object would be the furthering of more intimate commercial relations between the two countries, I hope I shall be assisted by British manufacturers and merchants in the difficult task of conveying to Russian commercial people a right and adequate idea of British trade and industries.—I am, dear Sirs, your obedient servant,

BORIS M. BRANDHENDLER.

c/o Brockhaus-Efron Co., Ltd., 6, Pracheshny, St. Petersburg.

[We are privately informed that the general scope of the work referred to in the above letter will tend to an increased knowledge in Russia of British goods.—ED. B.J.P.].

A LETTER FROM MR. E. J. WALL.

To the Editors.

Gentlemen,—Allow me to utilise your columns to thank the numerous friends who have so kindly written to express their sympathies with me in my accident, and may I ask them to kindly accept this, for the present, as my thanks?—Yours, etc.,

E. J. WALL.

December 28th, 1901.

AN EASY ENLARGING DODGE.

To the Editors.

Gentlemen,—For those workers who cannot spare the necessary time to make their enlargements during the day, the following dodge may be of use. Last winter I constructed an enlarging camera which works perfectly. First I bought from a druggist one of the packing cases used by the Angiers Emulsion firm, a machine made box, 9 inches by 9 inches by 8 inches; the lid I fitted with a pair of hinges, and at either end cut an oblong aperture; to one, which I may term the back, I fitted a door having a circular opening in which a twill sleeve, similar to those used in a changing bag, was attached. Inside, and against the front I screwed a ground-glass drawing slate (this is to diffuse the light), and at each side of the box I cut a two-inch hole, against which is fixed a piece of flashed ruby glass; these side windows are to be used for watching the ribbon when lighting it. For the camera I made two boxes, the one sliding within the other, having an aperture for the lens, and an opening at the back to take the slide, holding the negative. The lens (R.R.) in my hand camera is mounted on a moveable front, and I take it out of the camera and place it in a recess in the outer box of enlarging camera. As I only enlarge to whole plate, I use a printing frame of that size on an easel, with a piece of plain white paper to focus upon, this of course being replaced with bromide paper at the right moment. To focus, a cycle lamp will give a fair light, used inside the box with the back door opened.

In the corner of the box I placed an inch or two of wax candle, this is to ignite the magnesium ribbon; then break off a couple of inches of ribbon and hold this piece in a small pair of pliers, and place it on the floor of box, then, having focussed, remove plain paper from printing frame and replace with bromide paper, instead of the plain white; cap the lens, close the door at back, insert the right hand through the sleeve together with a match and light the candle. Then take up the pliers holding the ribbon and light at the candle flame, and as soon as it is alight remove cap with the left hand, and wave the burning ribbon to and fro behind the ground-glass, taking care not to touch the ground-glass or the enlargement will be spoiled. When the ribbon is burnt out, replace the cap on lens, blow out the candle (if you can) and remove bromide paper to develop. The whole operation takes place in a dark room or any room rendered suitable for the work. As this will be a test print to work from, the right length of ribbon can be estimated. I found that two inches was about right for thin negatives, and three to three and a half for dense. This dodge is not new I am aware, but may not be known to many. I have "cribbed" the idea from various articles on the subject appearing in the "Almanac" during the past twenty years.—I am, yours, etc.,

East Bank, Oxon, Birkenhead. KENNETH M. BEAN.

WITH A POUND OF TEA.

To the Editors.

Gentlemen,—Please find enclosed a circular of cheap enlargements from a well-known established tea dealer. What do you think of the idea?—Yours truly,

FAIRPLAY.

The circular enclosed by our correspondent is as follows:—

"Finn's Stores, St. Margaret's-street, Canterbury.—We have just completed an arrangement with the producers of the celebrated 'Aerinda' portraits whereby all regular customers for Finn's 'Standard' teas (1s., 1s. 2d., 1s. 4d., 1s. 6d. and 1s. 10d. per lb.) can obtain through F. Finn and Sons (Ltd.) (who are the sole agents for these works of art) enlarged (20 in. by 16 in.) copies of photos of themselves and any of their relatives or friends, for the low sum of 5s. per copy. Enlargements similar to these have hitherto been sold at very much higher prices. We have decided to extend this offer to those who have not used the blends mentioned; conditional upon 1 lb. of tea being ordered at the time, as we are confident that a trial will be mutually advantageous. The portraits are copied and enlarged by a new process and are absolutely permanent. Our traveller will show you copies of photos of persons known to you, and others can be seen at the Stores; also patterns of frames suitable for these portraits at 4s. 6d. per frame, which are often sold at 6s. 6d. The work to be completed in about 14 days and to be handed to you with the original photograph."

["Fairplay" should join the East Kent Branch of the Professional Photographers' Association, and persuade his brother professionals of the district to join him in inducing Messrs. Finn to reconsider their scheme.—EDS. *B.J.P.*]

THE WELLINGTON ALMANAC.

To the Editors.

Gentlemen,—Herewith we have much pleasure in enclosing you copy of our almanac for 1902. We should be much obliged if you will

inform your readers that a copy will be sent post free on application. We think that a copy would be acceptable to all and sundry in the photographic world.—We are, yours faithfully,

Elstree, Herts. WELLINGTON & WARD.

December 28th, 1901.

[The Wellington Almanac makes a useful date reminder, and is tastefully illustrated and printed.—EDS. *B.J.P.*]

THE BECK LENSES.

To the Editors.

Gentlemen,—We are taking the liberty of sending you herewith a catalogue of our Beck-Steinheil lenses. You will see that we have made arrangements to have these lenses fitted to various makes of cameras now on the market. We have no doubt that some of your readers would be interested in knowing of the possibilities of this lens, and we are always ready to advise as to what particular lens or telephoto attachment is the most suitable for any particular form of camera. We should be pleased to forward a list, similar to the enclosed, upon receipt of a postcard from any persons who would like to have them.—Yours faithfully,

68, Cornhill, London, E.C. R. & J. BECK, LTD.

[Messrs. Beck enclose a 16 page catalogue, which is fully illustrated and descriptive.—EDS. B.J.P.]

FORTHCOMING EXHIBITIONS.

1902.	
Mar. 1902	Corporation of Glasgow Photographic Exhibition and Competition. Hon. Secretary, Peter Macnair, People's Palace, Glasgow.
Jan. 4, 1902.....	Glasgow Southern Photographic Association. Hon. Secretary, J. B. Haggart, 93, Norfolk-street, Glasgow.
January 31–Mar. 1 ...	Dundee and East of Scotland Photographic Association in the Victoria Art Galleries, Dundee. Hon. Secretaries, V. C. Baird and Archibald Campbell, 39, High-street, Dundee.
February 13–15	Nottingham Mechanics' Institute Camera Club, Mechanics' Lecture Hall, Nottingham. Joint Secretaries, W. Ward, 14, Stratford-terrace, Nottingham; E. H. Atkin, 68, Blue Bell-hill, Nottingham; A. Black, 9, Bowers-avenue, Nottingham.
15–Mar. 8 ...	Edinburgh Photographic Society, Society's Rooms, 38, Castle-street, Edinburgh. Secretary, J. B. Johnston, 52, Hollybank-terrace, Edinburgh.
„ 19–26	Croydon Camera Club, The Art Galleries, Park-lane, Croydon. Hon. Secretary, E. A. Salt, 76, Heathfield-road, Croydon.
March 1–8	South London Photographic Society, Public Baths, Church-street, Camberwell. Hon. Secretary, Frank Godgard, Woodlands, Vanbrugh-hill, Blackheath, S.E.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY, 24, *Wellington-street, Strand, London, W.C. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

MISPLACED LIGHT.—"LANTERN."—From your description of the disc on the screen it is clear that the light is not central—that it is not in the axis of the optical system. The remedy is obvious—centre the light.

PHOTOGRAVURE.—H. REID asks: "What kind of tissue is the best for making the carbon transparencies for photogravure, as I am anxious to try the process?"—In reply: The tissue most generally used for the transparencies is the "special transparency tissue." Other tissues are sometimes used, but not often.

COPYRIGHT.—JAS. LEACH.—You were unwise in parting with any of the pictures before you had registered the copyright. Your best way now will be to register at once, then you can proceed for damages for any future infringements. We do not undertake to answer correspondents by post.

SPECTROSCOPES.—COL. GUBBINS writes: "Can you tell me where I could get a spectroscope for testing dark-room light, and what would be the approximate cost?"—In reply: Pocket spectroscopes are supplied by all the leading opticians. Messrs. Browning, Strand, London, make a speciality of these instruments. The price is about a couple of guineas and upward.

PROCESS BLOCK PRINTS.—The prints sent are from ordinary process blocks. The lens mentioned would be well suited for the production of the negatives. Any camera will do if fitted with a suitable ruled screen. Messrs. Penrose & Co. make a speciality of cameras and screens for process work. Any of the ordinary developers will do for the negatives.

DISCOLOURED COLLODIO-CHLORIDE PAPER.—T. EVANS writes: "I have several sheets of collodio-chloride paper which was given to me, but it is quite of a brown colour, and will not give pure whites when toned with platinum. Can you tell me how I can get good whites with it?"—In reply: We are sorry we cannot, as the paper has become spoilt with long keeping. It is practically useless, except to add to the residues if you collect them.

THE VICTOR SHUTTER.—MADEIRA says: "Who are the makers of the Victor shutter as supplied to some of the American cameras now in the market, and have they any agent in London, or are these shutters made in London? I ask as I should much like to get a catalogue of their different sizes, price, &c."—In reply: We believe Messrs. G. Houghton & Son, High Holborn, supply the Victor shutter. Better communicate with them.

VALUE OF PICTURE.—J. HARE writes: "I herewith enclose copy of an old picture. Can you please inform me whether you consider it to be of any value? The small letter R stuck on the back of print can be seen by looking through the painting at a strong light."—In reply: We can give no idea whatever of the picture from the photograph sent, which, by the way, must be a very bad reproduction of it. Your best way will be to get it valued by a picture dealer.

PHOTOGRAPHING DEER.—R. C. writes: "I am anxious to get some good photographs of a herd of deer in the park here. I have made several attempts, but as I approach them near enough to get them of any size on the plate they run away, they are so nervous. Can you suggest anything that will help me to effect my object?"—In reply: The best way will be to photograph the herd with a telephoto lens. With this you will be able to obtain a large image a long way off. Or you may secure a small negative and subsequently enlarge it.

LECTURE ON J. M. W. TURNER.—E. SHIVAS writes: "I am preparing a lecture for a local literary society on Turner, the artist, and wish a set of lantern slides of his principal pictures to illustrate my lecture. Do you know if this can be got on hire, and where? I would make the slides myself, but I find that reproductions of Turner's famous works are very expensive."—In reply: The most likely firms to supply the slides on hire would be Mr. Walter Tyler, Waterloo-road, S.E., or Messrs. Newton & Co., Fleet-street, E.C.

CLEANING AN OLD ENGRAVING.—A. HARVEY writes: "Shall be very glad if you could inform me how to successfully clean an old engraving?"—In reply: There are different methods of cleaning engravings, but they are all based upon the bleaching action of chlorine. One way is to first treat the print with a solution of chloride of lime, and then with a dilute acid—lemon juice is often employed. Or the print may be treated with hypo-chlorite of soda. If the engraving is a valuable one we should advise you to get it cleaned by an expert in print restoring. Many valuable engravings have been ruined by amateur attempts at cleaning them.

LENS QUERY.—M. BIGGS says: "A friend of mine, not a photographer, has a lens the like of which I have never seen before, yet he says he knows it is a photographic lens. The back glass is about 3 in. in diameter, and the front one is much smaller, and about midway between the two is one much smaller still, close to which the stops are fitted. Can you tell me what the lens is for?"—In reply: The lens is evidently one of the old triplet form, which at one time was much used. Now, however, it is not much employed, except for copying purposes. This form of lens has been superseded by others of more modern construction.

RAIN OR DISTILLED WATER.—G. COLES says: "I often see in formulæ 'distilled or rain water' given. When that is the case, I have always used the distilled. Rain water, I am told, when collected from the roofs of houses, is always impure. How would it be for me to collect snow and melt it, and store it for future use? Would that be purer than rain water if it were taken from the garden?"—In reply: If the snow were collected in the open country it would probably answer, but that got in the neighbourhood of London or other large towns would not. Collect some London snow and let it melt, and you will find the water it yields is very dirty and discoloured, clean as the snow may seem.

DEVELOPERS.—A. LEVER writes: "I should be glad if you can assist me by answering the following. Out of the following developers for bromide enlarging—ferrous oxalate, metol, metokinone, hydrokinone, amidol, eikonogen.—(1) Which of the above developers has the greatest tendency to clogging up of the shadows? (2) Which of the above has the least tendency to clog up the shadows?"—In reply: All the developers mentioned are good, but some will answer better with some brands of paper than with others. All bromide papers are not alike, and the developer that answers best with one may not do so with another. We should advise you to adopt that recommended by the makers of the paper you employ, as they are more likely to know which suits it best.

THE BRITISH

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EX CATHEDRA.

Stereo-micrography. A new method of obtaining stereoscopic effects from microscopic photographs was described at the last meeting of the Royal Microscopic Society in a paper by Professor G. P. Birdwood, of McGill College, Montreal. He attaches the object to be photographed in the microscope to a tilting frame attached to the stage. He first takes a photograph, after giving a slight tilt to the object, then a second picture after tilting in the opposite direction. The prints from the negatives so obtained were mounted stereoscopically in the usual manner. A specimen stereograph was placed in a stereoscope, and handed round for the inspection of the members present.

* * *

Röntgen Rays and Smuggling. In the early days of X-ray work, much was said of their possible availability for Post Office work; but as to their actual use in that direction little if anything was published. It appears to have rested with the Post Office authorities of Buenos Ayres to establish a record in this direction. We do not learn whether the results they obtained were photographic or from a fluorescent screen. Whatever their method it was efficient. The Government had been informed by the jewellers that by means of registered letters dutiable articles, such as rings, watches, chains, etc., were being smuggled. Not desiring to use illegal measures to discover the truth of the allegations, they employed a Röntgen-ray apparatus and obtained conclusive proof of the presence of the dutiable articles. They then obtained a court order to open the packages, and in a single week confiscated more than twenty thousand dollars' worth of smuggled goods.

* * *

Becquerel Rays. The remarkable properties of the radiations from the new metal radium, or the natural ores containing it, continue to be investigated by Messrs. Curie and Debierne, and the latest contribution to the subject read at the Paris Academy of Science, has been published in its records. They have already described how all bodies become endowed with radio activity when placed in contiguity with a solid salt of radiferous burning, now we learn from them that this induced radio activity can be brought about in even a more regular manner if solutions of the salt are employed instead of the solid. Thus in the case of copper platinum, lead, tin, aluminium, glass, paper, wax, zinc, sulphide, etc., the same induced activity was brought about when exposed to the emitting solution under the same conditions as the solids, and was independent of the nature of the surrounding gas or its pressure. The action of the radium is so powerful in the case of some bodies, especially phosphorescent ones, as actually to cause them to become luminous, zinc sulphide becoming especially brilliant, glass, particularly Thuringian, acquire phosphorescent qualities.

* * *

Poisoning by Oxalic Acid. On several occasions recently we have chronicled cases of poisoning by chemicals used in photography—chiefly cyanide of potassium. Last week an inquest was held at Rochester on a young lady who died from oxalic acid. In mistake for a bottle of Epsom salts she took one containing oxalic acid—the two salts being almost identical in appearance—mixed some, and took it, and, although emetics were administered, she died. Had a simple antidote—carbonate of lime, or scraped up chalk—been given at once, no doubt she would have been none the worse. We allude to this case because oxalic acid is sometimes used in photography, and accidents will happen occasionally. If one does, however, with this poison, a little common whiting, or chalk, mixed with water, if administered quickly, will render it inert. The lime combines with the acid, forming oxalate of lime, which is insoluble, and thus the poison is rendered harmless. In the case of the bichloride of mercury, should a solution of that, which is in more general use in photography than oxalic acid, be accidentally swallowed, the whites of two or three eggs should be taken at once; they

will combine with the bichloride and render that inert. In any case, after the administering of the antidote, medical aid should be called in, though it may not be absolutely necessary.

* * *

The Light of the Past Year. Whether professional portraitists are to be congratulated on the business they did in the past year or not may be a question. Some we know—high-class workers—may be, without doubt. Others, we are aware, have found it anything but a matter for congratulation. But there is no question that, taking the year through, the weather has not been the cause of lack of trade, for last year the weather was exceptionally propitious for photography, both indoors and out. We learn that the aggregate rainfall for the year was deficient over the entire area of the British Isles, except in the north of Ireland, where there was an excess. The greatest deficiency in any part of the kingdom is no less than 6.7 inches, in the south-west part of England, and that is followed very closely by 6.2 inches in the north of Scotland. The mean temperature for the year over the United Kingdom was, however, about the average. But there was everywhere an excess of bright sunshine, varying from 199 hours in the south of England to 287 in the north-west. In the Channel Islands, however, there was but 35 hours, and in the south of Ireland but 36 hours above the average. In London, as shown by the observations made at Greenwich, the total rainfall for the year showed a deficiency of 3.3 inches on the average for the last sixty years. The returns from Greenwich also show that during the year there were 1,550 hours of sunshine, which is about 290 hours in excess of the average of the last twenty years. The weather, to the professional portraitist, since the introduction of gelatine plates, is not of the same importance as it was in the days of the old wet collodion process, but, still, light is necessary. The case, however, is somewhat different with the landscapist; he must have a fairly good light and, for some effects, bright sunshine. The return just issued shows that there has been no lack of that during the year just expired, indeed, it was much above the average.

* * *

Fire Insurance Policies and Photographers During the past week or so several letters have appeared in the columns of the *Standard* with reference to the "Average Clause" which is inserted in most fire insurance policies, and the effect of which is not fully realised by many insurers, and not, perhaps, by most photographers. In effect, it is this: If the insurer insures, say, for only half the value of the property on the premises, and that is partially destroyed by fire, the insurance company will only compensate for half that damage. For example, if the property is of the value, say, of £2,000, and it is insured for only £1,000, and a fire occurs, doing damage to the extent of £500, the insurance company will only pay £250; whereas had he insured for the £2,000, he would recover the full £500. It is not all policies that contain this clause, but it is very common for photographic and other insurers not to read the clauses and conditions of their policies at the time they effect their insurances, and therefore are ignorant of what they really are. But if, by chance, they have to make a claim upon them, they find the conditions under which they insured were very different from what they imagined they were. Owing to the high premiums charged by most offices to photographers, they frequently do not insure their stock and premises to their full value, thinking that if a fire occurred it would probably not occasion more damage than would be covered by the sum at which they were insured. But that would not be the case when the policy contains the "Average Clause." We call special attention to this matter for the reason just alluded to, that many photographers, on account of the light rates charged to them, do not insure their premises and plant to their full value. It is always well to rather over than under insure when there is the "Average Clause" in the policy, so as to secure compensation for the full amount of damage that may be sustained in the event of a fire.

* * *

Pressure of Light. When Sir W. Crooke's radiometer was invented, it was at first thought that an efficient and simple light measure or practical actinometer had been discovered, the principle availed of being that the vanes of the light-mill in a vacuum were acted upon by the actual pressure or impact of the light waves. It was not long, however, before it was shown that heat rather than light brought about the rotation, for it is quite possible to cause the rotation by blowing with the breath upon the outside of the bulb, and, further, that instead of increasing the rapidity of revolution when diminished resistance was brought about by increasing the vacuum, the motion ceased entirely. Maxwell pointed out that the concentrated rays of an electric lamp might, however, possibly produce a mechanical effect capable of being measured. Professor Lebedew, of the Moscow University, has shown this idea to be correct, using a bulb of high exhaustion, fitted with vanes of aluminium suspended by glass fibres, and filtering out the rays from an electric arc light, which were capable of heating the bulb itself, he found that the pressure was directly proportional to the energy of the received light, and was independent of its colour. The instrument was thus a real actinometer, but we are afraid one not practicable for photographic use.

* * *

The Significance of Trifles. Although but little past the time of the big resolutions of the New Year, the great majority of those who made them are already experiencing a sense of humiliation at having broken them. Having been through the mill ourselves, we are sympathetic. We also wish to be cheerful and helpful towards those now in the slough of despond of disappointed estimate of will power, in which we have oftentimes found ourselves towards the second week in January. It may ease somewhat the disagreeable feeling of self-depreciation present in the mind of a man when looking upon the broken fragments of a resolution that has proved too big for him to handle, to get hold of something smaller, but practicable, on the credit side. From contrast and reaction, the significance of trifles will serve well. If his year is to be the better for a change, the change to an appreciation of the value of trifles will be distinctive enough, for, of all things, they are the most liable to be overlooked. Were we to examine a little more closely, we would acquire a great respect for trifles. They have a direct money value. Success is in great measure due to the attention bestowed upon them. It would pay every photographer—making a start at the beginning of the year, if he prefer it, or it will in any way strengthen his further action—to go thoroughly into, and examine upon a basis of their cash value, the petty details of his business. He will most certainly find that many existing trifles could be altered, and many fresh ones introduced, to his benefit. To be done thoroughly it should be done systematically, say, for instance, under broad heads that will naturally include the whole field of his work.

* * *

Trifles of Light. Roughly outlining a practicable method, one fine head, and one having a special appropriateness in his case, is light. As far as light is con-

cerned, does he get the best value out of it, both in quantity and kind? Probably he does not. He is aware, possibly, that in one or two directions small alterations would improve matters. But they are so trifling that he has allowed them to remain as they are, and has been in consequence handicapped for years to the extent of the trifles that might easily and inexpensively have been altered. It may be that a rearrangement as to cut, or slight shade of colour, of the blinds of the studio would mean a slightly wider working range. As it is, he has cramped his work—slightly, it is true, but still cramped it—for a trivial matter of blind arrangement. If he is a wise man he will alter it. Success is gained, not upon the broad, but the narrow margin. His brother photographer is too near himself in skill and business capacity to admit of broad margins. Or perhaps his showcase in the entry is badly lighted, as a whole or in parts. A reflector, such as is used outside windows of bottom back rooms in a London house, properly arranged, might double the advertising value of his case. He might gain a similar advantage in his window, if needed, by similar or other means. Still clinging to light, in summer time it may be too fierce, and he has to think of a sun blind. Now, one would think that there cannot be much in this item. All needed is something that will effectually shade off the undesirable intensity of the light and heat. It is only upon a visit on a hot, sunny summer's day to a rising seaside town, and seeing the new, clean, and gaily striped sun awning above the photographer's or other tradesman's window undulating responsively to the breeze, that we realise there can be much of attraction, and so of advertising value, in a brilliant splash of colour. It would thus be good business policy to buy brilliant, flimsy material for a sun blind that, lasting only one season, would mean complete renewal the next. Having come to summer along the pleasant pathways of light and heat, and under the shade of the awning, the suggestion of a seasonable attraction in the window naturally offers itself. The idea of coolness suggested by a good enlargement of the local waterfall, the river weir, the town reservoirs, or an interior view of the ice-house, would be easy to convey, and be extremely grateful to the heated passer-by, ready to linger. The soothing state of mind induced in looking at it would be the best for the profitable study of the other items—pictures, prices, and so forth—in the window.

* * *

Studio Trifles. Coolness suggests airiness. How can the impression of airiness be best conveyed? In all sorts of small trifling ways, if a man will but take the trouble to think the matter over. By white or cream enamelled paint, with a touch of gilding or light blue to emphasise outline; by a sparing display of work set off by a graceful plant or fern. The man who wreathes the well-framed 10 by 8 picture of the bride with a light spray of real orange blossom, and makes it the solitary object in his window for a day or two, knows what he is about. The suggestion of freshness and coolness could extend with advantage to all within the premises. A large glass filter dripping water into its bowl is a pleasant object anywhere on a hot summer's day. A drink out of it would oftentimes be particularly acceptable to a heated sitter, or to a tired and fidgety child, and might make all the difference between a good and a bad picture. A few drops of lavender water or eau-de-cologne sprayed in the studio, would help in freshening up the place and the spirits of the customer. Pyro-stained fingers are not acceptable in arranging the pose of a body or the folds of a dress. They are not a necessity. The brush and comb in the dressing-room do not gain from being patriarchal in appearance, and there should be an ample supply of water and clean towels. All these details come under such broad heads as those mentioned—light, heat, airiness, seasonableness, and cleanliness. There are many more heads, and more items under them, in the various divisions; the buying, arranging, and selling, in a business. All are trifles, but, avoiding the chestnutty flavour of the tag as to their bearing upon the making up of perfection, every reasonable man of experience and good sense must see that they are of the highest importance in the gross from the point of view of business profit. But as trifles they are neglected. It is an unwise neglect, and every worker should do his best to remedy the state of things in his own best interests. If he did, he would be surprised at the result by January, 1903.

* * *

Quack Photography. Among the host of traders who employ photography in some form or other to advertise their wares, the vendor of patent medicines holds a very prominent place. Pills, it is true, as far as appearance goes, are as like to one another as the proverbial "two peas," and bottles of medicine have a family resemblance which is apt to pall upon the observer when a hundred or so have been held up to his admiration. Indeed, neither pills nor physic phials, although they may contain the elixir of life, as advertised nostrums invariably do, can be said to lend themselves to pictorial display. It may also be regarded as an axiom that neither the one nor the other possess those essentials out of which artistically gifted photographers are able to coax æsthetic delights. Perhaps it is for these reasons that those who sell to their fellows, under the ægis of a 1½d. Government stamp, magical compounds which are foreign to the British Pharmacopœia, are constrained to publish the portraits of those who have survived the recommended treatment. It is the only way of adapting photography to their particular industry, and they do so under the belief that the camera is a witness whose veracity no one can possibly question. Such portraits assail us in many of the daily newspapers, and we look upon them with awe, wondering whether, if after seeing them, any person can be so wilfully blind to his future as to seek a pill or potion which can bring about such lamentable results. We have been told that the appalling ugliness of some of these brands saved from the burning (by a timely application of Jenkins' Hydro-Empyrean fluid) is neither congenital nor acquired, but is due to the unskilfulness of the artist who has translated the original photograph into line form for newspaper printing. This may be so, but why do not advertisers of these patent medicines patent some method of getting more presentable portraits? Surely the man who has the genius to discover a specific for every imaginable disease, from toothache to elephantiasis, ought to be equal to such a comparatively easy task. As the case stands at present a sufferer, say, from gout looks at the picture of the man who has been cured of that malady by taking three bottles of Agglutinative Agglomerate, and as he shakes his head and turns away, he mutters, "No, thank you; I prefer the gout!"

* * *

Journalistic Snapshots. That pleasant annual function, the birthday dinner of the *Daily Graphic*, took place at the Hotel Cecil on Saturday evening last, when, as usual, artists and writers met together in friendly converse. It was only natural, in connection with a journal whose birth was only rendered possible by photo-process work, that the camera should in some way intrude itself into the proceedings. The opportunity came with a speech from Mr. Sydney P. Hall, the *doyen* of the artistic staff, whose enviable lot it had been to accompany their Royal Highnesses the Prince and Princess of Wales on board the *Ophir* on the occasion of their recent memorable tour round the world.

It was a unique position which Mr. Hall then held, for he was the only newspaper artist who was permitted to accompany the distinguished travellers, and was actually appointed one of the Royal suite. There was another artist on board, in the person of Sig. Martino, marine painter to his Majesty the King, and there was a little friendly rivalry between the two knights of the brush in the matter of finding studio room in the somewhat limited area of a steamship. Mr. Hall decided that he would take with him a camera, but when he made the suggestion to his chief the latter exclaimed, "For heaven's sake don't; you *can* sketch—a little, but you are sure to make a mess of photography." Nothing daunted, however, the artist provided himself with a camera, and a plentiful supply of spools and cut films, and, like a child with a new toy gun, he pointed it at everything he saw. In due time the *Ophir* made its way to Hobart, Tasmania, and here a local photographer was found who, for the modest sum of half-a-guinea, undertook to develop the artist's films. At last, thought Mr. Hall, the opportunity had come of falsifying the chief's gloomy prognostications as to the artist's competence as a photographer. Surely a man who could so deftly use a pencil would be capable of pressing a miserable button! The next day the Hobart photographer presented himself with the packet of negatives, received his money, and, somewhat hurriedly, went his way. In the privacy of his cabin Mr. Hall opened the precious packet, only to find that there was no trace of a picture on any of the films. Some showed a few indistinct blurs, and that was all. Eventually he threw them all on one side, but a zealous ward room officer discovered them, and strung them together in festoons for the adornment of the saloon and as specimens of the most recent journalistic photographs. Whether Mr. Hall was at fault, or the films, or the Tasmanian photographer, will probably never be known.

* * *

A Pioneer Process Worker.

From a recently-compiled list of the principal art sales of the past year, we learn that, in November last, £700 was paid for 54 leaves of William Blake's "Songs of Innocence and Experience." This work, a copy of which can be seen at the British Museum, is, we need hardly say, extremely rare, or it would not fetch the price named. And it is, or should be, of great interest to the photographic process worker, for it is, to some extent, the prototype of the present printing block. As William Blake flourished in the eighteenth century, photography had no part in his work, but he was one of the first to show how a metal plate could be etched with acids so as to afford a printing surface. Born in 1757, the son of a hosier, Blake soon showed signs of artistic genius, and at the early age of 14 he was apprenticed to an engraver. He lived with a younger brother, Robert, who died in 1787, and this loss greatly affected the survivor, who had by this time not only become a painter, but was also a poet. He was about this time casting about for means to get one of his literary effusions printed, but he was without money and without patrons. But the vision of his brother Robert appeared to him at this juncture and counselled him how to proceed. With his last half-crown he purchased some copper plates, and inscribed them, in resinous ink, with his verses, intermingling them on the plate with illustrations and ornamental scroll work. He then etched away the untouched copper by the aid of acid, leaving the lines of the writing and drawing standing up in relief. Little did the artist imagine, when he bought with his last coin those copper plates, that impressions from them would some day fetch fifteen pounds a-piece. There is little doubt that Blake was an artist who was just on that narrow borderland which separates genius from insanity. He asserted that he was constantly helped in his work by ghostly visitations, and would sit for hours in a darkened room so that he might receive his uncanny friends. Homer, Moses, and Edward the 1st were amongst those whom he declared had held converse with him in the watches of the night, and he was thus able to paint their portraits. Some one wrote of Blake that in him "The wisdom of the sage, the simplicity of the child, and the uncontrolled imagination of the madman were strangely allied." The latter part of this commentary upon the life of Blake will by many be considered fair, when his picture in the National Gallery is examined. Its title is, "The Spiritual Form of Pitt guiding Behemoth," and it is difficult to see the meaning of it, as it is easy to imagine that "visions were about" when it was painted. We must acknowledge, however, that Blake is worthy of honourable mention in the matter of the etching of copper plates which had been treated with a "resist."

THE PERSONALITY OF AUTHORS.

It is always a matter of great interest, especially in the case of studious readers, to visit the scenes and places described by or associated with a favourite author. The country round about Stratford-on-Avon is known by everyone as "Shakespeare's Country," and depends largely for its modern prosperity upon the multitude of tourists who go to visit the home of the immortal poet. In minor degree the spots described with such masterly care by Charles Dickens are regularly visited by his readers. There are always a few to be found in Westminster Abbey gazing reverently at the novelist's grave, and some do not forget to leave on it a few flowers, as silent but eloquent token of their regard. Recognising this kindly, reverential feeling between masters of the pen and their disciples, Messers. Doubleday, Page, and Company, of New York, have recently published what they call "The Personal Edition" of the works of George Eliot. So far as we know, this edition is not on sale in Britain, and the volume now before us, "Scenes of Clerical Life," came into our hands quite fortuitously. Its novel feature, which gives the book a great charm, in its photographic illustrations of the places dealt with by the author in the text. We are shown here the veritable scenes where the action of the play takes place, and we are constrained to think that George Eliot, like her contemporary, Dickens, preferred to weave her romance around a real object rather than trust too much to imagination for her *mise-en-scéne*. Otherwise the publishers would have found it most difficult to carry out the scheme which they have brought to such a successful issue.

In order to get some idea of the scope of this method of illustration, we turn over the pages of the volume, looking, as a child would do, at the pictures first. The frontispiece is a pleasant view of Shepperton Church, the church associated with the sad fortunes of the Rev. Amos Barton. This is not, as many have believed, the Shepperton-on-Thames, but an even quieter village in Warwickshire. A street in the village forms the subject of another picture, and we note with regret that there is a railway arch in the far background, showing that the place is undergoing the usual change from the picturesqueness of the past to the bustle of the present. Next we come to several pictures of Cheveral Manor, both exterior and interior, the scene of Mr. Gilfil's love story. The third, and last, story of the series, which occupies about one half of the volume, is

"Janet's Repentance," and in this case it has been possible, by some occult means, to illustrate the text in a more "personal" manner. We have here portrayed by the camera, "Lawyer Dempster's House in Orchard Street," Mrs. Pettifer's house, where Janet took refuge after being turned out of doors by her drunken husband, and a view of Mr. Tryan's church at Paddyford, besides other pictures which it is unnecessary to mention. Such is the new edition of the works of George Eliot, an author whose books will live so long as the English language lasts. We understand that the publishers have in hand a new Shakespeare, which is to be drawn on the same lines, obviously a far more difficult task. It may be urged that these photographs of village streets, old-fashioned country mansions, and ivy-clad churches which have known many generations of worshippers, are such familiar objects to all, in these days of rapid transit, that there is no need to encumber our choice literature with such well-known things. There is certainly a show of reason in this objection in the case of an author whose books have but the limited circulation of his own county or country. But writers like George Eliot, Thackeray, Dickens, and some others, are known and cherished wherever the English language is spoken. Nay, by means of translations into foreign tongues, their books have secured a worldwide reputation. It is therefore evident that there are millions of readers over sea who will never have the opportunity of visiting the places immortalised by our eminent authors, and it is these readers who will value most of all the photographic illustrations. Otherwise they can see only in imagination the scenes described, and each will colour his mental images by his own particular surroundings, just as the artists of old dressed their classical and scriptural heroes and heroines in the costume peculiar to the time and country in which they themselves lived and painted. There is something so distinctive about an English landscape, village, or town, something so different to what we find even just across the silver streak which separates us from our Continental neighbours, that pictorial aid to an author is a great advantage. More than this, the changes which are coming over the face of the country, owing to new methods of locomotion, threaten to be in the near future far greater than that change, more than half a century ago, which saw the last of the stage coach.

Let us suppose, however, that the readers of an author's works are confined only to English-speaking peoples. We naturally, in the first place, think of our transatlantic cousins in America and Canada. How can the untravelled dwellers in that huge continent obtain any correct idea of the appearance of, say, one of our sleepy old cathedral towns, or of an old-fashioned English inn? It is by the aid of pictures that they are enabled to enter into the spirit of a writer's meaning, and if the pictures be photographs, they feel that they are in nearer touch with the author's mind, although to dwellers in England the beauty of the mere word-pictures may be all-sufficient. A story is told of an American visitor, to an old English country seat, who asked one of the gardeners how they managed to keep the lawn in such splendid order, as smooth as so much velvet. "Well, sir," was the answer, "we cut it, and roll it, and water it over and over again for six hundred years." The American said no more, but it may be assumed that he thought that after all there was a something about the old country which America, with all its splendid achievements, lacked. It is no doubt owing to this feeling that in a crowd of sightseers to any of our public monuments a large proportion prove to be American. Americans have set up a memorial window to Shakespeare in the church of Stratford-on-Avon, and they have placed a marble bust of the poet Keats in the church at Hampstead. These are the people who buy our photographs, and who will best appreciate the effort which is being made to illustrate English classics by the help of photographs.

OBSCURE CAUSES OF FOGGY PLATES.

An article of great interest in the issue of *Nature* for last week by Dr. W. J. Russell makes it desirable to recall attention to two important papers he read before the Royal Society and the Royal Photographic Society about three years ago. The practical teaching of his communications should have been the means of imparting valuable knowledge, but this would appear to be almost a dead letter. They showed, to put the matter briefly, that peroxide of hydrogen, when permitted to act on a plate, though in infinitesimal quantities, was capable of exerting an action of some sort that resulted in the production of a darkening of the film upon the application of a developer. He did not attempt to predicate the nature of this action; he merely showed that it was produced, and he described an elaborate series of experiments, proving that the deposit obtained could not have been produced in any other way than from the influence of the peroxide. Our readers may say, "All this is very interesting, but it is not practical." We will show the very practical bearing it has, and the extent to which the teaching referred to is ignored. Let any purchaser of, say, a new magazine hand camera, with its metallic sheaths and interior carefully blackened to prevent reflections, charge it with plates, and after leaving them in for some time, make exposures and develop. In too many instances the results will be all fogged. Another dozen plates may be put in and exposed shortly afterwards, and they will be all that could be desired. The conclusion will be arrived at that the first lot of plates were defective, and the plate-maker will be blamed. But the blame is to be put on peroxide of hydrogen, and its presence accounted for by the composition of the varnish or stain used to blacken the inside of the camera. The same thing may occur with an ordinary dark slide; but we give the instance of a magazine camera as showing the action on a dozen plates at a time, and as leading more especially to incorrect and unjust inferences. We have on a previous occasion narrated an example of each of a number of plates being fogged in a batch at one end of the film, and the cause being traced to the presence of a similarly explainable disturbing influence from the waterproof cloth newly used for repairing the hinged back of the slides, one slide not repaired being fortunately used on the same occasion, thus aiding in discovering the cause of what at first seemed a very mysterious case of fog. Dr. Russell in his experiments showed how great a number of substances were capable of producing fog, and in his later paper further showed that the active agent was the hydrogen peroxide.

The fog-producing substances most likely to be used in photographic work are the terpines and freshly-exposed surfaces of certain metals. The higher the temperature the quicker the action, as a general rule. Printers' ink was capable of exerting the action, but its power gradually waned with the age of the printed matter. For example, the periodical *Punch*, which is printed in good ink, gave at ordinary temperatures a picture in two weeks, while at 55 deg. Centigrade two hours was sufficient, and at boiling point, ten minutes. We learn from this how much more probable will fog be just at the time when a larger number of plates would be used—the summer days, when the light is good, and best work most probably be at a maximum.

Dr. Russell also showed that old and seasoned wood was capable of absorbing the fog-producing agent, and giving it off again afterwards, at a greater or less rate as the temperature was higher or lower. Even the plain and seasoned wood itself would give off sufficient to produce fog after a long exposure in contact with the plate. Linseed oil and copal varnish gave off a large amount of the injurious emanations.

One singular thing was the variety of permeability of various bodies to the fogging agent. Porous substances naturally might be expected to permit it to pass; but it was capable of being absorbed by and of passing through thin sheets of celluloid, gelatine, gutta-percha, or india-rubber. Gum arabic, when dissolved and used to coat paper, allowed the peroxide to pass through when it was fissured with minute cracks, but was impervious in a continuous coating. Zinc, when a freshly-scraped surface was exposed, acted very quickly, especially in the presence of moisture. Some kinds of paper were more active than others in impressing the film. Dr. Russell found that one of the most impermeable substances was paper treated with paraffin, while the well-known tracing-paper was freely permeated. These latter experiments give important suggestions as to the mode of treating dry plates for storage. The effect on contact with paper is conspicuously seen every day on the edges of the paper separating slips, though one maker who produces excellent plates packs them face to face in pairs of twos, and wraps each four plates in paper, apparently with perfect success.

Dr. Russell, in his recent communication to *Nature*, enlarges on the effect on papers of various kinds of inks —printers' and writing—in various conditions. Cotton and hemp are entirely without action, but the other materials used in paper-making all act more or less. The order following represents the degree of action, the strongest being placed first:—Mechanical wood pulp, flax, esparto, and straw cellulose. When bleached the action is destroyed, though it may return, and sometimes the sizing material gives off the peroxide; especially is this so with a resin size. Ordinary writing ink gives off no fog-producing matter, and even when very old this action continues. The article is copiously illustrated, and will well repay perusal. Finally, we would say that the lesson to be learnt is to avoid contact between paper and film; and to substitute some substance in lieu of the ordinary needle paper employed for wrapping, etc. If paraffined paper be employed for the folding up of the sets of plates in their boxes, we might then expect to get rid of the too frequent effect of plates injured through emanations passing through paper and strawboard to the plates, and so producing ultimate fog.

We are pleased to learn that Mr. E. J. Wall is progressing favourably after his recent severe accident. He will be confined to the hospital for some weeks yet, but there is every prospect of a good recovery.

The many friends of Mr. Philip Everitt at home and abroad will be sorry to learn that he has been confined to his house for the past month with an affection of the eyes, causing very great pain and total incapacity for work. However, we are glad to say that Mr. Everitt is well on the way to recovery, and hopes soon to resume his photographic work.

The arrangements for photochronographic observations in the physiological laboratory of Moscow University form the subject of a paper by Professor L. Morokhowetz and Drs. A. Samojloff and A. Judin, published by the Imperial University Press. The room used for these observations is divided into four parts, one of which is described as a "monster camera," being a dark room in which the photographs can be exposed and watched during the exposure. Among the apparatus used is a pendulum photochronograph, in which the pendulum carries a sensitive plate, and is provided with a contrivance for releasing it at will and fixing it at the end of each half-oscillation. The papers are illustrated by photographs of the curves of different vowel sounds, taken in the laboratory.—"Nature."

STEREOSCOPIC VISION AND RANGE FINDERS.

(Abstract of a Paper read at the Society of Arts, December 18th, 1901.)

Instruments for measuring the distance of an object by optical means are required not only by military and naval men, but by surveyors, by travellers, by sportsmen, by the mercantile marine, and by others. For each purpose there are special requirements as to the accuracy, range, and portability of the instrument. The instrument which I have perfected is the most difficult. It is intended only for military use, and only for one arm of the service. A time may come when I may adapt it for other purposes, but in the form now shown it is intended only for use with rifle fire. It is not suitable for long-range artillery, nor for the navy. The instrument before you looks simple enough, such as might be designed and completed in a month or two. But it has taken me ten years of intermittent, besides two years of incessant, work and experiment and trial and alteration to arrive at the present simple and effective type, suitable for a single arm of the service. I may say, however, that this infantry type is by far the most difficult, because, in addition to accuracy, extreme portability is such an essential feature. At the same time, the infantry are more in want of some addition to their present resources than anyone else, and the urgent want for such an instrument has been proclaimed and re-echoed by all our officers who have returned from the war in South Africa. All methods of optically measuring the distance of an inaccessible object depend on using a base of known length, which must be measured on the ground, or else be part of the instrument. In the latter case the instrument can usually be worked by one man, who can find the distance without changing his position. This class of instruments is sometimes spoken of as short-base range-finders. Numerous patents for such instruments have been applied for; but the difficulties in the way of ensuring accuracy are so great that only one type has ever been perfected and generally used. The Barr and Stroud range-finder has been adopted by the navy with most satisfactory results, and this has proved the fact that a short base ($4\frac{1}{2}$ feet) is not inconsistent with accuracy. But the Barr and Stroud instrument is as unsuitable for use with infantry as the instrument before you is for naval use. For the use of infantry, where extreme portability, and accuracy, and suitability for ill-defined objects, such as men, bushes, rocks, &c., are essentials, there is no instrument in existence which has ever been put forward as fulfilling the conditions, except the simple folding range-finder which I have to bring to your notice. In spite of all the tentative patents, it is noteworthy that this is absolutely unique, as no other short-base infantry range-finder exists. Let us devote two minutes to noting the means by which we can find the distance of an inaccessible object, which may be any distance, and suppose it is to the north of us. Let us measure a base on the ground, east and west, 100 yards long, driving in a peg in the ground at each end of the 100 yards base. Let us have a table or drawing-board placed level at each of these pegs. Now we take a sheet of paper, and draw a line, A B, one inch long, to represent 100 yards. Going to the drawing-table on the left, we pass a needle through the point A, and so pin it flat and level on the table. Then we turn the paper round, until a ruler, resting against the needle and lying on the line A B, points along our base. Then, keeping the paper fixed, we turn the ruler until it points to the distant object, and we draw a line, with pencil, on the paper along the ruler. We then go to the table at the other end of the base, and fixing the paper with a needle through the point, B, to that table, we go through the same operation and draw another line pointing to the distant object, B. The intersection of the two lines and the line, A B, on the paper, form a map of the positions of the distant object and of our base, on the scale of 100 yards to one inch. If the intersection be ten inches from A or B, we know that the distant object is $10 \times 100 = 1{,}000$ yards from either

end of our base. It is quite clear, now, that if we have a short base, say 6 feet long, then if we can measure the angle between two lines drawn from the distant object, one to each end of our base, we can determine the distance of the object from the base. All range-finders are founded upon this principle.

Professor Piazzi Smyth tried to make a short, self-contained base telemeter for surveying, with a base of 60 inches, Colonel Clarke 72 inches, Otto Struve used a base of 73.5 inches, and Adie one of 36 inches. All of these were failures. I am pleased to have discovered, and to be able to exhibit here, one of the few Adie telemeters ever made. It may be taken as the germ of all later attempts. Its faults are well known, and it is to the elimination of these faults that all subsequent inventors of this class of instrument have devoted themselves. It consists essentially of four mirrors at 45 deg. to the base, and a telescope in which two superposed pictures are seen of the distant object, one picture being seen by reflection from the two mirrors to the left in the diagram, the other picture being seen by reflection from the two mirrors to the right. Since the object is seen in a slightly different direction from the two ends of the base, the observer sees the object double in the telescope until he moves one of the mirrors so as not to lie at 45 deg. to the base. The angle through which he turns it is double the angle between the two lines coming from the distant object to the base, and, as we saw before, this angle tells him the distance of the object.

The mirrors are supported on an arm, and their weight bends it. Even the sun's rays will distort it, and the angle we have to measure is so small that the errors thus introduced destroy the accuracy of the instrument. The present Astronomer-Royal, Mr. Christie, used a screen for the sun's rays, and to this Messrs. Barr and Stroud added an arm so designed for strength that it does not bend by its own weight. All this makes the instrument very heavy, and not at all suitable for infantry use. Now, in naval work, for which the Barr and Stroud instrument is made, a ship, or its mast or funnel, is very sharp against the sky, and the coincidence can easily be made; but this method is almost valueless in the field. A bush, or a rock, or a man is an object so ill-defined, especially against certain backgrounds, that in attempting to make a coincidence you may move one picture in the telescope over the other for a considerable angle before you are sure that it is double. An officer who used such a thing in South Africa said it was impossible, in most cases, to get any accuracy of coincidence, and deplored the fact that there were no steeples or masts on the veldt. Sir David Gill, of the Cape-town Observatory, confirmed this, and Messrs. Barr and Stroud asserted that no range-finders could be invented to get over the difficulty.

The difficulty has been got over by Messrs. Carl Zeiss and by myself, who use stereoscopic vision. If you will look at the diagram of the Zeiss telemeter, you will see that it resembles the one we have just examined in most particulars, but it has two eye-pieces used with the two eyes. In the two focal planes also are two photographs on glass of two scales, the marks on one being at slightly different distances from the marks on the other. Each pair of marks has a distance, so many hundred metres, marked upon it, and a certain degree of convergence of the eyes is required to make any pair of marks appear single. The object aimed at also appears single with a certain muscular convergence of the eyes, and it is easy to pick out a pair of marks requiring the same convergence as the distant object, and you read off the number of hundred metres on that pair of marks directly. I will speak of the accuracy of stereoscopic vision presently. I now wish to say that if you are looking at an ill-defined object the two pictures leap together into one so soon as you concentrate your attention on them. This is true even if the object be out of focus or so feebly outlined as a cloud. It is the consequence of our spending our lives in working those eye-muscles so as to make two pictures of an object appear as one. No muscles of the body are more constantly trained than these, and however faint the object may be the coincidence effected is absolute and immoveable. This physiological action is referred to by Sir John Herschel ("The Telescope," p. 118). In describing an arrangement of powerful telecopes for stereoscopic vision he says:—"When used for viewing near objects the mounting must admit of a slight convergence being given to the axes of the telescopes, to direct them at once to the same object. If this be not done the object is seen double; but so soon as the images are brought very near they suddenly spring together, even while some minute deviation still subsists, in a very singular and striking way; while the sensation changes at once from that of contemplating a picture to that of viewing a real object." This remarkable training, by which our eye-muscles and our vision work automatically, hand-in-hand, is so remarkable that you will, I am sure, excuse me if I make a further quotation from the article, "Microscope," in the *Encyclopedia Britannica*:—"Comparing Wenham's device with those of Nachet and Riddell for obtaining a stereoscopic effect with a binocular microscope, the author, after admitting that in the former the two images may be of different sizes and of unequal brightness, goes on to say: 'It is well known to those who have experimented upon the phenomena of stereoscopic vision (1) that a slight difference in the size of the two pictures is no bar to their perfect combination, and (2) that if one of the pictures be good, the full effect is given to the image, even though the other picture be faint and imperfect, provided that the outlines of the latter are sufficiently distinct to represent the perspective projection.' It might have been added that it is also well known that where both images are indistinct, as when a khaki-coloured coat is observed against a sandy background, or when both images are slightly out of focus, the two images still leap together by involuntary muscular action of the eyes, and the axes of the two eyes are held fixed at the true convergence required for making a single picture out of the two images of the object viewed. 'Dr. Pulfrid has correctly stated that not only indistinctly defined objects which cannot be clearly pointed out in the ordinary way—a distant fold in the ground, irregular bush, or the skirt of a wood—but also such things as a cloud of smoke or dust—absolutely without contour—so long as they detach themselves from the background, can have their distance determined stereoscopically as well as the most distinct object."

The diagram here exhibited will assist in understanding the description which I now give. The instrument consists of a folding aluminium base, 6 feet in length, and a field glass. The base is a square tube hinged at its middle, and folds up to 3 feet 6 inches. Each half has at each end a doubly reflecting prism. The rays of light from a distant object strike the outer pair of these four prisms, are reflected at right angles along each tube, and are then reflected at the two middle prisms into the two telescopes of the binocular fixed to the base, in directions parallel to the original rays intercepted by the outer prisms. It is the measurement of the angle between these rays that tells the distance of the object looked at. This angle is measured by two vertical wires, one in each telescope, seen by the two eyes. One of the wires is fixed, the other is moved by a micrometer-screw until the two wires appear as one, while the object is seen distinctly. This gives the distance accurately to 2 per cent., even at 3,000 yards. But now stereoscopic vision comes in and gives far greater accuracy. The wire seems to stand out solid in space, and the slightest turn of the micrometer screw causes the wire to appear to be nearer or farther than the object looked at, and when the wire appears to be at exactly the same distance the micrometer reading gives the distance with an accuracy far greater than that attainable by observing the duplication of images on the retina. I have spoken of wires in the focal planes of the binoculars, but I haven these up. I will tell you why. If I adjust the vertical wires crossing the field of view, until they seem to be at the distance of any object, say a tree, then the lower part of the wire cutting the foreground ought to be also at

the distance of the tree. But common sense opposes this view, for the foreground is nearer than the tree. Thus the stereoscopic sense, if I may use the expression, believes itself deceived, and refuses to work so readily. To obviate this, I next used a line coming from the top vertically down to the centre of the field. This got over the difficulty entirely. Then I thought out a way of getting over another difficulty. We are not accustomed to see wires or lines in the sky or landscape, and we do not find the same tendency for them to "spring together," as Sir John Herschel describes it. The only real object I could think of with a point at its lowest part was a balloon with a tail rope, the lower end of which is at the centre of the field. This has been a grand success, and the two balloons spring together even with observers who could never bring the lines to look like a pole at a fixed distance. Almost everyone can now get the stereoscopic effect easily. There are not many men of science who have tested the accuracy of stereoscopic vision. All who have done so are aware that the stereoscope is the most accurate means of measuring an angle that we possess. Dr. Wolfe, of Heidelberg, has a stereoscopic comparator for detecting the motion of stars from photographs taken at different dates. With this instrument, I have stereoscopically observed some of the stars lying in a direction at right angles to the sun's motion in space, by means of two photographs taken at an interval of four years. The nearer stars appear, with this gigantic base, to stand out distinctly nearer than the others in the stereoscope, although no micrometer, with the same magnifying power, could detect the parallax. It cannot be doubted that the naked eye can stereoscopically detect an angle of less than ten seconds. The stereoscopic method has also this advantage, that the muscles of the eyes are being trained by us, every hour of our lives, to make two pictures of an object appear as one. Hence, when you look, even at an ill-defined object, the muscles compel the two images to jump together.

I may mention that the wonderful accuracy of stereoscopic visions was first discovered by Professor Dove, of Berlin (Optische Studien, Berlin, 1859, pp. 26-36). As examples, he found that in a stereoscope the eyes were able to detect the difference in size between a bronze and silver medal struck from the same die. On being examined, one with each eye, the resulting form appeared always to be curved, and not flat; also two impressions of printed matter from the same type seldom failed to show some of the letters advancing in front of, or receding behind, the plane of the paper. Professor Helmholtz, in his physiological optics, has emphasised the same fact. I had a good illustration of it when describing my range-finder to a scientific audience. One speaker said he did not believe in the accuracy of stereoscopic vision, and gave the reason as follows:—"There is a blind in front of the window there with a cord. Holding my head steady, I tried to judge its distance from the window-frame. I put it at 2 inches, but now I see that it is 6 inches distant." He was about 24 feet from the cord, and we may take $2\frac{1}{2}$ inches as the distance between his eyes. The angle subtended was 28′.56″. But he thought the distance was 24 ft. 4 ins., the angle subtended being 28′.30″ So that in this first rough essay, he was able to measure the angle correctly to 26 seconds of arc—a very accurate estimate, instead of being inaccurate as he thought it was. I have had an excellent opportunity of testing the accuracy of stereoscopic vision. I adjust the micrometer screw until the balloon in the focal planes appears to be at the same distance as some clear object against the sky. The observation is repeated ten times, and the maximum difference between any two of the ten readings amounts to less than one second of arc with a magnifying power of twelve. This means a maximum error of half a second, or six seconds with the naked eye. An accuracy to half a second is far closer than I have sought, for my limit being 2.8 seconds, to give 2 per cent. at 3,000 yards. Thus my instrument is five or six times more accurate by the use of stereoscopic vision than I require. I am, therefore, diminishing the magnifying power of the binoculars to eight instead of twelve, and even then I can confidently say that in the hands of an average man viewing an average object the range-finder will give the distance correct within 2 per cent. at 3,000 yards. I have put the instrument to the severest tests, and am ready to welcome the strictest trials of its accuracy. Moving figures, badly lighted objects, and even the targets at Bisley when they were dancing with mirage, have given distance measurements that exceeded the standards I had aimed at.

My base is 6 ft. long, and folds to 3 ft. 3 ins., and in carrying I find it best to strap it on the back. It weighs from $2\frac{1}{2}$ to 3 lbs.

I have had many binoculars made, and at last have arrived at the beautiful solid scientific engineer's instrument which Messrs. Carl Zeiss, of Jena, have made from my designs, and which I now show you as the regulation type which I think ought to be adopted for infantry. Its optical qualities, used apart from the base, are superb. Used with the base, its indications are absolutely reliable, and it is strongly built and suitable for rough service. It weighs $2\frac{1}{2}$ lbs.

PROFESSOR GEORGE FORBES, F.R.S.

SOME APPLICATIONS OF LIGHT FILTERS IN LANDSCAPE PHOTOGRAPHY.

(A Paper read before the Photographic Club.)

It is a matter of some surprise, having regard to the length of time orthochromatic plates have been procurable, that the bulk of photographers still remain either indifferent to their advantages or unable to grasp the principles associated with their use. A large number of photographers take it for granted that an orthochromatic plate cannot be used except in conjunction with a light-filter, and that a light-filter requires an enormous increase of exposure, making the use of these plates out of the question for anything like practical work. Yet another section of photographers disallow that the orthochromatic plate has any advantage over the ordinary for landscape work. In the tenth edition of Sir W. Abney's Instruction in Photography, published a few months ago, it is somewhat astonishing to me to read that, "Orthochromatic plates are principally useful for photographing pictures, and are not of much advantage for landscape work."

In the present paper I would like, with your permission, to review the advantages of the orthochromatic plate, plus its commensal—the light-filter, from a landscape photographer's point of view. And I must ask your consideration, if I appear to ignore somewhat the title of my paper, for it is advantageous to compare the ordinary plate with the orthochromatic at many points, and also the orthochromatic without a light-filter against a similar plate with one. At the outset I would disclaim any exactitude in orthochromatic processes; to the workers in trichromatic photography my methods and appliances must seem crude and elementary. For the class of work I have in view, however, they are sufficiently exact, and my aim is to encourage workers to take up colour-sensitive plates and filters by keeping accessories and manipulations as simple as possible rather than deter them by suggesting difficulties and refinements which are uncalled for.

The selection of filters for trichromatic photography is a care requiring very considerable knowledge and research, but in landscape photography a comparatively rough method will suffice. It is, of course, undesirable to eliminate any portion of the visible spectrum when choosing a filter for landscape work; what is required is a medium which will reduce the activity in the violet region. For a long time I worked entirely with glass media, but the quality of absorption in any glass I examined left so much to be desired that I found it more satisfactory to prepare my own filters by using one of the various dyes suggested for this purpose. The two I pass round satisfy my demands very effectually. Of the two the ammonium picrate filter is the one

generally used, it subdues the activity in the violet sufficiently to be useful, yet does not disturb the tone values. You will notice that the filter is graduated; in use the denser portion is placed so that it intercepts those rays falling upon the plate from the sky and extreme distance. The amber filter is a most valuable item in the landscape outfit, but it requires considerable care in its application. Its fault, from a photographic point of view, is that it absorbs too effectually the blue rays, hence its use completely upsets the tone values. However, as I shall endeavour to show you later on, there are occasions in landscape practice, when, if the photographer is willing to compromise a little, he will obtain results with it which are impossible by any other method. If you examine the two filters with the spectroscope you will notice that the ammonium-picrate absorbs strongly in the violet, while the amber filter continues further into the indigo.

Although the title of my paper does not justify me in instituting any comparisons between the ordinary plate and the orthochromatic, it will, perhaps, be interesting if I show you comparative results in order that you may decide for yourselves how much advantage rests with the orthochromatic plate. The slide No. 1 is from a negative on an ordinary plate, No. 2 being the same subject from an orthochromatic plate, used in conjunction with the picrate screen. You will notice that on the ordinary plate the distant mountains and well-defined clouds do not appear at all, though they are perfectly rendered on the orthochromatic. In many instances I have failed to detect any advantage of the orthochromatic over the ordinary plate when the orthochromatic was used without a filter. It must not be thought, however, that because in some subjects the orthochromatic fails to register an improved rendering when used without the filter that no advantage accrues from the adoption of the orthochromatic plate; in very many landscape subjects a distinctly better result is obtained on the orthochromatic plate even when used without the filter. The case for the orthochromatic plate is very well put by saying that there is no disadvantage attending its use, while the advantages over the ordinary plate are undeniable. I will show you three slides of the same subject, one from an ordinary plate, another from an orthochromatic plate, minus the filter, and a third from an orthochromatic with a filter. All three were taken within half a minute of each other to obtain constant conditions. There is, as you will observe, practically no difference between the ordinary plate and the orthochromatic without the filter, but the difference is most marked when the filter is used. One other example I give you of the difference between an ordinary and orthochromatic plate. The subject is a bit of common, with fleecy clouds upon a background of pale blue sky. You will, I think, agree with me that the ordinary plate has completely failed to render this with anything like the truth of the orthochromatic when conjoined with a suitable filter.

Passing now to the legitimate scope of my paper, I will instance several conditions familiar to the landscape worker that may be considerably improved by the use of an orthochromatic plate and filter. In mountain regions, or when any considerable extent of country has to be included in a view, haze is one of the most serious drawbacks to successful photography. The distance is sure to be quite obliterated, unless some means is available of reducing the activity of the blue rays. This means we have in the filter; interpose the ammonium-picrate filter between your plate and the subject and you will get the distance clear and sharp; at the same time procuring full detail in the foreground. It has been said that this haze is one of the chief charms of an English landscape, which it is undesirable to eliminate by the use of orthochromatic plates and filters. But anyone who has tried to reproduce, quantitatively in a negative, the haze of a landscape knows how impossible is the task; the distance *will* solarise out of all recognition if the foreground is to receive an adequate exposure. But by the use of a filter of suitable depth the activity of the blue rays will be reduced just enough to give a fair rendering in the negative of the amount of haze in the original. At times the haze is so great that even visually the distance is almost obliterated. Light-coloured filters are useless when such is the case; if the photographer must work under such conditions the deep amber filter will be his best friend. In the next slides I have endeavoured to illustrate the value of this filter for dense haze. One of the slides is from a negative with the filter, which shows a range of mountains about twenty miles away just perceptibly outlined, whilst in the negative taken without the filter these mountains have absolutely disappeared and the coast line but two miles away is seriously degraded. This was a very severe test of the capacity of a deep-coloured filter to remove haze; the distant range of mountains, even to the eye, was but barely distinguishable owing to the north-east wind that had been prevalent for some days.

When using these deep-coloured filters care has to be taken against under-exposing the plate, or the result shown in the next slide will be the consequence. You will notice that although the clouds and distant mountains are nicely rendered, the foreground is unsatisfactory from over-correction. The water is too dark, while the grass in the immediate foreground is quite white. This false rendering of tones is due to over-correction in the filter, greatly aggravated in this instance by under-exposure. Full exposure, of course, minimises the evil of over-correction when using these deep filters, as you will see from the next slide, which is of practically the same subject and taken under the same conditions, but with nearly double the exposure of the former. It is entirely a matter of compromise when using these deep filters, and I consider the slight amount of over-correction is more than counter-balanced by the superior general effect. When the foreground is some considerable distance from the camera, and does not consist of light greens, the over-correction is barely noticeable, a point that will be apparent from a consideration of the next slide. Another picture very well illustrates both the advantages and the disadvantages of the deep filter. You will observe in it a large newly-mown field in the middle distance which has been made to look like a field of snow by the over-correction of the filter; the remainder of the landscape is very well rendered. It was an error of judgment to use such a deep-coloured filter on this subject; had one similar to the ammonium-picrate been used everything would have been correct in tone-value.

There is one application of the deep amber filter I would like to illustrate, although it may be more interesting than practical. If such a filter is used when the light is very poor its tendency to over-correction becomes really useful, as the greens in the landscape are brightened up in a wonderful manner, and any haze that may be obscuring the distance is effectually removed. The picture shown is from a negative taken as a test. It was obtained late in the afternoon of a dull, wet day; a fine drizzle was falling during the exposure, and the quality of light may be estimated by the fact that it had about forty seconds' exposure with a fairly-rapid orthochromatic plate. You will allow, I think, that there is a fair amount of sparkle n the result; certainly an ordinary plate under the same conditions, or even an orthochromatic without a filter, would have failed altogether.

For mountain work these deep filters are invaluable, and as there is rarely much foliage in this class of work the over-correction is quite negligible. Haze is so prevalent in the mountain districts of England that unless it is modified by the use of filters there is little chance of rendering the contour lines of distant mountains. The next slide shown is a view of the central Snowdon group from a distance of about fifteen miles. You will observe that, in spite of the distance, no loss of modelling occurs in the mountain slopes.

If the photographer has work to do in towns and cities he may, by the aid of filters, wage a fairly successful war against the

smoke that generally makes photography so difficult in such places. The drawback to their use is, of course, the prolonged exposure, though even this may be turned to advantage at times. If, for instance, it is desired to photograph some building without having inexplicable patches on the negative of what, in the subject, were passers-by, a filter and small stop by prolonging the exposure will prevent their transitory movements impressing the plate.

It will be readily understood from what has previously been said that when dealing with foliage subjects the photographer has, in the filter, a means of improving the quality of his negatives not open to the user of ordinary plates. Even without the filter the orthochromatic is the superior of the ordinary plate for this class of work; with the filter the advantages in more than one direction are incontestable. Where various shades of green are present it is possible to get their tone values better translated with a filter than by any other means. The slide before you represents very well the rendering of an orthochromatic plate for foliage subjects. Care has to be exercised when using filters on such subjects that they are not too deep, otherwise the over-correction is worse than its opposite, which obtains with the ordinary plate.

It has always appeared to me that negatives taken with a good filter reproduce the effect of sunlight better than is possible by any other means. When I look at the next view it reproduces in my mind the exact impression I derived from the original subject. There is a truthful rendering about subjects taken with a filter that is absent from those where it is not used. In this subject the birches stood out against a background of dark clouds, with a brilliant white cloud towards the horizon, while a flood of sunlight bathed the middle distance. Had this negative been on an ordinary plate it would have failed to suggest any of these conditions to the mind. I have here slides from comparative negatives done for the purpose of satisfying myself that a better rendering of sunlight can be got with a filter. These were taken late in the evening with the sun low down. You will see that, in the negative without the filter, the rendering of sunlight is practically nil, and one gets no idea conveyed to the mind of the broad masses of shadow that filled the foreground.

I think that a good deal of the neglect the landscape photographer has shown orthochromatic photography with filters is due to the fact that he has grown so accustomed to the translation of tones by the ordinary plate that he cannot bring himself to accept the more truthful rendering of the orthochromatic. It is, I admit, rather revolutionary to find a group of trees represented by leaves and stems in place of the dark patch usually made to do duty for it.

To conclude, gentlemen, I have tried to show some of the advantages to be had from the use of orthochromatic plates and filters. In my own work I have used them exclusively for the last thirteen years, and I have satisfied myself by repeated comparative tests that the colour-sensitive plate and light-filter is of the greatest value to the landscape photographer. It is quite true that not every subject is the better for being taken on an orthochromatic plate; unless a filter is used the difference in very many subjects between an ordinary and orthochromatic plate is barely discernible, but once the filter is applied the case is quite different. Even halation gives way in a great measure before the use of the filter. Finally, let me give intending users a word of advice—don't carry fluid filters into the field; they are sure to leak sooner or later, and stained films answer very satisfactorily all average requirements.

GEORGE T. HARRIS, F.R.P.S.

LEICESTER Literary and Philosophical Society.—At the monthly meeting held on January 3, Mr. Scotton, of Derby, gave a demonstration of iron printing processes for copying drawings, plans, &c.

THE WORK OF A PHOTOGRAPHIC SOCIETY.

(Presidential Address to the Leeds Camera Club.)

A FORTNIGHT ago you did me the honour of election to the office of president of this club, for which I sincerely thank you, whilst at the same time fully recognising the responsibilities which it involves. Without any opportunity of an official meeting of your new committee, and before this year has run twenty-four hours, I am expected by your rules and syllabus to fulfil the duty imposed upon me; so, at this, the first meeting, I have pleasure in wishing all the members, both present and absent, a happy and prosperous New Year. As an incentive to work on the part of every member, the following remarks are offered for your consideration. The first point which requires attention is the doubling of the membership; I think it is not too much to assume that each of you *must* know at least one member in our art or science who is not allied with any photographic organisation; kindly impress such a one with the undoubted advantages of joining the Leeds Camera Club at once, pull out a nomination form (I take it for granted you always carry one for such an emergency), obtain the signature of your friend, sign it yourself if not already filled in, and present it to the next meeting, when I am sure no coercion will be needed to secure a seconder, after which nomination and election follow in due course.

If you will only act on this suggestion within the next few days, January 7th, 1902, will be a red letter night in the annals of this club. Allow me to point out that doubling the membership will not halve your present advantages (which is the case in some organisations), but such a succession of new members would enable your committee to prepare a still better syllabus of lectures for next session. This is an age of specialists, when, if a man intends to succeed, he must devote himself to one particular branch of art, science, literature, craft, or business; if he attempts to succeed in all, he might just as well commence to plough the sand of the seashore, and expect the furrows to remain intact ready for the seed on the following morn. Occasionally an intellectual giant arises who excels in several branches—Michael Angelo, for instance, who at the same time was a great painter, sculptor, architect, and engineer, a marked combination in one man never equalled. You may be asking yourselves the question, "What has this to do with photography?" My answer is, "Specialise in your hobbies, and particularly in photography."

Do not commence to photograph silver birches because you have heard a lecturer expatiate eloquently on the sylvan beauties of the forest, each season having its own charm, and then, after a few trials, and possibly failures, you hear another man discourse on the irresistible enchantment of the sea in its various moods, and at the first opportunity you rush off to the seaside, and produce very satisfactory results—for the platemakers, but not yourself. No! sit down and think for yourself, which way do your inclinations lead you? In this case follow them, because in all probability your hobby of photography has been taken up as a relaxation, a method of getting rid of a superfluity of loose cash in a sensible fashion, and one in which you will have something to show when the money is spent. Having chosen a particular line, stick to it, read about it, and study it; you will then produce results which I have no doubt will be interesting to others besides yourself; whereas if you attempt to run on too many lines, you will accomplish nothing worth showing. The following are a few ideas which occur to me on which you might act; they are by no means exhaustive:—Natural history subjects, flower studies, curios, rocks, clouds, cosumes of various countries or cities, diversified methods of locomotion and traction, gears subjects, landscapes, men at all kinds of work, portraiture at home, and last, but not perhaps least, colour photography. In all you attempt, aim at good and pleasing composition, perfect technique, and the definition and printing process best suited for the delineation of the subject.

Although there is a pictorial section in the club, I do not intend saying much on that head; do not misunderstand me, because my sympathies lie in that direction. If my ideas on that subject were reduced to writing, even the apostles of pictorial work might be shocked, whilst the photographic purist would be paralysed by the methods advocated, and so would be unable to denounce me as unfitted for the position in which you have placed me. Pictorial work has had a good innings; let it rest for awhile, especially as it is at a standstill according to some writers in the photographic press. "All work and no play, etc.," perhaps may account for the pause; it has been worked nearly to death; day and night, in season and out of season has it been dinned into our ears from all sides, north, south, east, and west; it has even reached the Royal Photographic Society, so let it take breath there, and whilst halting for a while let us turn aside to something more solid, and accomplish work more lasting, which twenty years hence will not be out of date and looked upon as old-fashioned; out of which posterity will thank us. Some of you will perceive at what I am hinting, viz., photographic survey work. This is a class of photography which a large number of our members could take part in—if they will take the trouble.

Survey work is for the purpose of recording photographically historic remnants of past ages, which have survived the ravages of time, the hands of iconoclasts, and the misapplied zeal of the "restorer." These may be in the form of buildings ecclesiastical or domestic, exteriors or interiors, wood, metal, or plaster details; on the other hand we have the privilege of recording with our cameras old ceremonies, rites, and customs fast becoming obsolete; photographs of dying industries and old methods of daily work are also asked for. If an old manuscript comes across your path, make an attempt to reproduce some of the most interesting parts by photography. In all such work obtain and transcribe reliable information to accompany the record. The application of our science to such ends as this will not only yield us present pleasure, but we shall have the satisfaction of knowing that generations unborn will revere the memory of those who left such records. What would we not give to-day to have a cinematograph film of some of the miracle plays enacted in bygone centuries in the streets of York and Wakefield, along with a phonographic record, if such had been possible? It is no use dreaming of what might have been; let us be up and doing whilst so much yet remains. At present I am not aware of any concerted effort on survey work in this district; personally, I only know of one serious worker in this direction—our friend Mr. Godfrey Bingley; needless to say, the records deposited by him are faultless.

A few days ago I visited the British Museum with the idea of learning the way in which this work was carried out. After looking at a number of the records, which, from a technical point of view, none of the members of this club need be afraid of equalling, I asked for some Yorkshire records, Leeds in particular; the answer given was, so far as I could understand, that there was no index of the prints; a number of the outer covers of the bundles and not even the districts indicated of the within-contained prints. In a short time a package was brought containing some prints of old York by a resident in London; these were wrapped up with others of Warwick and London—truly a charming variety, but not of much use to a man who wished to know in a reasonable time the work which had already been done in a particular district, and who was desirous of avoiding the duplication of the work of others. I shall be pleased to be corrected if I am wrong, but it appeared to me that at present accepted prints from any and every locality are numbered in the order of reception and filed away, but no system of classification or even indexing has been yet attempted. Seeing that there are some thousands of such prints already deposited, anyone wishing to know what had been done in their part of the country would have rather a tedious search. Could not some form of index-cards have been written at the time the prints were filed, with the number corresponding with that on the print, and then, as the prints accumulated, arrange the cards in alphabetical order of countries, districts, towns, and villages, and as the collection increased, the additional cards could be inserted along with the others. Then the whole collection could easily be referred to by anyone with an hour to spare, and who wanted information about this particular locality. So far as I could see, the supply of records depends on the interest of a few who will take the trouble to send up prints from any suitable negatives they may happen to possess.

I think the time is now ripe when this club could do some systematic work of this kind. My suggestion is that a goodly number of the members pledge themselves to furnish record prints during the next summer, not of any building that may strike their fancy, but that the committee make inquiries in the proper quarter, and then set forth a scheme for commencing on some building, and either add other records to any that may have been deposited, or if the building has not received any attention whatever, that is to be dealt with and finished before beginning with another structure; the work to be divided amongst the various members according to their predilections for general views or details. It must be fully understood that each member's print bears the producer's name, date of exposure, along with the remarks of interest. If this scheme be carried out systematically during the forthcoming summer, the Leeds Camera Club will be able to review with some degree of satisfaction the commencement of a work worthy of emulation, and which will be highly creditable as well as to the individual members. I would suggest that the records, which, of course, must be permanent so far as we understand the term—say carbon platisotype—be presented to four institutions: the British Museum, the Yorkshire Archæological Society, the Leeds Public Reference Library, and the Thoresby Society, for records appertaining to Leeds only. Further, why should not the Yorkshire Photographic Union take up this matter, and each society have a district mapped out in which to work, and so avoid any overlapping? I am sure in this way the Union would have a permanent record to the already splendid work carried out by that body. I trust we shall all carefully think over this matter and be prepared for action, as I do not intend the matter to simply end with this address, but hope to lay further details of procedure first before the committee and afterwards the members.

Another matter which has occupied my attention—why cannot the fifth city of the United Kingdom organise a photographic exhibition when less important towns are doing so? With two such organisations as the Leeds Photographic Society and the Leeds Camera Club working amicably together, I see no reason why a successful photographic exhibition should not be organised and held in Leeds during next winter; and I would suggest that our committee approach the Leeds Photographic Society with a view of forming a joint committee for that purpose. There has been a suggestion that we become affiliated with the Royal Photographic Society; this will no doubt receive the attention of your committee in the early part of the year.

I am of the opinion that the cause of photography could be materially strengthened in Leeds by the establishment of a class in photography under the ægis of the Leeds Institute of Science, Art and Literature, who already have a number of classes which are examined by the same organisation as this particular branch would come under, viz.: the City and Guilds of London Institute, and would suggest that inquiries be made for accomplishing that end. I will close these somewhat lengthy remarks by epitomising the suggestions:—

I.—Increasing the membership of the club.
II.—Specialising in our photographic work.
III.—To place ourselves in order for photographic survey work.
IV.—To organise a photographic exhibition.
V.—The establishment of a class in photography.

CHARLES B. HOWDILL, A.R.I.B.A.

PARAMOL—LIGHT FILTERS.

As saving of time is the order of the day, I suggest the following modification of the Pyro-Developer given last year, by which negatives of the same beautiful quality as with the standard developer may be obtained in shorter time, development being finished in 2 to 2½ minutes.

The formula stood:—

Solution I.

Distilled water	20 ounces.
Pot. metabisulphite	40 grains.
Pyro	160 grains.

Add to this 16 grains Metol.

Solution II.

Water	20 ounces.
Carbonate of soda (crystals)	640 grains.
Sulphite of soda (crystals)	1½-2½ ounces.
Bromide of potassium	4 grains.

Add to this 80 grains potassium carbonate, and take 5 instead of 4 grains pot. bromide and not less than 2 ounces of the sulphite of soda.

Paramol, a new developer.—Another Richmond in the field! If further proof were needed that the photographic industry is likely to become one of the world's large industries, it might be found in the fact that very large and important chemical works turn their attention to the needs of the photographer. This time it is the *Farbenfabriken, vorm-Friedr. Bayer & Co., Elberfeld* (Photographische Abteilung), one of Germany's largest coal-tar dye works, that is sending out a new developer that stands *between* the so-called *rapid developers*, as Metol, Amidol, Rodinal, and the *slower developers*, like Pyro, Hydroquinone, Glycin. The chemical name of this substance is *o—Amido meta oxy-benzyl alcohol.* I had occasion to make a trial with one tube containing the mixed substances, the paramol, the alkali and the preserver, and I found it to be a splendid developer indeed, giving in four-minute times a rather over-developed negative of almost too much vigour, and working very clear at the same time. The image was brought out rather quickly, and afterwards density and detail came up simultaneously, so that the new agent seems to give a very manageable developer. It is said to be rather sensitive to the addition of bromide, dissolves in 12 parts of its weight of water, and may be used with the carbonates as well as with the caustic alkalies. Its keeping qualities are claimed to be very satisfactory. It may be used for negatives, diapositives, and papers. The tone of the negative developed by me was rather a little too bluish for my taste, but that may perhaps be altered by making up the developer in another way.

Tried side by side with my pet Pyro-developer, with Chapman-Jones' plate tester, the Paramol brought out in 5-minute times the lower numbers decidedly stronger, but there was a little more fog than on the absolutely clear pyro-plate and the gradation seemed to be a little steeper. The first numbers appeared after four seconds, temperature of developer being 20 deg. C. (68 deg. F.). The developer works remarkably clean.

When Mr. Howard Farmer demonstrated in such an able manner the advantages of liquid filters—in his case pot. bichromate solution—for dark-room lighting, the difficulty of getting suitable receptables for the coloured solution may have stood in the way of adapting this principle more largely. Mr. Eggenweiler, of Raabe, known by his excellent studio-construction, had the clever idea to adapt the common flat, round travelling flask with screw-stopper to this purpose, and has patented dark-room lamps of such a construction. One of those lamps, the flask of which had about 3½ inches diameter by about ¾ inch thickness, I tried with Chapman-Jones' excellent and very useful and convenient plate-tester on a non-orthochromatic and an orthochromatic rapid plate prepared from the same batch of emulsion. The distance of screen from flask (this is probably filled with the strong bichromate solution, the spectroscope showing that all blue and violet, and even almost all blue-green is absorbed) was about 15 inches, and the exposure in both cases 5 minutes. The first plate showed, as last number, the 11 very faintly, while on the orthochromatic plate the 25 was seen, and this last square showed about the same density as the 11 on the other negative. The 1 in the ordinary plate was about as dense as No. 10 or 11 in the orthochromatic plate. Would this mean that the orthochromatic plate is, according to the values given by Mr. Chapman-Jones, 128 times more sensitive to the rays passed by the Bichromate Filter than the non-orthochromatic? The light given by the dark-room lamp was ample, and rapid plates developed by it with usual care showed no fog whatever.

R. Jahr (Dresden).

THE LONDON COUNTY COUNCIL SCHOOL OF PHOTO-ENGRAVING AND LITHOGRAPHY.

Abstract of Principal's Report for the Sixth Session, 1900-1901, to the Technical Education Board of the L.C.C.

The object of the school is to provide instruction in certain branches of the craft of producing surfaces for printing. Instruction is given in the most important methods of photo-engraving, photographic copying, lithography, drawing, design, and lettering. The school is open to all those who are genuinely engaged in business in the actual work of any branch of the photo-engraving, photographic, lithographic, engraving, designing, and printing crafts. In some cases the classes are confined to those who are particularly engaged in the branch taught therein.

The total number of individual students who entered the school during the session is 265, as compared with 229 for the preceding session.

The total entries to the various classes for the whole session amounted to 441, as compared with 429 for the preceding session. These entries were as under:—

	1900-1901.	1899-1900.
DRAWING CLASSES—		
Life	40	33
Costume	46	47
Colour	32	30
Antique	45	53
TECHNICAL ART—		
Design	31	42
LITHOGRAPHIC DRAWING—		
Bolt Court	31	29
Branch Classes—		
Regent Street, Central School of Arts and Crafts	16	12
Camberwell School of Arts and Crafts	11	9
Borough Polytechnic	5	—
Line negative making, elementary	35	26
Line negative making, advanced	10	5
"Screen negative" making	15	19
Tricolour	12	13
Line etching	24	21
Enameline	32	35
Fine etching	36	31
Collotype	12	9
Photo litho	6	9
Day classes (not included in above)	2	6
	441	429

If the entries in the three branches are grouped the figures are as follows:—

	1900-1901.	1899-1900.
Drawing classes	163	163
Technical art classes	94	92
Process classes	184	174
	441	429

It will be seen that the entries in the drawing classes are the same as in the preceding session and practically the same in the case of

the technical art classes, but there is an increase of six per cent. in the process classes.

The number of individual day students was eight, as compared with twelve for the preceding session. Taking the entries term by term we have the following figures:—

1st term...	339
2nd ,, ...	259
3rd ,, ...	174

The position of students attending is as follows:—

Apprentices	97
Improvers	33
Assistants and journeymen...	108
Under preliminary training	2
In business on own account	25
	265

There has been a large increase in the number of apprentices and improvers as compared with the previous session.

The occupation of students attending is detailed below:—

Process workers—	
Operators	11
Printers (resist)	4
Etchers	5
Fine etchers	5
Prover	1
Mounters	2
General assistants	2
Apprentices	17
Improvers	13
Student under preliminary training	1
Collotype worker	1
Woodbury type worker	1
Photo lithographer	1
Electrotyper	1
Photographers—	
On own account	1
Operators	4
Printer	1
Engravers—	
Wood	8
On own account	2
Metal	8
Apprentices	20
Improver	1
Lithographers—	
On own account	6
Designers and draughtsmen	21
Apprentices	43
Improvers	8
Under preliminary training	1
Litho printers—	
Printers	4
Improver	1
Apprentices	4
Artists, designers, and draughtsmen—	
On own account	15
Black and white artists and designers	21
Apprentices	12
Improvers	8
Letterpress workers—	
On own account	1
Compositors	2
Printers	3
Apprentice	1
Improvers	2
General—	
Bookbinders	2
	265

It is interesting to notice the large number of firms who are represented by employees in this school. I have been to some trouble in extracting the precise number, which I find is 136. One house is represented by as many as thirteen students, another by seven, many others by five or six, and so on in varying numbers.

The school has now completed its sixth session, and it is fair to ask whether it is fulfilling the object for which it was started. I think that it does so, so far as it goes, but I hope to see the Board make further extensions to the work, because there are many things that an institution of this kind should deal with which have not been attempted. At the same time, there is little chance of expanding under the present conditions as to space. But there would appear to be no harm in pointing out those additions to our work which I think should eventually be made, because the arrangements for such will require, when dealt with in detail, very careful consideration. I feel myself called upon to deal only with things that are living, and that are of daily importance in the industry. I have previously suggested to the Board that the lithographic work should be extended so as to include printing. This has been seen by others than myself, and many of those engaged in the trade asked me some time ago to endeavour to arrange for adequate provision for the teaching of litho-printing, the facilities for which were very small. Unfortunately the conditions of space prevent my dealing with the subject, but I do not think that we should allow it to be indefinitely postponed. I think that no very great progress will be made until the Board itself deals with the matter. On the subject of the mounting of blocks I have already spoken several times. I think that we ought to deal with the proving of process blocks, especially for colour work, and also with the reproduction of engraved plates in line and half-tone by electrotyping. This latter item is of great industrial importance, and I cannot see that any real practical attention has been given to instruction in the subject.

I should like to draw the Board's attention to the fact that the number of students who have joined the school for the last session is greater than that of any previous session. It may be remarked that the entry is limited entirely to those engaged in the trades, and that we have no amateurs. The attendance is not always so regular as I could wish, but I am quite certain that this will continue to be the case so long as "rush" work obtains so largely in our crafts. I think it will always be difficult to get high attendance averages with students engaged in certain trades. Again, when we remember the small amount of free time (after working and travelling hours are absorbed) in each week, it is fairly gratifying to find attendance so good as it is.

As regards the general work of the session, I make the following observations: I consider that the work of the etching classes has been very well carried out, and I may say the same of the fine etching class. The attendance in the etching classes has throughout the session been excellent. The collotype work, although the class is small, has been satisfactory; the greatest drawback is that we cannot get the students to attend sufficiently regularly on Saturday afternoons to learn properly the exposing of plates. We find, however, that they do put in a considerable amount of extra time for practice on extra evenings. I am glad to see that one of our students has obtained one of the Board's exhibitions for collotype work, which was done entirely in the school. In negative-making the results in the line classes were quite satisfactory. I am not satisfied with the work done in the screen negative-making class, as the students have been below the average on the whole. It is only fair, however, to add that they get only a small amount of time. The students attending for day-work have, with one exception, been very satisfactory. In lithographic drawing a very large amount of good work has been done, and in very great variety. The branch lithographic drawing classes will in future be carried on by the respective school authorities entirely on their own responsibility, and they will arrange for the proving of students' work in their own schools.

CHARLES W. GAMBLE, Principal.

LANTERN Lecture on the Empire at Work and Play.—The Christmas lectures at the London Institution were given last week, before large and enthusiastic audiences, by Mr. Howard Angus Kennedy, who took as his subject "The Empire at Work and Play," and illustrated it with over 200 lantern slides. His aim being to interest his juvenile hearers in the life lived by their lesser-known fellow-citizens over the seas, he showed no views of the "town-hall" order and gave no statistics, devoting his whole time to the social, sporting, industrial, educational, and religious customs of the people. In the first lecture, after a visit to the Newfoundlanders and the Labrador Eskimo, he took his audience through the old Hudson's Bay territory and across the Rocky Mountains to the Pacific coast, returning by way of Ontario and Quebec, and ending with the West Indian Islands and British Guiana. In the second lecture, which comprised both Africa and Australia, Mr. Kennedy gave numerous illustrations of life among the British West and East Africans, the people of Uganda and British Central Africa, and the Basutos, with a few typical war scenes and a glimpse into Cape Colony. Thence he proceeded to the back country of Australia, with its pioneers and aborigines, and wound up with some touches of life in New Guinea and Fiji. The third lecture was devoted chiefly to India—its rural life and village industries, its festivals and ceremonies, its ways of communication, its white rulers and their servants, and the wild beasts of the country. After a brief southward digression to Ceylon and Mauritius, he concluded by an illustrative excursion through Burma, and finally to Hong Kong. The audience, which had evidently been keenly interested throughout, closed the proceedings, at the lecturer's suggestion, with three cheers for the sons and daughters of Britain, who are upholding the national honour and increasing the happiness and prosperity of other races in all parts of the Empire.—"The Times."

ORTHOCHROMATIC PHOTOGRAPHY FOR AMATEURS.

[Abstract of a pamphlet published gratis by Messrs. Mawson and Swan, Mosley Street, Newcastle-on-Tyne.]

It is well known that the ordinary plate is sensitive in an extremely small degree to all the visible spectrum, so that if a light filter were adjusted to an ordinary plate in such a way that the colour values were correctly rendered (quite a possible feat), the ordinary plate, in conjunction with its own light filter, would give colour-corrected negatives, but the exposure would be so enormously prolonged that this method of working, except as a scientific curiosity, is seldom adopted. A method of sensitising the emulsion may be discovered at some future date, which will remove the necessity for a light filter, but at present it is absolutely essential that it be used in order to obtain colour-corrected negtives. The Light Filter must be carefully adjusted to the brand of plate in use. This is an important factor, for its true efficiency depends upon the accuracy with which it corrects the colour-rendering of the plate. The Light Filter must always be used with the selected plate in order to obtain a correct rendering of colour into monochrome. Let it be clearly understood that in order to obtain a colour-corrected negative it is necessary that the chosen plate be used with its own light filter, each is necessary to the other in order to obtain a correct result. The light filter is of no use alone, and an orthochromatic plate used by itself is not much better than an ordinary plate, but in combination they represent the highest advance in the art of correctly translating colour into monochrome by means of photography.

The advantages obtainable by the use of colour-corrected plates will already have been appreciated by the reader, the gain in effect being illustrated in a striking manner in this pamphlet. In every case, when photographing pictures, flowers, landscapes, seascapes, portraits, clouds, stained glass, architecture, etc., the colours are rendered in exactly the same luminosity as the eye sees them at the moment of taking the photograph. It will be as well to explain here the difference between colour contrast and colour luminosity, two frequently confused terms. The luminosity of colour is the quantity of light. The contrast of colour is the quality of light. As an illustration, imagine a stained glass window composed of only two pieces of glass, one being green and the other red; let them be of such a character that exactly the same amount of light passes through each piece of glass. Then the luminosity of these two colours is equal, whereas the difference seen between the red and the green is known as colour contrast. Were such an example photographed on a colour-corrected plate the two glasses would appear in the same monotone. Fortunately, such a case is unlikely to occur in actual practice, but it is a good example of what is meant by the term colour luminosity.

Orthochromatic plates naturally require to be handled in a very subdued and carefully selected red light, on account of their great sensitiveness to all the visible colours of the spectrum.

In order to minimise this disadvantage a brand of Orthochromatic plates, known as Mawson's Ortho. A Plate, is made, which is sensitive to all the colours, with the exception of the red rays; this enables them to be worked under safer conditions in the dark room, when a properly arranged illuminant is employed, whilst still retaining sufficient colour sensitiveness to allow of their being successfully used for all branches of work in which the reds are practically absent, including such important branches of photography as landscape, seascape, portraiture, cloud studies, etc. This is pre-eminently the plate to be used when commencing the practice of orthochromatic photography. It works clean, possesses a fine grain, gives plenty of density, and may be used on occasion as a high speed ordinary plate. A capital method to follow when working in the field is to load the dark slides with Mawson's Ortho. A Plates, and to carry a Mawson's Light Filter which has been carefully adjusted to these plates by the manufacturer. Thus equipped, the photographer is able to do high-speed shutter work, or to obtain correct colour rendering at his pleasure, accordingly as the plates are used without or with the Light Filter. The sensitiveness of these plates to yellow light is of considerable value when rapid exposures have to be made upon foggy days, or under a yellow light. After experience has been obtained in the use of Mawson's Ortho A Plate, the photographer may proceed to use Mawson's Ortho. B Plate, which is sensitive to all the visible colours of the spectrum, including the red. In order to obtain colour-corrected negatives with these plates, it is necessary to use them in conjunction with a Mawson's Light Filter. As these plates are very sensitive to the red rays of light they are preferably handled in the dark.

Light Filters are frequently somewhat vaguely spoken of as Yellow Screens. They certainly are yellow, more or less, but any chance piece of yellow glass or dyed film will not answer. Each filter must be carefully adjusted and tested for use with its own particular brand of plate. The glasses between which the filtering media are sealed have also to be of special quality, carefully selected and examined. The manufacture of these appliances can only be carried out by an experienced person. Therefore it is preferable to purchase a light filter instead of attempting its manufacture at home. Considering the time, care, and skill that are involved in their manufacture, they are sold at a very reasonable price. Mawson and Swan manufacture a Light Filter adjusted for use with their Ortho. A Plate and Ortho. B Plate respectively. They will, when used in conjunction with the plates to which they are adjusted, give correct colour rendering, with a very small margin of error. Mawson's Light Filter is adjusted for use with Mawson's Ortho. A Plate and Mawson's Ortho. B Plate only, and is sold for use with these plates. It increases the exposure about thirty times, but this may vary slightly with different batches of plates.

In reply to the many erroneous statements which have been made from time to time as to the advisability of occasionally dispensing with the use of a light filter, or substituting for it a light, medium, or dark yellow screen, it is necessary to state here that when correct colour rendering is required, the selected plate and its own light filter must always be used in conjunction with each other. When photographing by yellow light, such as the electric incandescent light, gas lamp, lamp light, the yellow light of sunset, or with what comes to the same thing, light filtered through a light or dark yellow screen, results will be obtained differing more or less in character from those obtained when no screen, or light filter, is used, the difference depending upon the precise character of the light, or yellow screen, used at the moment of exposure. But it is extremely improbable that these results will be a correct translation of colour into monochrome. It does not matter how yellow the light may be, or under what conditions the photographer is working, or what the character of the work is that he is employed upon. So long as the plate and light filter are used together, the colours will be correctly rendered in the same luminosity as the eye sees them at the moment of taking the photograph. The position of the light filter is immaterial, so long as it filters all the light which acts upon the plate, care of course being exercised in preventing any possibility of reflected light.

Focussing.—When using orthochromatic plates and a light filter, the focussing must always be done with the filter in position. Exposure.—The production of a good negative depends mainly upon the plate receiving the correct exposure. To ensure this the use of some form of exposure meter (both Watkin's and Wynne's are good) is strongly recommended. With such a guide the correct exposure may be found for the plate, and this must then be multiplied by the factor for the light filter when it is used.

The following example may serve as some guide to the actual exposure necessary, when working in the field, in order to obtain a fully exposed negative, and will also show that the exposure is not necessarily excessive.

The subject was an open landscape, photographed at 10.30 a.m. in June, the light being good. The exposure on an Ortho. A Plate used in the ordinary way without a Light Filter would have been one-fifteenth of a second with F22, and when this plate was corrected for colour with a Light Filter the exposure was found to be two seconds with F22.

Development is carried out in the usual manner, but care must be exercised in ensuring that the dark-room is illuminated by means of a "safe light," or else there will be a considerable danger of the plates suffering from light fog, owing to their sensitiveness to the yellow and red rays of light. Provided that the right kind of stained glass is obtained, a combination of a ruby glass with an orange glass is usually safe when engaged in handling Mawson's Ortho. A Plates, but even then the light must be kept low, and these plates must not be unnecessarily exposed even to this dim light. When arranging a dark-room lamp for use when working orthochromatic plates, it is necessary to remember that the power, or quantity, of the light employed is an important factor. The filtering media must always be tested with the same light with which they are to be used, and when the dark room lamp is in use the source of light must not be altered nor the power of the light increased. The efficiency of a perfect "safe light" depends upon the accuracy with which the rays of light from any given source are filtered through a media, so that a maximum of light is obtained with a maximum of safety. The source and power of light, the filtering media, and, to a certain extent, the brand of plate in use, are all dependent one upon the other in the formation of a perfect "safe light." Mawson's Ortho. B Plates have to be handled in the darkest corner of the dark-room, as far from the light as it is possible to get. When developing orthochromatic plates, the use of Mr. Watkin's system of Timing Development will be found of great service. It considerably lessens the risk of light fog, as the developing dish may be kept covered during the greater portion of the time of development.

ARTHUR PAYNE, F.C.S.

CRIPPLEGATE Institute.—Photographic Classes for Ladies and Gentlemen.—A course of eleven practical lessons in photography will commence on Friday, January 10, 1902, under the direction of Mr. C. W. Coe, specially suitable for those starting photography. Further particulars and syllabus can be obtained on application to the manager, Cripplegate Institute, Golden-lane, E.C.

THE ROYAL PHOTOGRAPHIC SOCIETY.

The following circulars have been issued to members by the council of the society:—

To the Members of the Royal Photographic Society.

In view of the unrest that is evidenced by the requisitioning of three special general meetings within three months, your council consider it their duty to lay before you a short statement with regard to the state of affairs.

The fact that the president, after the delivery of his annual address, on October 8th, asked the members to sign a requisition to the Council, demanding a special general meeting, has led to the assumption that the president and the council were at variance—that it was the refusal of the council to entertain the president's suggestions, or their opposition to him, that led him to take that course. These assumptions are entirely erroneous, and the president has publicly recorded that fact in his letter to the photographic press of November 29th, 1901. The president's suggestions were not submitted to the council before he brought them forward at the meeting, and they had no opportunity of considering them prior to the occasion of his address, and after the receipt of the first requisition for a special general meeting the matter was out of their hands.

Before the last special general meeting was held, your president and council had decided to draw up such alterations of the articles of association as might be necessary to enable every member to record his vote in writing on any proposed alteration of the articles. The council hoped that if this had been announced at the commencement of the meeting it would have led to an adjournment until the proposal had come into force, but the president did not make this announcement until after the close of the meeting, as he considered it his duty to follow the agenda before making his statement.

Accompanying this is a notice of a special general meeting convened by your council for the purpose of altering the articles of association so that every member who is entitled to vote may have the opportunity of voting, either personally or in writing, upon any proposed alteration of the articles. Your council hope that this will meet with the unanimous approval of the members, and that the change will have the effect of binding together more closely the widely separated members of the society in a common interest for their common welfare.

The council have decided, in response to the third requisition, to convene a special general meeting at the close of the annual general meeting in February. They hope that by then the extended system of voting will have been adopted.

By order of the council,

December 30th, 1901. JOHN A. HODGES, Honorary Secretary.

66, Russell Square, London, W.C.
January 3rd, 1902.

Sir,—I beg to inform you that an extraordinary general meeting of the members of the Royal Photographic Society will be held at 66, Russell Square, London, W.C., on Monday, the thirteenth day of January, 1902, at 7.30 o'clock p.m., at which meeting the resolutions at foot will be proposed to be passed as special resolutions with a view to amending the articles of association of the society.

I am, Sir, your obedient Servant,
JOHN A. HODGES, Honorary Secretary.

(1) To amend Article 52, by the addition of the words—Any article once altered shall not be revised within twelve calendar months of such alteration.

(2) To introduce the following regulations as to voting:—

(a) Upon every question to be decided every ordinary member and Fellow present in person or by proxy shall have one vote.

(b) Every instrument of proxy shall be in writing, and shall be deposited at the registered offices of the society 48 hours at least before the day and hour for holding the general meeting or adjourned general meeting whereat the proxy is to be acted upon.

(c) The member in the chair at a general meeting shall in every case of an equality of votes on a poll or otherwise have an additional or casting vote.

(d) Whenever notice of any extraordinary general meeting is given for the purpose of amending the articles of the society opposite the resolutions showing the proposed amendments shall be printed a column, and each member receiving the notice calling the meeting may in such column state opposite each resolution whether he is for or against the said resolution, and at the end of the resolutions may sign a proxy form which shall be printed at the foot of all notices proposing to pass special resolutions to amend the articles in the following form:—

"I of an ordinary member (or Fellow as the case may be) of the Royal Photographic Society of Great Britain, hereby appoint the chairman of the general meeting (or, as the case may be, adjourned general meeting) of the society, to be holden on the day of , 19 , and at any adjournment thereof to act as my proxy and to vote on each of the resolutions to be submitted at the general meeting (or, as the case may be, adjourned general meeting) in manner shown by me in the column opposite each of the said resolutions.

As witness my hand this day of , 19 .

(Signed in the presence of)

and the chairman shall be bound to vote in accordance with such instrument.

(e) At any extraordinary general meeting called to amend the articles of association of the society even if no poll is demanded on the show of hands, the chairman shall state the number of votes under the special form of proxy set out in the last preceding article, voting for or against the particular special resolution then before the meeting, and the number of votes so held by the chairman, for and against such special resolution, shall be added to the number of votes for and against, on the show of hands the votes of the absentees so specially voting being taken just as though the said absentees were present and voted.

(3) To amend Article 6 by the addition of the words—"except as hereinafter provided."

At the special general meeting of the members held at 66, Russell Square, on Monday last, January 6th, the president, Mr. Thomas R. Dallmeyer, in the chair, the resolution passed on December 9th, the effect of which was to omit nominators' names from the council ballot paper, was unanimously confirmed.

SOCIETY OF ARTS CHRISTMAS LECTURES.

The first of the two juvenile lectures was given at 5 p.m. on Wednesday, January 1, by Sir Henry Trueman Wood, secretary to the society, the subject being "Photography and its Applications." The first portion of the lecture was devoted to elementary photographic optics. The formation of images by light passing through a small aperture, such as a pin-hole, was first explained, and it was then shown how a lens produces in a different, though somewhat similar, manner a much more brilliant image. The faults of the photographic lens were next described and demonstrated by means of a very large and curious burning-glass, some 200 years old, possessing to a remarkable extent all the possible faults of a lens for photography. Thus it was shown that an uncorrected lens could not bring the rays to an accurate focus, in consequence of the fact that light of different colours was focussed at different distances from the lens, and also because each zone of the lens from the centre to the circumference has a focus of its own. The defect known as astigmatism was then explained, and it was shown that a lens, except for the rays falling directly upon it, will not give in the same plane sharp images of vertical and horizontal lines. The uses of photography for scientific observation were then discussed, and the lecturer remarked that the special qualifications of photography for the purpose lay in the facts, first, that it gave an accurate and truthful record of any subject, however complicated, or of any phenomenon, however evanescent; secondly, the photographic plate could record much more rapidly than the human eye could see, and therefore successive stages of an operation too rapid for human vision could be separated, and movements of the most rapid nature thus analysed; thirdly, that the photographic plate had the power of storing up faint impressions, so that by receiving the radiations from a dimly illuminated object for a considerable length of time, it was able to detect objects far too feebly luminous for the human eye ever to perceive.

As regards objects in rapid motion, pictures could be taken by the use of a shutter, or by a sudden flash of light, or even, when the latter as ordinarily produced was too long, by the electric spark, the duration of which could be limited to a few millionths of a second. Each of these methods was experimentally demonstrated, the application of the electric spark to photography being shown by means of a Wimshurst machine. In further illustration, photographs were shown of men and animals in rapid movement, of flying projectiles, falling drops, air waves, and other phenomena. The value of photography in detecting objects too faint to be seen was specially illustrated by examples of stellar photography. It was not too much to say that the existence of uncounted millions of stars, which had never been seen and never could be seen by the eye, had been rendered evident by photographic means. The best illustration of a complex subject rapidly rendered by photography was the spectrum, and in consequence of this all spectroscopic observations were now made by means of photography. A large collection of pictures was shown and explained, in illustration of the various applications of photography to scientific purposes, including physics, zoology, astronomy, botany, geography, surveying, meteorology, microscopy, mineralogy, bacteriology, surgery, biology, geology, anthropology, etc. A demonstration of the action of Rontgen rays was given, and at the conclusion of the lecture a flashlight photograph was taken of the audience.

New Books.

'Photography for Naturalists." By Douglas English. 132 pages. Illustrated. Price 5s. London: Published by Iliffe & Sons, Limited, 3, St. Bride-street, E.C.

Mammals and birds, reptiles, fish, insects, pets and domestic animals furnish the subjects of the illustrations to Mr. English's book; and it will assuredly interest admirers of his excellent photographs to learn that the negatives were "taken with an unpretentious French rapid rectilinear, for which he was recently offered 7s. 6d. exchange value by a well-known City firm." We recommend Mr. English to hold fast to that lens. The natural history objects which Mr. English in his book tells us how to photograph are within sight and touch of those unadventurous stay-at-homes who take delight in the common objects of the garden, the country side, and the fish-tank. Unlike the Keartons and Mr. Lodge, Mr. English has not climbed lofty and dangerous crags in pursuit of timid wild fowl; he has planted his camera on ground lying within more convenient distance of his own fireside, and the result is the production of a charming guide for the undoubtedly large class of "arm-chair" natural history photographers. It is a guide which, if carefully studied before a plate is exposed upon a cat, a rat, a snake, or a butterfly, will tell the would-be photographer what precisely to look for in these objects as "food for the camera" (horrible phrase!), and above all what kind of photograph it is essential to take in order that those objects should be properly delineated from the point of view of the naturalist. Although he confesses that he is "unable to enter on the vexed question (*sic*) of lenses with any degree of authority or experience," in all photographic aspects of his subject Mr. English seems a sound teacher, and his book strikes us as useful and suggestive. We can sincerely recommend it to the amateur photographer in search of easy fields of work presenting more novelty and profit than the aimless snapshotting of the seashore and the back garden.

"A Treatise on Photography." By Sir W. de W. Abney, D.C.L., F.R.S. Tenth edition, 425 pp. 134 illustrations. London: Published by Longmans, Green, & Co., 39, Paternoster-row, E.C.

The new edition of Sir William Abney's best, if not his best known, book on photography, which forms one of the publishers' text-books of science series, makes its appearance at an opportune time. It is perhaps the principal source of reference for students who submit themselves to examination at the hands of the City and Guilds of London Institute on the subject of photographic theory in the spring of each year, and as the edition before us has been modernised it may be as well if the attention of both examiners and students is drawn to its publication. We observe with some surprise that, though trichromatic photography is apportioned a chapter in his treatise, Sir William Abney entirely ignores the Lippmann interference process, which is far and away the most interesting and fascinating system of colour photography at present before us. Again, the chapter on elementary photographic optics leaves off just where it might have become exceedingly interesting to the users of modern lenses—we mean that the work of Von Hoegh, Rudolph, Steinheil, and others in adapting the Jena glasses to the reduction of the aberrations in lenses is not even mentioned. If there is one subject in which the modern student of photography is usually in a hopeless state of ignorance it is that of the new lenses and wherein their special properties and points of novelty reside. That Sir William Abney's otherwise fine treatise is silent on this point is to be regretted, and we hope it will not be long before the present edition is exhausted, so that the two omissions we have indicated may be remedied. An outline of the Lippmann process should, we submit, be within the knowledge of candidates for honours at the City and Guilds examinations. The chapters on photospectroscopy, actinometry, celestial photography, and the failure of a photographic law may be specially recommended to the advanced student. The chapter "on the picture" singles out the artistic work of Manners Gordon, Woodbury, and Robinson for commendation. Sir William evidently has little sympathy with very modern exponents of pictorial photography. In many respects Abney's "Treatise" is the most valuable book of the kind in the English language, and it should find a place in the library of every conscientious student of the phenomena of photography.

"The Stereoscopic Photograph." Quarterly. One Shilling. Illustrated. Published by Messrs. Underwood & Underwood, Heddon-street, Regent-street, London. W.

The December number of this admirable publication is by far the best of the series, and, with its wealth of binocular illustrations and well-chosen articles, should play a great part in stimulating interest in stereoscopy. One article in particular is off the beaten track. It is by Mr. F. V. Cornish, and it tells how the writer used the stereoscope for class teaching at an East End school. If Mr. Cornish can be instrumental in persuading our educational authorities that in the study of solid objects stereoscopic photography is capable of rendering very high service he will have advantaged the cause of progress. The other articles in the number before us are of great interest, particularly the one on the use of the stereoscope in medicine, from which we gave a lengthy extract in last week's JOURNAL. There are some extremely high-falutin references to President Roosevelt, which too cold-blooded Englishmen like ourselves quite fail to appreciate, but in all other respects "The Stereoscopic Photograph" for December is admirable.

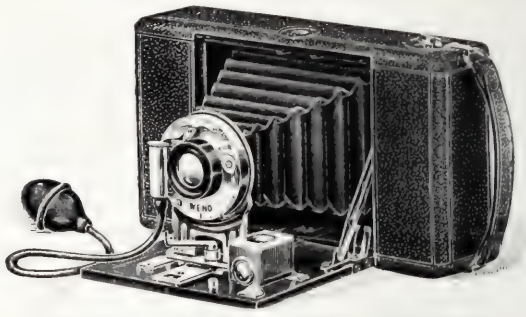
"Orthochromatic Photography for Amateurs" is the title of a clearly-written booklet, published by Messrs. Mawson & Swan, Mosley-street, Newcastle-on-Tyne, and obtainable gratis on application. The author is Mr. Arthur Payne, F.C.S. In another part of the JOURNAL we print an extract from the book, which should be in the hands of all students of orthochromatics.

Received:—"Finishing the Negative." By George E. Brown. Price 2s. 6d. Published by Dawbarn & Ward, Limited, 6, Farringdon-avenue, London.

New Apparatus, &c.

"Two American Cameras." Agents: A. E. Staley & Co., 35, Aldermanbury, London, E.C.

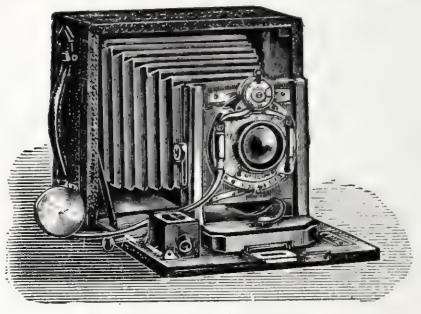
1. The No. 4 Folding Weno Hawkeye.—This Camera takes 5 by 4 rollable film and has a Bausch & Lomb Unicum shutter, giving exposures from "time" to 1-100th of a second, attached to an F8 lens of the doublet form. On the baseboard are a focussing scale and a movable finder for "upright" and "square" photographs. A spring catch in the back of the



THE NO. 4 FOLDING WENO HAWKEYE.

camera actuates a disc which shows the number of films that have been exposed. Measuring something like 9 in. by 5 in. by 2 in., the camera is light, beautifully made and finished and, of its kind, simple to use.

2. The Ray No. 9.—This quarter-plate instrument takes dark slides, and has a focussing screen. It extends to about 10 in., and the front allows the lens plane to be either raised or depressed. On the baseboard a level, a



THE RAY NO. 9.

finder, and a focussing scale are placed; and the lens is a doublet controlled by the almost ubiquitous Bausch & Lomb shutter. It is on the whole a pretty and well-made little camera, which can be used on a stand by serious workers.

Messrs. Staley should have a large sale for these ingenious little cameras, which are really excellent value for the prices charged for them.

Morgan's System of Electric Lighting for Portraiture. London Agents: O. Sichel & Co., 20, Berners-street, W.

We have availed ourselves of an opportunity of inspecting an installation of this system of studio-lighting at the showrooms of the London agents, Messrs. O. Sichel & Co., 20, Berners-street, W. The idea upon which the system is based is to imitate as nearly as possible the conditions of lighting which exist in an ordinary daylight studio. The arrangement consists of a frame glazed with obscured glass, which resembles the ordinary glazed sash. This is placed at an angle of about 45 degrees, the bottom being about 5 ft. from the floor. The light used is from arc lamps so arranged that all the rays, both direct and reflected, pass through the obscured glass into the studio, closely simulating the effect of daylight, and, like daylight, the light may be controlled by curtains or screens. The arc lamps are automatically fed, and are compensating in their action. They are made to carry a large quantity of current if necessary for rapid exposures. The switches have resistances for putting on various degrees of light, and the light may be increased or diminished gradually, so as to cause no distraction of attention on the part of the sitter. The working parts are all out of sight except the switchboards. The advantages claimed for the apparatus are a large area, from 100 to 180 square feet, of dispersion and diffusions. A soft light, causing no strain to the eyes. Economy of current and ease of manipulation. Using the light at full power, a rapid plate and the lens working at F3, a quarter of a second exposure will give well-exposed negatives. The price of the current thus used, taking the unit price as 6d.,

works out at 1s. 6d. per hour. Very much less light, however, may be used for focussing and arranging the subject, and the full current need only be turned on for a few seconds. Indeed, the full power of light is not by any means necessary for the exposure in ordinary work. The negatives we saw produced convinced us of the practical utility of the arrangement. The lighting of the subjects left nothing to be desired, and the large area of the source of illumination obviates the difficulty which sometimes arises with systems of artificial lighting in obtaining sufficiently even illumination in standing figures and groups.

Studio Gossip.

FRADELLE & YOUNG'S Annual Gathering, January 1, 1902.—The New Year started right merrily at 283, Regent-street, when by invitation of Mr. and Mrs. Young nearly forty members of the past and present staff of Messrs. Fradelle & Young were assembled, and it was universally voted to be quite the jolliest of all the series of these pleasant annual gatherings. The fun of the evening, which commenced with Professor Graham's inimitable living marionettes, never abated, and directly this much appreciated performance was concluded, the "Lucky Tub" was carried round, and the dips in this, with the scramble at the finish, caused immense amusement; especially as, by the irony of fate, the ladies usually secured the cigarettes, whilst the gentlemen came in for the sweetstuffs, and some of the very bashful members had miniature feeding-bottles. As soon as the laughter had subsided and the bon-bons had ceased to crack, Mr. Young's magnificent concert-phonograph came into requisition, and the meeting which took place twelve months back was called into remembrance by the reproductions of the contributions then given. Chief of interest were those from the absent members—first the intrepid mountaineer and skilful photographer, Mr. Frank Ormiston Smith (who since the last gathering had founded his own studios), was again heard to advantage in the eloquent speech made at the close of his charming lantern lecture, although the speaker was away in the heart of the Bernese Oberland. Then a song from Mr. Wheeler, whose duty to the firm had called him away to Palestine only a few days previously, and whose absence was universally regretted. Next, a speech from Mr. Bolland, who was unable to be present with his charming wife, owing to the recent bereavement sustained through the death of a near relative, who had given his life for his country at Tweefontein. Last, but not least, Francis Santiero (who with another old member of the staff—John Groves—has been serving the King in "B.P.'s Police" since the last annual) was heard once more, even though the thousands of miles between South Africa and England separated him from the party, and his farewell "Good-bye all" was heartily cheered. Then a souvenir was secured of the present meeting, as the songs, speeches, instrumental solos, and recitations were faithfully recorded by the ever obedient phonograph, and surprising talent was discovered, as each member contributed a share. After this the room was cleared for a dance, which was entered upon with great spirit, Mr. Hammond presiding at the piano, and giving every melody which was called for. It was a merry sight, and it would have been difficult to find a prettier bevy of girls or a jollier set of young men, so, needless to say, the huge bunch of mistletoe which the Misses Arnot and Winter had hung, when their deft fingers had arranged the decorations, was in great request, the prime instigators being Messrs. Delaney and Hutchins, who were the life and soul of the evening. Mr. J. W. Debenham, who was unable to be present until the night had somewhat advanced, was heartily welcomed, and gave some pleasing reminiscences of his voyages on the Mediterranean on behalf of the firm, and an artistically rendered recitation; whilst Miss Kate Young and Mrs. Bacon worked hard throughout the whole evening in attending to the refreshments. "Auld Lang Syne," heartily joined in by all with linked hands, and the toast of "The Health of Mr. and Mrs. Young and the young Youngs" (Franklin and Kathleen), wound up an evening which will live in the memory of all present for months to come. It is a gathering like this which gives genuine pleasure to all concerned and promotes the good feeling and comradeship between principals and employees. The guests included:—Mr. and Mrs. Eckhardt, Mr. and Mrs. Hamilton, Mr. and Mrs. Bacon, Mr. Constable, Miss Laws, Miss Arnott, Miss Winter, Mr. Hutchins, Mr. Delaney, Miss Pearce, Mr. Hammond, Miss Hammond, Mrs. Webb, Miss G. Webb, the Misses Saunders, Mr. J. W. Debenham, the Misses Sommer, Mr. B. Clarke, the Misses Perry, Mr. H. Mason, Miss Shipman, Mr. J. Benham, Miss C. Fordham, Miss Wright, Mr. Rouse, and the lads, A. Thoene, J. Wooler, W. Rouse, E. Phillips, and E. Mather.—*Communicated.*

EFFECTS of an Australian Storm on Photographic Studios.—We often find here in Australia the unexpected happens, and our Melbourne friends were far from expecting in the month before Christmas a phenomenal hail-storm such as occurred on the 14th instant. During the morning of that eventful day heavy showers fell, just such showers as we often experience during electrical disturbances. As the day wore on the velocity of the wind increased to hurricane force. At 5.50 p.m. the terrific storm was at its worst, and at 6 p.m. the hail descended as it never had before in the memory of the oldest citizen. The stones which forced their way through the defenceless skylights of the leading studios in Melbourne measured 1½ in. in diameter and 4½ in. in circumference. Some were as large as hens' eggs. The storm lasted in full force for over a quarter of an hour. The wind was from the south-west, so that all glass windows and skylights exposed to that quarter dearly paid the penalty for enjoying that aspect. It is estimated that in the destruction of glass alone the loss will amount to thousands of pounds. As yet, however, no estimate can be offered of the damage done and loss sustained by Melbourne photographers who have, unfortunately, suffered most severely from the effects of this truly record storm. As far as we can gather from the limited news to hand, the studios which have suffered most are those of Humphreys, Talma, Vandyck, Swiss, Sarony, Johnstone O'Shannassy, and Mendelssohn. Not a sound plate of glass is left in the skylights of these studios. In addition to the breakage, the heavy downpour of rain caused a lot of damage to the back-grounds and cameras. In the Mendelssohn studio the studio camera had fully 6 in. of hailstones on top of it. In Johnstone O'Shannassy's the water came into the reception-room ankle deep, and flowed down the stairs into the street. Several other studios were in the same deplorable condition. Messrs. Baker & Rouse, photographic dealers, Collins-street, had their two large skylights destroyed by the heavy fall of hail, but came off with comparatively little damage to the stock. The picture we produce of Bourke-street, Melbourne, by Harvie & Sutcliffe, will afford some idea of the quantity of hail which must have fallen.—"The Australian Photographic Review."

Commercial & Legal Intelligence.

FULLER & Co., Limited.—Registered by Judd & Manners, 76, Cannon-street, E.C., with a capital of £2,000 in £1 shares. Object to acquire the business carried on at 18, Rampant Horse-street, Norwich, as Fuller & Co., and to carry on the business of druggists, chemists, makers of photographic and scientific apparatus and materials, &c. No initial public issue. T. B. Fuller and A. E. King are joint managing directors.

MESSRS. G. WATMOUGH WEBSTER & SON have opened a new showroom, with a large stock of kodaks and other cameras suitable for presents, at 31, Bridge-street-row, Chester. Some features of the business are: Plates, films and paper, platinotype materials, chemicals (all tested), apparatus, 5 by 4 sizes always in stock, mounts in great variety, large dark room free, developing, printing, enlarging. A branch of the business has also been established at 1, Grange-road, West Kirby.

THE "Columbia" Competition Awards.—Amateurs.—Class 1 (for photographs taken by Pecto or Bullard cameras, and printed on Columbia self-toning paper): First Prize, No. 103—"With Wind and Tide"—Mr. G. Clark, 1, Montholme-road, Wandsworth-common, S.W. Second Prize, No. 150—"Busy Fingers"—Mr. A. H. Almond, 60, Hindle-street, Darwen. Third Prize, No. 124—"The Leven, Newby Bridge"—Mr. A. Barnes, Craigmore, Accrington. Fourth Prize, No. 117—"Reflections"—Mr. R. F. Thompson, 35, The Grove, Wandsworth, S.W. Fifth Prize, No. 104—"Grindelwald"—Miss F. Jones, Thorp Bassett, Rillington, Yorks. Class 2 (as above, less than ¼ plate size): First Prize, No. 209—"Autumn Woodlands"—Mr. J. Dunlop, Myrtle-bank, Motherwell, N.B. Second Prize, No. 238—"Study of Fruit"—Mr. W. Baldwin, Colne. Third Prize, No. 202—"Washerwoman of the Pyrenees"—Mr. A. M. Evans, Padua House, Western-road, Littlehampton. Class 3 (for any print on self-toning paper, taken by any camera): First Prize, No. 368—"Near High Beech, Epping"—Mr. W. Page, 39, Ash-street, New Kent-road, S.E. Second Prize, No. 1,194—"Basket of Fruit"—Mr. A. H. Almond, 60, Hindle-street, Darwen. Third Prize, No. 362—"Entranced"—Mr. A. D" Miller, 28, Delaval-terrace, Blyth. Fourth Prize, No. 142—"Sunny Canal."—Mr. A. J. Linford, 47, Langham-road, South Tottenham. Class 4 (for any print on Columbia gaslight paper, taken by any camera, ½ plate or under): First Prize, No. 481—"In the Backs at Cambridge"—Mr. J. A. Wilson, B.A., Westminster College, Cambridge. Second Prize, No. 1,404—"Kittens"—Mr. C. D. Falck, 4, Hayley-grove, Edgbaston, Birmingham. Third Prize, No. 482—"Silver Birches"—Mr. G. V. Taylor, 29, Vernham-road, Plumstead. Fourth Prize, No. 429—"Solitude"—Mr. J. J. Hartley, Craven Bank House, Colne. Fifth Prize, No. 464—"Leaving Ryde"—Mr. F. Pinder, 245, Manchester-road, Burnley. Class 5 (for any print on metalotype paper, taken by any camera, ½-plate and under): First Prize No. 527—"Highland Cattle"—Mr. R. Braid, Livingstone, Mid-Calder, N.B. Second Prize, No. 578—"Silvery Mist"—Mr. A. W. Cooper, 9, Jordan-street, Preston. Class 6 (trick photography): Withheld. Class 7 (snapshots of objects in motion, ¼ to ½-plate, taken by any camera, printed on Columbia self-toning paper): First Prize, No. 710—"Feeding Time"—Mr. A. A. Bellingham, 2, Grimshaw-street, Burnley. Second Prize, No. 735—"Summer Fun"—Mr. H. J. Horton, 21, Skipton-road, Colne. Class 8 (snapshot as above, under ¼-plate in size). First Prize, No. 807—"Chickens"—Mr. A. W. Cooper, Jordan-street, Preston. Second Prize, No. 804—"Reaping"—Mr. J. Dunlop, Myrtle-bank, Motherwell, N.B. Class 9 (professionals; for any photograph taken by any camera, printed on Columbia self-toning paper, ¼ to ½-plate): First Prize, No. 909—"Queer Chums"—Mr. A. Burn, "The Studio," Wooton-under-Edge, Glos. Second Prize, No. 907—"A Fine Wind"—Mr. O. G. Coates, 19, Lee-road, Dovercourt. Class 10 (as above, printed on Columbia gaslight paper): First Prize—Withheld. Second Prize, No. 1,001—"A Dainty Miss"—Mr. A. Durn, "The Studio," Wooton-under-Edge, Glos. The judges were Messrs. R. Child Bayley and A. Horsley Hinton.

AT the Spelthorne Sessions, on Monday, December 30, 1901, Thos. Bradshaw, of 1, Love-lane, Windsor, an itinerant photographer, surrendered to further answer a charge of having obtained from Daniel East, labourer, New Farm, Stanwell, a sum of 5s. 6d. by means of false pretences, and with intent to defraud. In the previous week Detective Crutchett, the officer in charge of the case, had called various witnesses, in addition to the prosecutor, viz., William Wilder, a signalman at Colnbrook railway station; Frederick Edward Dexter, of Moor-lane, Staines, a carpenter; and John Lidster, of the Swan, Moor-lane, Staines. The object was to prove the systematic practice of a photographic swindle, and the evidence extended

over a period of four years. The officer was now prepared with other witnesses, and they were severally called.

Mr. Walter King, stationmaster at Colnbrook, said that on October 4 last the defendant came to his office and asked for permission to photograph the station. Witness told him that he might do so, but that he himself would not want a copy. About an hour later he returned to witness with a request for the payment of 1s. 6d., remarking that his (witness's) wife had sent him, he having photographed their cottage, of which the lady wanted a copy. After a little hesitation witness paid him the money, and took his receipt for it. A month or six weeks later a porter, who had also parted with some money in the same way, wrote to the defendant for the photographs or the return of both sums, but there was no cesponse to the application.

Mrs. S. K. Gargory, a widow, of Polye, Colnbrook, said that about two months ago the defendant came and asked her if she would like to have her cottage photographed. She said she would, and asked what the price would be. He replied that the charge would be 3s. for two copies, and he mentioned the time for delivering them. She paid him the 3s., and he gave her what she regarded as a proper receipt. She had, however, never received the photographs, nor had her money been returned. She had not written to him for either, feeling that if she did so she would only have an experience similar to that of other people.

Mrs. Charlotte Gillett, of 1, Polye-cottages, Colnbrook, said that in the first week of October the defendant came to her back door and suggested that he should "take" her cottage, she being in the picture. She consented, and said she would take a copy if it came out all right. Subsequently, however, she paid him a shilling, the sum he demanded, and he said he would send the photograph at the end of the week. He had not done so, nor had she got her money back.

Mrs. Tilbury, of Polye Manor-cottage, said that in the first week of October the defendant photographed her dwelling, and said the price for three copies would be 4s. 6d., and for twelve 15s. She told him three would be enough at first, and that she would have more if she approved of them. She asked if she could pay for the three copies when they came, but he said that was not his rule. She then paid him the 4s. 6d. in advance, and he promised to send the views by the end of the week. As it was getting dusk, she asked him if there was sufficient light for photography, and he said it could not be better.

Defendant pleaded not guilty, and elected to give evidence on oath. Having been sworn, he attributed the omission to supply the photographs in the several cases mentioned to his having had "to face a lot of misfortune." Nearly the whole of the plates were "fogged," and after he made this discovery he had the gout. He produced two bad negatives, but one depicted a horse and carriage. Those of the cottages had been destroyed.

The Clerk questioned him about the four-year-old case.

Defendant: Ah! At the time I was taken ill and laid up for nine months. After that, it was some months before I got round, and the consequence was neglect on my part, or something.

The Chairman: You are convicted of this charge.

Detective Crutchett said he had made inquiries as to the defendant's antecedents, and had received information from the Windsor police to the effect that complaints had been made about him there for years. He had been charged in Bucks with obtaining money under false pretences.

Defendant: I object to that, sir; the case was instantly dismissed.

Detective Crutchett: That is true; it was an isolated case.

The Chairman remarked that defendant had been carrying on a swindle for a long time, and he questioned whether the man could take photographs. He had been carrying on the practice amongst people who could ill afford to lose their money, but the Bench would now put a stop to it as far as possible by sending him to prison for three months.

CHARGE against a Photographer Dismissed.—William Arthur Sims, of Market-street, Watford, photographer, was charged with stealing eight negatives, a packet of printing-out paper, four large photographs, and twenty-one other photographs, together valued £2 14s., the property of the Automatic Photo Printing Syndicate, carrying on business at Scots Bridge, Rickmansworth, between May 6 and November 11. Defendant was further charged with inciting George Beckley to commit a felony on December 8. Mr. Bucknall appeared to prosecute, and Mr. Ellis defended. The case for the prosecution on the first charge was concluded at the last Court.

Mr. Ellis, after recalling the witness Beckley and cross-examining him, addressed the Bench for the defence. He pointed out that defendant was eminently respectable and well connected. No charge of any kind had been made against him before. He had a perfect explanation with regard to every article he was charged with stealing. The facts were that when he left the prosecutor's employ he applied to the Rotary Photographic Company for a situation. He saw the manager, and when he was there noticed a lot of prints lying on the table. He said, "Those are some of the prints I made myself with the Automatic." The manager then said, "We have a dispute over copyright with them; can you get any of your prints?" Defendant said, "I don't know, but I will see." Mr. Balfour, the manager, then told defendant, "I don't want the Ellis-Davis photographs, because I have got them." Sims looked through his own odds and ends, and recollected that Beckley had some photographs in his possession. He thereupon asked him if he had got any, adding, "I don't want the Ellis-Davis, which I have." What he had in his mind was that Mr. Balfour had them. Beckley misunderstanding this, told the Automatic Company that Sims had the Ellis-Davis photographs, and a search warrant was issued. But when defendant's premises were raided no Ellis-Davis photograph was found, but the present charge was then brought. It would be given in evidence that these copyright photographs could be purchased in the open market, and the idea was that if Sims had not got them he could go and get them from customers. There was no suggestion that defendant should steal them or do anything of that kind. It was said that photographs had been missed from the works, but that was both before and after Sims had left, so that there was nothing in that. As to the eight negatives, every one of them was useless, and with regard to the other articles defendant came by them in a legitimate manner.

Joseph Balfour, works manager of the Rotary Photographic Company, West Drayton, said that when defendant called on him for work, and pointed to some prints lying on a desk as a sample of his work, witness suggested that if he had anything they had not, if he procured it they would make it worth his while. Witness meant that he could write to customers in the ordinary way. Witness had nothing to do with any of the photographs and negatives which formed the subject of the charge. The eight negatives produced were rubbish, and ought to have been broken up. Operators generally asked for, and were allowed, a copy of two of their prints. The prints produced were bad, and not suitable for reproduction.

In cross-examination, witness said that what he wanted was evidence that the Automatic had pirated their copyright.

Ernest Clarence Elliott, partner and head manager of the firm of Elliott & Fry, photographers, Baker-street, London, said it was the custom of operators to be given one or more copies of their work. The negatives produced were "wasters," and such as his firm threw on one side. He should say they had not been printed from. The ten prints produced were indifferent, and he did not think any one would reproduce from them if he could get anything else.

George Alexander, photo process engraver, said that defendant showed him some of the prints, and he gave him an order for similar paper.

Richard Lang Sims, photographer, said that defendant, his brother, had been in the habit of testing "P.O.P." paper belonging to the Automatic Company, at his establishment. Defendant showed him some of the London scenes, taken with witness' camera and developed in his dark-room, and witness said he should like a set if defendant could let him have them.

Cross-examined: I have not had a set.

The witness Balfour, recalled, said that defendant called on him some time after November 20.

Frederick Pugh, photographic operator, formerly in the employ of the prosecutors, said that in June last he heard Sims say to Beckley, who had a print in his hand, "If you have a copy of that to spare I should like to have it." Witness did not hear the reply, as they began joking about the subject of the picture. Defendant took away paper to test.

The defendant gave evidence as to the interview with Mr. Balfour. The eight negatives he treated as waste and not worth sending in. The late manager knew that witness had them. He had not used them in any way. The prints produced were on test paper. They were lying about when the late manager said, "Tear the things up; they are useless." Witness said, "If they are no good I will take them home for my little boy, who went round with me when I took them." The manager said, "All right." The prints were useless, and had been lying about his house since. After Mr. Christensen left witness asked for one set of the London views, and he picked out a set. Those marked "copyright," which it was said Mr. Christensen could not have given him, formed part of the set. He took paper home to test.

The Chairman, in giving the decision of the Bench, said they were unanimously of opinion that this charge ought never to have been brought against defendant, and he would be discharged. It appeared that in the first instance a search warrant was issued for one particular picture, which was not found, but certain other articles were found which the prosecutors alleged were their property, and had been stolen by the defendant. There had been a lot of evidence, but they were perfectly satisfied that no jury with anything like common-sense would dream of convicting the defendant. Here was a man who held a certain position in this firm. He had in the course of his employment the custody of various things. After a time he left the service and this raid was made on his house. Things were found, which, according to the evidence, were next door to valueless and useless to him, and yet the Bench were asked to commit the man to take his trial on a charge of having stolen them. The case was dismissed.

With regard to the second charge of inciting to commit a felony, Mr. Bucknall said that the prosecution would withdraw it.

FORTHCOMING EXHIBITIONS.

1902.	
January 31–Mar. 1 ...	Dundee and East of Scotland Photographic Association in the Victoria Art Galleries, Dundee. Hon. Secretaries, V. C. Baird and Archibald Campbell, 39, High-street, Dundee.
February 13-15	Nottingham Mechanics' Institute Camera Club, Mechanics' Lecture Hall, Nottingham. Joint Secretaries, W. Ward, 14, Stratford-terrace, Nottingham; E. H. Atkin, 68, Blue Bell-hill, Nottingham; A. Black, 9, Bowers-avenue, Nottingham.
„ 15–Mar. 8 ...	Edinburgh Photographic Society, Society's Rooms, 38, Castle-street, Edinburgh. Secretary, J. B. Johnston, 52, Hollybank-terrace, Edinburgh.
„ 19-26	Croydon Camera Club, The Art Galleries, Park-lane, Croydon. Hon. Secretary, E. A. Salt, 76, Heathfield-road, Croydon.
March 1-8	South London Photographic Society, Public Baths, Church-street, Camberwell. Hon. Secretary, Frank Goddard, Woodlands, Vanbrugh-hill, Blackheath, S.E.
Mar. 1902	Corporation of Glasgow Photographic Exhibition and Competition. Hon. Secretary, Peter Macnair, People's Palace, Glasgow.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK

January.	Name of Society.	Subject.
14.....	Thornton Heath Polytechnic..	Annual General Meeting.
13.....	Southampton Camera Club....	Lantern Slide Competition. Subject: *Landscape.*
15.....	Southsea Photographic Society	*A Little Known Part of the Welsh Coast.* Mr. W. G. Lewis.
16.....	Brentford Photographic Society	The Various Printing Processes and their General Effects.
16.....	Liverpool Amateur	Annual Meeting.
15.....	Borough Polytechnic.....	Lantern Night. Monthly Slide Competition.
14.....	Stonehouse Camera Club.....	*Elementary Photography.* Development by Mr. Bayley.
16.....	North-West London	*The Practical Side of Pictorial Composition.* Mr. Arthur R. Read, junr.
17.....	West London Photographic ..	*The Manipulation of Rollable Film.* J. Brown.
16.....	London and Provincial.....	Open Night.
16.....	Richmond Camera Club	Exhibition of Lantern Slides by Members of the Kingston and District Photographic Society. Ladies invited.
16.....	Darwen Photographic	*Tour in the North of Ireland with the Bioscope.* By Wm. Diggle, Esq.
14..... ..	Newcastle-on-Tyne Association	*Toning.* Open Meeting.
16.....	Oldham Photographic Society	Lantern Lecture. *Native Life in the Plains of Bengal.* Mr. J. W. Hadfield.
14.....	Leeds Photographic Society ..	Annual General Meeting.
16.....	Rodley and Farley Society	*Printing-out Paper.* Mr. H. Hardaker.
15.....	Croydon Camera Club	At 7.30, Council Meeting. At 8.30, *My Experiences with the Pocket Chrono.* By Mr. Hector Maclean, F.R.P.S. Films exposed by daylight, and also by Mr. W. H. Smith's Oxy-magnesium Lamp, will be shown on the screen.
15.....	The Photographic Club.....	Mr. Thomas K. Grant. *A Practical Process of Colour Photography.*
13.....	Camera Club.....	Mr. H. W. Fincham. *A Ramble in Old Clerkenwell.*
16	,, ,,	Mr. A. L. Middleton and Friends. Smoking Concert and Duologue.
16.....	Maritzburg Camera Club—...	*Platinotype Papers.* S. S. Watkinson.
14.....	Birmingham Photographic Soc.	A Demonstration on the making of Lantern Slides by Contact, Reduction, and the Carbon Process, will be given by Mr. W. A. Clarke. Chairman— Mr. R. Haines, M.A.
15..... ..	G.E.R. Mechanics' Institution	Annual Meeting.
13.....	Southampton Camera Club....	Competion. Subject—*Landscape.*

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JANUARY 2.—Mr. T. E. Freshwater in the chair.

The hon. sec. passed round some samples of "Goldaxe," a new gold toning and fixing bath of the neutral order. The makers, Messrs. Fuerst Bros., also sent some of their "Flashaxe" cartridges. These smokeless flashlight candles are made in sizes that give respectively 2, 4, 7, 12, and 20 seconds exposure. He also passed round samples of the Columbia gaslight papers and the same firm's Metalotype developing paper. The emulsion in the case of the latter is coated upon a silver basic paper, which it does not attack in any way. The hon. sec. said that gaslight papers, as a rule, were developed with vigorous developers. He had worked in the other direction, using a normal hydroquinone developer for bromide paper. The paper gave marvellous latitude, as would be seen on reference to prints he passed round made with 3, 15, 30, 60 seconds and 5 minutes exposure. The developer was the same throughout, with no dilution or bromide. He showed the exposure and development of a sheet of the paper, using a glass plate as a support, and applying the developer with a sponge.

The Chairman said that the association started the new year very favourably, a fact that was exceedingly gratifying in view of its approaching coming of age. In addition to the annual grant by Mr. Henderson of the sum of £5 5s. for the encouragement of photographic research and the communication of the results to the association, another member had come forward with the offer of a further grant of £2 2s. annually. The name of the member he was not at liberty to disclose. The prize was for the best paper on photographic subjects, preferably by a member of the association. It had also been suggested that the association should commence a series of exhibitions. An effort had been made in this direction once or twice, and more or less successfully. Additional interest attached to the present efforts, however, because the hon. secretary had offered to provide a silver medal (and if necessary an additional bronze medal) to be awarded for the best pictorial photograph by a member of the association.

Mr. Walter D. Welford gave a lecture on

PICTORIAL AND DECORATIVE WORK ON AUSTIN-EDWARDS FILMS AND WARWICK PLATES.

During a tour of some one hundred and twenty photographic societies in all parts of the country he was struck by nothing so much as the complete absence of the pictorial side of photography from the subjects commonly under discussion. Technique, and that alone, appeared to be the be-all and end-all of their existence. Formulæ seemed to have a charm of attraction to certain photographers that was nothing short of marvellous, and just as this side of the pursuit of photography received particular attention, so the pictorial aspects were neglected. By pictorial aspects he did not allude to those high art notions that frightened away the humbler worker, but he referred to a something that was between these and mere exposure and development. The technical worker proceeded by rule of thumb with nothing in view beyond his optics and his chemistry, but the pictorial worker had an eye for something further, and made his processes follow him. It was true that he had to master processes and technique, and up to this point the two classes of workers went together. There, however, came the parting of the ways. The merely technical man stood still and the pictorially-minded man went on, making laws for himself. The pictorial photographer, he proceeded to point out, required in the first place the best materials, and as regards freedom from halation, fogging, coarseness of grain, combined with good colour sensitiveness, he claimed that the goods he represented were not to be beaten. The emulsion for celluloid films was not similar to that put upon glass plates. It had been recognised by the firms he represented that emulsions were not exchangeable in this respect, and that a celluloid film required a specially suitable emulsion. Mr. Welford then uttered some warning notes in regard to halation, not merely that which occurred in windows, but in tree tops, roofs, &c. Backing a plate minimised the trouble, but did not prevent it, as there was the halation due to spreading of the light in the film itself where strong contrasts met in the negative. The coarser the grain the more the halation, therefore the plea for a fine grain was substantiated. Coarseness of grain interfered with the true rendering of colour values, and further, in enlarging, the same defect caused a disagreeable effect in the enlargement with loss of definition. A fine-grain plate could be enlarged much more for the same degree of definition and quality than a coarse one. In landscape work, green grass, trees, &c., were commonly rendered too dark for the want of an isochromatic plate which, even without a colour filter, gave much improved results. The colour filter should be "suitable," because it was possible to "over-correct" and err on the other side. As regards the use of isochromatic plates, he favoured speed in changing to any method that involved the use of only a little light in the dark room. The plate properly sheltered during its manipulation could be safely worked in a very light dark room. In his own dark room the window measured 44 square feet. Coming to the actual photography, he urged the putting aside of all set ideas as to ultimate size of print, sharpness, printing surface, tone, and kind of mount. A half-plate camera did not compel one to keep to 6 by 4 prints, and if a sharp negative did not give the effect desired, one could focus less sharply. The sharp print was not necessarily pictorial, and the less sharp print might be. Do not crowd too much into a picture, was his next advice; make the main object dominant, all others and everything else secondary to that main object. Then the person viewing the picture would not be able to excuse himself for missing the point of interest. Avoid figures, male or female, and animals in landscape pictures. Art principles should be abhored; lines and their relation one to the other should be scorned, at least in one's preliminary work. Let the photographic critics point out the defects. Do not make the negative to suit a given paper, but choose a paper to suit the negative. Do not print a snow scene in red chalk or follow other similar absurdities; and finally, do not adopt any elaboration of mount. Fake as much or as little as necessary. Those who cry against it are a selfish crew. Mr. Welford supplemented this advice by showing how he would improve the join of a sky to a foreground, reduce the harshness of a patch of water, help a cloud, and so forth, and then showed a number of slides illustrating his remarks.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

CHEAP ENLARGEMENTS

To the Editors.

Gentlemen,—In your issue of January 3rd I notice "Fairplay" seems to be a little bit nettled about Messrs. Finn and Son, Ltd., presenting their customers with a 20 x 16 enlargement on purchase of a pound of their noted tea and payment of 5s. I should just like to draw "Fairplay's" attention to the fact that in one of Lancashire's largest towns a well-known firm of trade enlargers advertise in the evening paper, and also have showcases stationed in different parts of the said town, with specimens of 20 x 16 enlargements, for the small sum of 4s. 6d., either from a personal sitting or from a copy. What does "Fairplay" think about this when we pay as much as 5s. for a 12 x 10 mounted, etc.? In fact, I have paid the said firm 3s. 6d. for a 12 x 10 and had to pay carriage, which brings the figure to a total above 4s., and on comparing my enlargement (executed by them) with their specimens of the 20 x 16 in their showcases I must certainly say one was as good as the other. My advice to "Fairplay" is to study some original idea of his own to make money. Say he reverses the advertisement and gives to every purchaser of his beautiful and highly-finished enlargements one pound of tea for the small sum of 1s. 6d. guaranteed of the finest Indian and Ceylon blend. He can make a profit out of the tea as well as the enlargement at the

above figure, and have his name and address printed on the wrappers, and the tea packed in ¼lb., ½lb., or 1lb. packets. What more do we want if we want to give some useful article? Enclosed I forward you a cabinet photo that I am turning out at 2s. 6d. per dozen as per particulars. What is your opinion of the photograph?—Yours respectfully, BUSINESS IS BUSINESS.

[Two shillings and sixpence per dozen for cabinet photographs is a small sum to charge, as a rule, but quite enough in this particular instance.—ED "B. J. P."]

BUSINESS CHANGES.

To the Editors.

Gentlemen,—By arrangement with the firm of A. and M. Zimmermann, as per enclosed circular letter, we beg to inform you that we have taken over and shall carry on the photographic department of that business.

We have pleasure in informing you that we have been appointed agents for

The Actien-Gesellschaft fuer Anilin-Fabrikation Photo Dept., manufacturers of Patent Developers, etc.

The Vereinigte Fabriken Photographischer Papiere, Dresden, manufacturers of the Crossed Swords Albumenised Paper and Kosmos C.C. Paper.

The Deutsche Gelatine-Fabriken, Hoechst a/M. (Heinrich's Gelatine), and of Messrs. C. F. Kindermann and Co., Berlin, manufacturers of accessories.

Mr. R. J. Kindon, who has previously represented the old firm and managed that department, will in future act in that capacity for us.—Wishing you a prosperous New Year, we are, dear Sirs, yours faithfully, CHARLES ZIMMERMANN & Co.

9 and 10, St. Mary-at-Hill, London, E.C.
1st January, 1902.

The following are the circular letters referred to:—

9 and 10, St. Mary-at-Hill,
London, E.C.
31st December, 1901.

Sir,—We beg to inform you that from this day Mr. Charles M. Zimmermann, son of our senior, will, in accordance with a friendly arrangement, discontinue to be a partner in our firm.

He acquaints you of his future plans by the attached circular, which we commend to your kind attention.

Our business will be conducted on the same lines as before, with the exception that Mr. Charles Zimmermann will take over our photographic department and a few other agencies.

All outstanding accounts up to December 31st, 1901, will be collected and paid by us.

Appreciative of your past favours, we shall thank you much for their continuance.—Yours respectfully,

A. & M. ZIMMERMANN.

9 and 10, St. Mary-at-Hill,
London, E.C.
1st January, 1902.

Sir,—I beg to inform you that the partnership hitherto existing between my father and myself has been dissolved, and in perfect agreement with my father I have established myself on my own account as merchant and commission agent, under the style of

CHARLES ZIMMERMANN & CO.

at above address.

I shall endeavour to deserve the continuance of your favours which you have been good enough to confer on me during the several years of partnership in my father's business.

I remain, dear Sir, yours very respectfully,

CHARLES ZIMMERMANN.

TELEPHOTOGRAPHIC FOCUSSING.

To the Editors.

Gentlemen,—In the almanac you speak about the great difficulty of focussing with the teleobjectives, especially so in some cases of long focus. I can assure you that this focussing is very much facilitated when the focussing glass is cut in two halves, leaving a ¼in. free in the middle, so as to focus in the air. The same refers to all kinds of badly-lighted subjects, such as interiors, etc., and I am astonished that all cameras are not made in that way, as it is most handy for all purposes, allowing easier, quicker, and sharper focus than on any other surface. I use it on all my cameras, and I am highly pleased with it.—Yours very truly, ALBERT LEVY.

Asnières (Seine).
January 5th, 1902.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY, 24, *Wellington-street, Strand, London, W.C. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

FOREIGN COPYRIGHTS.—"Interested" writes:—"I read with much interest your leaderette on 'Foreign Copyrights.' To make the article complete there should be attached the names of 'all the countries that were signatories to the Berne Convention.' Kindly say what countries these were."—In reply: The countries are mentioned in a work on international copyright law published by Messrs. Eyre & Spottiswoode, the King's Printers.

PORTRAITURE BY ARTIFICIAL LIGHT.—J. G. GOWLAND writes: "(1) Can you inform me which you consider the best light for portraiture as night—acetylene or incandescent gas? (2) Which do you consider cheapest, when ordinary coal gas here costs 3s. 9d. per 1,000 cubic feet? (3) If acetylene, what size reflector, and how many burners would be required?"—In reply: (1) Both answer well. One is as good as the other, and it is simply a question which will be the most convenient to you. (2) Not much difference. Acetylene would, perhaps, be the cheaper when the apparatus for its generation is installed. (3) A reflector, such as is used for the arc light, about 5 ft. in diameter, will be suitable. Eight to twelve, or more; the more lights there are, of course the shorter will be the exposure.

COPYRIGHT.—MORPHITE writes: "A London firm sent to a prominent man in our town to give them a sitting, which he did. They took several negatives and sent him proofs. He kept one of the proofs and returned the others and sent them an order for one dozen copies, which they sent him a bill for, and also included the proof he kept on the bill. Now, this gentleman sent his photo to a daily paper to be reproduced in their paper. The photographers who took him want to claim a fee from this paper, stating they hold the copyright of the photo. I may say he paid for every photograph that was sent to him. Have the firm any claim on the publishers of the paper?"—As the gentleman paid for the portraits in the ordinary course of business the photographers have no copyright whatever in them.

IDENTITY OF PRINTING PROCESS.—J. BELL writes: "I am often receiving photographs from friends in America, and I find they are nearly all printed on paper similar to the enclosed. Can you tell me what it is—is it a printing out paper or a special kind of bromide printed by artificial light? Can you tell me if the same kind of paper can be obtained in this country, and if so, where? I have tried a variety of kinds, but have not met with one similar."—In reply: The prints appear to be on a printing out paper, but we cannot say who are the makers, as we are not familiar with American papers. You should have no difficulty in obtaining similar results on English matt P.O.P. The prints have been returned as requested.

THE CARRIAGE OF NEGATIVES.—A. B. writes: "On June 18 last I sent a box containing photographic negatives to my enlarger, numbering twelve, with cash enclosed for enlargements to execute in oils, per rail, and the box was never delivered. Fortunately I was able to execute all of them with the exception of three, which I have claimed for from the Company, my loss being £7 0s. 6d., that is, eleven negatives, £1 7s. 6d.; one glass positive, 5s.; and three oil paintings at 40s. each, 24s. less for the frames. I have been in communication with the Company ever since. Now they have made me an offer of £2 4s. 6d. which I refused to accept. By their delivering me the box I can execute the work. They tell me they are not liable for consequential damages, which, of course, I had the work ordered before I sent away the negatives."—In reply: The only remedy you have is in the County Court, and you should have taken proceedings before this when the facts were fresh in mind. We do not expect that you will be able to recover for consequential damages.

VARIOUS QUERIES.—AN OLD READER writes:—(1) Kindly give me the address, or addresses, of firms that supply photographic materials at wholesale prices; (2) the address of a firm that supplies picture frames and materials as above. (3) Can you tell me where I can get a plan to build a studio, what size does it want to be for a ½ plate camera to take say ½ plate pictures, downwards? (4) Who supplies fretwork materials, wood, &c., at wholesale prices? I am going to open a shop to sell these above articles, also to take photos; and I wish to get them so as I can retail them at list prices. Do I have to have a licence to sell any of the above? In your front page of JOURNAL you say all almanacks are sold out, but can I obtain one by sending cash?—In reply to 1, 2, 4, it is against our rule to recommend any particular houses, so we must refer you to the advertisement in the JOURNAL and "Almanacs." You must bear in mind that wholesale houses only supply their goods in wholesale quantities. 4. Bolas' book, published by Marion & Co. 5. No licence is, of course, necessary. 6. No. You may, however, be able to secure a copy at some of the dealers. They may possibly have one left.

Several Letters and Answers are unavoidably held over.

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EX CATHEDRA.

Fire Insurance. We have frequently referred to the need for care in introducing fire risks into photographic manipulations on account of the danger to the maintenance of the policy, for it must be remembered that by the conditions which form part of every policy issued, the doing of any act which increases the danger of fire at once cancels the policy. We are quite willing to admit that, as is the case, the fire offices are usually inclined to interpret the insurer's acts from a liberal standpoint—we shrewdly suspect from a matter of policy rather than ethics—but the real gravamen of such acts lies in the fact that if a fire does occur such contraventions of the clauses gives the companies overwhelming power when the arrangements for valuing the damage are made; they are virtually in the position to say, "Take it, or leave it." We are led to make these remarks in finding that a similar condition of things obtains in France, as was amusingly shown the other day. M. Georges Latruffe, who recently crossed the Channel in a balloon, invited a number of his friends, a Sunday or two ago, to the Hippo Palace in Paris to witness a trial of his new model of an airship. The apparatus for inflating the balloon was brought into the ring, and the inflation of the envelope was started. It appears, however, that the manager (who had lent the Palace to M. Latruffe) had been under the impression that the inflation was to be made with atmospheric air, and when he found that hydrogen was to be employed he incontinently stopped further proceedings; he would not allow his circus to be transformed into a gasworks—it would be sufficient to cancel all his insurance policies. *Verbum sap.*

The Kodak Company and the Wholesale Dealers. The Kodak Company possesses a mastery of the art of getting itself talked about. The latest development of its business policy has once more set the tongues of the trade in motion, and the new situation that has been created is the subject of much discussion. Briefly, the wholesale distributer of Kodak productions finds that from the 1st of January last his occupation in this particular respect has entirely gone, the company having taken the bold step of going direct to the retailer and offering him preferential terms, calculated, it is to be presumed, to destroy the position of the wholesale agent on the one hand, and to obviate by anticipation the inroads of competition on the other. Two or three large photographic houses and several firms of wholesale chemists and druggists are affected by what amounts to the loss of a considerable part of their business. It seems to be the general opinion that, following upon the promulgation of the famous conditions of sale of twelve months ago, the new Kodak departure may have, in the long run, an unfavourable effect upon the company's business. At least two large firms have to our knowledge decided to take up the manufacture of rollable celluloid film, and the importation of German-made cameras of the Kodak form will, it is stated, shortly take place in large numbers. Thus there is every prospect of sharp competition in rollable films and cameras. In our correspondence columns we print a letter from Messrs. George Houghton and Sons on the subject, from which it appears that the Photographic Trade Association has the matter under consideration. It will be interesting to learn what steps that body will decide to take. Frankly, we are unable to see what it can do at present against a powerful antagonist like Kodak, Limited.

* * *

Flashlight Photography. According to the *Scientific American*, a new apparatus is being introduced by Mr. H. B. Schaeffer, of Altoona, Pa., for the purposes of portraiture, and it is stated that it is being largely introduced into a number of studios. The apparatus consists essentially of a box for combustion, which is fitted with a number of incandescent electric lights, for focussing purposes, and is provided with a large velvet sleeve to take away the products of combustion through the window into the open air. The front of the box is covered with a thin fabric to allow the light to pass, and yet to diffuse it so much that it has the effect of coming from a cloud, rather than from a point. Judging from the description, which suggests, virtually, a copy and a blending of old ideas, the apparatus should be capable of doing excellent work; and, most important of all, the studio remains clear, and there is an entire absence of the usual smoke or fumes.

These are the drawbacks to all interior work with flashlights, as, generally when an exposure has been made, the atmosphere becomes so clouded that a second exposure must be deferred till the fumes have settled. This is one of the great drawbacks to the extemporaneous use of the flashlight, but it must be said that there are great differences in respect of fumes in the various preparations sold. The pure magnesium powder itself unquestionably sins largely in this respect; but there are some preparations of magnesium or other powder in combination with what may be termed pyrotechnic mixtures that give off a very small amount of fumes, and a similar claim is made for the flashlight candles recently reviewed in these columns.

* * *

Electric Heating. The number and variety of purposes to which electricity is applied is continually increasing, and, as the cost of the electrical unit decreases, so will its applications increase. The time is not yet arrived when electricity will be available for heating large spaces, such as photographic studios; but when it comes to a question of small areas, it is not uneconomical, for, unlike the use of a coal or coke fuel, there is no waste when once the desired temperature has arrived, as the current once switched off, there is no further consumption. Portable electric heaters are seen in increasing quantity, made into various forms for particular trades, from the large smoothing-iron for use on a billiard table to heating of a kettle in a dentist's operating room, and recently a form of electric furnace on a small scale has been devised, which may very probably be utilised for some photographic purposes. Professor H. M. Howe, of Columbia University, has described such a furnace for crucible work in a laboratory, and it has occurred to us that it would not need essential modification to fit it for employment in enamel work, that beautiful process, so little taken up by photographers, mainly, we should imagine, because of the difficulties, imaginary or real, in connection with the necessary furnace. Professor Howe constructs his crucible of pure magnesia, surrounds it with a platinum wire, fits it into a cavity made in a large block of magnesia, and finally covers the whole with another block of magnesia. The current is then switched on and passes through the wire, which is instantly brought to a very high temperature. 1,400 deg. Centigrade has been reached, and it is stated that, as must be evident, a constant temperature can be maintained for a long time, and without injury to the platinum wire.

* * *

Calendered Paper. It is generally known that, during the Parliamentary recess, writers to the newspapers, signing themselves "Constant Reader," "Fairplay," etc., have a chance of airing their grievances which does not occur when a whole page or more is taken up with debates. A number of persons have recently profited by this opportunity to write to the *Standard* regarding the iniquity of publishers in using glazed or calendered paper for books and periodicals. The reflecting surface of this highly-glazed material is said to be destructive to the eyesight, and one writer indignantly asks how we, as a nation, can be expected to keep up our rifle-shooting if this terrible evil continues. He also suggests that, in many cases, extra profit to the book-producer can be the only object in employing this paper. There are other suggestions of a like charitable nature, and to anyone ignorant of printing methods it would seem that publishers and printers had entered into a horrible conspiracy to bring grist to the mill of the ophthalmic surgeon. Why, oh, why, do not these constant readers read up their subject a little before they write about it? In the case before us they would then have learnt that calendered paper is by no means cheap, and that the sole reason for its employment is that the process-blocks, so widely used for illustration, must be printed on a very smooth, non-absorbent surface to get the best results. When these process-blocks first came into use, a couple of decades back, the printers made sad havoc of them, for they imagined they could be printed from as easily as an impression from a woodcut could be produced. But they soon found that far more care was necessary, and that a finer grade of ink, as well as a highly-glazed paper, was necessary to coax out of them all their best points. So necessary is this question of ink that, in printing some of our illustrated journals, it is found economical to print the letterpress pages with a lower grade of ink than that used in printing the illustrated pages. Publishers certainly find an economy in using photo-blocks instead of woodcuts, for the former cost but a tithe of the latter. But, at the same time, they have to be so lavish in their use of blocks, and, as we have seen, have to pay so much more attention to printing and quality of paper, that the balance to the good is often unappreciable. It is certainly unfair to charge them with meanness, when they are only doing their best to produce the finest results with the materials at their command.

* * *

Coloured Lantern Slides. It has been the fashion among photographers, ever since photography took possession of the magic, or optical, lantern, to decry anything in the shape of a coloured picture. "A photograph coloured is a photograph spoilt," so ran the familiar formula. It was natural that photographers should take up this tone, for at the time when transparencies were first shown by the lantern the coloured pictures which they displaced were of the very crudest kind. We are here alluding to the ordinary pictures supplied with a shop-purchased magic lantern. At the same time, by paying a good price, really artistic paintings on glass could be obtained. At the sale, twenty years ago, of the effects of the old Polytechnic Institution in Regent Street, many of the lantern pictures fetched 50s. a-piece, and this was about a sixth only of what they cost. They were exquisitely-finished hand-paintings on glass, and measured about 8 inches by 5 inches. We believe that most of them were bought for the American market, and doubtless they now figure as decorations in some big mansion. The tendency among photographers nowadays is not against coloured lantern slides, but all in their favour; but they must not be due to handwork, but to the tri-colour method, suggested by Ives, and perfected by Sanger Shepherd and others. Anyhow, the present fashion runs towards coloured pictures for lantern use, and it is only natural that those who remember the old hand-paintings should compare them with the modern pictures, produced from three negatives and stained with aniline dyes. So far as artistic effect is concerned, the palm must, of course, be given to the hand-paintings, and in stating this we have in our minds the very beautiful series of lantern pictures copied from David Roberts' studies in the Holy Land, which were shown in London a generation back. The modern tri-colour method is a strictly mechanical one; it does not call for the exercise of any artistic qualities, and, therefore, it is likely to be widely adopted. It gives texture, such as the sheen on a butterfly's wing, to perfection, but the colouring in many examples which we have seen has been far from satisfac-

tory. We fancy that this is in great measure due to the gaudy character of the dyes employed, and we cannot help fancying that if the producers of these gorgeous lantern slides were to ally themselves with a capable manufacturer of artists' pigments, a far better state of things might be arrived at. What would an artist in water-colours say if he were deprived of his paintbox, and compelled to use coal-tar colours? Would not his pictures become as gaudy as the tri-colour lantern slides referred to?

* * *

Printing in Damp Weather Gloomy January, with its damp fogs and mists, is a time of the year that is very trying to photographers, and in large towns and cities the printing department of a studio may be said to be at a standstill; whilst even in many country situations things are very little better, for what little light there may be is of such short duration and so feeble in its energy as to require even moderately-dense negatives being kept in the printing frames for several days before a sufficiency of density is obtained. To overcome orders for printing, it is well known that many of our leading photographers do their printing in country situations apart entirely from the main studio; and a few years ago, in cases where highly-glazed samples of paper were concerned, it became customary to produce as many prints as possible by resorting to a system of partial printing, and finally developing up to full density by means of a special formula containing a large percentage of bromide. Other photographers, again, made bold to discard entirely what may be termed printing out, and practically pinned their faith to one or other of the many excellent brands of bromide paper now on the market. Circumstances do arise, however, where, for special purposes, prints have to be pulled from negatives which show the utmost amount of detail possible, as well as freedom from all grain in the paper. Among this class of prints may be mentioned those required for reproduction in process-block form, and many country workers, not having special facilities for artificial-light printing, partial or otherwise, have no help for it but to patiently grin and bear the delay of printing by daylight in the ordinary manner. At no other time of the year is the liability so great to contract injury to negatives by silver staining from damp, and, therefore, extra precautions have to be taken to guard against such. All negatives should not only be varnished with a hard sample of varnish, but even after such has been done, it is a wise precaution to polish, in a sense, the coating of varnish by applying a dusting of French chalk, well rubbed in, after the manner of preparing enamelling glasses prior to the squeezing down of a wet print. It is not only, however, in the matter of injury to negatives that a photographer who has to conduct printing by means of daylight is concerned; there is the further liability of seeing all his labour going for nothing, by his prints turning out blunt. A more annoying circumstance than this can hardly be conceived, for frequently a considerable number of days are required before the printing has been completed, and then it is found that all labour has been spent in vain, and the whole thing has to be gone over again.

* * *

The Cause and Cure of Blunt Printing. Fortunately, the cause of blunt printing is well known, and although at times it is difficult to combat, especially at such a trying time of the year as the month of January, when no two days are alike in regard to moisture in the atmosphere, still, precautions may be taken that will go far to avoid such disastrous results. There is no doubt that any rapid change of temperature, such as a dry, frosty day suddenly changing to a dull, damp, heavy condition of the atmosphere, will do a lot of mischief to a print that has been exposed to such changes, and it is possible that the common precaution generally taken by printers to guard against damp, by seeing that all negatives and pads and printing frames are dried before printing is commenced, is just one of the sources that yield such blunt prints as they are striving to avoid. If a negative has been protected by having its surface covered with a coating of varnish that is impervious to moisture, and the same is gently warmed in front of the fire to drive off all moisture, prior to the printing paper being placed in contact, only a few minutes will be required on a dull January day for the dampness of the atmosphere undoing all he has attempted to guard against, and very likely the precaution of storing his printing paper in a dry situation will likewise tend to add to his liability to produce blunt prints. The storing of the paper in a drier atmosphere than that to which the printing frame will be exposed is certainly one of the chief causes of blunt printing, and where large sizes of negatives are concerned, say, from 12 by 10 to 15 by 12 inches, it is almost impossible to print a dry sample of paper in a dull January light without the print showing symptoms of bluntness. Anyone desirous of experimenting in this matter need only carefully measure the dimensions of his paper prior to its being placed out to print, and in a very short time he will find a distinct amount of stretching has taken place, and not only is this noticeable in the length or breadth, according to the manner the paper has been cut, but certain portions of the paper will belly up in patches, no matter how carefully the padding and springs of the printing frame may have been attended to. Probably one of the best provisions against this stretching is to place the paper it is intended to print in another frame, having an opaque shield, and expose the same to the influence of the atmosphere, without drying the same in any way when placing the paper in contact with the negative. This treatment need not in any way injure the negative, if care be observed not to print the negative in sunshine, or in any position where it would be liable to a sudden change of temperature. Were the printing conducted so that a collection of beads of moisture were produced between the surface of the negative and printing paper, as is liable to occur when any sudden change of heat and sunlight is allowed to fall upon the printing frame, no doubt injury to the negative might be contracted, but making a fixed determination to only print in the shade will avoid such danger. No doubt, the temptation to utilise what little sunlight there is at this time of the year is very great, especially when a print is wanted off without waiting till the following day; but at no time of the year is printing in sunlight fraught with such danger to negatives as at present, when any moisture in the atmosphere is sure to affect both printing material and negative alike to an appreciable extent. All negatives after being printed at this season of the year should be subjected to close scrutiny for some days or weeks afterwards, and if the slightest trace of silver staining be observed, steps should at once be taken to remove it.

CAMERA Club Company, Limited.—Registered by Hensman & Co. 62 Lincoln's Inn-fields, with a capital of £4,000 in 6,000 10s. Preference shares and 1,000 £1 Ordinary shares. Object to adopt an agreement with a company having a similar title (in liquidation) and the liquidators thereof; to provide a club house with dark rooms, studios, workshops, photographic, scientific and mechanical apparatus, artists' requisites; to form a library of photographic and scientific literature. No initial public issue. The first directors (to be not less than five nor more than twenty) are to be the directors of the old company. Qualification, ten preference shares. No remuneration. Registered office: 28, Charing Cross, W.C.

UNDER-EXPOSURE IN PORTRAITURE.

THERE is, perhaps, scarcely anything so much to be guarded against and avoided in portraiture as under-exposure. And yet it would certainly seem that quite a large proportion of professional photographers are hardly aware how much that is unsatisfactory and unpleasing owes its genesis to this one fault. Hard, saturnine faces, fixed expressions, glaring eyes, absence of likeness, are only a few of a plentiful crop of evils due to this cause. Undoubtedly, one of the primary requirements of pleasing and successful portraiture is softness and delicacy of lighting. The reason for this is not far to seek. The human face, except in early infancy and childhood, is not, photographically at least, sufficiently round and soft of outline to look well in a harsh and abrupt light. We are not often brought into cognizance of this fact in ordinary life, although it thrusts itself forcibly on our attention in the studio. And yet there are occasions now and then when it is evident to everyone, as for instance, when the gay frequenters of a ball leave the precincts of the softened candle and gas lights for the unsubdued brightness of early morning, and notice with wonder how unflattering the light is to many a proud beauty, who looked the perfection of loveliness in an artificial light. The contrast is more in seeming than in reality. To those who come from the ballroom the difference is striking, but the loungers outside will not notice it so much, if at all. It is simply a valuable example of how very much better even the fairest face may look under suitable conditions of lighting.

But, it may be said, we are not speaking of lighting at all, but of the effects of under-exposure. Well, it is not difficult to prove that under-exposure has a very similar effect on a portrait negative to that caused by a harsh and unsatisfactory light. Unless it is very slight in degree, and most skilfully compensated for in development, it will cause the very same evils of excessive contrast and lack of softness. And these undesirable qualities by no means exhaust the list of things objectionable due to under-exposure. It has a distinct and decided effect in modifying the likeness, and always in the wrong direction. The retoucher who has to deal with such negatives appreciates this perhaps more than any other person, and will, if appealed to, confirm the statement as to the great difference that is often shown, as regards likeness, between a correctly or over-exposed negative and one that is not. In the first place, the age of the sitter is nearly always exaggerated, lines, furrows, and wrinkles are unduly displayed and emphasised, and any natural defects of the face become more than reasonably apparent. It is true that, to a great extent, it is in the power of the retoucher to make amends for this, but beyond all that is in his province and ability to soften and remove, there is a nameless something, unpleasing and forbidding, about the under-exposed portrait that cannot be atoned for, be his pencil never so skilful. Or, it may be, if retouching is carried to a sufficient extent to soften and smooth the face to the same degree of roundness that would have been present in a correctly-exposed negative, there becomes apparent an insipidity and lack of character that is even worse than the first evil. Not only does under-exposure seem to age the sitter, but it has undeniably a detrimental effect on the rendering of expression. If two negatives be taken at the same time, as may be done with a stereoscopic camera, one being correctly and the other under exposed, the difference may be readily enough appreciated. If in the former the sitter is rendered with a pleasing smile, it will probably be noticed that in the latter the expression is slightly less agreeable, more rigid and stiff, and perhaps even rather staring. And when we consider how all-important such little things are in contributing to the satisfaction or otherwise of one's customers, it is palpable that the photographer cannot afford to ignore the question.

It may be worth our while to inquire into the why and wherefore of this under-exposure, intentional or the reverse. It is certainly a fact that many photographers deliberately give their negatives an insufficient exposure in order to secure certain results, which, they imagine wrongly, can only be obtained by that means. The idea will be found, mostly, among those who have for some time been working the albumenised silver process, and cannot get rid of the memory of the strong and vigorous negatives that were, in the earlier days, necessary for successful prints on these papers. They lose sight, or are not aware, of the great changes in manufacture and sensitising which have called for a different class of negative, one of lesser density, softer, and more adapted to the less richly-coated papers of to-day. And for the worker in gelatino-chloride attention to this question is even more essential. It is only beginning to be recognised as it ought, how delicate and true in gradation should those negatives be which are to give the most perfect results with that process. It has also been a cherished delusion with some that good prints in platinotype and carbon could only be obtained by the employment of negatives possessing strong contrast. Vigour and sufficient printing-density are, it goes without saying, essential, but these qualities are not necessarily identical with great contrast. And curiously enough, the special beauties of the platinotype process—its delicacy and softness—have often been entirely overlooked and counteracted by the use of unsuitably hard negatives. So much for intentional and deliberate under-exposure, with a definite, though mistaken, object in view. We will now examine those cases where it occurs rather in deference to what are believed to be unavoidable circumstances, than the operator's direct desire. Some studios, for instance, are handicapped with an insufficiency of light, by reason of situation or adjacent obstacles, and a certain amount of under-exposure is generally obliged to be accepted as a disagreeable necessity. In such cases there is hardly any avoidance of the evil, though certainly much may be done by the employment of as large a glazed surface as possible; light backgrounds and surroundings; a lens of the largest obtainable aperture, and, it may be, without stopping down; also, it might be suggested, the use of isochromatic plates. Then, again, longer exposures might be attempted than the average photographer cares to deal with. They are more tiresome, perhaps, and risk of movement is greater; but, within limits, the ordinary sitter is quite capable of the necessary endurance and patience, and will take it good-humouredly if properly treated. The results are certainly more satisfactory than under-exposure would have given. Those, however, who are plagued with a really bad light, will find it far better to rely on electricity, or some other satisfactory artificial means of illumination. It is, under such conditions, a saving of time, trouble, and temper in the end.

Another instance of practically necessary under-exposure is found in the photography of young children or animals. Here the difficulty of keeping the subject still has compulsorily to be reckoned with. It is extremely fortunate, however, that these cases are precisely those which suffer least from a moderate deficiency of exposure. It is, nevertheless, better to insure against it, as far as possible, by the means before suggested. Quietness, tact, absence of fussiness, and quickness to seize the golden moment, are invaluable auxiliaries in dealing with the excitability and ebullience of life in both animals and children, acting like

a soothing anodyne, to the promotion of stillness and repose. It should not be overlooked that there is room for much difference of opinion as to what constitutes under-exposure. It is probable that a negative which one man might consider under-exposed would appear to another the acme of correctness. The true definition, perhaps, can only be arrived at by securing an idea of those conditions which should be satisfied by the perfectly-exposed negative. The qualities to be sought after are truthful gradation, proper rendering of tone values, and just sufficient density to give satisfactory prints in the chosen process. Judging from this standard, the under-exposed negative is found principally to fail in the first two requirements. It is not only undeniable chalkiness and absence of detail in the darker shadows that suffice to brand a plate as not having received its due exposure. These are only the extreme indications of the fault in question. Quite as objectionable to the trained and critical eye is that steepness of scale and untruthful relation of light and shade which so often pass unchallenged, and, in portraiture especially, are so fatal to pleasing and artistic results. In conclusion, it is necessary to remember how great a difference may be made by selection of developer. A plate may, indeed, be under-exposed for one developer and quite the reverse for another. Both exposure and development should be carefully adjusted to each other, and not treated as distinct and independent things. The special circumstances of the particular studio, as to light and other matters, the effect desired, the printing process to be employed, should all be kept in view and allowed for in the composition of the developer. Then exposure and development will work amicably together hand in hand, to the saving of much worry and perplexity, and the producing of both technically and artistically perfect negatives.

GLASS POSITIVES—REPAIRING AND COPYING.

The glass positive process has quite died out, except in the hands of itinerant photographers who follow their avocation on the sea beach and bank-holiday resorts and the like. Yet the process is one that is capable of yielding results that will compare very favourably with any modern one, if worked with skill. Indeed, in the early days of the collodion process there were more positives taken by high-class photographers than negatives, and high prices were charged for them. They were, in fact, for some years strong competitors with Daguerreotypes. In America the positive process, under different names, survived, amongst the better class of photographers, longer than it did in England. Now, here, at least, the working of the glass positive process is unknown to the majority of photographers. Indeed, we have known these pictures, when they have had at all a metallic appearance, to be mistaken by some professionals for veritable Daguerreotypes. We merely allude to these facts to show that the collodion positive process is really a very excellent one, and that the usual wretched productions of the beach operator are no criterion whatever of the work that used to be produced in the early days of the process.

It not infrequently happens that photographers are, in the ordinary course of business, called upon to copy or to produce enlargements from some of these old pictures, or, may be, to repair them if damaged. Often those who are called upon to do this know nothing of the practical details of the process by which they were made, and are sometimes at a loss as to how to proceed, as evidenced by the answers frequently to be seen in the "Answers" column of this Journal. If the picture is a good one, and in good condition, a glass positive is the easiest thing in the world to copy. But it is when it is inferior, or damaged, that the trouble comes into those who are not familiar with the working of the process itself. A glass positive, it may be mentioned, is, practically, a very thin negative backed with some black or dark material, such as velvet or black varnish. Sometimes this backing was applied direct to the collodion surface, and sometimes to the back of the glass. In the former case the image would be non-reversed as regards right and left, and in the latter it would be reversed, as in the case of a Daguerreotype. When the black varnish was applied directly to the film it, to an extent, degraded the whites of the picture. It was usual, when the blacking was on the glass side, to varnish the picture with a colourless dammar varnish, but this was not always done, and as a consequence the picture, if air had access to it, became tarnished, as is the case with Daguerreotypes. Theoretically, the tarnish might be removed, as with Daguerreotypes, but we would not recommend a novice to attempt the work, for the probability is that the picture would be ruined, inasmuch as by the exposure the collodion film, to an extent, will have become decomposed, and, if not, it would probably come entirely away from the glass when wetted. Such a picture if copied in the ordinary way would yield but a very poor result; but, still, as a rule, good results may be obtainable from it by those who know the way.

As we have just said, a glass positive is actually a thin negative, and in a case like that under consideration it will be best dealt with as such. The first thing to do is to entirely remove the black varnish, either by scraping it off or by wiping it off with a pledger of cotton-wool charged with benzol. As the collodion film is not varnished, and it might now be dangerous to varnish it, it would certainly be damaged if it were attempted to be printed from in the ordinary way. Therefore, it must be dealt with in the copying camera, either by making a transparency and from that a negative, or a bromide enlargement may be made direct from it, the thin image rather lending itself to that method. Sometimes the picture, as a positive, is bad, the image being grey and lacking in contrasts. Now it generally happens that the worse a picture is as a positive the better it is as a negative, and so much to the advantage of the photographer who has to reproduce it. Frequently, when the film is marked or stained, the stains, which would be very manifest if copied in the ordinary way, do not show at all by transmitted light. When this is the case the reproduction may, with care, be made even superior to the original.

It occasionally happens that a photographer has a positive brought to him to be copied in which the black varnish has cracked, showing map-like markings and, in some instances, leaving the glass in flakes—a very common occurrence with some of the earliest black varnishes that were used. Now, of course, all that has to be done is to remove the old varnish and replace it by new, when the picture will be as good as new. One would imagine that this simple treatment would occur to every one, but apparently it does not, for some months back we received a positive in this state from a correspondent, a professional photographer by the way, asking if there was any known method of "restoring" it? If the black varnish has been applied to the collodion film, and has cracked in the way described, the case is a more difficult one to deal with—sometimes impossible to do so successfully. However, if the case is not a very bad one, it may often be repaired in the following way:—The back of the plate is first fumed with ether for, say, half an hour or so, to soften the edges of the collodion at the fissures, and after

that submitting it to the fumes of benzol for an hour or more. This will sometimes so soften the varnish as to fill up the cracks, when a fresh coating may be applied. But as we have just intimated, the treatment is not always effectual; and, as a word of caution, we may add that we should not recommend anyone who is not conversant with the working of the collodion process to attempt the work for the first time with a picture upon which any value is set by its owners..

There are other defects, beyond those referred to, in these old pictures to be dealt with before they can successfully be reproduced, but this article is already too long for them to be gone into now. On some future occasion we may possibly recur to the subject, for, as most professionals are aware, making reproductions and enlargements from old and inferior pictures—worthless as they may appear to all but their owners—is a very profitable business.

JOTTINGS.

At a time when the strained and artificial heroics of Mr. Rudyard Kipling are receiving the large-type patronage of *The Times*, with the consequent result that the author of "Plain Tales from the Hills" maintains his reputation as the fashionable poet whom one may always safely quote on the smallest provocation, and even without reference to appositeness or appropriateness, I hope I may not seem too hopelessly out of the movement by putting on paper the jingling refrain of a song which has haunted me ever since it was written some twenty years ago by the well-known poet of the people, Mr. George R. Sims. It is the chorus of "The Lights of London," which was set to music by the late Louis Diehl:—

"O cruel lamps of London,
If tears your lights could drown,
Your victims' eyes would weep them,
O lights of London town!"

Whether this be bathos or pathos I will leave to individual taste to decide. I quote the lines because, with the shrewd commonsense that characterises all his work, Mr. Sims hides in this little shell of sentiment the kernel of a sound practical warning. The struggle for life is, perhaps, harder and fiercer in London than anywhere else; and yet, as moths to the flame, country workers are unceasingly drawn towards the brilliant glare of the capital, only to find that failure to rise above the common level is the rule and not the exception. I might quote many cases of successful country photographers whose ambition led them to London, with disheartening results. Money was comfortably earned in the provincial town; in London it was a sharp tussle to make both ends meet. I think I might go the length of saying that Fashionable London has far too large a number of good photographers for its needs. Within the last few months four most able professional men have separately admitted to me that the experiment of opening in London has not been the success that was anticipated. And this is putting it mildly. Still, the Londonward movement is going on even now. I hear of three very well-known and successful provincial photographers who contemplate shortly challenging Fortune at the West-end. They may succeed where others have merely made a *succès d'estime*; but the element of doubt is strong. My formula for London success in modern photography is: A nicely-appointed studio in a thickly-populated industrial neighbourhood + Good Work + Moderate Charges + Cash Down.

I have received a pleasant souvenir of the Oxford Convention in the form of an illustrated account of the week's proceedings printed in French. The book is by M. Charles Puttemans, whom I heartily thank for his courtesy. It occupies 40 pages, is beautifully printed, and has 38 perfectly reproduced half-tone views from negatives made by M. Puttemans and his fellow Continental visitors to the Convention. The Union Internationale de Photographie, of which M. Puttemans is the secretary, appears to have thoroughly appreciated its stay at Oxford—in fact, the two concluding pages of M. Putteman's report bear testimony to the happy experiences of the members in England. The book is published by Emile Bruylant, Rue de la Régence 67, Brussels, and I recommend conventioners to secure a copy of it. This year the Union holds its meeting in Switzerland, and the report concludes with an invitation to English conventioners to be present. Better architectural photographs than those of M. Puttemans and his colleagues one could not wish to see—in particular the interior of the Oxford Town Hall is an almost faultless rendering of a by no means easy subject, whilst the views of the City and Colleges; at Abingdon; Dorchester; Banbury; Kenilworth; Broughton; and Compton Wynyates show that the fullest opportunities were taken by the members of the Union for securing negatives of the grand historic buildings of the Midlands. The Union is in its tenth year of existence, and it will be interesting to watch if its future proceedings are at all influenced by the experiences gained at Oxford. The Convention is termed "cette puissante Association." I do not know the numerical strength of the Union Internationale, but doubtless the wish of its English hosts will be that it may not, as time goes on, fall behind the P.C.U.K. in numbers and success. That an official meeting of the two bodies may one day take place on the Continent is within the bounds of possibility; but it is to be hoped that when the event occurs the times may be more propitious than they are at present. The absurd epidemic of Anglophobia at present afflicting the Continent might not directly affect a body of peaceful English photographers, but its existence could hardly conduce to the cultivation of the most suitable spirit in which to discuss the temporary removal of a United Kingdom Convention to a foreign shore. The members of the latter body might resent having the name of "Sir Chamberlain" hurled at them as a taunt.

The Colour Club, I am told, is the latest addition to the long list of photographic societies. As its name suggests, the club is actuated entirely by one idea, namely, the study of the science and the practice of colour photography. Progress at home and abroad will be systematically noted, and nothing will find its way upon the records of the club which is not in the nature of an original addition to existing knowledge. The club is strictly limited in membership, and the honorary support of the principal foreign experimentalists is to be invited. All told, the roll of the club will probably not extend beyond 20 members, each of whom will be prominently identified in some special manner with colour theory or practice. Conducted on the lines of a postal photographic society, with occasional meetings, a small subscription, and consisting of first-rate workers interested in the subject from strictly non-commercial motives, a wide field of usefulness lies before the Colour Club, into which, according to my information, the quack, the charlatan, and the self-exploiting bounder stand absolutely no chance of gaining admission. The club will constitute itself the depository of authenticated records to which reference may be had by those genuinely interested in the progress of colour photography. I wish success to the idea, which is in good hands. By the way, what has become of the admirable MM. Chassaigne, John Wallace Bennetto, Doctor Gustave Selle, General Barwell-Barwell, Wilford Roxby, Montague Barstow and other gentlemen whose names have been identified with colour processes which have not fulfilled the anticipations of their inventors or exploiters? I don't know whether the Colour Club will ever unbend from the severely scientific course of work it has set itself to undertake—although the possibility of a small and exclusive dinner every two or three months has been hinted at—but if so, and opportunity be given me, I think I could enliven the proceedings with a few stories of my adventures

with some of those named. Or again, if the Colour Club will welcome the addition of curiosities to its archives, I may in time offer it some interesting letters bearing on the celebrated colour fiascoes of which I have been an amused spectator, including some fiery documents from pompous legal gentlemen containing all sorts of fearful threats of actions for libel and all the rest of the usual braggartry and bounce—the sort of thing to which I have grown rather more indifferent than a salamander was supposed by the old fabulists to be to fire.

Before half-past nine on a bright, cold morning in last December, and after a brisk walk on the renowned Leas which the sleek Channelside town of Folkestone always maintains in such drawing-room-like neatness, I had sat to Mr. Sidney Lambert Weston for half-a-dozen portraits, and a few minutes later I was smoking my cigarette in the South-Eastern boat train bound for Charing Cross. The exposures were made in four or five minutes, and the occasion will always be memorable to me for two reasons—(1) I had never before had my photograph taken *quite* so early in the day; (2) I never remember to have seen studio work so quietly, quickly, and effectively performed. The results of Mr. Weston's kind forethought in making a pleasant visit exceedingly agreeable in retrospect by these commemorative photographs are before me. Naturally amongst them one in particular pleases me and mine; but all of them, technically regarded, are splendid specimens of studio portraiture, well printed and mounted with taste and care. The photographs are of special interest to me in that for the first time for a score of years they show me without that short black beard which had for so long been a close companion, whose society was never agreeable to me. But at last we have parted! The business of Lambert Weston and Son, Folkestone, is one of the oldest in Britain, if not the world. It dates back to the year 1846, when the founder commenced the practice of Daguerreotype. The studio at Sandgate Road is one of the largest and best appointed in the provinces, and the present Mr. Weston is the third of his name in the direct line to be associated with the business. For the moment I cannot recall a similar case in the annals of British photography where the control of a studio has remained uninterruptedly in one family for 56 years. If this record can be beaten some reader will perhaps put me right. A high-class clientèle and high-class work are the characteristics of Messrs. Lambert Weston's Folkestone *atelier*, to which I may be permitted to wish continued and increased success. An interesting item in the studio was the signature book, wherein I saw the autographs of such distinguished people as Lord Roberts, the ex-Crown Princess Stephanie, and many other notabilities of European celebrity. Of course, that of "Cosmos" was added—by invitation. The only other photographer's autograph book that I have seen is in the possession of my friend Mr. Alfred Ellis, the famous delineator of stage beauties. This book contains the signature of nearly every prominent footlight favourite who has struggled up the insecure and rickety ladder of theatrical fame. I omitted to say that, with the vanity of advancing years, I am most pleased with the particular photograph of me by Mr. Weston which contains fewest of Time's furrows!

The reform party of the R.P.S. should see to it that next year the nomination papers for the annual elections of council, judges, etc., are sent out in a sensible manner. Following the bad old precedent of former times, this year's paper was placed in the January number of the Society's journal, from which in all probability not half the members took the trouble to tear the cover. The effects of this neglect will be that the opportunity of sending in nominations will in many cases be missed. The nomination paper should be sent out separately and specially, and then nobody could excuse himself from doing his duty on the ground that he was not provided with the proper facilities. The present crisis in the affairs of the Society has set many pens at work in London and country newspapers, but not more than two or three of the crowd of scribes who have dealt with the subject have written of their own knowledge. One gentleman, who valiantly declares that he refuses to be led by the nose in the matter of reform, had not the courage to express his very peculiar opinions at the meeting on December 10th; another, who perhaps writes more about the Society than anybody else, is not a member, and therefore is out of court; a third, who is a member, never attends the meetings, and is content to rely on hearsay evidence for his inspiration; and others again base their comments entirely on what has been written by somebody else at second-hand suggestion. My brethren of the "gray goose-quill" must not suppose from this that I have set out to gibe at the very interesting communications with which they are favouring their millions of readers. My object is to inform them that the initiative in opposing the stick-in-the-mud policy of the R.P.S. was taken many months ago by men who have devoted years of valuable time to its service, and that the strongest advocates of reform are those who, with the advantage of having officially participated in the Society's work, have been brought, by their experience, to admit the necessity of many radical changes in its administration. It is in fact a case of reform from within and not from without. The ballot paper, when it goes out, will no doubt present many surprises. As manifestoes are the order of the day, for one thing it will not bear the name of the writer of this paragraph, who in future will be quite content to do "spadework" as an unofficial ordinary member, and in that capacity to serve the Society to the best of his opportunity and ability. Will the gentleman who objects to being led by the nose therefore kindly note that the destination of his nasal appendage obviously has no interest for me?

The first London Committee meeting of the Professional Photographers' Association after the Christmas recess will be held at 51, Baker Street, London, on Friday evening, January the 24th. The Liverpool Branch meets this (Friday) evening, and the Edinburgh members will reassemble on the 22nd inst. An early fixture is the first annual dinner, which will take place in London some time in the month. I learn quite unofficially that the hon. sec. of the Local Branches Sub-committee is arranging for the institution of branches at Birmingham and Manchester, and that in the latter city Mr. Franz Baum is spoken of as a likely chairman or hon. sec. Another fixture that should be mentioned is the statutory meeting of the general body held every two months. This will take place in February, and on that occasion the report of what has been done since December will be presented to the members. It will be found from documents in my possession that though the Christmas season is one that finds most professional photographers exceedingly busy and unable to devote much time to legislative work, the executive of the Association, so far from being idle, has accomplished much useful work which beneficially affects photography, in however small a degree. But all this and more will no doubt be referred to in the report to be brought next February before the members. The well-known South London photographer and publicist, Mr. R. Lang Sims, has ideas on the subject of a benevolent fund in connection with the Association, and he has so often shown his ability as an organiser, that if he takes an active part in this work its success is assured. The Professional Photographers' Association has entered the sixth hundred of its membership; has a three-figure balance at the bank to its credit; and is in the right hands to assure its permanent success. Officially speaking, it is barely six months old, and the field of work it has marked out for itself will not be covered yet awhile; but in my experience of photographic societies, which is not inconsiderable, I know of not one of them which starts the new year with a greater promise of

doing quiet, progressive, useful work. But, of course, it exists for the benefit of its members—and its members only.

If I have any American readers who aspire to such fame and fortune as may be obtained from lecturing before English audiences, I hope that, unless they occupy a position not less exalted than that of President Roosevelt, Mark Twain, or Mr. J. Pierpont-Morgan, they will profit by the hint contained in the letter which I quote a little lower down. A few weeks ago I received a communication from an utter stranger in the States, enclosing the illustrated prospectus of a "stereopticon" lecturer. My correspondent coolly asked me to put him in the way of getting his protégé engagements in this country, so I sent the letter to the best-known agent in London who pilots the chief lecturers and entertainers through England. Here is his reply: "Many thanks for your favour enclosing a letter with reference to an American lecturer named ————. To anyone in the lecturing profession, the idea of a complete stranger coming over here in the summer and fixing a tour of fifty engagements at £30 per lecture is absolutely ludicrous. I have many similar letters from American gentlemen who seem to think that our public has little else to do except go to hear Americans talk." It may be useful to our friends on the other side to know that this kind of American invasion is "n.g." But the impudent request of an utter stranger, that I should act as an intermediate showman for him "on the nod," as the racing folk say, was outdone in sheer cheek a little while since by one of his compatriots. Apropos of an article on a pet subject which I wrote a year or two back, an exceedingly enthusiastic American amateur sent his London agent a voluminous type-written request for further particulars, which, if given, would have occupied at least two pages of this journal. And the London agent calmly invited me to call upon him at a distance of two miles for the purpose of gratuitously supplying him with information not to be found in any text-book. The reply I sent probably surprised him, for it brought a special messenger and an apology. I love my American cousin with a deep, great love, but his cool audacity is at times trying to the temper. In the early eighties there was an American amateur who had a weakness for worrying and irritating the principal London dealers and never buying even so much as a pound of hypo. He usually started in raucous tones: "I he-AR you sell the best appaRARtus." The third time he tried the trick on a former chief of mine (since dead) the wind was in the east, *i.e.*, liverishness reigned, and so the American was unceremoniously taken by the seat of the trousers and flung out! But years afterwards I met him at a P.S.G.B. soirée, and he was still in quest of the best "AppaRARtus."

At least 30 or 40 outside newspapers which insert photographic columns pass under my observation every week, but I seldom do more than glance at them, as the matter contained in them is rarely new and not always to be relied on. An exception should be made in the case of "The Traveller," to which the versatile and accomplished H. C. Shelley contributes sound stuff out of his own knowledge. Recently two important London daily newspapers have commenced photographic columns. The matter in "The Morning Post" is contributed by Mr. Hector Maclean, who writes with such taste, judgment, and restraint that photography generally must benefit by the latest feature of this JOURNAL'S neighbour at the bottom of the street. "The Daily Telegraph" photographic article, on the other hand, is of the "piffling" order and susceptible of great improvement. I am often asked if these "outside" photographic columns are good for all concerned. In my opinion, "Yes." Well done, they interest the general reader and perhaps make him a photographer. The daily paper which is mostly thrown away after ten o'clock in the morning never perhaps acts the part of a stimulant to really serious work in any ordinary recreation, science, sport, or pursuit; but in the case of photography I can quite imagine that a short paragraph on one of its many wonders may excite curiosity and pave the way to a visit to a retailer of photographic apparatus. But, gentlemen of the lay Press (*pro tem.*), take my word for it, the daily newspaper-reading public are really not interested in photographic politics! If a special "fight on to the last dying gasp" circular of that awe-inspiring body, the Council of the R.P.S., sent round to the 1,000 members of the Society draws exactly an attendance of 45 (20 of which number was specially whipped up privately—leaving the Council only 25!), in the name of the Prophet, Messieurs of "The Eatanswill Gazette," "The Eatanswill Independent," &c., &c., what amount of interest can the non-photographic outsider possibly take in the goings-on of the "opposition leader" and his handful of discomfited supporters?

COSMOS.

THE BIOSCOPE.

[A paper read before the Edinburgh Photographic Society.]

THE bioscope or cinematograph has indeed a wonderful and most interesting history. Although only a few years old, it has had marvellous and rapid developments. It has also procured for itself a great popularity, which seems to be ever on the increase. Twenty years ago we had beautifully painted canvases, called panoramas or dioramas, which revolved from one roller to another, and thus displayed before their audiences the beauties of nature at home and abroad without the discomfort of long railway journeys. Now we have the animated or living pictures, which, thanks to photography, and the great geniuses who spend their time working up this branch of science and art, are thrown on the screen, depicting life and scenes and events just as they happened. And so realistic are some of those scenes represented, that it is only necessary to mechanically reproduce the sounds which would take place, such as the firing of a cannon or pistol, the hammering on an anvil, or the rumbling sound of a waterfall, to make one feel they were witnessing the actual scenes and not a series of photographs. The zoetrope or wheel of life may be taken as the earliest attempt at animated pictorial effects, and although a wonderful invention, it was a very crude instrument with its badly-drawn pictures. The numerous attitudes through which a man or animal passes when in active motion are not perceived by the eye. So rapidly do they succeed one another that only a general impression of the whole is conveyed to the mind. This general impression, though perhaps satisfactory (from an artistic point of view) when shown in a single picture, cannot be expected to afford sufficient grounds for the preparation of an analytical series of diagrams representing the successive phases of a motion which is only perceived as a whole. With the advent of instantaneous photography many possibilities were placed in the hands of scientific men, and numerous were the experiments in analysing, by means of the camera, the various motions of man and animals. Our journals and magazines were soon flooded with reproductions of photographs of horses jumping or galloping at full speed, and living movements of various kinds. Some of the positions of these movements seemed quite impossible, and the camera appeared to misrepresent things in a most erroneous manner. The correctness of these photographs can now, however, be easily proved when reproduced in the cinematograph, and the incongruous-looking pictures made to move along on the screen in life-like reality.

In 1877, Muybridge, for the purpose of investigating animal motions, laid out a course or running path, one side of which was bounded by a white background. Along the other side was ranged a series of separate cameras. A trotting horse was then caused to pass between the lenses and the background, at the same time automatically releasing their instantaneous shutters. Although these photographs were taken at too long intervals

between each to be of any practical value for viewing as an animated picture, Muybridge did produce series photographs with this object, and even succeeded in projecting them for the illustration of his lectures on this subject on the screen. Anschütz in Prussia also carried out very successful experiments, and devised a shutter and camera in which successive images were taken on a rapidly moving plate or series of plates in one camera and with one lens. In 1889 he also devised an instrument (he called it the living wonder) by which the transparencies from these negatives could be viewed. The successive photographs were placed on the periphery of a wheel which revolved behind a lens, and by an ingenious arrangement each picture was illuminated by an electric spark as it came behind the lens, no shutter being used when viewing the transparencies. These experiments were all carried on on glass plates, which were exceedingly difficult to handle and very unsuitable for these purposes. A great many investigators now entered the field and carried on these experiments, but it is not necessary to weary you with details. Great advances having now been made in the manufacture of flexible, transparent celluloid film, coated with sensitive emulsion, on which really reliable photographs could be taken, Edison, following up the various experiments which had now been made in the taking of pictures on glass negatives, produced on a long flexible film a series of photographs taken in rapid succession, and also succeeded in exhibiting them in his wonderful invention, the kinetoscope. The films on which Edison took his photographs were almost 40 feet long, each picture being one inch broad by $\frac{5}{8}$ inch high, and this is the gauge adopted for the present-day cinematograph. These small pictures mean a great saving in film and materials compared with the usual size of three inches adopted for lantern projections. There are a few other sizes used, notably the one for the biograph, in which the pictures measure two by two and a-half inches. This latter, although it has advantages, is counteracted by the enormous amount of film required. The mechanical difficulties are also increased by the moving of a greater mass of film. A film measuring 40 feet with the Edison gauge will contain over 600 of these small pictures.

Persistence of Vision.

Before proceeding further it might be well to say a word or two on this peculiar phenomenon, which we call persistence of vision. This peculiarity of our vision was well known to the ancients, and is mentioned by one of our early writers as far back as 61 B.C. Every one knows the experiment of revolving a stick with a red charred end in the air when in a darkened room, how it appears to the eye as a complete circle of red light, and yet we know the red point can only be in one place at a time. A similar result may be obtained when a spinning top with a coloured spot on one side is spun round; the spot will appear as a complete circle on the spinning top. This points to the well-known fact that when an image is formed on the retina of the eye it is not immediately erased when the cause of the image is removed. The persistence or length of time ranges somewhere from $\frac{1}{8}$ to $\frac{1}{20}$ of a second. It is therefore necessary that this short period of time should elapse before an image formed on our vision is blotted out, so to speak. It is owing to this physiological phenomenon that we are able to produce by means of the cinematograph and such-like instruments the so-called living pictures, which are in reality optical illusions. It is therefore necessary when showing an animated picture that an intermittent motion be given to the series—that is to say, a single picture is shown for a fraction of a second, then as quickly as possible the following picture of the series is jerked into its place. During this rapid change an opaque shutter intervenes to cut off the light. This rapid change must not occupy more than $\frac{1}{8}$ to $\frac{1}{15}$ the space of time that the picture is shown to the eye, so that you have picture following picture in rapid succession, and owing to the persistence of our vision, or retaining power of the eye, the pictures are so blended into one another that they appear as one animated picture. The camera used in cinematography is optically and mechanically similar to the projection apparatus. It is practically a magazine camera of enormous capacity, being made to hold a film ranging from 100 to 600 feet in length, on which 1000 to 1,400 of these little photographs may be taken (that is surely an ideal camera for the snapshotter). A lens of very large aperture is generally used. The attention and skill of our best lens makers have been turned towards the production of these lenses, and so satisfactorily have they attended to their business that very good photographs have been taken even when the weather was far from being propitious. It is very necessary, therefore, to be provided with a really good lens, as it so often happens that important and interesting events take place when the sky is overcast. Like all kinds of photography, however, a good and suitable light is always desirable. To go into a full description of the mechanical arrangements of the taking and projecting apparatus would prove very tedious, but it might be interesting to mention a few of the essential details of these machines. Every one has his own ideas as to which is the best apparatus. I shall not discuss the merits and demerits of each, but rather give you the principles of how those pictures are taken and projected.

Cameras for Cinematography.

A great many eminent names are connected with the inventing and perfecting of the various apparatus for cinematography. In 1895 Messrs. Lumiere in France were triumphing over their difficulties while Mr. Birt Acres in England was perfecting his machine. Mr. Acres photographed the University Boat Race, 30th March, 1895; but Lumiere had filed his patent a few days earlier. They were each, however, quite independent workers. I shall only give a brief description of our present-day camera for taking these animated pictures. You have a box pattern camera fitted with a lens which is usually interchangeable. So as to get various lengths of foci it must have a wide aperture, and be fitted with Iris diaphragm and focussing pinion, an adjustable focal plain shutter, a dark box containing the unexposed spool of film, and a spool for receiving the film after exposure. The mechanism consists of toothed wheels and pinions and two sprocket drums over which the film passes as it is being exposed. There is an eccentric motion given to the film as it passes behind the lens and shutter, causing the film to remain stationary when the lens is open, making the exposure; then when the shutter closes the lens, the film is quickly passed forward and is ready for another exposure. In this way the film passes along from one spool to the other until it is all exposed. The entire mechanism is operated by the turning of a handle, which must be kept moving at a uniform speed. The pictures are in this way taken in series and in very rapid succession. Hundreds of these little photographs can be taken on one film in this way, 50 feet of the film being passed through in a little over a minute, and as the pictures are only $\frac{5}{8}$ inch high, you can easily calculate the large number of pictures that are exhibited in the course of an evening's entertainment. One maker claims that his camera is constructed to take from 50 to 1,500 feet of sensitive film, which makes it possible to take a continuous cinematographic picture of events lasting thirty consecutive minutes without reloading. This may be possible so far as capacity in the machine is concerned, but it seems to demand a severe tax on the capacity of the operator to keep his handle turning at a regular speed for half an hour.

Development.

Having secured our photographic image on the sensitive film, we must proceed to develop it. This may be done by winding the film on a circular drum, and the whole revolved in a shallow trough or developer. The subsequent processes of washing,

fixing, and final washing and drying may be completed before it is again removed from the drum. This completes your negative. Now your positive film for projecting a living picture is nothing more after all than a multiple lantern slide, and its production is therefore in all respects similar, with the exception of the care required to secure absolute registration of each picture with its predecessor. The negative and positive are now passed through a machine with a sprocket wheel which holds the films in exact registration, each film passing independently and continuously from one spool to another, but held in close contact, negative uppermost, between two plates under a shielded incandescent electric lamp. The development of positives is conducted in the same manner as that of negatives, but the greatest care must be taken regarding density and gradation. Light is of extreme value, and the animated pictures must be kept thin owing to the great extent of magnification required for the small picture. At the same time all detail must be secured. White spots and sparkling points have a distressing habit of drawing attention to the failings of flicker and incorrect registration, even when only present in a slight degree, and must therefore be avoided. The registration of a film is a very important item in the securing of the projection of a good animated picture. The Edison gauge and perforation is the one generally adopted, the extreme width of the film being $1\frac{3}{8}$ inch. There are four perforations to each picture. Special machines have been invented for the perforating of these films, but with all the accuracy of these machines we find that certain films do stick and tear and get out of gear in our projecting apparatus. This is very annoying to an audience, but still more so to an operator, should one of these films be handed him without his first having tried it in private through his apparatus. It is very important that the perforations of the film agree with the sprocket wheels of the projecting apparatus. It is therefore necessary to try every film through your machine before showing them in public. If you take almost any two films and place them together and compare their perforations, you will find that they will agree for a few inches only.

The Bioscope.

There are many good projecting machines to be had, but I think it will suit our purpose best to describe the one I have at the other end of this room, and by which I intend to throw a few of those living pictures on the screen. I have here the latest make of the bioscope. To look at it seems very complicated, but it is really very simple. The entire mechanism is operated by the turning of the handle. You have first the upper spool containing the film before it has been exhibited. From this the film is unwound and passes over a sprocket drum to the film trap, which is provided with springs which press on each side of the film and keep it in position, for it is at this point the picture is shown. There is also a metal mask at this point with a rack and pinion for accurately centring the picture as it passes behind the lens. The film then passes over the eccentric roller, which gives the intermittent movement. Then the film passes over the lower sprocket drum, and is wound on to the lower receiving spool. We have also a single blade shutter which revolves in front of the lens, cutting the rays of light at their crossing point. The shutter is adaptable, and must cut off the light as the eccentric motion shifts the picture. There is also an automatic shutter which intercepts the light and heat from the film, which falls down in the case of any stoppage of the machinery, and thus prevents the firing of the films. Several cog wheels and pinions are acted on by the turning of the handle conveying the various motions to their respective parts. I trust I have made the mechanical description clear to all, or at least conveyed the idea of its workings. The object to be aimed at in the mechanism is to show one picture at rest for a fraction of a second and then to immediately follow it with the next of its series. It is impossible that this change can take place too quickly so far as the optical viewing is concerned, but it is another matter to get the mechanism to act intermittently and very quickly without tearing the film. I have said nothing about the light used for the projection of these animated pictures. My attention has been chiefly given to the mechanism. The light is contained in an ordinary magic or optical lantern body, with its usual condenser. Any illuminant may be used, but the limelight and the electric arc certainly are the best. The limelight gives a powerful and at the same time a very soft light; but when in a very large hall and a large screen is used, with long focus lenses to throw your picture from the back of the hall, then electric light is necessary. Mr. Urban, Managing Director of the Warwick Trading Company, has very kindly specially prepared for me a few lantern slides to aid me in describing the mechanical apparatus, along with a few slides of the developing room and drying apparatus, &c. I will then follow these slides by an exhibition of the cinematograph and series of animated pictures.

James Buncle.

ON THE USE OF SENSITIVE PAPER IN X-RAY WORK.

[A Paper read before the Section of Photography and Microscopy of the Franklin Institute.]

The use of so-called "bromide papers" in X-ray work is, of course, not new or original. Rontgen himself, in his early publications on the subject of the X-rays, intimated that he had used sensitive photographic paper in the course of his investigations and experiments, and many if not all X-ray operators have from time to time made use of this variety of photographic material in their experimental work. The objections that most experimenters have had to contend with in the ordinary commercial brands of paper is the fact that the surface of even the so-called smooth paper is a decided matt. This matt surface gives the resulting picture the appearance of being buried in the texture or pores of the paper, with a consequent loss of much of the necessary detail. The finish or surface of this matt-surface paper is of such a nature that squeegeeing on glass or ferrotype plate does not materially improve the surface or appearance of the picture. Of late years, several manufacturers have put upon the market a glossy variety of developing-paper as a substitute for, or to compete with, the well-known varieties of printing-out papers. This glossy variety of developing-paper has the advantage of keeping the image on the surface, and for this reason is well adapted for the reproduction of more detail in the picture. It should be remembered that the developing papers now on the market vary greatly in speed, or the amount of exposure that is necessary to produce the latent image, and it is obvious that the slow varieties now so extensively used, especially by amateurs, and in which the sensitive silver salt is composed largely, if not entirely, of a chloride, are not at all suited for X-ray work. We must confine ourselves therefore to the older and comparatively rapid bromide papers.

The particular paper that I myself have been most successful with is a comparatively new German brand of bromide paper now being introduced into this country. It is made by the "Neue Photographische Gesellschaft" in Berlin, Germany, and is marketed in different grades of smooth, glossy and rough; it is coated on what appears to be a very excellent quality of paper stock. The glossy variety is one that is best adapted for X-ray work, on account of the smooth finish and fine texture of its surface. How well it is adapted to this particular purpose may be determined by an inspection of the samples shown here. The question naturally arises, What possible advantages are to be derived from the use of sensitive paper instead of glass plates? The possible advantages are many, and it is my purpose now to call attention to some of the more evident points of vantage as they have occurred to us while experimenting with the various brands of bromide paper available at the present time. First, the matter of price: in this the use of paper would result in a

saving of from forty to sixty per cent. of the cost of dry plates. Other things being equal, this one feature alone would be of sufficient importance to insure the very wide use of a sensitive paper that could be relied on to give satisfactory results under all conditions and at all times.

Another advantage is the saving in possible breakage. Every X-ray operator has had experience in this line. The breaking of a glass plate usually occurs towards the end of an exposure, and always in a case that has necessitated a considerable amount of care in the preparing for and patience in making the exposure. The ominous click that accompanies the accident not only means the loss of a rather expensive plate, but also a waste of the time and energy that has been expended in preparing for and in making the exposure. Nothing of this kind is at all likely to occur with paper, so that the exercise of ordinary precaution would insure us against any possible danger of wasted exposures. The facility with which the resulting pictures may be stored will, of course, appeal to all, as the difference in bulk and weight is self-evident. One feature of considerable importance in this connection is the fact that the name of the patient and all the necessary data relating to the case or the making of the exposure may be written on the back of the exposed sheet before development, in this way obviating any possible chance of making a mistake by confusing two or more of the resulting pictures. Many physicians who are not familiar with, nor in the habit of looking at photographic negatives, cannot see detail in a transparent plate, and, consequently, prefer to have a print. This opens up another possible field for sensitive paper. Not only would the use of this paper obviate the necessity of making positive prints, but we may, if we choose, utilise the paper in combination with glass plates for the same purpose. By exposing a piece of paper and a glass plate at the same time, and developing them in the same solutions, we not only make the paper print and the glass negative at the same time, but we also, in addition to this, have a more or less valuable means of control; for by comparing our results a possible flaw in the plate could not possibly be mistaken for a pathological condition of the part of the patient radiographed.

If for any reason we desire to have two or more prints of the same subject, we can readily obtain them by exposing the required number of sheets of paper at the same time. The paper itself offers little or no resistance to the rays, so that we can expose a dozen sheets as readily as we could one. Probably the greatest advantage is the rapidity with which we can obtain the desired information. Those of you who have had any experience in this line well know how anxious the doctor usually is to see the result of the exposure; you also know that a plate in the process of development is not always the most reliable source of information, so that, under ordinary circumstances, we are obliged to wait until the plate is sufficiently fixed to be transparent. This extra wait for the fixing bath can be avoided by using paper, as, after proper development and a thorough rinsing in water, the resulting picture may be examined in broad daylight without any appreciable damage by fog or other change of the residual silver salts. The necessary fixing in hypo may be done later. These are but a few of the possible points of superiority that have presented themselves to us while experimenting, or in the regular routine use of the X-rays. There are, of course, drawbacks and defects in paper at the present time. One of them is the comparative slowness of the emulsions used on ordinary bromide papers. This, to some extent, has been overcome by this same German company, in what they call their negative paper, the emulsion on which is much richer, and, consequently, more rapid than that used on their regular grades of paper. This negative paper is very thin, and is intended to replace celluloid films, and also the various kinds of stripping films that are at present being reintroduced and used quite extensively, especially in Germany. This thinness or transparency of the paper would also tend to do away with another rather serious objection to heavy bromide paper—the tendency for an image, especially of the heavier portions of the body, to veil over or fog; a perfectly transparent paper would give us all the possible advantages of a glass plate in this respect. There remains but one more serious question, and that is the keeping-quality of paper coated with a very sensitive emulsion of silver salts; and, while this may possibly be a serious, or rather a difficult problem, there appears to be no positive reason why manufacturers cannot obtain a paper that will not affect the sensitive salts in the emulsion.

In addition to its use as a substitute for glass plates in taking the impression direct, glossy bromide paper can, of course, be used to advantage for reproduction, or the making positive prints from X-ray negatives. For this purpose the German brand of paper also has some points of superiority; for, in addition to its being a very rapid paper, so far as the time necessary for exposure is concerned, it has the added advantage of being a slow or rather steady developer, so that we have considerable latitude in this step of the process, and can modify the resulting picture to a considerable extent by either accelerating or retarding the same in the course of its development. Those of you who are in touch with or consult German photographic or X-ray journals will probably recall the really beautiful reproductions on bromide paper that these journals occasionally contain. This so-called method of "light printing," while it appears to have originated in this country, does not seem to have been developed or followed to any considerable extent. In Germany, on the other hand, it has evidently been developed into a distinct branch of the printer's, or, rather, the photographer's art. The printing and developing of these pictures is done automatically, by means of specially constructed machines, and it would appear that there was a possibility of developing this same method of photographic printing in this country so as to make it available for illustrating books and periodicals in cases where the presentation of detail is considered of sufficient importance to assume a possible slight increase in cost.

M. I. Wilbert.

THE ROYAL PHOTOGRAPHIC SOCIETY.

The circular addressed to the members of the Royal Photographic Society, and published on page 35 of last week's Journal, attracted an attendance of 45 to the extraordinary general meeting at 66, Russell Square on Monday evening last. Of that number only 11 voted for the Council's proposition to amend Article 52, by the addition of the words—Any article once altered shall not be revised within twelve calendar months of such alteration.

The resolution was therefore lost.

Thirteen members only voted for the proposed regulations as to voting (see page 35 of last week's Journal), and the proposed resolution was consequently lost. The opinion of several of the speakers was in favour of a simpler form of proxy voting than that proposed by the Council.

With reference to the forthcoming election of officers and Council, the following signed requisition has been handed to Mr. Dallmeyer, the retiring President:—

To Thomas R. Dallmeyer, Esq.,
President of the Royal Photographic Society.

Sir,—We, the undersigned fellows and members of the Royal Photographic Society, have read with much regret that it is your intention not to stand for re-election as President of the Society.

Thanks to the initiative taken by you in your last Presidential address to the society, followed up, as it has been, by the passing of some of the amendments to the society's Articles of Association, which we all held to be so desirable, the society seems now to have entered upon a path which should lead ultimately to the discharge of its duties and the fulfilment of its responsibilities to an extent which has never been the case heretofore.

Now that it is just passing through the throes of a transitional state, it seems to us more than ever important that your guiding hand should be upon it, for, at any rate, one more year; so that you may

hand over to your successor in the Presidential chair, the society with its constitution upon a stable basis, and the unrest caused by the changes a thing of the past.

We therefore hope that you will re-consider your decision, and will see your way to stand as President for another year. By so doing we recognise that it will make further demands upon your time and energy, but conscious that you, Sir, like ourselves, have the welfare of the society so greatly at heart, we trust that you will accede to our request.

Assuring you of our enthusiastic support, we are, Sir, yours, etc.,

R. Child Bayley.	Furley Lewis.
Thomas Bedding.	Gilbert H. Lovegrove.
T. Henry Brettell.	E. Marr.
J. Brown.	J. McIntosh.
C. Churchill.	S. C. Mote.
Leslie E. Clift.	J. C. S. Mummery.
W. T. B. Cunningham.	C. H. Oakden.
W. P. Dando.	John H. Oliver.
W. E. Dunmore.	J. H. Parsley.
E. C. Fincham.	William C. Plank.
J. T. French.	E. A. Robins.
S. Herbert Fry.	P. R. Salmon.
T. K. Grant.	James A. Sinclair.
W. G. Holman.	William F. Slater.
A. V. Kenah.	

SOCIETY OF ARTS CHRISTMAS LECTURES.

The second and last lecture of the course of juvenile lectures on "Photography and its Applications" was delivered on Wednesday, 8th inst., by Sir Henry Trueman Wood. At the commencement of the lecture an enlargement on silver bromide paper was developed, and this afforded an opportunity for an explanation of the way in which the photographic image was retained and fixed upon a suitable surface. The manner in which the colour of the silver image could be altered by treating it with various metallic solutions was demonstrated by the exhibition of a number of slides of various tones. Certainly many, probably most, and possibly all, substances were affected by the action of light, but only a few were available for photographic purposes. Amongst these the most important were the sensitive salts of silver, salts formed by the combination of silver with such a material as bromine. Other metallic salts were also available and were employed. Amongst them were the salts of iron, the sensitiveness of which was the foundation of the beautiful platinotype process, perhaps the best of all methods for obtaining a photographic picture. Gelatine and other similar materials, combined with such a salt as potassium bichromate, were sensitive to light, the parts acted upon by light being hardened and rendered insoluble, while the unaffected portions could be dissolved away by hot water. This was the foundation of the well-known carbon or autotype process. This part of the lecture was illustrated by pictures lent by the Autotype Company, the Platinotype Company, Kodak, Ltd., and Messrs. Morgan and Kidd, also by a collection of examples showing photographic action on various materials, leather, coloured papers, etc.

Bitumen was another sensitive material, by the use of which the first of all photographic pictures had been produced, and it still played a useful part in the production of typographic printing surfaces. This led up to a discussion of the various methods of producing by photographic means surfaces which could be used for printing in the press; and the lecturer showed how, by the use of a suitable lined screen, the different shades of a photographic picture could be broken up and translated into lines and dots, suited for the reception of printer's ink, and capable of being used in the press in the same way as ordinary printing type. The next subject was the production of colour by photographic methods. The only direct process for this purpose—the very beautiful device of Professor Lippmann—and hardly passed as yet beyond the experimental stage, and consequently we were driven to use indirect methods—methods which involved the use of colouring materials or dyes. The principles of the "three-colour process" were then explained, and it was shown how coloured transparencies could be produced, first, by combining on the screen the images from three monochrome positives, each illuminated by light of its proper colour, and second, by the transmission of light through three superimposed prints, each stained its proper colour. This portion of the lecture was illustrated by experiments with the spectrum and with a triple lantern, as well as by the exhibition of a collection of lantern slides by Mr. Sanger Shepherd and others. The application of similar methods to printing in colour was then referred to, and illustrated by a very fine collection of examples lent by Messrs. Bemrose and Sons, the proprietors of the "Graphic," the proprietors of the "Sphere," and Mr. Carl Hentschel.

THE LUMIERE PROCESS OF COLOUR PHOTOGRAPHY.

The following practical details of this process are published by the Lumière N.A. Company, 78, Queen Victoria Street, London, E.C., who supply the necessary materials for working it:—

It is necessary to procure three colour screens or light filters, and those employed by Messrs. Lumière are made as follows:—Optically worked glass is evenly coated with a 10 per cent. solution of gelatine, as perfectly filtered as possible, allowing 5 c.c. of gelatine to each 10 cm. of glass surface. These must be dried on a horizontal table and in a position absolutely free from dust. When thoroughly dry, immerse these coated glasses in the following staining solutions carefully filtered.

GREEN SCREEN.

Solution of Methylene Blue N, at ½ per cent.	5 c.c.
Solution of Auramine G, at ½ per cent.	30 c.c.

BLUE-VIOLET SCREEN.

Solution of Methylene Blue N, at ½ per cent.	20 c.c.
Water	20 c.c.

ORANGE SCREEN.

Solution of Erythrosine, at ½ per cent.	18 c.c.
Saturated Solution of Metanile Yellow at 60 deg. Fahr	20 c.c.

The screens should be allowed to remain in the dyes for five minutes at a temperature of 70 deg. Fahrenheit, then rinsed and dried carefully. When dry cement two of each tint together with Canada Balsam and bind the edges with gummed tape. Screens made according to these formulæ form a part of the collection of necessary materials listed on page 6. Having prepared the screens, the next operation will be to make the necessary exposures, and for this we must use plates suited as follows:—

With the Green Screen use Lumière Orthochromatic, Series A.

With the Blue Screen use Lumière Extra Rapid, Blue Label.

With the Orange Screen use Lumière Orthochromatic, Series B.

The time of exposure will, of course, be considerably augmented by the use of these screens. Roughly speaking, the exposure required, taking one as that necessary for the Blue-Violet screen on the Extra Rapid plate, will be 12 times for each of the other screens, namely, green and orange, used, of course, in conjunction with the plates mentioned. Care must be taken in the development of these plates, as, owing to their peculiar sensitiveness, one is very prone to produce a foggy image unless great care is exercised in the selection of the dark room illuminant. For the Series A plate a very weak red light must be employed, while for Series B and for the Blue Label Plate a very faint green light will be found the most reliable. Halation must be carefully avoided, and the plates should be backed with the solution supplied. The character of negative to be aimed at is one containing a full range of gradation and entirely free from the slightest trace of stain or discolouration of any description. Should it be necessary to intensify or reduce the negative, the use of the following solutions will be found most reliable:—

INTENSIFIER.

Anhydrous Sulphite of Soda	10 grammes.
Mercuric Iodide	1 gramme.
Water	250 c.c.

REDUCER.

Peroxide of Cerium (Lumière's Patent)	5 grammes
Water	100 c.c.

The next operation is to print the three colour records or monochromes, and for this a sheet of non-stretching baryta paper is mounted on a glass plate, which has been previously edged by a band of solution, composed of

Benzole	1,000 parts.
Masticated Rubber	15 parts.

and when dry, coated with a collodion, prepared as follows:—

Alcohol	500 parts.
Ether	625 parts.
Pyroxyline	12.5 parts.
Castor Oil	3 parts.

The paper is applied by immersing plate and paper (baryta-coated side in contact with collodioned glass) in a 7 per cent. solution of gelatine at a temperature of about 145 deg. Fahrenheit. Excess of gelatine is removed by a squegee, and the plate put to dry. After drying for 12 hours at an ordinary temperature this prepared support must be coated with a sensitive coating composed as follows:—

Water	1,000 parts.
Emulsion Gelatine	120 parts.
Hard Glue (Coignets)	120 parts.
Ammonium Bichromate	60 parts.
25 per cent. Solution Potassium Citrate	40 parts.
Cochineal Red	1 part.
Alcohol	200 parts.

Soak the Gelatine and Glue in the water for 12 hours, then melt in

a water bath at a temperature of 120 deg. to 140 deg. Fahr. Allow the mixture to cool down to 95 deg. Fahrenheit, and then add in order given, while shaking or stirring the Ammonium Bichromate, Potassium Citrate and the Cochineal Red. Then little by little add the Alcohol, and filter through a fine cloth. Apply a coating of this mixture to the paper mounted on the glass, allowing about 5 c.c. of mixture to a 13 by 18 cm. plate. The plates thus coated must be placed on a levelling slab to set, and then dried in a well-ventilated dark room at a temperature not exceeding 68 deg. Fahrenheit. Drying should in no case take longer than 12 hours. After drying the Sensitive Papers are stripped from the glass support. They may now be printed, and for this purpose are placed under the negatives as in ordinary carbon printing. The use of an actinometer will be found the best printing guide. Exposure being deemed sufficient, it is now necessary to develop the image. Take the print, together with a plate which has been collodionised as before mentioned, and then coated with a 7.5 solution of masticated rubber in benzole, and immerse both for 15 to 20 seconds in a basin of ice water, bring the two into contact, and squegee well as in the carbon process. Place under pressure for five or ten minutes before development. To develop, first soak the glass plate bearing the print in cold water for two hours to permit the gelatine to become thoroughly soaked. Then immerse in water at 100 deg. Fahrenheit for half an hour, when the paper support will leave the print. Development is then carried out in the usual manner employed in the carbon process, until all the soluble gelatine has been dissolved, and there remains on the glass only a colourless image of insoluble gelatine in slight relief. This should be washed in cold water and then put for five minutes in alcohol and placed to dry.

When dry, these colourless positives of insoluble gelatine are to be immersed in their respective dyeing baths of Red, Yellow, and Blue. Care must be taken not to mix up the positives, and they should be marked to avoid error. The positive printed from the negative taken through the Green screen is dyed Red; that from the negative taken through the Violet screen, Yellow.

The composition of the dyeing baths is as follows:—

RED BATH.

Water	1,000 parts.
3 per cent. Solution of Erythrosine J. ...	25 parts.

BLUE BATH.

Water	1,000 parts.
3 per cent. Solution of pure Diamine F. ...	50 parts.
15 per cent. Solution of Hard Glue	70 parts.

YELLOW BATH.

Water	1,000 parts.
Chrysophenine G	4 parts.

Dissolve at 160 deg. Fahrenheit and add Alcohol 50 parts.

Immersion for 12 hours is sufficient at ordinary temperatures.

After dyeing, the prints are briefly washed in cold water to get rid of the excess of colour. The yellow monochrome may be put to dry without further precaution, but the red and blue are preferably immersed in a 5 per cent. solution of Sulphate of Copper and rinsed before drying. After drying it is advisable to bring the dyed positives into temporary superposition for viewing, which is most easily accomplished by placing two blocks of wood on a sheet of white paper and carefully placing the positives in register, putting the yellow first, then the blue, and lastly the red. By examination from above it can be seen whether any correction of the monochromes is necessary. Notwithstanding all precautions, it is rarely that the representation of the colours is quite perfect. The monochromes may be easily intensified by further immersion in the tinting baths. For instance, if inspection shows that the result is too green, the red needs intensification. The red or yellow images may be easily reduced by merely soaking in water, but the blue will be found to resist hot or cold water, acids of any organic solvent, but the colour may be readily reduced by the employment of a Solution of Gelatine or Glue of about .5 to 1 per cent. in strength. To make these corrections the three monochromes should be clipped together with wooden clips, placing the monochrome needing correction at the bottom with the coloured surface outwards. It is then easy with the aid of a moist brush to reduce the regions which are too highly coloured. With a knowledge of the properties of the colours used, these local corrections may be made on all three images. If the red will not respond to the use of pure water, or great reduction is needed, a 5 per cent. Solution of Ammonia may be employed, while for increasing the depth a Solution of Erythrosine is used The Yellow may be reduced generally by soaking or locally with the brush, but cannot be easily intensified, owing to the slowness with which the insoluble Gelatine absorbs Chrysophenine.

In the case of the Blue, the slow absorption and the general resistance of the colour to any solvent, renders it much less amenable to after treatment than in the case of the Red or Yellow. When the effect by superposition is satisfactory and the Red and Blue monochromes (if corrected) have been re-dipped in the Solution of Copper Sulphate and dried, the three surfaces of the prints should be coated with a 1.5 solution of Rubber in Benzole, and when this is dry with a 1 per cent. collodion. To finally place the films in superposition it is necessary to use a temporary paper support, which is coated with the following solution:—

Water	1,000 parts.
Hard Glue	150 parts.

and applied to the Yellow Positive. When completely dry the paper is stripped, which brings with it the Yellow film, which must be applied to the Blue positive, using the following mountant:—

Water	1,000 parts.
Hard Gelatine	120 parts.
Glycerine	50 parts.

This solution, while warm, is put in a dish in which is immersed the glass bearing the blue image; the two are then brought into contact and adjusted into perfect register, and any excess of solution removed by squegeeing. When quite dry the paper is stripped from the glass, bringing with it the Blue film on which is imposed the Yellow. The operation is repeated by applying this to the glass bearing the Red image, using the same solution of Gelatine and Glycerine. This paper being again stripped when dry, will bear the three films, Red, Yellow, and Blue, in superposition, and it is necessary to transfer these to glass in order that it may be viewed as a transparency. This is best accomplished by the medium of the Gelatine and Glycerine solution. The first transfer of the Yellow film having been made by Glue, which is much more soluble than Gelatine, it is easy to remove the paper, leaving the completed print adhering to the final support of glass.

New Apparatus, &c.

The "Snap-Shot" Plates for Studio Work. Manufactured by B. J. Edwards & Co., Castlebar Works, Ealing, W.

Amongst the older firms of dry-plate makers Messrs. Edwards exhibit a vitality and resourcefulness of idea which marks them out as destined to maintain that high reputation amongst photographers the foundations of which were laid at the old Hackney works more than twenty years ago. It is only a few weeks since we tried and reported upon the firm's latest introduction: the beautiful matt surface "Kristal" transparency plate, which adds a new charm to modern glass positive work for the lantern and the stereoscope, and in the interval we have had in use some of the well-known "Snap-shot" plates. It does not seem six years ago that a brief holiday at Southwold with a photographic friend was, to some extent, made memorable by the fact that in the then Edwards's "Snap-shot" plate we obtained some excellent negatives at short exposures, but such is the case. *Tempus fugit!* The plate at present before us is probably faster than its congener of 1896, although we are unable to submit ascertained evidence bearing on the point. But a practical trial in the camera during the recent gloomy weather satisfied us that the sensitiveness of the "Snap-shot" plate is so exalted that it should be of especial use to professional photographers desirous of shortening their studio exposures as much as possible in the dull months. With all its rapidity the "Snap-shot" plate showed in our hands no tendency to fog on development, a clean, bright image resulting from the use of a metol-hydroquinone solution. The grain of the deposit is also extremely fine, and, altogether, the preparation of the emulsion and the coating appear to have been carried out with the utmost nicety. We have much pleasure in bringing the "Snap-shot" plate to the notice of our professional readers, and when our amateur friends recommence outdoor work it will, no doubt, find favour with them.

"The Steadfast Actinometer Paper." The Watkins Meter Company, Hereford.

The sensitive papers that have hitherto been used with actinometer which depend upon the colouring of a sensitive surface, although they have answered their purpose fairly well, have been far from perfect from a scientific point of view. One of the most essential properties of a paper for this purpose is that the action of light should be uniform, irrespective of temperature and other atmospheric conditions. The papers hitherto available have not fulfilled this condition, for, not only has their sensitiveness varied according to the humidity of the atmosphere, but the tint obtained on exposure to light has also varied. These variations, though, perhaps, insufficient to lead to any great amount of error on the part of anyone exercising a reasonable amount of judgment, of course should not occur in the use of an instrument which claims to be an instrument of precision, and to obviate this defect the Watkins Meter Company have succeeded, after exhaustive experiments, in producing a sensitive paper which will entirely supersede that hitherto used. The new paper is prepared by a completely original method, and, unlike the old papers which depended for sensitivenes upon the presence of a soluble salt, it is washed and therefore free from any hygroscopic substance. It does not vary in sensitiveness whether used damp or dry, and the tint produced by the action of light is the same under all conditions. It darkens well beyond the standard tint, and the colour, a pleasant grey, is one that is easily judged in all lights, either with or without the blue glass that is usually employed with the actinometer.

With this improvement the Watkins exposure meter should become a still more popular instrument than heretofore. There is no doubt that even among the most conservative of photographers it is becoming recognised that the system of testing instead of judging the light is the correct one, and every invention or improvement towards the perfection of light-testing instruments will secure fresh adherents to the system. The present change will cause no inconvenience to those who already are in possession of a Watkins actinometer of any pattern, as a new standard tint is supplied with every box of refills. In ordering it should be stated whether the "disc" or "ribbon" form is required.

"The 'Climax' P.O.P." Manufactured by J. J. Griffin & Sons, Ltd., 20-26, Sardinia Street, W.C.

It is claimed for this new gelatino-chloride paper that it is one of the quickest printing papers on the market, and it is also one of its desirable features that, the gelatine being hardened in the process of manufacture, it will bear an unusual amount of hard usage during the manipulations without injury. It is a further advantage that there is no necessity for preliminary washing of the prints before toning, and resulting in a considerable saving of time. The directions given for the use of the paper are: Thin or flat negatives should be printed in the shade, hard negatives may be exposed to sunlight, the printing to be carried a little deeper than the finished result is required. The preliminary washing of the prints before toning may be dispensed with. The prints, however, may be wetted or washed without harmful effect. The toning baths recommended are:—For rich purple tones:

Water	20 ounces.
Sulphocyanide of ammonium	15 grains.
Chloride of gold	1½ grains.

For brown tones:

Water	16 ounces.
Sulphocyanide of ammonium	15 grains.
Phosphate of soda	10 grains.
Chloride of gold	1 grain.

After toning, the prints must be transferred as finished to a dish of water containing a little salt to act as a short stop to the toning action. The fixing bath consists of 4 ounces of hyposulphite of soda to the pint of water. Those who prefer a combined toning and fixing bath may use the following, in which the prints are to be placed without previous washing:—

Water	16 ounces.
Hyposulphite of soda	3 ounces.

When the hypo is dissolved, add sulphocyanide of ammonium 3 drachms. Then add 7 grains of chloride of gold, and filter. A little old bath should be added to a newly-made one, say one part of old to nine parts of new. This addition will make the bath work faster. Used bath should not be thrown away, but kept separate for mixing with new as directed above. If no old bath is available, some scraps of any sensitive silver paper should be put into the bath to start toning action. The bath can be heated to 70 deg. F. if it is desired to accelerate its action. The paper is made in two qualities, "A" for soft results from strong negatives, "B" for vigorous results from weak negatives. In experimenting with the paper we chose the sulphocyanide bath for purple tones, immersing the prints, as directed, without having previously washed them. The toning action was fairly rapid, and after finishing the results were entirely satisfactory, the tone being admirable. There was no trace of double toning, and the whites were pure. As a test of the behaviour of the paper under hot-weather conditions, in the course of washing the prints were finally soaked for some minutes in water of 75 deg. F., and then squeezed with ferrotype plates. When dry they left the plates easily.

"Neutral Toning and Fixing Salt." Prepared by the Actien-Gesellschaft fur Anilin-Fabrikation, Berlin. Agents: A. & M. Zimmermann, 9 and 10, St. Mary-at-Hill, E.C.

This preparation is in the form of a granular powder, and is supplied in tins containing 6 ounces of the solid, which, according to the directions, should be dissolved in 25 ounces of water. The salt is easily soluble, and it is immaterial whether hot or cold water be used. The result is a turbid solution, owing to the presence of carbonate of lime or chalk added for the purpose of securing neutrality. For use the solution is allowed to stand until cleared by the deposit of the chalk, or the chalk may be filtered out. The prints, which need not be much over-printed, as very little reduction takes place, are immersed in the solution as they come from the printing-frame, and without washing or other preparation, taking care, of course, that the whole of the print be wetted at once to avoid marks of uneven toning, and also taking care to avoid the formation of air bubbles on the prints. The prints take five or six minutes for thorough fixation, and by that time they tone sufficiently, if warm tones are required; for a colder tone a longer stay in the bath is required. The colour when the print leaves the bath should be a little colder than the finished print is desired to be, as, on drying, the tint becomes slightly warmer. The bath should be used at a temperature of about 65 deg. F. The bath may be used over again by adding about half its bulk of unused bath, but it should be first poured back into the bottle containing the neutralising deposit, which should be again allowed to settle. In keeping the bath in solution it should either be stored in a brown or yellow glass bottle, or the bottle should be kept in the dark, as the action of light tends to precipitate the gold. Our own experience of the bath has only been of an experimental nature. We made a number of prints upon various kinds of commercial gelatino-chloride paper, and treating them strictly according to the instructions succeeded in producing admirable results in every case. The tones varied, according to length of stay in the bath, from a pleasant, ruddy tint to purple, and in no case was there any suspicion of double tones. The great objection to the combined toning and fixing bath has been the doubtful permanency of the results. Its convenience is beyond question. It is notorious that a combined bath made with acid or alum will continue to tone after the gold is exhausted. This bath does not do so. When the gold is exhausted it ceases to tone, and as it is essentially a neutral bath the risks that arise from an acid hypo bath need not be feared.

News and Notes.

Mr. Ernest Human will demonstrate S.C.P. at the London and Provincial Photographic Association, on Thursday, the 23rd inst. Visitors welcome at the White Swan, Tudor Street, E.C.

The Photographic Club meets weekly, on Wednesdays, at Anderton's Hotel, Fleet-street, at 8 o'clock. Next Wednesday the Kodak Company give a demonstration, at which any visitor will be welcomed.

The L. & P. Annual Supper will be held at headquarters, the White Swan, Tudor-street, London, E.C., on Tuesday, February 6th, at 7 p.m., Mr. Thomas Bedding, F.R.P.S., in the chair. Friends of members will be welcome.

The twenty-ninth annual issue of "Willing's Press Guide," published at 125, Strand, London, has been issued. The cross-references make this guide serviceable to those whose business it is to acquaint themselves with the localities and varieties of English newspapers.

Royal Photographic Society.—On Tuesday, January 21st, 1902, at 8 p.m., at 66, Russell-square, Mr. Henry Stevens will show some slides of flower, animal, and figure subjects. An exhibition of his photographs will also be on view. Ladies are specially invited.

The abridged catalogue of the Thornton-Pickard Manufacturing Company, Ltd., Altrincham, contains a complete list of the reduced prices of the company's famous shutters. We note the company proposes introducing shortly a new focal plane shutter, triple extension Ruby camera, camera set, series of hand cameras, film roll holder, plate magazine, and balls and tubes.

Tyneside Camera Club.—On Thursday, January 9th, 1902, Mr. Purvis in the chair, the President, Mr. A. B. Gardiner, gave a lecture and demonstration on Lantern Slide Making. Mr. Gardiner is an able, energetic, and devoted photographer, and great interest was shown by the members in his lecture. The slides produced were very fine. Thanks to lecturer and chairman closed the meeting.

At the last meeting of the South London Photographic Society Mr. W. H. Dawson dealt with the chemistry of photography, from the manufacture of the dry plate to the mounting of the finished picture. A discussion followed on the merits or otherwise of the metric system, gelatinochloride paper, and the properties of various kinds of mounting boards.

The Vanguard Manufacturing Company of Maidenhead are issuing a useful catalogue and price list of the many chemical preparations which have won such well-deserved appreciation at the hands of amateur and professional photographers. Accompanying it is a table of postal arrangements with other countries, giving the weights of the preparations and the various postal rates to all parts of the world—a sensible idea that is sure to be much appreciated.

Sir James Timmins Chance, M.A., head of the firm of Chance Brothers & Co., Birmingham, of which he had been a partner for over sixty years, died on Monday, 6th inst., at his residence at Hove, Sussex. He was born March 22nd, 1814, the son of William Chance, J.P., of Spring-grove, Birmingham. He was educated at University College, London, and Trinity College, Cambridge, graduating B.A. in 1838, as Seventh Wrangler. From 1859 he devoted himself especially to the manufacture and improvement of dioptic illuminating apparatus for lighthouses, and he worked with the Royal Commission of that year, to correct existing errors and deficiencies therein in the lighthouses of these islands. In 1867 he was awarded the Telford Gold Medal and Premium of the Institution of Civil Engineers for his paper on "Optical Apparatus used in Lighthouses." He founded the Chance Chair of Engineering in the University of Birmingham.

The Kodak Amateur Photographic Competition.—The response to the Kodak Company's invitation to users of the Kodak and Kodak materials to compete for prizes to the total value of £300 has been that no less than 22,000 prints, either direct or enlargements, have been forwarded to the company's chief office in Clerkenwell-road, where they are undergoing a preliminary selection previous to the commencement of the judges' labours. By invitation, we have had the opportunity of inspecting this vast assemblage of photographic work, and perhaps some idea of what it means may be formed if we state that, spread out on trestle-tables, with only sufficient space between each row to pass, five floors of a large warehouse are entirely occupied. Needless, to say, we were not able to examine every print sent in, but a general inspection convinced us that a marvellous improvement has taken place since the last Kodak exhibition at the New Gallery. The average quality is really very high, both from the pictorial and technical points of view. An exhibition of a selection of the work, including, of course, that which receives the awards, will be held at the Kodak Gallery, 40, West Strand, W.C., as soon as it can be arranged for.

THE Teb Competitions.—The judges' awards in the Professional Section of this competition were as follows:—Cabinet (Professional).—First Prize, £7: C. Skelton Tyler, Earle's Colne, Essex Second Prize, £5: R. S. Webster, 60, Princes-street, Edinburgh. Three Prizes of £2 2s.: J. FitzGibbon-Forde, 15, Waterloo-place, Sunderland; T. R. Boughton, 54, London-road, Lowestoft; J. K. Horne Crawford, 223, High-street, Portobello. Seven Prizes of £1 1s.: Thos. Bell, 35, High-street, Chatham; S. Bowen-Barry, Royal Arcade, Cardiff; G. Hastings, Station-road, Whitley Bay; S. Wyatt, Esplanade Studio, Burnham (Somerset); Edwin Matthews, 21, East Dulwich-road, S.E.; C. B. Keene, 39, Kedleston-road, Derby; H. M. Cooper, photographer, Burnham. C.D.V. ((Professional).—Third Prize: R. S. Webster, 60, Princes-street, Edinburgh. Midget (Professional).—Three Prizes of 10s. 6d.: Chas. Treasurer, 21, Inglis-street, Inverness; R. S. Webster, 60, Princes-street, Edinburgh; C. St. John-Vaughan, 48, Whitley-lane, Bradford. Complimentary prizes were awarded in the Amateur Class to make up the amount of money which the judges did not allocate in the Professional Class. The entire competition attracted between six and seven thousand prints, a result upon which the promoters, Messrs. Charles Tyler and England Brothers, are to be congratulated. Some of the "amateur" prints were of great pictorial merit, although we are at a loss to know what becomes of the "amateur" status of successful competitors for money prizes. We understood that it is the intention of Messrs. Tyler and England Brothers to repeat the competition in an amended form at the close of this year, and that no distinction will be drawn between two classes of persons competing for money prizes. The competition, we are persuaded, will be none the less successful on that account.

THE Chemistry of the New Postage-stamps.—The nature of the colouring matter used for distinguishing the value of postage-stamps is, as we have pointed out before, a matter of some importance, for, however dangerous the dirty practice of licking stamps may prove to be, the convenience of possessing a moist tongue for the purpose cannot be resisted by most people. That the habit has its dangers is no hypothesis. Blood-poisoning has without the slightest doubt been traced to licking an infected postage-stamp, and the chances of a postage-stamp becoming infectious are obviously abundant. We may at least expect the postal authorities to avoid as far as possible the use of doubtful colouring materials on stamps, and we have reason for believing that considerable care is exercised to secure this desirable result. This year it was decided to revert to red as the distinguishing colour of the penny stamp, and all the new stamps bear the portrait of his Majesty the King. In the particular instance of the new penny stamp, the colour, as we find by experiment, is admirably adapted for the purpose. We have been able to recognise it as one of the innocuous aniline reds, which is peculiarly resistant to atmospheric action or the action of moisture. Indeed, strong acids disturb it but little. We could find no injurious matters present, no irritant or metallic poison. The new halfpenny stamp, we find, is coloured with similar innocent materials to those which we found on a previous occasion. The adhesive material is dextrin or British gum in all instances. From a chemical standpoint, therefore, the postage-stamps are not likely to prove poisonous, although in giving this opinion it is well to reiterate that infection from septic matter must always remain a strong possibility (when it is considered how postage-stamps are handled and how they are left lying about, frequently under an undesirable environment), so long as the habit of licking them is persisted in.—"The Lancet."

OXFORD Camera Club.—An Exhibition will be held on Wednesday, Thursday, and Friday, March 5, 6, and 7, 1902, in the Assembly-room, Town Hall. The following are extracts from the regulations:—1. Silver and bronze medals will be given for the two best pictures in the open section—a silver medal for the best picture, and six bronze medals for any other work that may deserve special recognition in the members' section. Certificates will be given for the best pictures (first and second, and any number may be commended) in each of the classes. 2. The entrance fee will be 1s. for members of the Club, to cover any number of exhibits; for non-members, 6d. for each exhibit. 3. The judges will be appointed by the Royal Photographic Society; they shall have full discretion as to number of awards, if any, given in each class. 4. The pictures may be of any size, but will not be classified according to size. They must not be framed. 5. There shall be restriction as to the method by which any print is produced from the original negative. 6. No picture will be admitted which has been previously exhibited at an exhibition of the Club. 7. Each mount shall bear on the front the name of the picture and the nom-de-plume of the exhibitor, which must not exceed one word. The real name must not appear. 8. All pictures for competition to be sent in, with the entrance fee, by noon on Monday, February 10, to the secretary, Mr. Norton, 149, Woodstock-road. With each set must be sent a sealed envelope marked with the nom-de-plume and containing the exhibitor's real name. 9. The pictures (except the mounting) must be entirely the work of the competitor. 10. Pictures not for competition will be exhibited if sent to the secretaries at the Town Hall on Monday, March 3. Local exhibits may be framed. The non-members' section is open to any professional photograper or amateur not a member of the Oxford Camera Club. Pictures for this class may be any subject and any size; they must not be framed. The hon. secretaries are Messrs. Geo. W. Norton, 149, Woodstock-road, and A. Mardon Mowbray, 40, Queen-street, Oxford.

IN common with most photographers I have great admiration for the conspicuous energy and ability displayed by the Kodak Company in the building up of their colossal business, which has made the word "Kodak" a household word, though the use of the word is pushed too far when with many unthinking people to photograph is called "to Kodak," and every form of photographic camera is described as a "kodak." This has been the forerunner of a large and increasing number of more or less absurd and unmeaning coined words similarly applied, which may or may not be necessary from a business point of view; but I think many will agree with me that the multiplication of them is certainly to be regretted on other grounds. To give an instance, a popular form of camera is sold on the Continent under the name of the "Piff-Paff"; may we assume that amongst those to whom this name becomes familiar a photographer will be known as a "Piff-Paffer"? I hope not, and I do not think we have yet any so silly a name in this country, though we seem to be approaching it. As a pharmacist I am one of those who do not consider that the true interests of pharmacy are bound up in the sale of proprietary medicines or quack nostrums, and consequently have not had the experience of inventing or registering any word to describe such. I can, as I remarked, understand the use of a coined word in connection with such preparations, many of which consist simply of well-known constituents, the object of such word being to create an impression upon the buyer that he is using some extraordinary compound or new discovery in medicine. This practice of presuming upon the credulity of the public does not commend itself to me; but surely such considerations do not apply in the case of a photographic instrument, whose inherent qualities and fitness for its intended purpose are evident to the senses. If it be considered necessary for business purposes to apply a distinctive name, is it unreasonable to expect that the word used should be in some way descriptive or appropriate, and not absolutely meaningless?—"Pharmaceutical Journal."

COLOURS of Butterflies not due to Diffraction.—Mr. W. B. Croft writes to "Nature":—"Some years ago your correspondent, Mr. Benham, corrected the mistake that mother-of-pearl owes its beauty to diffracted light. The error had lived long, partly, perhaps, because it came from an authority so eminent as Sir David Brewster. A similar idea seems to be still prevalent, that butterflies and moths derive their colours from diffraction. Two of the best modern natural histories, which I have at hand, favour the supposition. The patches on the wing are groups of uniformly-coloured scales, which contain pigment. Diffraction colours are of a different character; they are many-coloured iridescent lights varying as they glance off at different angles. The distinction is familiar to a worker in optics; it is easy for anyone to appreciate it by seeing recognised forms of diffraction. I have lately examined a collection of British Lepidoptera, and found no specimens which were coloured by wave interference. The Purple Emperor has two uniform colours, grey and purple, so arranged that there is a direction of vision favourable for seeing each colour. Shot silks and Labrador spar are cases somewhat similar. I have before me a foreign Thecla which has a brilliant light blue pigment; perhaps in this and some others a certain shimmer is added by a slight diffraction interference, but the predominant effect is the blue colouring matter. It is, however, interesting to note that all scales have fine diffraction rulings. These lines, as in the case of diatoms, consist of rows of small spots. I have had a wing of the Small Tortoiseshell for about twenty years; the scales are complete, but the colours are faint, and the wing is partly transparent. It is possible to arrange this with care in a strong light so that brilliant rainbow lights are seen, but they are not the familiar tortoiseshell pattern. This effect does not seem to be possible with a fresh wing, so that I doubt whether butterflies are often seen to act as diffraction gratings. No doubt some insects show interference colours, but these seem usually to arise from the phenomenon caused by thin plates. Diffraction can be well studied in humming-birds; there are the brilliant, ever-varying lights, and the fine markings on the feathers may be seen with a microscope. No iridescence is more delicate than that on the side of a fresh mackerel. I am not quite sure to which class of wave interference this is due."

LENGTH and Speed of Waves.—At a meeting of the Royal Geographical Society recently Dr. Vaughan Cornish gave a lecture to young people on "Waves," illustrated by lantern slides and cinematographs. Nearly half the audience consisted of juveniles, but the bulk of the lecture was of two scientific a character to afford them sustained interest. Dr. Cornish stated at the outset that he had already published some of the results of his investigation into the records of wave measurement, especially as to the height of waves. He proposed on that occasion to give attention to the equally interesting question of the length and speed of ocean waves. By noting the time which elapsed between the arrival of successive waves at any point the length and speed in deep water could be accurately calculated. During storms waves with periods of from eight to eleven seconds were observed, with lengths from 328 ft. to 620 ft. A ten-second wave was 512 ft. long, which was exactly the length of Burlington-gardens from the Royal Geographical Society's house at the bottom of Savile-row to the houses facing the street on the west side of Bond-street. A set of such waves would have a height of about 25 ft., but there was generally a "swell" running at the same time, which increased the total rise and fall of the water and caused waves of much larger size to recur not infrequently. After a storm the swell became most conspicuous, and he had observed, when majestic rollers burst on our shores from the Atlantic, a series of 139 consecutive breakers, with an average period of 19½ seconds. The length of these in deep water would be more than 1,900 ft. Dr. Cornish illustrated this part of his lecture by asking the audience to imagine themselves on the crest of an oceanic swell at the Park-lane end of Piccadilly, when the next crest would be passing Walsingham House. There such crests would pass every minute, travelling at the speed of sixty-eight miles per hour. The vision of an "oceanic swell" in Piccadilly created much amusement. Wave forms were illustrated by a number of lantern slides from original photographs taken by the lecturer, and the motions of waves by the cinematograph. Other slides showed the nature of waves produced in experiments with model battleships in a large tank at the Admiralty works at Haslar, and the lecture concluded with an exhibition of the cinematograph pictures of the Severn bore as shown at a recent meeting of the Geographical Society.

Commercial & Legal Intelligence.

THE Little "Nipper" Competition.—The following are the prize-winners—Class A.—1st, £2 2s., Walter H. Wells, 13, Tudor-road, Leicester; 2nd, £1 1s., G. W. Porte, 54, Back-lane, Skelton-in-Cleveland, Yorkshire; 3rd, 10s. 6d., Vivian R. Cocq, 45, The Common, Woolwich. Class B.—1st, £1 1s., Walter H. Wells, 13, Tudor-road, Leicester; 2nd, 10s. 6d., F. Forest, 129, High-street, Guildford; 3rd, 5s., J. F. Alexander, 37, Burnbank-gardens, Glasgow. Class C.—No. 1 Camera.—1st, £1 1s., H. R. Lewis, Seymour-street, Bath; 2nd, 10s. 6d., Lallie Dod, 52, Chalsey-road, Brockley; 3rd, 5s., G. Axon, 84, Shaw-heath, Stockport, Cheshire. No. 2 Camera.—1st, £1 1s., Kate King, 53, St. Thomas's-road, Hastings; 2nd, 10s. 6d., L. Watts, 29, Evering-road, London, N. Class D.—No. 1 Camera.—1st, £1 1s., Alfred Wildswith, 2, Well Close-terrace, Leeds; 2nd, 10s. 6d., Stanley J. Milner, 3, Bellevue, Clifton, Bristol; 3rd, 5s., F. Stuart, 25, Ann-street, Chatham-hill, Manchester. No. 2 Camera.—1st., £1 1s., Rev. W. C. Hope, Powys Villa, Park-road, Cowes, I.W. Class E.—1st, £1 1s., Kate Dod, 52, Chalsey-road, Brockley; 2nd, 10s. 6d., A. R. Osborne, 36, High Town, Hereford; 3rd, 5s., Sidney Hicks, 2, Kingston-road, Bath. Class F.—1st, £2 2s., Walter Ridler, Cotteswold-road, Tewkesbury; 2nd, £1 1s., Albert Douglas, 77, High-street, Egham.

SCIENTIFIC Commerce.—In his recent suggestive speech upon Technical Education, Mr. Balfour made some broad statements as to the future of commerce, which should be noted and remembered. He had been distributing prizes to students at the Goldsmiths' Company's Technical Institute, but he spoke out boldly upon the whole great question of our trade. He did not believe even in our relative decay; and he pointed out that to hold that the manufacturing success and commercial prosperity of others was not so much an addition to the wealth of the world as a subtraction from the wealth of Great Britain, was a profound and dangerous fallacy. He maintained that, broadly speaking, the prosperity of one nation conduces to the prosperity of all nations, and we are not poorer, but richer, because other people are rich also. Undoubtedly, this is true in fact and principle, and it is a truth of which we, as the greatest Free Traders, and as the workshop of the world, have had abundant means of knowing and proving.

But, in spite of this fact, says "Kemp's Mercantile Gazette," there are admittedly certain manufactures in which we have lost ground through our own laziness or want of enterprise, or difficulties with workmen. Yet this loss must not be confused with the fact that other nations have now become traders, and are doing well in markets where once we were mainly alone. The general increase in the world's wealth by the manufactures of foreign peoples does not do us any harm so long as we hold our own. But we shall only continue to do this if we so organise our labour that the best workmen get the highest wages; that industry and thrift are properly rewarded; and that we have no lack of skilled and trained workers for our various manufactures.

All these things are true, and whatever tends to improve our technical training is of national advantage. But the broad principle to aim at is a thoroughly scientific teaching in all departments. By this we mean the training of the young in scientific habits of thought. As a people we have never acknowledged the power of science. Although we can boast many great names as individual discoverers, yet, as a people, we have neither admitted nor appreciated the application of pure science to commercial methods of manufacture. It is rather our way to sneer at theories, forgetting that a theory of to-day may be a fact of to-morrow, and that the silent work of a chemist in his laboratory may, at any moment, bring to light a process of manufacture out of which fortunes are to be made.

This old and obsolete way of looking at pure science, which has become one of our national habits, is really at the bottom of our failure to compete in the application of chemistry, especially with our German rivals. Every new discovery in the great fields of chemistry and physics adds new powers to our means of increasing the wealth of the world. But it is not only in regard to the study of physical science, but also, and generally, as to a scientific thoroughness in our modes of thought, that we are wanting. It is here that the average young German is better taught than is the average Briton. Nor will any superficial teaching of a technical character make up for this fundamental defect. The methods of science are clear and certain, and inevitable; and if our habits of thought can only be made scientific in that sense, our success in the scientific commerce of the future will be assured.

THE Photographer and His Artist.—At the Clerkenwell County Court, before his Honour Judge Edge, Annie Perodeau, photographic artist, 260, Upper-street, Islington, sued Samuel Reichman, photographer, 246, Burdett-road, Bow, E., to recover £9 13s. 8d., the balance of an account for work done. Mr. Williams, solicitor for plaintiff, said defendant was a photographer, who carried on trade principally with sailors at the East India Docks. He took the photographs and engaged plaintiff as one of his artists to paint them. She had done work for him for the past three years, and up to June 4th last an account was rendered and paid by defendant. Then further work had been done, amounting to £14 7s. 8d., on which he had paid a sum on account, leaving a balance of £9 13s. 8d. Plaintiff decided not to further continue painting for defendant, and it was not until then that defendant made any suggestion about a set off to the account. Then he sent in a bill in respect of rejected pictures which had been painted by defendant. Plaintiff, the wife of an Islington chemist, denied that there was any agreement come to when she engaged with defendant in respect of deductions for rejected pictures. It was not until September 6th of last year, when he paid £2 on account, that he presented any account for rejected pictures. By the Judge: The account he presented went back to the time she engaged with defendant—three years last October. Replying to Mr. Clark, who represented defendant, plaintiff said that about twelve or thirteen years ago she worked for defendant, but she did not remember that he ever made deductions for rejected pictures. She knew that he had made deductions from Mr. Newman, a painter, and remembered that matter being mentioned to her on one occasion either by defendant or his wife. She replied that if Mr. Newman had so many rejected pictures he ought to give up painting; but she never agreed to defendant making deductions from her account. If he had told her that such deductions would have been made, she would have never undertaken the work. Both defendant and his wife went into the box, and stated that it was an understanding between them and plaintiff that deductions should be made for rejected pictures. Defendant's wife stated that plaintiff promised to pay when the deductions amounted to £10. Replying to the judge, defendant admitted that he several times settled up with plaintiff without making any reference to deductions. The judge said he had to take into account the fact that for three years plaintiff had been doing this work, and for the greater part of that time no claim had been brought forward by defendant in respect of rejected pictures. Such conduct did not imply that any contract as alleged by him was ever made when the engagement was entered into. It seemed to him that the balance of evidence was in plaintiff's favour, and his verdict would be in her favour, with costs.

RE FREDERICK JOSEPH SEAMAN, Hucknall Torkard, Heanor, and Matlock Bath.—The above-named debtor appeared for his public examination at the Nottingham Bankruptcy Court, on Friday last, before the Deputy Registrar, Mr. R. H. Beaumont. The statement of affairs filed by the debtor disclosed liabilities amounting to £228 and assets estimated to produce £29. In reply to questions put by the Official Receiver, debtor stated that he commenced business in November, 1897, at Hucknall, with £11 capital and apparatus he had acquired while a journeyman. In September, 1899, he opened a studio at Heanor, and since last Good Friday he had done business at Matlock Bath. At neither of the latter places was he successful. The Official Receiver closely questioned bankrupt as to the execution of a bill of sale with Mr. Oswald J. Gilbert, an auctioneer and valuer at Heanor, for £75, and the disposal of the money, which, the debtor said, Mr. Gilbert had not fully accounted to him for. The Official Receiver explained to bankrupt that Mr. Gilbert said that he had paid Mr. Wilson £2, Mr. Severn £4 5s., his own charge for settling with Mr. Severn 5s. 1d., Mr. Cattle £3 0s. 2d. and 6s. 8d., gas account £5 0s. 1d., Mr. Hill £20, and the balance was absorbed by the item "Gilbert, £30." Debtor said he could not understand the last item, as he owed Mr. Gilbert nothing except the £75, but he afterwards recalled £10 which he owed Mr. Gilbert, and which was included in the £75 and was to be repaid. The Official Receiver: What about the other £20? It is that £20 that I cannot account for. The Official Receiver: I will tell you what Mr. Gilbert says. He says that, in addition to the £10, there was to be interest paid. Is that correct? Yes. Mr. Gilbert says that he loans made to you before the date of the bill of sale, with interest, amounted in round figures to something like £20. No, sir. Mr. Gilbert says there are promissory notes in existence. He has not produced them, but he says they are in existence, signed by you, for something like £20. Is that correct? Debtor: I should like to see them, and I should like you to see them. Have you ever asked him to show you them? Yes. And has he always declined to do it? Yes. And, as regards the other £10, Mr. Gilbert says that was to be paid to him for his services generally in connection with the bill of sale? No, sir. Was the question of your paying him £10 or any other sum ever discussed? No, sir. Do you say, then, that this sum of £10—this fee that has just been put down—was not the result of an arrangement, but put down arbitrarily by Mr. Gilbert? Yes. Have you ever asked Mr. Gilbert for an account showing how he disposed of the money? Yes, several times. And what has he said when you asked him? He has always been out, or busy, and could not attend to it. Bankrupt was also examined with particularity about his studios, and he admitted that since he knew he was insolvent he had contracted debts amounting to £132. Since the bankruptcy his wife had tried to collect 5s. from Mr. Daniel Clarke, grocer, of Heanor, for work done prior to the failure. This account, debtor said, he had not included in his assets. Answering questions by Mr. Joseph Herbert, debtor admitted that he had bought a bicycle from this creditor at the time he was in difficulties. Mr. W. B. Smith, who appeared for bankrupt, put one or two questions, and the examination was closed.

FORTHCOMING EXHIBITIONS.

1902.	
January 31–Mar. 1 ...	Dundee and East of Scotland Photographic Association in the Victoria Art Galleries, Dundee. Hon. Secretaries, V. C. Baird and Archibald Campbell, 39, High-street, Dundee.
February 13–15	Nottingham Mechanics' Institute Camera Club, Mechanics' Lecture Hall, Nottingham. Joint Secretaries, W. Ward, 14, Stratford-terrace, Nottingham; E. H. Atkin, 68, Blue Bell-hill, Nottingham; A. Black, 9, Bowers-avenue, Nottingham.
„ 15–Mar. 8 ...	Edinburgh Photographic Society, Society's Rooms, 38, Castle-street, Edinburgh. Secretary, J. B. Johnston, 52, Hollybank-terrace, Edinburgh.
„ 19–26	Croydon Camera Club, The Art Galleries, Park-lane, Croydon. Hon. Secretary, E. A. Salt, 76, Heathfield-road, Croydon.
March 1–8	South London Photographic Society, Public Baths, Church-street, Camberwell. Hon. Secretary, Frank Goddard, Woodlands, Vanbrugh-hill, Blackheath, S.E.
Mar. 1902	Corporation of Glasgow Photographic Exhibition and Competition. Hon. Secretary, Peter Macnair, People's Palace, Glasgow.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

January.	Name of Society.	Subject.
22	G.E.R. Mechanics' Institution	A Comparison of Printing Methods.
21	Birmingham Photographic Soc.	*Halation.* Harold Holcroft, M.A.
20	Southampton Camera Club	*The Photographic News* Prize Slides.
20	Camera Club	*The Camera as a Travelling Companion.* Nicholas Everitt.
23	,, ,,	*Castles in England after the Twelfth Century.* C. H. Bothamley, F.C.S, F.I.C.
24	Bognor Photographic Society	Paper. C. J. West.
22	Southport Photographic	*Failures and Successes.* J. Lambert.
24	Borough Polytechnic	*Home-made P.O.P.: its Preparation and Uses.* P. C. Cornford.
23	Richmond Camera Club	*Photography in the Hunting Field.* H. M. Lomas.
23	Liverpool Amateur	Competition Pictures on View.
20	Glasgow and West of Scotland	Ordinary Monthly Meeting. Paper: *Mistakes I Have Made.* James Baillie.
21	Stonehouse Camera Club	*Flashlight Photography.* Mr. Oakes.
22	Southsea Photographic Society	Annual General Meeting.
23	North-West London	Outing to Brins.
23	London and Provincial	Demonstration: *S.C.P.* E. Human.
22	Croydon Camera Club	To be announced.
24	Sutton Scientific and Literary	Lantern Slide Making (demonstration).
23	Woolwich Photographic	*Some Notes on English Gothic Architecture.* J. Borthwick Panting, F.R.P.S.
22	The Photographic Club	The Kodak Company Demonstration.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JANUARY 9.—Mr. H. C. Rapson in the chair.

Mr. W. P. Dando gave a display of some recent photographic work of his in the gardens of the Zoological Society. Some of the best slides were, as the pointed out, the easiest to take, while those that in themselves were of a lower pictorial standard were often the results of much more skill and judgment. For this reason circumstances have to be accounted for in awarding or withholding praise, yet it may be truthfully said that few collections of animal studies possess so many of those attributes that make a set excellent as does the work of Mr. Dando. Patience, he pointed out, was the prime factor in success. Development was sometimes a matter of an hour or more, and many of the animals had to be photographed again and again before a result that was satisfactory to him was secured. The collection comprised examples of all kinds of creature, some of them easy to negotiate, others always on the move, whom it was very difficult to portray. The whole of the work was done during the past year, and, as such, is deserving of all praise.

Mr. R. P. Drage showed some prints on the Columbia paper distributed at the last meeting. He could not get a good black upon the paper, however, and he was inclined to attribute this to the fixing bath, which contained alum. The prints invariably turned to a brownish colour upon drying, although as they left the developer they were of a good black tone. He tried a variety of developers, including that recommended, but with little difference.

Mr. A. J. Brown said that he had not failed to get a good black on the paper. As regards the use of alum in the fixing bath, he held that, even if one got a good black, the print would not keep, and therefore he considered it a very serious thing to introduce alum into the fixing bath. He had prints showing this, on paper distributed here years ago by Mr. Cowan. Those fixed in simple hypo were still good, but the others had faded.

The Chairman said he had got intensely black pictures on the paper, but no alum was put in the fixing bath. His efforts to secure warmer tones encountered a lot of opposition, and it was only after the addition of quite a lot of bromide that he succeeded.

Mr. W. T. Wilkinson passed round some prints toned with the Goldaxe combined toning and fixing salt, and suggested that they be kept to test the permanence of the tones. He also passed round a carbon print on tissue sensitised three months ago and only developed a day or two before. It was kept in a platinotype tube.

PHOTOGRAPHIC CLUB.

JANUARY 8, 1902.—Mr. A. Mackie in the chair.

Mr. A. Barton Kent gave an interesting lecture on "Pharaohland," illustrating his remarks with a fine collection of photographic lantern slides. With Cairo as the starting-point, the audience was conducted up the Nile as far as Luxor and Karnac, the country and inhabitants intervening being presented in a way that engaged the rapt attention of those present from start to finish. The bazaars and mosques, which form so typical a feature of Eastern cities, were amply exemplified in Cairo, the City of Mosques. As the lecturer pointed out, their beauties of design and execution remained, notwithstanding much damage done by modern vandals and the cannon of Napoleon's army. A Mohammedan funeral procession, with its attendant howling and wailing by hired mourners, was shown at the outset. Photography in Egypt, especially with stand cameras, was exposed to considerable difficulties of one sort and another, but, as the lecturer remarked, the camera increased the pleasure of travelling by a great deal. One saw things that would be passed by the ordinary tourist, who had not the keen eye for wayside bits that the pursuit of photography developed. Several of the views were done with the panoram-Kodak, which lent itself very well to the portrayal of many of the scenes that one journeying up the Nile will come upon. The Oriental dragoman, Egyptian as elsewhere, had a wonderfully inventive or imaginative faculty. He stopped at nothing that he thought was likely to excite the interest of the Christian traveller, and was full of tales based more or less upon Biblical history. Mr. Kent proceeded to point out that no visitor to Egypt could leave without being impressed with the fact that the great Nile was the life and support of everything along its course. The dependence of the crops upon the periodical overflowing of its banks by the river, and the after-deposition on the land of its fertilising silt or mud as the water receded, was soon plain to all. A low Nile spelt disaster and famine, but an excessive overflow equally brought unwelcome consequences. For this reason, the Nilometer, which registered the state of the river's bulk, was watched with great concern. In Egypt there is one of the largest ostrich farms in the world. Great numbers of birds are bred and reared for their plumage. Mr. Kent's pictures and remarks, applying particularly to ancient Egypt, had a special interest to even the least acquainted with the wonderful history of its people. A photograph of an obelisk—the only one remaining—at Heliopolis encouraged the reflection that anything subsequent to the coming of Christ was but recent in the light of the hoary antiquity of such subjects as this. It is estimated to be at least 5,000 years old, so that it antedated Abraham's sojourn on earth, and was old when Moses studied at the place where it stands. There were several of these obelisks originally, but when the city was destroyed and the great library was removed to Alexandria they disappeared. It was by some believed that Cleopatra's Needle originally stood at Heliopolis. Five miles out of Cairo stand the wonderful Pyramids and the silent Sphinx. One hundred years ago the face of the latter was perfect, but the advent of guns, and their acquisition by the Arabs, led to its being regarded as a convenient target, and much damage has been done to it. The Sphinx was some 6,000 years old. Sand embedded a great part of it when it was discovered, but long and patient labour freed it from the driving sand. Still further up the Nile one came to Luxor, Philæ, etc. The great rock temples, hewn from the solid rock, generally by the ruler for the time being in honour of himself, have an absorbing attraction. One can only wonder at the skill of the engineers who fashioned these lasting memorials; how the transport of colossal statues, weighing, it is estimated, a thousand tons or more, was compassed, and, still more, what power brought about their overthrow, as the broken remains show to have been done. Mr. Kent's lecture was full of interesting observations gained during two or three visits to a country whose remarkable history is still the subject of inquiry, and his photographs were particularly good.

CAMERA CLUB.

ON Thursday, last week, the subject of the usual lecture was "Colour Photography," as practised by the well-known firm of Messrs. Lumière, of Lyons, and Mr. Grant was the lecturer. After giving a brief review of the various theories of colour propounded by different scientists, Mr. Grant showed how theory had been gradually borne out by practice, and alluded to the labours of Dr. Joly Ives, and others. He urged upon his hearers the importance of a correct analysis of the tints of a subject, and the equal importance of correct synthesis in copying it. Mr Grant then proceeded to give in detail the various operations necessary in producing a picture according to the Lumière method, which we may say at once is a tricolour superposition process like that of Sanger Shepherd and others. After the three necessary negatives have been taken under their respective colour screens, each one is printed on paper coated with bichromated gelatine, development being conducted with warm water, as in the carbon process. The three colourless pictures in gelatine thus obtained are then dyed in their respective baths of red, yellow, and blue, and are superposed on a sheet of glass to form a lantern slide or transparency. Prints in colour may also be produced by this process on paper, and some good examples of the work were passed round for examination. After Mr. Grant's description of the process and the various operations required to carry it through successfully, a number of lantern slides were thrown by the electric lantern. The subjects were, as is usual when tricolour lantern slides are thrown, mostly of flowers, vases, rich fabrics, etc. Only one landscape, and that an unsatisfactory one, was shown, and there was an entire absence of portraits, by which one could judge of the possibility of reproducing delicate flesh tints by this process. The paper gave rise to an animated discussion. The first speaker found many faults with the pictures shown, complaining more particularly of the false colours of the metallic objects. He wanted to know whether at any time more than three colours had been tried to work out these processes, for he felt that in these pictures there was something wanting. Mr. Cadett said that he felt some diffidence in speaking upon this subject at all, for he was, as a manufacturer of plates etc., in the position of a competitor with Messrs. Lumière. He was well aware that the Lyons firm had done a great deal for photography, and he welcomed them as brothers. He quite disagreed with the view of the lecturer that there was an advantage in using three separate plates for the negatives, instead of producing them on one plate. It was of vital importance to have the same development factor, and you have the nearest approach to this when you develop all three negatives together. He next pointed out that in the Sanger Shepherd process no actinometer was necessary, for the bromide of silver in the film obviated its use. He also remarked upon the employment of collodion having a detrimental

effect in causing reticulation, which was very evident in some of the pictures which they had seen that evening on the screen. Another difficulty, he suggested, was in the matter of procuring a sample of paper, for the temporary support of the positive pictures, which would not stretch. He also asked how it was possible to secure correct registration when paper was employed as a backing. Mr. C. H. Bothamley, who occupied the chair, pointed out that colour was not an objective, but a subjective phenomenon. It was not reducible to figures, and affected different individuals in a very different manner. The adverse criticisms which they had heard with regard to the specimens which had been shown that evening were possibly due to the circumstance that the pictures had been prepared by daylight and projected by arc-light. It was really unfair to condemn pictures subjective to such conditions, for the results shown were so different to those obtained when the pictures were made. In dye houses where the arc-light is used at night it is found that they cannot match colours as they can by daylight, and recently a method of modifying the electric light has been adopted in such places to obviate the difficulty. If they had been able to show these tricolour lantern pictures by the same light by which the pictures had been adjusted, the results, he felt sure, would have been very different. The vicious violet of the electric arc was at the bottom of the mischief. After Mr. Grant had replied to the various questions raised as to the details of the process, a hearty vote of thanks to him for the efficient manner in which he had introduced the subject terminated the proceedings.

SOUTHAMPTON CAMERA CLUB.

The annual general meeting of the above club was held at the Philharmonic Hall, Southampton, on the 6th inst., under the presidency of Mr. W. Burrough Hill, F.S.I. The committee's report was received and unanimously adopted. It showed that the club had made rapid strides during the year and, chiefly owing to the exhibition held in October last, had doubled its membership. Competitions had been held, and a silver medal had been won by Mr. Johnson and certificates awarded to Messrs. Johnson, Northover, and Trigg. The financial statement showed that a substantial balance was on the right side. Some alterations to rules were generally approved, and it was specially pointed out that ladies were eligible for election as members of the club. Mr. W. Burrough Hill, F.S.I. was re-elected president for the third time, and in returning thanks expressed his desire to do all in his power to advance the interests of the club. The three retiring vice-presidents were re-elected, viz.: Messrs. A. Horsley Hinton, G. Vivian, and the Rev. E. C. Bennett, and the name of the Sheriff of Southampton, G. H. Weston, Esq., M.R.C.S., &c., was added as a vice-president. Mr. S. G. Kimber was re-elected as hon. secretary for the fifth time with acclamation, the president most suitably eulogising the past invaluable services of Mr. Kimber by his untiring efforts towards the interests of the club and photography generally. Mr. W. H. Trigg was unanimously re-elected treasurer for the fifth time. Mr. G. Vivian was appointed as lanternist, as was Mr. G. R. Johnson as reporter, whilst Messrs. O'Connor, Max Mills, Compton, and Copeland were re-elected as committee-men, and Messrs. Winzar, Berry, Goatcher, Carden, Henley, and Rider were added to form the augmented committee. It was suggested that a library be formed in connection with the club, but the matter was delegated for the consideration of the committee. A vote of thanks to Mr. Vivian, who had taken over the chair from the president, was accorded, and the meeting closed.

REDHILL AND DISTRICT CAMERA CLUB.

Abstract of report for 1901:—The committee, in presenting the third annual report, take great pleasure in noting the continued prosperity of the club financially, in numerical strength, and in the considerable improvement of the quality of the work sent to their exhibition, Mr. Chas. Moss, the judge, having said "that the general standard of the club was that of excellence, that there was no rubbish, and that not a single picture had to be rejected." This is highly satisfactory, but the committee would remind the members that the continued prosperity and success of the club depends entirely upon their individual efforts; and the committee take this opportunity to appeal to the members, by keeping up the attendance at the weekly meeting and regularly contributing to the portfolio, to assure the future welfare of the club. Fifteen new members have been elected during the year. Very good use has been made of the library during the year, which now contains fifty-four books.

CROYDON NATURAL HISTORY AND SCIENTIFIC SOCIETY.

On Friday last, a practical demonstration was given before the members of this society (formerly known as the Croydon Microscopical and Natural History Club) on the slow-contact paper of Messrs. Wellington & Ward, by Mr. Ernest Human. The question of exposure was first dealt with, and it was shown that from 1 to 3 minutes at six inches from a No. 5 Bray burner, according to the density of the negative, would be about right. Mr. Human stated that the latitude between *under* and correct exposure was considerable, but there was not much margin between correct and *over* exposure. Development was next referred to, and the developer, consisting of metol-quinol, recommended by the maker, gave very good blue-black tones; and if softer results were required, then the exposure should be slightly prolonged, and the developer diluted with an equal quantity of water. If, however, a sepia colour is desired, this may be obtained by using a developer suggested by Mr. Human himself, *i.e.*, No. 1 pyro 15 grains, water 5 ounces, No. 2 carbonate and sulphite of sodium, crystals, of each ½ ounce, bromide potassium 5 grains, water 5 ounces. Use equal parts of each. This, even if slightly discoloured, does not stain the paper. The image appears very quickly, and gains nothing in density by a prolonged application, *unless* the exposure has been excessive. Mr. Human considered that a print *developed* to a sepia colour was more likely to be permanent than one *toned* to a similar tint. After development, the prints are fixed in a bath composed of 4 ounces of hypo to 1 pint of water, or the acid fixing bath may be used. After discussion, Mr. Human and some of the members present proceeded to expose and develop several prints from negatives which the latter had brought with them. Mr. A. Roods occupied the chair, and an instructive evening was spent.

NORTH MIDDLESEX PHOTOGRAPHIC SOCIETY.

January 8.

The nomination of officers for the year took place. Mr. Child Bayley, the president, and Mr. Bentley, the hon. sec., both gave notice that they would be compelled to give up office.

Mr. Norgate described a telephoto lens of home manufacture, and showed results obtained with it. Mr. MacIntosh illustrated and explained the principles of a telephoto lens, and said that the focus of the negative element should be, for general use, one-half the focus of the objective, as a shorter focus gave too great an enlargement of the image as well as other difficulties, while a too long focus necessitated a great extension of the camera.

Mr. Barnard showed an acetylene generator which had given him some trouble. Mr. Haylett said it was wrong in principle. The carbide should be allowed to drop into the water, of which there should be a considerable volume. If the water was allowed to fall on, and be gradually applied to the carbide, great heat was caused, and trouble ensued.

LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

The following are extracts from the annual report:—The membership roll at the beginning of the year contained 327 names, the number of new members elected during the year amounted to 39, resignation, lapses, and deaths to 49, leaving 317 names in the books at the end of the year. The coffee meetings held on Wednesday afternoons from 4 to 5 o'clock have been well patronised, the informal discussions and interchange of ideas which take place rendering these meetings exceedingly useful, as well as being a means of maintaining the social character of the association. The attendance at the Thursday evening meeting has also been gratifying, and with the object of catering for all classes of workers, your council cordially invite suggestions as to any subjects which it may be desirable to demonstrate before the members. During the summer months the club-rooms and studio have been redecorated, and your council desire to place on record the valuable assistance rendered by Mr. James Parkinson in drawing up the specifications for the work and in superintending its performance. A balance sheet is appended to the report, from which it will be seen that the society is in a strong financial position. The thanks of the society are due and are hereby tendered to the several gentlemen who have given lectures and demonstrations before the members, or have otherwise given their services for the benefit of the society, to the judges in the annual competition, to Mr. James Parkinson for a pair of portia curtains for entrance to club-room, Mr. Edwin Kite for a fourfold screen; Dr. J. W. Elis, F.E.S., for a framed photograph of the Volce Chamber, Kingsland; Mr. E. Simnett for a framed photograph of a woodland glade; Rev. J. D. Riley for twelve Daguerrotype photographs; Mr. Richard F. Soper for two books, viz., "The Shakespearean Guide to Stratford-on-Avon" and "Shakespeare's England"; Mr. A. W. Taylor for a book, "Studies from Leading Photographers"; Mr. Harry Wheeler for "The New York Photographic Times," Mr. Paul Lange for Messrs. Voigtlander & Sons' catalogue of photographic lenses. The council regret that they have to record the death of five members during the year, viz., Mr. J. R. Moir (elected 1889), Mr. T. S. Lamb (elected 1889), Mr. E. Causer Lowe (elected 1893), Mr. James Stott (elected 1894), and Mr. J. H. Eccles (elected 1900).

CROYDON CAMERA CLUB.

The meeting on Wednesday, the 8th inst., was devoted to a demonstration given by Mr. Human introducing to members a new make of "Gaslight" printing paper, viz., Messrs. Wellington & Ward's S.C.P., which is short for "Slow Contact Paper." Using negatives provided by Councillor J. Noaks, the lecturer exposed three sheets of the paper to the electric light, giving one, two, and four minutes at 9in. The above were developed with an "M.Q." solution, and resulted in three prints which were under, over, and properly exposed. Mr. Human then called on the youngest member present to try his 'prentice hand, in response to which Mr. Allen, using another of Mr. Noaks' negatives, exposed and developed a sheet of paper, and although this was his first essay, as luck would have it, he turned out a print which was superior to any which the lecturer had succeeded in producing. Subsequently Mr. Noaks experimented with a trial sheet of paper, and produced a very satisfactory result, from which it would seem that "S.C.P." is a capital printing medium for the armchair amateurs. A number of delightful specimens made by Messrs. Wellington & Ward were passed round, and indicated that very charming results were possible, the tones shown ranging from pure black to red. At the conclusion of the demonstration Mr. Human presented every member with trial packets of the paper, and an example of the finished print.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

KODAK, LIMITED, AND THE WHOLESALE DEALERS.

To the Editors.

Gentlemen,—You have no doubt received the Kodak Company's trade circular for December, announcing—

1st.—The withdrawal of their restrictive conditions introduced in the early part of last year.

2nd.—Their new scheme framed with a view to induce their customers to confine themselves to their rollable film specialities on the penalty (in case of their not being willing or able to do so) of losing a portion of the discount they have hitherto been allowed.

3rd.—That they dispense with the wholesale dealer.

We have refrained from commenting on these announcements until we had their whole scheme before us, as now set forth in their trade circular of January, 1902. With regard to their first announcement, we are glad to be able to congratulate the trade generally on having succeeded, with the very effective help of th photographic Press, the photographic societies, and almost all interested in photography, in obtaining the withdrawal of these obnoxious conditions. With regard to the new scheme, it must remain to be proved how far the photographic public and thetrade generally will consent to continue to use, or assist the sale of, articles in respect of which such a penalty as we have referred to is to be imposed, presumably with a view to maintain the sale of Kodak goods against present or future improvements. The executive of the Photographic Trade Association are considering what course it is best to recommend to their members under the circumstances, and while you may rely upon our personally leaving no stone unturned to enable the trade to take up an independent position, we prefer, for the present at least, to leave the association to deal with this question.

With regard to their "dispensing with the wholesale dealer." We propose to make a plain statement of antecedent facts and to leave our friends to judge as to how far such a course is justifiable from an equitable point of view, even if justifiable from the point of view of their own personal interests. We have had a considerable and growing account with the original Eastman Co., later on transformed into the Kodak Co., since they commenced business in this country. They commenced by giving us very special terms as wholesalers as an inducement to push the sale of their cameras, etc., through our travellers, and by other means, especially when we were prepared to take quantities of any one article, and for some years did all they could to induce us to take an active interest in the sale of their goods. Gradually, however, they withdrew these special terms and offered inducements to the retailer to buy direct, so much so that for some years past any retailer who could buy twelve Kodaks assorted at one time, or £20 worth of other materials during one month, could buy most of their goods on the same terms as ourselves, although we bought very large quantities, amounting often to considerably over £1,000 worth in a month.

Even on the few goods on which they gave us special terms for quantities the extra discount was only 2½ per cent. This margin of 2½ per cent. to the wholesale buyer (and even then on part of their goods only) is, we presume, "the saving or benefit" to which they refer in their December circular as being prepared to hand over to their retailing customers. Now, without a word of thanks for past business or of regret for taking such a step, they give us the curt notice contained in a circular letter issued early in December that in a few weeks' time—viz., January 1st, they will dispense with our services as distributors. The business in their goods has been to us not very profitable; but for this we do not so much blame them, as it was, of course, optional to us to give away as much of their discount as we liked to our retailing friends. As is well known, however, we have especially set ourselves out for many years past to supply the retailer with everything that he may require in the way of photographic goods, at a very small margin of profit, and we venture to think that our action, and that of other wholesalers who have done the same, in giving the facilities we offer, both in terms and in keeping a stock of the thousand and one articles required by amateurs, has been very largely instrumental in popularising photography and indirectly and directly increasing the demand for Kodak as well as other manufacturers' specialities.

The question naturally arises—what may the retailer expect when the Kodak Co. feel themselves sufficiently strong to treat them in a similar manner? As we commenced by saying, we leave our friends to judge for themselves, aided by the above-mentioned facts. We are daily receiving letters of sympathy with us from our numerous retail friends, also asking what we propose to do to help them to act independently.

Our course is a very clear one. Instead of being, as heretofore, not particularly anxious to introduce competitive articles, we are now forced in self-defence to do so, and we are glad to say that very shortly we, in common with other wholesale houses and manufacturers, hope to put before you some specialities in the way of films and film cameras of first-rate quality which will enable you to take up an independent position. We would point out to those of our friends who wish to be free to sell anything that they may be asked for, that they can do so by sacrificing the supplemental discounts on Kodaks and films, which we hope will soon be made up to them in an increased business in freely advertised and popularised goods.—We are, dear Sirs, yours faithfully,

G. Houghton and Son.

88 and 89, High Holborn, London, W.C.
January 7th, 1902.

[We are obliged to Messrs. Houghton for their letter, and our columns are, of course, unreservedly thrown open for the ventilation of the subject referred to. We note, by the way, that in the last number of our esteemed contemporary, "The Optician," a well-known North-country dealer delivers himself of the following piece of advice:—"At present wholesale dealers are objecting to Kodak terms. There are only two ways open, as far as I can see, one to play at opposing Kodak and hugely advertise them; the other, provide a better rollable film spool. The latter method is the one to put your money on."—Eds. B.J.P.]

MESSRS. WATSON'S OPTICAL WORKS.

To the Editors.

Gentlemen,—We should be glad if you will kindly find space in your next issue to announce that we have engaged the services of Mr. A. E. Conrady, the well-known mathematician and optical expert, as chief optician and adviser, and that in future all our optical work will be produced under his supervision. The scope of this is now being extended in the direction of a series of astronomical telescopes of both the ordinary and photo-visual types, which will shortly be completed. We may mention that Mr. Conrady is the computer of our Holostigmat Photographic Lenses and of our Holoscopic Microscope Objectives and Condensers, which, by their unique construction and fine performance, have achieved such complete success, and his assistance is a guarantee that the supremacy already obtained by the Watson Optical Instruments will in the future be fully upheld.—We are, dear Sirs, yours faithfully,

W. Watson and Sons.

313, High Holborn, London, W.C.
January 9th, 1902..

THE BIRMINGHAM EXHIBITION.

To the Editors.

Gentlemen,—Will you kindly announce the fact that our annual exhibition will be held from February 22nd to March 1st, at the Royal Society of Artists, New Street, Birmingham? The judges will be Messrs. F. M. Sutcliffe, J. H. Gear, F.R.P.S., and an artist judge to be appointed. The Managing Committee will consist of Mr. W. T. Greatbatch, F.R.P.S., Mr. Smedley Aston, and Mr. Harold Holcroft, M.A. (president Wolverhampton Photographic Society).

I am, yours very truly,

January 1st, 1902. H. Vooght-Cornish, Hon. Sec.

THE GLASGOW EXHIBITION.

To the Editors.

Gentlemen,—In your description of the Photographic Exhibition being held in the People's Palace, Glasgow Green, I notice you refer to a professional who has put his business card on his exhibits in Class III. I have not yet had time to see the exhibition, but in case I am the delinquent I hasten to explain the reason my name appears, as I think it does, on my exhibits. When my pictures were sent in I was not aware there was any other class I could send to but the competitive one. Meeting the secretary, Mr. James Paton, a day or two after they had been delivered, he informed me I could have sent to the non-competitive professional class. I would much prefer this, and Mr. Paton said there was yet time to so arrange it, and that he would see my pictures were altered to the non-competitive class, and I might send in name plate for them. These were sent in the following day, and I had nothing further to do with the matter, only I learned afterwards from the Curator that my pictures were hung before Mr. Paton spoke about them and the intended alteration, and they did not wish to disturb the walls by removing them. I understand, however, they were not included in Class III. at the judging, and the names were put on accordingly by the Curator. I understand, too, he was adding a label with "non-competitive" on it.

I assure you I should be sorry to do anything that would not be considered good taste.—Yours faithfully, G. Comrie Smith.

Giffnock, near Glasgow.
8th January, 1902.

THE HACKNEY PHOTOGRAPHIC SOCIETY.

To the Editors.

Gentlemen,—In enclosing you a card of fixtures for the next three months, may I ask if you will favour by stating in an early issue, that the present is the most favourable time to join the Hackney Photographic Society, as per following rule:—

"Any member being elected between 1st of January and 1st of May shall pay the entrance fee (5s.) and subscription (7s. 6d.) at the time of election, but shall not be again liable for subscription until the following May twelve months."

Thanking you in anticipation, and with best wishes for the New Year, I am, yours faithfully, WALTER SELFE, Hon. Sec.

70, Paragon Road, Hackney, N.E.
December 31st, 1901.

THE ALMANAC FOR 1902.

To the Editors.

Gentlemen,—Can you give me the name of any firm where I am likely to obtain a copy of your Almanac for this year? I have tried most of the people in this neighbourhood, including Harrod's Stores, and cannot get one, and oblige, yours faithfully, F. WEBB.

No. 15, Danvers Street, Chelsea, S.W.
4th January, 1902.

[A stock may be held by some of the large dealers in Central London, to whom we refer Mr. Webb and many other correspondents who have addressed to us a similar query.—EDS. B.J.P.]

THE PYRO-POTASH DEVELOPER.

To the Editors.

Gentlemen,—The Pyro-Potash Developer, published by Mr. Beach, of New York, some twelve years ago, is still a favourite with many. It gives clear negatives, free from stains, is capable of great modification, and keeps perfectly. But it is rather troublesome to make up. It would appear that metabisulphite is formed in this compound, and now that this salt is procurable commercially, the formula might be simplified. In Mr. Beach's formula one ounce of pyro is dissolved in four ounces of sulphurous acid (an ingredient not always handy), and to this is added a solution of four ounces of sulphite of soda in four ounces of water (a degree of concentration not easy to ensure). The alkaline solution consists of three ounces of sulphite and six ounces of carbonate of potash, dissolved in fourteen ounces of water. The latter gives no trouble. But ought it not to be possible, by the substitution of metabisulphite in the pyro solution, to obtain a parallel result, with less inconvenience?—Yours faithfully, M. H. F.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY, 24, *Wellington-street, Strand, London, W.C. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

T. M. FORD.—It is the only paper of the kind that we know of.

J. H.—Yes, without some preliminary knowledge which might be acquired by ten minutes' intelligent study.

S. J. A. CHURCHILL.—By the phrase "fix well in the usual way," the acid clearing is meant.

AN INTENDING, &C.—You must consult the indices at the Patent Office, London, or commission a patent agent to undertake the search. We do not answer by post.

ENLARGING CAMERA.—LIGHT writes:—"The enclosed is a sketch of an enlarging camera I want to make, and I should like to know if the incandescent light in the box would be sufficient light to enlarge with, and if the process would do instead of daylight."—In reply: The arrangement will answer very well if you interpose two thicknesses of ground glass, an inch or so apart, between the negative and the light, so as to cause equal diffusion over the negative.

STAINED NEGATIVES.—D. MCCONNELL says: "Enclosed please find two negatives, and I shall feel obliged if you will tell me the cause of the stains upon them. I have just developed some three dozen plates taken on a holiday trip, and they are all, more or less, stained like these."—In reply: The negatives sent are not stained. They are simply not fixed, i.e., the bromide of silver has not been dissolved by the hypo. Either that was too weak or sufficient time was not allowed for its action.

COPYRIGHT.—J. D. writes: "A firm here has brought me a portrait of actress to copy for them. They want to use the picture for an advertisement. It was taken by —— and is not marked "Copyright," do I run any risk in executing the order?"—In reply: Yes, certainly, you do if the portrait is copyright, as most likely it is, as we know that the firm named make all their published portraits of celebrities copyright before they are issued. You for copying the portrait, and also the firm who publish it will be liable for damages. It is not necessary that a copyright picture be marked "Copyright."

NOTICE TO QUIT.—B. H. says: "Three years ago I took my premises on a yearly tenancy, at the June quarter. I have just found premises close by that will suit me better. What notice must I give my present landlord?"—In reply: If the premises were taken under the usual yearly tenancy you must give six months' notice to expire at the quarter you took possession, which is June. Consequently you must give notice next Christmas, which will expire June next year. You cannot give up the tenancy before then, unless you can come to an agreement with the landlord to release you before that.

PATENT AGENTS.—H. H. writes: "In reference to the questions regarding a patent I wished to take out that you were so kind as to answer a week or two back, you advised me to apply to the Patent Office or put it in the hands of an agent, which I should be glad to do, but, living in the country as I do, I cannot find out the address of either one or the other. If you could let me know the address of a respectable agent through your paper I should be sincerely obliged to you."—In reply: The Patent Office is in Southampton Buildings, Holborn. Messrs. Hughes and Young, 55 and 56, Chancery-lane, London, will undertake the commission for you.

FAULTY LIGHTING.—BEGINNER writes: "Will you kindly let me know why the lighting of the two portraits enclosed is so different from those taken by professionals. They were taken in a studio?"—In reply: The fault in one is that it is lighted entirely by front light, which gives the face a flat and map-like appearance. The fault in the other is that too strong a direct side-light was used, consequently one side of the face is white and "snowy," while the other is little better than a black patch. Study the work of the best photographers, to be seen in the shop windows, and imitate the lighting of them. From such pictures you will be able to learn much.

FERROTYPES.—G. B. writes:—"You published in the BRITISH JOURNAL, about the latter end of September or beginning of August, an article on wet plates which could be converted into dry ferros and would retain their sensitiveness for some time. Could you inform me of number containing it, and how to obtain it? Will you inform me of book on making ferrotypes, &c., and oblige?"—In reply: We have no recollection of the article. You must please give us a more precise date than "about latter end of September or beginning of August." Any of the old works on photography give working details of the glass positive, or ferrotype, processes. Messrs. Fallowfield, we think, issue a work on the ferrotype process.

DISPUTED ACCOUNT.—W. J. writes: "A few weeks ago I sent two negatives and a c.d.v. photo to have enlargements made from to a firm with whom I have a monthly account. I got a postcard acknowledging order in the usual form, the goods not being specified. About a week after I received the enlargements from the negative and a letter stating that they could not find the c.d.v. I had packed the negatives and wrapped the c.d.v. inside my order, and put them all in a box. Whoever opened the box and order must have seen the photo, yet they say they cannot trace it. It is the only photo of a deceased gentleman, and I am responsible for it. I sent them the description of the card, but they cannot find it at all. I have had two more enlargements from them since, and my account has now come in. Would I be right in not paying account until they return photo or make some allowance? What would you advise me to do?"—In reply: We should certainly advise you to insist on a liberal allowance off the account unless the carte is returned to you.

VARIOUS QUERIES.—Our Armenian Reader writes:—"Some time ago I asked you kindly to give me information about a printing-out process that could give a negative print from a negative and a positive from a positive. Then you had referred me to some book, regarding the difficulties of obtaining books from London as to such a distant country as ours. I beg you kindly to take pains to give me formulæ for the process. Mr. Bothamley, in his 'Ilford Manual of Photography,' says that with the combination of ferric and ferrous salts such a printing process is obtained, but he does not give a definite formula for that. 2. I have seen in the Almanac for 1901, among the formulæ you have given for making sensitive plates, the words, 'Washed emulsion.' How is an emulsion washed? Will you kindly explain it to me? 3. Another inquiry I beg you kindly to answer. I have made two large trays of wood, 24 in. by 30 in., in which to develop the enlargements I make. I have coated with oil paint inside and outside, and used them with success three years. Now the wood has become cracked, so I am thinking of coating the trays with a thicker solution of resin—like bitumen—tar, &c. Will you kindly give me some formula for such coating." In reply:—1. We know of no printing-out process that will fulfil your requirements. The method you refer to is, doubtless, a development one. 2. By a washed emulsion is meant one from which the haloid salts are washed out before it is used. The emulsion is poured into a dish and the ether and alcohol allowed to evaporate, and then it is washed, afterwards dried, and then re-dissolved in fresh ether and alcohol. 3. Melt and mix together bitumen and beeswax, about four or five parts of the former to one of the latter, and apply hot to sides of the trays.

Letters, Answers to Correspondents, &c., are again unavoidably held over.

THE BRITISH

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EX CATHEDRA.

German Trade in Photographic Materials.

The *Photographisches Wochenblatt* recently published part of a pamphlet written by Fritz Hansen on the trade in photographic materials in Germany. The publication, of course, has special reference to the proposed increment of duties upon German imports, yet some very interesting statistics are given, which enable us to form definite ideas of the extent of the trade, the value of the exports, and the principal articles the latter include. German exports of photographic requisites amount to the sum of £550,000, and this sum represents about half the entire output of these goods in Germany. One of the most important articles of export is photographic papers, their value being about £155,000. Photographic lenses, of course, also represent a considerable sum, and rank for £125,000. Photographic chemicals must also be a valuable item, but the amount is not stated. According to the writer, plates and cameras are likewise amongst the most important articles of export. What surprises us, however, is the statement that two-thirds of the dry plates made in Germany are exported. According to the figures given above, German foreign trade in photographic goods, apart from paper and lenses, amounts to £270,000. A very considerable deduction must be made for the value of chemicals and cameras, and we may therefore conclude that the value of the dry plate industry in Germany must be comparatively small. It would be rash to assume, even within these limits, the value of the total production of German dry plates. But if we take the maximum figure, £270,000, which is obviously far in excess of the value of the dry plates exported, the consumption of dry plates in Germany cannot represent a total value of £135,000. We are informed by the writer that few foreign plates are imported, and it must therefore be considerably less.

* * *

The German Professional Photographer.

The statistics we have quoted in the foregoing paragraph are not only interesting from a commercial point of view, but they throw some light upon the position of the professional photographer in Germany. We hear the echo of their wailings of complaint, and the figures prove the truth of their unfortunate lot. In Germany there are about 4,500 professional photographers, exclusive of assistants, and as the professional uses plates for his work, it follows that the average consumption of dry plates in the studio of the German photographer is very considerably below £30 per annum. Perhaps we should be justified in taking half that amount as the average consumption. It must also be remembered that German dry plates are more expensive than English. By the light of these facts, can there be surprise that the German photographer is so discontented with his position that he turns his back on the country of his birth and seeks more profitable employment in other lands?

* * *

The Lippmann Process and Colour Photography.

From a short article in "Liesegang's Photographischer Almanach for 1902," by Dr. R. Neuhauss, we gather some interesting news concerning the progress of photography in natural colours. To the amateur in search of a new field of investigation the Lippmann process should be very attractive, especially as the prospect of obtaining suitable gelatine plates commercially lies before us. They are now made by G. Braun, of Berlin, and the price, fifteen shillings per dozen for 9 x 12 c. size, is so tempting that other manufacturers may be induced to enter the field. Concerning the future of colour photography and the possibility of producing a direct colour photograph independent of the process by interference, Dr. Neuhauss seems very sanguine. He writes that he has made some highly-promising experiments with a preparation of about the same degree of sensitiveness as albumenised paper, and that it gives a direct colour photograph. Moreover, the image can be fixed. Before publishing details in the Rundschau, he wishes to improve the sensitiveness, so that the process may be used for direct photographs in the camera.

Water Varnish. Probably few among the many thousands of amateur photographers are aware of the valuable properties of what is termed "A Water Varnish." Seeing that this useful chemical is not sold like other varnishes generally are by photographic dealers, the chances are that many of our readers whose experience does not date back beyond the introduction of the modern dry plate may never have heard of such a varnish. On the other hand, those who can look back upon a studio practice in the days of wet collodion will require no reminder of the advantages this simple wash conferred on a collodion film by reason of its being a certain preventative of the film splitting. In cases where only one or two proofs were required from a negative, its application did away with the necessity of the additional operation of varnishing by means of a spirit varnish. It also provided a most excellent tooth to the surface of the film, to enable any amount of retouching being performed. It is not only in connection with its application to a wet collodion film that water varnish forms a valuable addition to the stock of chemicals in all-round photography. It is almost invaluable in the case of gelatine, as with wet collodion films. In the case of gelatine negatives, the water varnish is applied in the shape of a wash directly after the negatives have been washed to free their films from all traces of hypo, or in other words, at that stage when the usual drying operation would begin. After the varnish has been applied the films are dried in the usual manner, and its application will soon convince anyone that has experienced the difficulty of retouching by reason of the want of a tooth in the film to make a lead pencil bite, as the saying goes, that, were this the only benefit accruing from its application, it is well worthy of being employed.

* * *

How to Use the Varnish. The use of water varnish, however, does away with the necessity of employing collodion as an additional protection to a negative, and is perhaps the best-known remedy against damage from silver staining that experienced workers are acquainted with. As a varnish it is not costly, neither is it difficult to make in reasonably small quantities; whilst its application is simplicity itself. To those desirous of benefiting by its use, we recommend the following formula as one that will yield an excellent sample of water varnish:—Place in a clean enamelled pan one pint of water, into which insert four ounces of shellac in thin flakes, and place the vessel on a fire or gas stove until the water is raised to 212 deg. Fahrenheit. When this temperature is reached a few drops of a hot saturated solution of borax is dropped into the boiling pan containing the shellac and water, taking care to stir vigorously with a long strip of glass until the shellac is all dissolved. Too much borax should not be added, only just sufficient to cause the shellac to dissolve, and it is better to stop short, if anything, before all the flakes dissolve out than to add too much borax. The solution is then filtered carefully, and when cold the water varnish is ready for use.

* * *

Workers and Workers in Photography. It is curious to note how in photography one worker will succeed with a process or material, while another will entirely fail, even when employing identical materials. The report of the meeting of one of the London societies in our last issue is a case in point. One speaker showed some prints on a paper that had been distributed at a previous meeting, saying that he could not get a good black upon it. Another speaker said that he had not failed to get a good black with it; while a third said that he had got intensely black pictures upon the paper. Here the same paper was used in each case. Why did two succeed and the one fail? It ever was so in photography. In the days of the wet collodion process one photographer would swear by, say, Brown's collodion, averring that Smith's, Jones', and all others were rubbish; while another would assert that Brown's was no good, and that Smith's was the only one that would yield good negatives, etc. It was the same with the different brands of albumenised paper. The same obtains still with dry plates, with bromide papers, and also with P.O.P.s, as well as with developers. What one will consider the best, another will fail altogether with, and *vice versâ*. As we have just said, it ever was so in photography, and we expect it ever will be. There are workers and workers in it, as in everything else, and with varying degrees of skill to adapt themselves to circumstances. We often have to answer correspondents something to this effect, "Why cannot I get good tones on ——'s paper?" "Why do I fail to get density with ——'s plates?" etc. Now we know that the materials are beyond reproach, and the answer, if we gave it in "plain English," would be that you do not use them properly. We always try to help further, but that is not possible with some workers.

* * *

The Copyright Question. Parliament has again opened, and no reference was made in the King's Speech to the question of any new copyright Bill. This seems to be a matter of regret to Mr. T. E. Scrutton, K.C., as, in a lecture on "The Law of Literary and Artistic Property," which he gave in the Old Hall of Lincoln's Inn, one day last week, he is reported to have said that the complicated question of copyright did not find a mention in the King's Speech, but there was a measure to improve the law relating to lunatics. After giving a history of the growth of copyright, he remarked that for several years attempts had been made to induce Parliament to deal with the subject, and it was a matter of regret that the Government should not make some endeavour to pass a Bill upon which a strong Committee had bestowed three years of hard labour. He added that it was a public scandal that the law of copyright should remain in the condition in which it was at present. Reference was made a few years back in one or two of the late Queen's Speeches to a proposed amendment of the copyright law, but nothing was done; business of a more important character engaged the full time of the House. Two or three new Bills relating to artistic copyright have been drafted, but they have all been in the interests of painters and publishers, and quite against those of photographers. Whether either of these will be reintroduced in the House during the present Session remains to be seen, but in the face of what Parliament already has before it, the matter is somewhat doubtful; or, if introduced, time could be found to discuss and pass it through both Houses. We have no doubt that the Professional Photographers' Association and the Photographic Copyright Union will keep a watchful eye on any measure that may be brought forward. Such work is one of their objects. Photographers are perfectly satisfied with the Act of 1862 as it stands, as it gives them ample protection against unscrupulous publishers who would like to utilise their pictures without payment.

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Mosquitoes and Colour. Seldom has a photographic studio been put to such a strange use as that in which certain most valuable experiments were recently carried out at Cambridge, under the supervision of Dr. Nuttall and

Mr. A. E. Shipley. The glasshouse in question was turned into a vast breeding-cage for mosquitoes in order that observations might be made upon the supposed preference of those irritating and dangerous insects for certain colours. Our readers are doubtless already aware that it has been established that members of this family are partly, if not wholly, responsible for spreading malaria, yellow fever, and possibly other contagious diseases, and that where it has been practicable to prevent their breeding, such diseases have been entirely stamped out. It would seem, from the experiments to be presently described, that travellers in mosquito-haunted regions have a means of protecting themselves from the assaults of this insect enemy to human life which was not until lately suspected. It is now certain that these creatures have a partiality for certain colours and shades of colour, and that if a traveller be careful to avoid these tints in choosing the material for his clothing, he at once removes the temptation the insects would otherwise feel to settle upon his person. In the experiments referred to, large breeding pans, with suitable food, were provided, and the insects increased and multiplied without difficulty. At one side of the studio a number of box-like nests were placed, each box being lined with a differently coloured cloth. And the position of these boxes was changed every day during the period over which the experiments lasted, so as to eliminate any preference due to place or light access. Careful note was taken each day of the number of mosquitoes found in each box, and when these figures were added together at the end of the 17 days during which the experiments lasted, some very curious results were shown. Navy blue appears to be the favourite colour with mosquitoes, for no fewer than 108 were found clinging to the cloth box of that hue. Ninety mosquitoes liked dark red, 81 reddish brown, 59 scarlet, 49 black. Then comes a sharp drop to 31 mosquitoes found in the slate-grey box, 24 in that lined with olive green. The light blue box held only 3 mosquitoes, the ochre and white contained only 2 each, the orange box had 1, and the pale yellow khaki none at all. This preference of mosquitoes for certain colours has been noted before by certain travellers; for example, it is recorded that, while a black dog was severely bitten, his yellow companion was not molested. But this is the first occasion upon which the question has been submitted to careful examination.

* * *

Toning Baths. A very interesting series of experiments, of great importance to amateur and professional photographers, has been made by Herr Franz Novak, of the Vienna Technical School. By desire of Dr. Eder, he has made a quantitative analysis of the amount of gold and silver contained in prints upon albumen and collodion paper toned with the following baths:—

Borax Bath—500 c.c. of a 2 per cent. solution of acetate of soda.
100 c.c. of a 1 per cent. solution of borax.
12 c.c. of a 2 per cent. solution of chloride of gold.

Sulpho-cyanide Bath A—1,000 c.c. distilled water.
40 grammes fused acetate of soda.
B—250 c.c. distilled water.
5 grammes sulpho-cyanide of ammonium.
For use, 100 c.c. each of A and B, with addition of 5 c.c. of a 1 per cent. solution of chloride of gold.

Combined Bath—1,000 c.c. water.
200 grammes hyposulphite of soda.
10 grammes nitrate of lead.
For use, add 5 c.c. of a 1 per cent. solution of gold to 100 c.c. of toning bath.

50 landscape prints, 13 x 18 c., were used in each instance, and by way of comparison, light and heavily toned sets were made. The light were toned to the brownish red-purple, and the heavy to the usual blue-violet stage. The following tabulated results are published with the paper in the *Photographisches Correspondenz*:—

Paper.	Gold (Milligrammes per square metre.)	Silver (Milligrammes per square metre.)	Relative proportion of gold to silver.
Albumen lightly toned with borax bath	24.9	123.5	1 : 4.96
,, heavily ,, ,, ,, ,,	28.0	122.0	1 : 4.3
Smooth celloidin A. lightly toned with sulpho-cyanide bath	58.1	49.1	1 : 0.84
,, ,, B. ,, ,, ,, ,, ,,	30.3	97.8	1 : 3.2
,, ,, A. heavily ,, ,, ,, ,,	122.2	31.2	1 : 0.25
,, ,, B. ,, ,, ,, ,, ,,	89.7	76.9	1 : 0.85
,, ,, A. lightly ,, ,, combined bath	25.2	80.3	1 : 3.18
,, ,, B. ,, ,, ,, ,, ,,	28.6	134.6	1 : 4.7
,, ,, A. heavily ,, ,, ,, ,,	37.6	43.1	1 : 1.14
,, ,, B. ,, ,, ,, ,, ,,	42.7	85.4	1 : 2.0

The celloidin papers A. and B. were bought of different Viennese manufacturers.

Herr Novak remarks that the amount of gold taken up depends in the first place upon the nature of the sensitive film. For instance, celloidin requires more gold for a given tone than albumen. At the same time, the less the quantity of silver in the print, the greater is the quantity of gold. The nature of the toning bath also has an influence upon the quantity of gold requisite to obtain a given tone, and it will be seen that the sulpho-cyanide bath involves the use of more gold than the combined bath. If the stability of a print depends upon the amount of gold it contains, then manufacturers are right in recommending the use of the sulpho-cyanide bath. It would have been very interesting had a set of gelatine prints also been included in the series of experiments.

* * *

Portraits and Likenesses. Synonymous terms, some will say, but the thoughtful know better. A skilful photographer will, as a result of his skill and experience, take a portrait which is also a likeness of his sitter, but there are hundreds of portraits turned out every week which are not like those whom they are supposed to represent. It is quite a common thing to be shown one of these pictures by the person whose portrait it is, and to whom it seems to give every satisfaction. Possibly, under the retoucher's skilful hand it has been flattered in some way, a wrinkle or two softened down, and the clock put back a few years. Has it occurred to many people that a sitter is quite the worst judge of his own portrait, for the simple reason that his knowledge of his own individuality is gained from the looking glass, in which, of course, every feature is reversed in position? It would be brutal to speak out one's thoughts on being shown one of these sophisticated portraits; if we venture to say that it is not a very good likeness, it is tantamount to saying that we think it flattered. Happily for photographers, it is an axiom among the general public, usually dubbed "the man in the street," that a photographic portrait represents the truth, and nothing but the truth. Good photographers and good painters know better, and are fully aware that to make a really satisfactory picture the face of each sitter must be studied as to expression, unless, indeed, they have to portray one of those immobile, vacant countenances, which merely call for the care it is necessary to expend upon a map or diagram. This belief in the Washington-like truth of the camera has led the careless to deplore the circumstance that photography is only half a century old. It would be so interesting, so they think, to have authentic

portraits of those who helped to make history before the dawn of the Victorian era. We do not share in these regrets. Our reason is that we are certain that the numerous historical portraits handed down to us, and now to be seen in our public galleries, and in those occasional exhibitions like that of "The Monarchs of Great Britain and Ireland," now open at the New Gallery, are both authentic and accurate likenesses of those whom they represent. It stands to reason that a portrait which failed in its first essential would not be preserved. But we have the opportunity in many cases of comparing the portraits of celebrities which have been executed by different artists. In the exhibition just referred to are several such portraits of Queen Elizabeth, Queen Mary, and others. In the National Portrait Gallery, and in other collections, similar opportunities of comparison occur, and it is not too much to say that the correspondence in feature and expression between these several likenesses of the same individual could not be closer if the pictures had been produced by photographic agency.

THE PHYSIOLOGICAL BASIS OF THREE-COLOUR WORK.

THERE are probably few such fascinating subjects to the physicist as those presented by the study of colour phenomena, and though to the average photographer the many problems connected with heliochromy must necessarily remain unsolved, there can be but few amongst us who have not heard something or other about three-colour work. At the present time the science of reproducing an object in colours by the trichromatic method is in a fairly advanced stage, and the class of work which is turned out by our leading printers is very much superior to what was done even such a short time ago as five years. The technical schools, which are doing such good work throughout the country, have in many cases taken up this branch of reproduction, and send out men whose work bears the impress of thoughtful and skilful labour. These men, moreover, in many cases further extend the instruction they have received at these institutes by after-study, and possibly by private experimenting, and find themselves taking a real interest in a subject which is pregnant with great possibilities for ardent workers. The subject of three-colour photography is by no means the simple one that many people seem to consider it, and the man who intends to succeed in it has to extend his labours into other regions than that of pure photography. No better example of the truth of this can be taken than by reading the life of James Clerk Maxwell,* who is very properly regarded as the pioneer of three-colour photography.

In studying Maxwell's work in this branch of science we are at once brought into contact with the physiologist, physicist, and mathematician, and it is from these three positions that we should endeavour to follow him. Let us take as an illustration his great experiment of colour-mixing by means of a top. The top consisted of a disc of metal, covered with white paper, and mounted on a suitable spindle, the circumference of which was divided into 100 equal parts. Three discs were then placed over the spindle and on to the graduated metal disc. These three discs were coloured respectively vermilion, ultramarine, and emerald green, and were capable of adjustment to allow of any amount of either colour to show; two smaller discs of black and snow white were also used. Working, then, on Hartley's teaching, "that the duration of the sensation promoted by a momentary stimulus excites activity and change in the retina of the eye, which lasts a measurable period," and further remembering Young's three-colour sensation work (see article on the McDonough-Joly process in the BRITISH JOURNAL OF PHOTOGRAPHY, January 18th, 1901, A. V. Kenah), in which he explains that "the quality of any colour depends, according to this theory, on the ratio of the intensities of the three sensations which it excites, and its brightness depends on the sum of these three intensities," Maxwell proceeded to measure the necessary proportions of his three colours to produce a neutral grey. By means of trial and error he so adjusted his black and white discs that he obtained, on spinning his top, the effect of a neutral grey, and similarly adjusted his three coloured discs so that on again spinning his top the effect produced on his retina by these three colours was the same as that produced by the black and white revolving sections. Measuring the exposed sections against the graduated circumference of his top, and putting the result in the form of an equation, Maxwell found that .37 V + .27 U + .36 E G = .28 S W + .72 Bk.

But Maxwell did more than this. He elaborately plotted out diagrammatically the constitution of these three primary colour-sensation tints, and his work has been taken as the standard basis for trichromatic photography by nearly all practical workers. Captain Abney, however, redetermined these curves, and his results are not precisely the same as Maxwell's. It is very important to note this, as it is absolutely essential that the basis one works on should be correct.

There is a desire among some three-colour men to make the process entirely a photographic one, whereas its fundamental principles are purely physiological. Whether the work be to produce records for Ive's Kronskop, transparencies for the lantern, or photo-mechanical work, it matters not, the physiological basis is the only one to work on. It is true that the imperfections of photographic emulsions and dyes and inks render many turnings from the direct path necessary—in the case of the Kromskop the screens and the plates must be mutually adjusted, while for the "minus" work, the colour curves of the dyes or ink must first be accurately determined, and then the taking screen adjusted to these curves, as well as to the chromatic properties of the plates which are being used. It must, however, be clearly understood that these various isolated adjustments are to be regarded as but factors jointly and severally necessary for the true realisation of the physiological fundamental colour curves. The problems to be solved are most difficult, but until they are universally recognised and settled we shall be working loosely, and will have to resort to diverse artificial methods to conceal the ill effects of our handicraft. The theoretical ideal may not be capable of realisation, but there is room for many improvements, *e.g.*, the taking screens, plates, and printing inks could be sold as a set mutually adjusted to each other, and the whole adjusted to a recognised or standard basis, instead of as at present, in most cases at any rate, a dissociated quantity. More and more attention is being given nowadays to three-colour work, and it should be the aim of both teachers and students, as well as practical workers, to thoroughly grasp the physiological fundamentals of the science, and to subordinate all their photographic work to the realisation of its teachings.

* Life of James Clerk Maxwell. Lewis Campbell, M.A., and William Garnett, M.A. Macmillan & Co., 1882.

THE "Teb" Competition.—In addition to the prize-winners already published, Mrs. G. A. Barton, of Four Oaks, Birmingham, was awarded a complimentary first prize of five guineas in the 5 x 4 Amateur Class, also a guinea prize in the same division, and a first prize of five guineas in the Bullet Class.

THE CARBON PROCESS: AWARD OF THE R.P.S. PROGRESS MEDAL TO MR. J. W. SWAN.

After the respectable interval of 38 years, the work of Mr. Joseph Wilson Swan, in rendering the carbon or pigment process of photographic printing a practicable one for commercial purposes, has received the highest photographic recognition in the world by the bestowal upon the inventor of the Progress Medal of the Royal Photographic Society. It was in the year 1864 that Swan's patent for the provision of a temporary support and development from the back of the image was published. As many of our younger readers may be unaware of the details of the method devised by Mr. Swan, we append an abstract of the inventor's description of his process, which undoubtedly conduced to the popularity of one of the most beautiful systems of printing placed in the hands of photographers:—

"My invention consists in the formation of tissues composed of, or prepared with, coloured gelatinous matter, and so constructed that, while they allow, in the act of printing, free access of light to one surface of the coloured gelatinous matter, they also allow free access of water, and the unobstructed removal of the non-affected portions of the coloured matter from the opposite surface, or back, in the act of developing; and I obtain this result either by the disuse of paper altogether, or by the use of it merely as a backing, or temporary support, of the coloured gelatinous matter; the paper so used becoming entirely detached from the coloured gelatinous matter in the act of developing, and forming no part of the print ultimately. My invention consists, furthermore, in the special mode of using the said tissues, whereby superior half-tone and definition in the print are obtained as aforesaid, and also in a mode of transferring the print after developing from a temporary to a permanent support, so as to obtain a correction in the position of the print in respect of right and left. In producing the photographic tissues referred to, I form a solution of gelatine; and for the purpose of imparting pliancy to the resultant tissue, I have found it advisable to add to the gelatine solution, sugar or other saccharine matter, or glycerine. To the said gelatinous solution I add carbonaceous or other colouring matter, either in a fine state of division, such as is used in water-colour painting, or in the state of a solution or dye, or partly in a fine state of division, and partly in solution. With this coloured gelatinous solution I form sheets or films, as hereafter described, either at the time of their formation, by introducing into the gelatinous compound bichromate of ammonia, or other agent of like photographic properties, or by applying to such non-sensitive sheets or films, after their formation, a solution of the bichromate, or other substances of like photographic property. This latter method I adopt when the sheet or film is not required for use immediately after its formation. I will, in my future references to the bichromate of ammonia or the bichromate of potash, or to other chemicals possessing analogous photographic properties, denominate them "the sensitiser"; and in referring to the coloured gelatinous solution, I will denominate this mixture 'the tissue-compound.' When the tissue to be produced is required for immediate use, I add the sensitiser to the tissue-compound; but where the tissue is required to be preserved for some time before using, I prefer to omit the sensitiser from the tissue-compound, with a view to the tissue being made sensitive to light subsequently, by the application of a solution of the sensitiser.

"With respect to the composition of the tissue-compound, it will be understood by chemists that it may be varied without materially affecting the result, by the addition or substitution of other organic matters, similarly acted upon by light, when combined with a salt of chromium, such as I have referred to. Such other organic matters are gum-arabic, albumen, dextrine; and one or more of these may be employed occasionally to modify the character of the tissue-compound, but I generally prefer to make it as follows:—I dissolve, by the aid of heat, two parts of gelatine in eight parts of water, and to this solution I add one part of sugar, and as much colouring matter in a finely divided state, or in a state of solution, or both, as may be required for the production of a photographic print with a proper gradation of light and shade. The quantity required for this purpose must be regulated by the nature of the colouring matter employed, and also by the character of a negative to be used in the printing operation. Where it is desired that the colouring matter of the print should consist entirely, or chiefly, of carbon, I prefer to use lampblack finely ground and prepared as for water-colour painting, or I use Indian ink; and where it is desired to modify the black, I add other colouring matter to produce the colour desired. For instance, I obtain a purple black by adding to the carbon indigo and crimson lake, or I add to the carbon an aniline dye of a suitable colour; where the colouring matter used is not a solution or dye, but solid matter in a fine state of division, such as Indian ink or lampblack, I diffuse such colouring matter through water, or other inert liquid capable of holding it in suspension; and after allowing the coarser particles to subside, I add, of that portion which is held in suspension, as much as is required, to the gelatine solution. In preparing tissue to be used in printing from negatives technically known as 'weak,' I increase the proportion of colouring matter relatively to that of the tissue-compound; and I diminish it, for tissue or paper to be used in printing from negatives of an opposite character. Having prepared the tissue-compound as before described, I proceed to use it as follows:—For preparing sensitive tissue, I add to the tissue-compound more or less of the sensitiser, varying the quantity added, according to the nature of the sensitiser, and to the degree of sensitiveness to be conferred on the tissue to be produced from it. For ordinary purposes, and where the tissue-compound is made according to the formula before given, I add about one part of a saturated solution of bichromate of ammonia to ten parts of the tissue-compound; and I make this addition immediately previous to the preparation of the tissue, and I maintain the tissue-compound in the fluid state, by means of heat, during the preparation of the tissue, avoiding the use of an unnecessary degree of heat; I also filter it through fine muslin or flannel, or other suitable filtering medium, previous to use; and I perform all the operations with the tissue-compound, subsequent to the introduction of the sensitiser, in a place suitably illuminated with yellow or non-actinic light. In forming tissue upon a surface of glass, I first prepare the glass, so as to facilitate the separation of the tissue from it. For this purpose I apply ox-gall to the surface of the glass (by means of a brush, or by immersion), and allow it to dry. The glass is then ready for coating with the tissue-compound, or I apply to the glass a coating of collodion, previous to the application of the coating of tissue-compound. In this case the preparation with ox-gall is unnecessary. When collodion is used, the collodion may consist of about ten grains of pyroxyline in one ounce of mixture of equal parts of sulphuric ether and alcohol. I apply the collodion by pouring it on the surface to be coated, and draining off the excess, and I allow the coating of collodion to become dry before applying the coating of tissue-compound. I generally use a plane surface on which to form the tissue, but surfaces of a cylindrical or other form may be sometimes used advantageously. In preparing sheets of sensitive tissue on a plane surface of glass, I prefer to use the kind of glass known as plate, or patent plate. Before applying the sensitive tissue-compound, I set the plate to be coated so that its upper surface lies in a horizontal position, and I heat the plate to about the same temperature as the tissue-compound, that is, generally, to about 100 deg. Fahr. The quantity of the tissue-compound that I apply to the glass varies with circumstances, but is generally about two inches to each square foot of surface coated. After pouring the requisite quantity of the tissue-compound upon the

surface of the plate, I spread, or lead the fluid by means of a glass rod, or soft brush, over the entire surface, taking care to avoid the formation of air bubbles; and I keep the surface in a horizontal position, until the solidification of the tissue-compound. In coating other than plane surfaces I vary, in a suitable manner, the mode of applying the tissue-compound to such surfaces. In coating a cylindrical surface, I rotate the cylinder in a trough containing the tissue-compound, and after having produced a uniform coating, I remove the trough, and keep up a slow and regular rotation of the cylinder until the coating has solidified. After coating the surface of glass or other substance as described, I place it in a suitable position for rapid drying, and I accelerate this process by artificial means, such as causing a current of dry air to pass over the surface coated, or I use heat, in addition to the current of air, or I place it in a chamber containing quicklime, chloride of calcium, or other substance of analogous desiccating property. When the tissue is dry, I separate it from the surface on which it was formed, by making an incision through the coating to the glass, around the margin of the sheet; or I cut through the cylindrical coating near the ends of the cylinder, and also cut the coating across, parallel with the axis of the cylinder, when, by lifting one corner, the whole will easily separate in a sheet. Where the tissue-compound is applied over a coating of collodion, the film produced by the collodion, and that produced by the tissue-compound, cohere, and the two films form one sheet. Sometimes, before the separation of the coating from the glass, I attach to the coating a sheet of paper, for the purpose of strengthening the tissue, and making it more easy to manipulate. I generally apply the paper, in a wet state, to the dry gelatinous surface; and having attached the paper thereto in this manner, I allow it to dry; and I then detach the film and adherent paper from the glass by cutting round the margin of the sheet and lifting it off as before described. Where extreme smoothness of surface, such as is produced by moulding the tissue on glass, as described, is not of importance, and where greater facility of operation is desired, I apply a thick coating of the tissue-compound to the surface of a sheet of paper. In this case the paper is merely used as a means of forming and supporting temporarily the film produced from the tissue-compound; and such paper separates from the gelatinous coating in a subsequent stage of my process. In coating a surface of paper with the sensitive tissue-compound, I apply the sheet, sometimes of considerable length, to the surface of the tissue-compound contained in a trough, and kept fluid by means of heat, and I draw or raise the sheet or length of paper off the surface with a regular motion; and I sometimes apply more than one coating to the same sheet in this manner. After such coating, I place the coated paper where it will quickly dry, and seclude it from injurious light.

"The sensitive tissue, prepared as before described, is, when dry, ready to receive the photographic impression, by exposure under a negative in the usual manner, or by exposure in a camera obscura to light transmitted through a negative in the manner usual in printing by means of a camera. I prefer to use the sensitive tissue within two days of the time of its preparation. Where the tissue is not required for immediate use, I omit the sensitiser from the tissue-compound, as before mentioned; and with this non-sensitive tissue-compound, I coat paper, glass, or other surface, as described in the preparation of the sensitive tissue or paper. In preparing sheets of non-sensitive tissue by means of glass as described, I use no preliminary coating of collodion. I dry the non-sensitive tissue in the same manner as the sensitive, except that in the case of the non-sensitive tissue, seclusion from daylight is not necessary. The non-sensitive tissue is made sensitive, when required for use, by floating the gelatinous surface upon a solution of the sensitiser, and the sensitiser that I prefer to use for this purpose is an aqueous solution of the bichromate of potash containing about two and a half per cent. of this salt. I apply the sensitiser (by floating or otherwise) to the gelatinous surface of the tissue; and after this I place it in a suitable position for drying, and exclude it from injurious light. After exposure for the requisite time, I take the tissue from the printing frame or camera, and mount it in the manner hereinafter described—that is to say, I cement the tissue, with its exposed surface, or, in other words, with that surface which has received the photographic impression, downward, upon some surface (usually of paper) to serve temporarily as a support during the subsequent operation of developing, and with a view to the transfer of the print, after development, to another surface; or I cement it (also with the exposed or photographically impressed surface downwards) upon the surface to which it is to remain permanently attached. The surface on which it is so mounted may be paper, card, glass, porcelain, enamel, etc. Where the tissue has not been coated with collodion previous to exposure to light, I prefer to coat it with collodion on the exposed or photographically impressed side, before mounting it for development, but this is not absolutely necessary; and I sometimes omit the coating with collodion, more particularly where the print is intended to be coloured subsequently. Or where I employ collodion, with a view to connect the minute and isolated points of the print firmly together, during development, I sometimes ultimately remove the film it forms by means of a mixture of ether and alcohol, after the picture has been finally mounted, and the support of the film of collodion is no longer required. In mounting the exposed tissue or paper previous to development, in the temporary manner, with a view to subsequent transfer to another surface, I employ, in the mounting, a cement that is insoluble in the water used in the developing operation, but that can be dissolved afterwards, by the application of a suitable solvent; or one that possesses so little tenacity that the paper or other support, attached temporarily to the tissue or paper by its means, may be subsequently detached without the use of a solvent.

"The cements that may be used for temporary mounting are very various, but I generally prefer to use a solution of india-rubber, in benzole or other solvent, containing about six grains of india-rubber in each ounce of the solvent, and I sometimes add to the india-rubber solution a small proportion of dammar-gum, or gutta-percha. In using this cement, I float the photographically impressed surface of the tissue upon it, and I treat in a similar manner the paper or other surface intended to be used as the temporary mount or support during development; and after allowing the benzole or other solvent to evaporate, and while the surfaces coated with the cement are still tacky, I press them strongly together in such a manner as to cause them to cohere. When the photographically impressed but still undeveloped tissue is to be cemented to a surface, that not only serves to support the picture during its development, but also constitutes permanently the basis of the picture, I prefer to use albumen or starch paste as the cementing medium; and where I employ albumen, I coagulate, or render it insoluble in water (by means of heat, by alcohol, or other means), after performing the cementing operation, and previous to developing. In the permanent as in the temporary mode of mounting, I cement the tissue, with its photographically impressed surface downward, upon the surface to which it is to be permanently attached. After mounting the tissue, as before described, and allowing the cement used time to dry, where it is of such a nature as to require it, I then submit the mounted tissue to the action of water, sufficiently heated to cause the solution and removal of those portions of the coloured gelatinous matter of the tissue which have not been rendered insoluble by the action of light during exposure in the printing frame or camera. Where paper has been used as a part of the original tissue, this paper soon becomes detached by the action of the warm water, which then has free

access to the under stratum or back of the coloured gelatinous coating, and the soluble portions of it are therefore readily removed by the action of the water; and by this means the impression is developed, that was produced by the action of light during the exposure of the tissue in the printing frame or camera, and the picture remains attached to the mount, cemented to the photographically impressed surface previous to development. I allow the water to act upon the prints during several hours, so as to dissolve out the decomposed bichromate as far as possible. I then remove them from the water, and allow them to dry, and those not intended for transfer, but that have been permanently attached to paper, previous to development, I finish by pressing and trimming in the usual manner. Those which have been temporarily mounted, I transfer to paper, card, or other surface. In transferring to paper or card, I coat the surface of the print with gelatine, gum-arabic, or other cement of similar character, and allow it to dry. I then trim the print to the proper shape and size, and place its surface in contact with the piece of paper or card to which the transfer is to be effected, such piece of paper or card having been previously moistened with water, and I press the print and mount strongly together; and after the paper or card has become perfectly dry, I remove the paper or other supporting material, temporarily attached, previous to development, either by simply tearing it off, where the cement used in the temporary mounting is of a nature to allow of this without injury to the print, or I apply to the temporary mount benzole or turpentine, or other solvent of the cement employed, or I immerse the print in such solvent, and then detach the temporary mount, and so expose the reverse surface of the print, and after removing from the surface of the print, by means of a suitable solvent, any remains of the cement used in the temporary mounting, I finish the print by pressing in the usual manner. If, however, the print be collodionised, and be required to be tinted with water colour, I refer to remove the collodion film from the surface of the print, and this I do by the application of ether and alcohol.

"Having now set forth the nature of my invention of 'Improvements in Photography,' and explained the manner of carrying the same into effect, I wish it to be understood that, under the above in part recited letters patent, I claim:—First, the preparation and use of coloured gelatinous tissues, in the manner and for the purpose above described; secondly, the mounting of undeveloped prints, obtained by the use of coloured gelatinous tissues, in the manner and for the purpose above described; thirdly, the remounting or transference of developed prints, produced as above described, from a temporary to a permanent support." Mr. Swan, who was born at Sunderland in 1828, is a Fellow of the Royal Society; Past President of the Society of Chemical Industry; Past President of the Institution of Electrical Engineers; and a Vice-President of the Royal Photographic Society.

TIMING DEVELOPMENT.

It is a pity that so few photographers adopt the method of timing development invented by Mr. Alfred Watkins. It is a method that should be adopted by all professionals, but probably few have ever taken the trouble to read about it, and fewer still to test it. Yet it is absurdly simple, needs no special apparatus, and can be applied to every developer except pyro and ammonia, for the ammonia developer is changing during the whole course of development, as the strength of the alkali is diminishing during the process. But it can be used with any developer made up with a fixed alkali. For the professional photographer, who has large numbers of plates to develop, it is particularly valuable, as it enables him to put the development into the hands of an assistant with the certainty of producing negatives of even density, provided that the exposures have been correct. It can be applied to any kind of plate, and even to plates of different makers, developed in the same dish. The method has often been described, but it is worth while going over it again. We will suppose that the photographer has a day's portrait exposures to develop, exposures which have been fairly correct, and that he uses his favourite developer, whichever that may be, except pyro and ammonia, and wishes to test the timing method. Having mixed his developer, he places his watch where it can be easily seen, and having noted the time, he pours the developer on to the plate and notices how long the parts which he wishes to print white take to appear. Having done so, he proceeds with development just as usual, and when the plate appears to have attained the density he wishes (which he judges in the usual way by looking on the back and through the plate) he notes how long the whole process of development has taken. He can now wait until the plate is fixed and examine it to see if the density is correct. If it is too dense the time of development has been too long, and if too thin it was too short. If the plate is right he can secure the same density in all the rest, if they have been properly exposed, but he must first find out the proper factor for multiplying the time of appearance to obtain the total time of development. This is done by dividing the total time of development by the time of appearance.

We will suppose that the time of appearance is thirty seconds, and the total time of development five minutes. Thirty seconds into five minutes goes ten times, and therefore his multiplying factor is ten. He may now hand over the rest of the plates to an assistant with the necessary instructions, which, if carefully followed, will produce a set of negatives of even density, provided of course that the exposures have been correct. If the assistant, by an error, should dilute the developer too much or too little, the result will be the same, as the addition of water merely lengthens the time of development and of appearance in the same proportion. The question of temperature has not been considered, but it has a marked effect in development, as every photographer knows. The temperature of the development should be kept uniform during the whole process. As a lesson in development it is worth while taking an exposed plate and cutting it in two, and developing one half with normal developer, carefully noting the time of appearance and the total time of development, and then developing the second half with the same developer largely diluted, again noting the time of appearance and multiplying it by the factor, found in developing the first half, to obtain the proper total time of development When fixed the two halves will be of exactly the same density. This is a fact which few will accept, but let them try the experiment, and they will be convinced. I was sceptical myself until I undertook some demonstrations to illustrate a paper by Mr. Alfred Watkins before the Birmingham Photographic Society. I had previously exposed some plates for experiments. Having cut one in two, Mr. Watkins asked me to take one half and pour on a developer, of whose constituents he was ignorant. "Tell me," he said, "when you pour on the developer, and when the image begins to appear, and also when you think development is complete." These directions were followed and the first half put into the fixing solution. "Now," he said, "take the second half and dilute the developer as much as you please. Tell me when you pour it on, and also when the image begins to appear, and I will tell you when to stop." When the two halves were fixed it was impossible to tell which was which; yet one was developed for a much longer time than the other, but in developer diluted with five or six times as much water.

It may be argued that this method of working reduces photography to a mere mechanical process. But such an argument is absurd. It is no more mechanical than weighing and measuring developers or timing exposures. If the photographer wishes to produce any special effect he knows that he needs a special kind of negative, and gives such an exposure and development as he

thinks will give him the negative he desires, and by adopting the timing method he can at any time be sure of getting just the amount of density needed. In addition, he can insure that his negatives are of much more uniform quality, as far as density is concerned; and that uniformity will be a great saving of time, materials and temper when printing. What would not the printer, the retoucher, and the enlarger give to have uniform negatives? In addition, he will have the advantage already mentioned, of being able to entrust the development of plates to an assistant, with the confidence that if his instructions are followed the negatives will be good. The newer developers, such as ortol, &c., can be used for several plates in succession, but after the second time of using they not only become much slower in working, but produce a different appearance, as the image will show through on the back of the plate at an earlier stage of the development, and if the density is judged by the back of the plate only it will be taken out and fixed before it is sufficiently developed. But by the timing method exactly the same density can be secured as with fresh developer. The plate need not be taken out of the dish to examine it at all, so that there is no frilling at the edges from handling; the fingers need scarcely touch the solution, and the plate will not be fogged by holding it near the dark-room lamp to judge its density. The advantages are so many that it is surprising that so few have adopted the method, but photographers are so conservative and so disinclined to adopt anything which involves a little extra care at one stage, even if it saves much trouble later on. Although the timing can be done with a watch, it is better to use the Eikronometer specially made for the purpose; it has a dial which is easily seen in the dark-room, and also a slide-rule arrangement which saves the trouble of calculating.

HAROLD BAKER.

THE PRODUCTION OF COLLODION NEGATIVES AND PRINTING ON ALBUMENISED PAPER IN THE EARLY DAYS OF THE PROCESS.

ALTHOUGH the use of albumen paper at the present day is confined, I believe, to a few professional photographers for special purposes only, I am quite at one with Mr. Harris* in his statement that albumen prints can be made to yield in quality of tone and appearance more pleasing and artistic effects than the highly-glazed gelatino-bromide or chloride papers of to-day. I am speaking from personal experience which dates back to the sixties, when the wet collodion process and albumen paper printing were the only processes in general use. The collodion from which the early negatives were made was iodized either with iodide of cadmium or iodide of potassium and developed with pyrogallic acid, which gave a very dense image, and of a different colour to the dry plates of to-day. These negatives were strong in contrast and somewhat deficient in half-tone, and in order to get uniformity in the prints, and to produce the best results the printing was done in sunlight. The formula for development was as follows:—

Pyrogallic acid	10 grains.
Glacial acetic acid	3⅓ drams.
Distilled water	10 ounces.

If any intensification were needed, which was seldom the case, a few drops of a 30-gr. solution of nitrate of silver was mixed with the developer towards the end of development. In the early days this was the only preparation used for the production of negatives, but it was soon superseded by the introduction of bromo-iodized collodion and iron development. The latter gave less density in the negatives, with a maximum amount of half-tone, and to some extent had the property of resisting solarisation in the more strongly lighted parts of the image and of bringing out detail in the deep shadows. The following was the formula for development:—

Proto-sulphate of iron	¼ ounce.
Glacial acetic acid	¼ ounce.
Spirits of wine	½ ounce.
Distilled water	8 ounces.

After removing the developer and washing with water, any amount of intensity could be obtained with the following:—

Pyrogallic acid	6 grains.
Glacial acetic acid	¼ ounce.
Distilled water	6 ounces.

To as much of the above solution as may be necessary to cover the plate add a few drops of a 30-gr. solution of nitrate of silver. To develop the plate it was placed on a levelling stand, not in a dish as at present, and the developer flowed over it. The plate was adjusted to a dead level by screws affixed to the stand. The character and quality of the collodion negatives were different to those of the modern dry plate. They were clearer in the shadows, more brilliant and vigorous, and to those characteristics was due in a great measure the superiority in the tone and artistic appearance of the prints. But this was not all. Before the ready sensitised albumenised paper was placed on the market photographers sensitised their own paper. The paper, either Saxe or Rives, freshly albumenised and prepared from fresh eggs, could always be obtained from any of the leading firms of the day. To sensitise the paper it was floated for three minutes on a 60-gr. solution of pure re-crystallised nitrate of silver in distilled water, and then suspended by glass or wood clips to dry. If sensitised in the day-time it was of course done in yellow light. I generally did it over-night, and printed the next day. After sensitising, the sooner the better the printing was done.

The toning bath in general use was the acetate bath, which gave clear, warm tones, but that from which I obtained the richest tones and most brilliant prints was the phosphate of soda toning bath recommended by Hardwich. As soon, however, as ready-sensitised paper became available, which, apart from its keeping qualities, was said to print quickly and to give equal results to freshly-sensitised paper with the expenditure of much less time and trouble, the latter was doomed, although it must have been apparent to all that the results were not equal. I do not say but what good prints have been, and are probably still taken with ready-sensitised paper. I used it myself up to the advent of gelatino-bromide paper, and have repeatedly used it since, and with some papers, the makers of which it would appear invidious to name, I have obtained excellent results. But I have never succeeded even, with collodion negatives, in producing the same quality of tone and effect with the ready-sensitised paper as I did with freshly-albumenised paper sensitised by myself. The inference, then, to be drawn from these remarks is that if we wish to obtain the best results from albumenised paper we must go back to the early methods of freshly-prepared and freshly-sensitised paper, and at the same time to secure a little more vigour and intensity, with clearer shadows, in our dry-plate negatives.

THOMAS MITCHELL (Colonel).

* BRITISH JOURNAL OF PHOTOGRAPHY, December 20, 1901.

THE following are the South London Photographic Society's excursions to the Continent for the season 1902, to be personally conducted by Mr. William F. Slater, F.R.P.S.:—May 10th to May 19th, Dead Cities of the Zuyder Zee (inclusive cost, about £5); May 31st to June 9th, Rhine Valley and Ahrgau (£5 15s); June 28th to July 13th, Bernese Oberland (£10); August 9th to August 18th, Valley of the Moselle (£6); September—to be announced later. Programme and all particulars may be obtained of Mr. F. Slater at 5, Firs Parade, High Road, Lee, S.E.

MOST people know that Mr. John Brett had theories of his own concerning the laws of optics, and that he took a certain interest in astronomy. His vision was abnormal, so much so that it is said that he could make out stars with the naked eye which were indiscernable to the ordinary man without a telescope. But even those who were best acquainted with the painter's scientific interests must have been surprised at the remarkable obituary notice that appeared in a contemporary:—"Mr. John Brett, A.R.A., the well-known Indian astronomer, has died at Daisyfield, Putney Heath-lane, in his seventy-first year."—"The Morning Post."

THE HALF-TONE TRICHROMATIC PROCESS.

(A paper read at the stated meeting of the Franklin Institute, held Wednesday, November 20, 1901.)

UNTIL recently, all of the finest colour printing has been done by the chromolithographic process, employing from seven to twenty stones, with as many inks and impressions, and the necessary drawings upon these stones have been made by specially trained lithographic artists. It has long been thought by some that in accordance with the trichromatic theory of colour vision, three printing surfaces, colours, and impressions might be substituted for the seven to twenty of the chromolithographer, and that the preparation of these surfaces might be accomplished by photography. The only commercially successful development of this idea to-day is by the employment of three half-tone process blocks made from a trichromatic negative colour record, and printed with three coloured inks in the type press. It will no doubt interest those present to know that the first public exhibition of a reproduction by this method was at the Novelties Exhibition of the Franklin Institute, in 1885.* This example was made by me in 1881, when I was the only man in the world engaged in the production of half-tone process blocks† and ten years before anybody else is known to have made a half-tone trichromatic reproduction. The time was not then ripe for the commercial development of such a process, which demands conditions in the printing office which have been realised only after many years, by a process of evolution which was greatly stimulated by the introduction of the half-tone photo-engraving process.

The half-tone trichromatic process was first commercially exploited less than ten years ago, and is already a competitor of chromo-lithography, because cheaper and more direct; but the quality of the product has been, up to the present time, so uneven as to have brought the process somewhat into disrepute. This state of affairs is due largely to the fact that such success as is achieved generally depends very largely upon the degree of skill available in the correction of errors and defects in the operation of the process by re-etching the half-tone blocks—a procedure technically and appropriately known as "faking." I have always contended that conditions could be secured which would make it possible to obtain the best results almost automatically, and it is my purpose in preparing this paper to show how this may be accomplished. As in all other practical forms of the trichromatic process, we commence with three photographs to represent the analysis of all colours into proportions of three "primary" or fundamental colours, and it is evident that correct results cannot be obtained without the aid of hand-work unless this photographic record correctly differentiates all the hue and luminosity values of the copy. How to secure this perfect differentiation of hue and luminosity value is a problem which certainly baffled the earlier experimentors in trichromatic photography; but its solution by working to the Maxwell colour curves, as first proposed by me in a paper read at this Institute in 1888,‡ has been sufficiently demonstrated by the results obtained in the photo-chromoscope. In the photo-chromoscope, however, we make up our white light, not of all of the spectrum rays, but of a mixture of three practically isolated groups from the two ends and middle of the spectrum. If we were to employ all of the spectrum rays equally, but sharply divided into three groups, we should find that when we attempted to reproduce certain hues of the spectrum, they would be somewhat degraded in purity, because pure spectrum reds, greens, and blue-violets cannot be reproduced by any *mixtures* of spectrum rays. From this I have argued that colour prints from Maxwell curve photographic records, if made upon paper which reflects ordinary white light, must show a little degradation of colour. Comparison of such prints with the originals and with the photo-chromoscope reproductions shows that this degradation, otherwise almost unnoticeable, actually occurs and disappears when the prints are viewed in a white light made up of a mixture of isolated groups of red, green, and blue spectrum rays. From this it might be argued that the photographic colour record which is suitable for one purpose is unsuitable for the other. The fact is, however, that for synthesis by any other light than the artificial white of the photo-chromoscope, no trichromatic analysis can be theoretically perfect; and I hold that the Maxwell curve analysis* introduces, even for synthesis in ordinary white light, less serious errors than any other; and that the best compensation for the modicum of degradation of purity should be sought in later stages of the process, in the lining of the process blocks, the absorption and transparency of the printing inks, and the paper and press-work. This question has been the subject of much controversy, and as it would take a volume to fully elucidate the subject, I will only add here that the demonstration which I now present is based upon Maxwell curve analysis, the results of which, under the conditions which I have secured, will speak for themselves.

The perfection of each indivdual element of the trichromatic negative record depends upon the relations of the source of illumination, the absorption of the selective colour screen and the colour sensitiveness of the photographic plate, one to another. Each of the three negatives may, however, be substantially perfect in itself, but out of key, so to speak, with the others, though being relatively less or more exposed or developed to lesser or greater density; and in the practice of the process this want of harmony of relationship is a source of error quite as serious as errors of principle in the analysis, and it is probable that two-thirds of the "faking" that is found necessary in practice is due to errors of this character, which may be introduced in any of the photographic operations, or even in the etching process, so long as the three operations are conducted separately. My cure for this difficulty consists in the production of the three images of the colour record by one exposure upon a single sensitive plate, for which purpose I have devised several special cameras, one of which,* together with triple negatives produced in it, is submitted for examination. After once correctly adjusting these cameras, triple negatives can be turned out with perfect regularity, in which the relation of the images one to another, in exposure and density, is bound to be correct. The printing upon the zinc or copper-plate and the etching is also thereby reduced from three operations to one. The importance of this procedure from a labour-saving point of view is very great, because it saves much time and labour in the initial stages of the process, besides eliminating errors which frequently necessitate costly and time-consuming "faking" operations in the later stages. In the most approved method of producing the half-tone process blocks, the half-tone process negatives are made through cross-line sealed screens, in order to translate the smooth gradations into definite line and dot, as is required by the typographic printing process. There are a few operators who employ the cross-line screen in the first instance, making the half-tone negative directly on the colour-sensitive plate; but very much longer exposures are then required, and the translation of body shade into line and dot is far less definite and satisfactory than when a transparency from the smooth colour record negative is made the copy for a half-tone process negative by the wet-plate process, or on special "contrast" dry plates. My special triple cameras can be fitted with the cross-line screens, so as to make the line negatives direct; but after some experience of both methods I at present favour making first a triple colour record, then a contact positive,

* Catalogue of the Novelties Exhibition, 1885, p. 36. See also *The Photographic News*, London, Sept. 5, 1884, first page.

† U. S. Patent No. 245,501, Aug. 9, 1881.

‡ *Journal of the Franklin Institute*, January, 1889, p. 54. U. S. Patent, No. 432,530, July 22, 1890.

* U. S. Patent, No. 668,989, February 26, 1901.

and from the latter a triple half-tone process negative in the copying camera. Allowing for the saving in time in making the original exposure through colour screens, no time is lost, and the half-tone process negative, made by the wet-plate process, or on a special "contrast" dry plate, is of a quality not obtainable by the first method.

Compared with the most usual procedure, fifteen operations* are thus reduced to five,† and compared with the shortest method practised with a single camera, nine operations are reduced to five, with gain in the quality of the screen process negatives and elimination of the defects commonly introduced by separate exposure, development, printing, and etching. If the screen negatives are made direct with the triple camera, the total number of operations is reduced to three. Another reason for favouring the use of a transparency as copy for the half-tone process negative, is the fact that original triple-colour records can most advantageously be made on a standard size of plate in a camera which gives images either larger or smaller than the plates required, and the images readily brought to the required size in the copying camera, when the triple half-tone process negative is made. The original triple negative is then available at any time for plates of different sizes, or with screens of different degrees of fineness, or for Kromskop slides or colour print lantern slides, or for any other kind of trichromatic process reproduction which may at any future time be desired. Three of the ruled cross-line screens are used in the copying camera in front of the one negative plate, and the arrangement is such that three small images can be made on plates of one size, or three larger images on a larger plate without change of screens or alteration of adjustment. It is necessary to use three screens in order to have the lines differently disposed in the different images to avoid an offensive watered-silk pattern. This disposition of the lines at different angles to avoid this effect is seen in my original example of 1881, a copy of which I have with me, and was patented by some one else twelve years after. By the means which I have described, sets of half-tone trichromatic printing plates may be produced with great regularity and precision, frequently requiring no re-etching to perfect them, and never any considerable amount of it. It remains only to reduce the printing to one run through the press in order to eliminate errors due to unequal inking and unequal expansion of the paper with changes of atmospheric condition, to make the production of half-tone trichromatic process reproductions as nearly as possible automatic, and of the highest average quality. Already it has been proved that the printing can be done successfully upon this principle with a special press which is now on exhibition in this city, but was not available for printing my specimens. They have been run off on an ordinary treadle press without any overlay or other "make-ready." The depth and "openness" of the etching of the plates, and the colour and transparency of the inks, are very important factors in this work. To fulfil theoretical requirements, the ink must be perfectly transparent and as specifically anti-chromatic as possible to the respective "primary" colours in ordinary white light. If they absorb too broad bands of the spectrum, or if the blocks are not etched sufficiently open, the colours will be degraded with black—"muddied" is the technical term. If they absorb too narrow bands of the spectrum, or if the two top colours are not perfectly transparent, the superposition of the three inks will not produce a good black, and some colours must be falsely rendered. If the absorptions are diffuse, a little difference in the relative amounts of the inks put down will make great changes in the colours of the print. If the absorptions are in sharply-defined bands, which meet each other over the Fraunhofer *D* and *F* lines of the spectrum, after putting down enough to make a good black by superposition, an excess of any one will scarcely alter the colours of the print except there be lateral spreading, increasing the area of the printed lines. Inks having broadly overlapping absorptions, or not perfectly transparent, produce a quite different hue when printed in lines side by side than when the lines superpose, while perfectly transparent inks with sharply defined absorptions which just come together in the spectrum will produce a tint of almost exactly the same hue where the lines overlap and where they do not. All of these facts should be taken into consideration in the selections of printing inks, and constitute a basis for predicting what will prove most suitable. The inks which I employ are a *minus* red (peacock blue), the absorption of which is strong and pretty even from the red end of the spectrum right up to the *D* line, but falls off to nothing in the greenish yellow; a *minus* green (crimson), the absorption of which is strong and pretty even from over the *D* line to the *F* line, falling quickly to nothing outside of those limits; a *minus* blue (yellow), the absorption of which is strong in the violet and blue, and falls off gradually between the *F* and *E* lines. A mixture of these three inks to make a transparent neutral gray, when analysed in the spectroscope, shows somewhat more absorption in the yellow and blue-green of the spectrum than in the red, green and blue-violet parts, proving that they effect a colour synthesis in some degree approximate in character to that in the photo-chromoscope, while still in bands sharp enough to make easy printing without the hue depending too much upon the flow of ink, or whether the lines or dots fall side by side or in superposition. These inks are not quite ideal, but they are the nearest approximation that I can now obtain, and they yield more accurate rendering of colours from Maxwell curve-record printing plates than the "regular" three-colour process inks.

FREDERIC E. IVES.

* Three separate colour-screen negatives, three separate transparencies, three separate half-tone process negatives, three separate prints on the zinc or copper-plates, and three etching operations.

† One colour record negative, one transparency, one half-tone negative, one print on copper or zinc, and one etching.

LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

The annual competition, followed by an exhibition of works by members of this society, took place last week, the judges being Messrs. Horsley Hinton, Huson, and Watmough Webster. The exhibition, which includes the competitive photographs and a loan collection by members, was opened on Saturday to members and friends. The prize-winners were Mr. Jos. Appleby, gold medal; Messrs. J. H. Canavelli, J. C. Timpany, W. E. Inston, C. Gostenhofer, and Mrs. Lister, silver medals; Messrs. J. Selkirk and T. W. Quirk, bronze medals. For lantern slides Mr. F. Anyon gained the gold medal; Mr. E. Ellis, Dr. C. Thurston Holland, and Mr. J. W. Towers, silver medals; and Messrs. J. Marples, bronze medal; H. J. Houghton, silver medal (stereoscopic). Miss Harvey was awarded the president's prize in the ladies' competition.

The exhibition is a strong one, and the association is to be congratulated on the result of their year's picture making, which shows pictorial quality of high excellence, and proves that the Liverpool society have little to learn in photographic technique.

The winner of the gold medal, who, by his success on this occasion, needs only to score another similar success to become the owner of the Challenge Trophy, sent in three pictures of conspicuous merit, one giving a cloud effect, with the sun's rays showing, fan-like, through a break in the clouds; though perhaps a little ad capitandum in treatment, it forms a most attractive picture; then we have a sea study, with waves breaking into foam on a shingly beach, under the lea of a rocky eminence, and again sea, a stretch of water with a huge roller stretching diagonally across the picture and caught just when beginning to break. The movement of the water, the actual rolling of the huge wave, and the swirl of the back wash of its predecessor are here brought before us with considerable realism.

Naturally, Liverpool might be expected to be well represented by sea pictures, and in another set, likewise by Mr. Appleby, we have again a powerful representation of wave and crest, and a view with clouds well deserving study. A strong competitor in this class was (¼ plate) the gainer of a medal in Class B, with three excellent figure studies. One that attracts attention at once shows a figure almost centrally placed, and a little too strongly silhouetted against a light sky; with this exception, that the whole is a little too heavy, this picture merits great praise for its composition and feeling An otherwise excellent photograph, showing two figures in the foreground, is marred by the figures being so arranged that each is going out of the picture at the sides, and they are thus shown back to back.

The other competitor from Class B was "Cavalier," who sent two seascapes and a charming view of cattle browsing under the shade of a tree. The grouping of the animals is very good, but the composition is rather divided by the tree separating the cattle into two groups. In one sea piece is seen the last remains of the skeleton of a wreck, with receding water, and almost poetical in its grim suggestiveness of desolation and neglect.

Commercial & Legal Intelligence.

Messrs. Thompson & Lee, technical photographers, inform us that their address in future will be 17, Eldon Square, Newcastle-on-Tyne.

The Austin-Edwards Monthly Film Competition.—The prize camera for the current month has been awarded to Mr. Harold D. Lowthian, 4, Milk Street Buildings, London, E.C., for his negative "A Winter Scene."

At the Leicester County Court, on Thursday last, Messrs. Taylor, Taylor & Hobson, opticians, Leicester, sued William Scorer, photographer, Havant, for £3 4s. 11d. for goods supplied. Mr. Ironside (Bennett & Ironside) was for plaintiffs. James Ronald Taylor, traveller for the plaintiffs, said he called on the defendant last July, when a photographic lens and other articles were ordered and supplied. Defendant denied that he ordered the goods, but admitted having received them. He did not return them, because he thought plaintiffs' traveller would call and he could hand them to him. Judgment for plaintiffs for the amount claimed.

The Anthony & Scovill Company.—Articles of incorporation were filed in Albany December 23rd, for the Anthony & Scovill Company, with a capital of 2,500,000 dollars. This corporation was organised to control the corporations heretofore known as E. & H. T. Anthony & Co., the Scovill & Adams Company, the Columbian Photo Paper Company of Westfield, Mass., the Monarch Paper Company of Binghamton, N.Y., and other corporations. The names of the incorporators are R. A. Anthony, William T. Wisner, Clarence B. Stanbury, William Edmond Curtis, F. Kingsbury Curtis and Alexander C. Lamoutte, all of New York City; Frederick A. Anthony, of Hackensack, N.J.; James F. Chard, of Buffalo; W. I. Lincoln Adams, of Montclair, N.J.; Hugo Kohlmann and Albert W. Putnam. At a meeting held December 27th the following officers were elected:—R. A. Anthony, President; F. A. Anthony, First Vice-President and Treasurer; C. B. Stanbury, Second Vice-President; A. C. Lamoutte, Secretary; E. B. Barker, Assistant Treasurer. The Anthony & Scovill Company will manufacture and sell photographic apparatus of all kinds, including paper, films and film cameras.—"Anthony's Photographic Bulletin."

At the Lutterworth County Court, on Saturday, January 11th, before Judge Wightman Wood, E. T. Pierson, Official Receiver in Bankruptcy, Coventry, and trustee in the estate of W. C. Bax, photographer, late of Rugby and Lutterworth, sued C. W. Turner, cycle agent, Lutterworth, to recover £3 3s. for an enlargement, credit being given for £1 3s. contra, leaving a balance of £1 19s. 10d. Bax stated that in September, 1900, defendant took him a photo to enlarge. It was very old and cracked, and required very great care. He remounted it and then enlarged it, and it proved a very difficult job. When he took it to defendant on October 15th he refused to accept it, saying the charge was too high. It was now in the possession of Mr. Dalby, the owner of the premises, who bought the business from the trustee. The Judge: Then how can you deliver it? Witness replied that there was a stipulation in the sale that it should be given up if required. As to the contra, he bought a bicycle from defendant, which came, with accessories, to £13 15s. 2d., of which he paid £12 12s. Defendant entirely repudiated the order, saying he asked Bax to remount the photo, but did not order the enlargement. When Bax brought it he at once refused it, and reminded him that he never gave the order. Bax said, "Oh, I took it as a sort of an order. You were looking at enlargements and asking the price, and I understood you to give the order." Defendant also stated he could have got the enlargement done anywhere for 5s. 6d. Plaintiff said he would not have undertaken the remounting under 10s. The Judge: Oh, nonsense. If you had soaked it in water for a few hours, it was simple enough. I see you made an intermediate. The enlargement was here handed to the judge (unframed), who, after critically examining it, remarked, "Why, this is a photogravure: one of the sort that an artist in Paris reckons to do for the cost of the packing case only. But, still, the point before me is whether the order was given or not, and neither has witnesses. I find plaintiff has failed to prove the order, and therefore give judgment for 2s. 6d. for the trouble of remounting."

Re James Stoyle Catford, photographer, 2, Lansdowne Villas, Hampton Wick.—The first meeting of the creditors interested under this failure took place at the offices of the Official Receiver, Railway Approach, London Bridge, S.E., on Friday last, under the presidency of Mr. Mackintosh, Senior Official Receiver. The statement of affairs filed by the debtor disclosed gross liabilities amounting to £1,154 4s. 11d., of which £984 4s. 11d. was expected to rank against the estate for dividend. To fully-secured creditors, £170, the value of the securities being estimated at the same amount. The assets consisted of £10 deposited with solicitor to pay costs of petition, and furniture valued at £50. Total assets £60, thus showing a deficiency of £924 4s. 11d. The report and observations of the Official Receiver were to the following effect:—"The debtor states that he does work for illustrated papers, but from 1898 until the 19th ult. he was in partnership, under a verbal arrangement, with a Mr. C. P. W. Bond, trading as 'The Royal Thames Guide.' A. Mr. Gisborne appears to have been a partner at one time, but debtor states he was bought out by Mr. Bond about a year before the receiving order. The partnership was, the debtor states, dissolved by order of the Official Referee on the 19th ult. Debtor further informs me that from March, 1895, until December, 1899, he was in business as a landscape photograph publisher. In January, 1900, he entered into an agreement with 'Photo, Limited,' a company now stated to be in liquidation, for the sale of his stock, plant, machinery, etc., and all patents and secret processes, British and foreign, which he then had or might invent during the time he was in the employment of the company, for £1,100, of which £100 was to be paid in cash and £1,000 in shares in the company. He was also to give his entire services to the company, at a salary of £3 10s. per week. It is to the failure of the company that he chiefly attributes his insolvency, and he states that he first became aware of it when the company went into liquidation. The creditor shown as fully secured holds a policy on the debtor's life for £500. The debtor further states that in March, 1897, he made a private arrangement with his creditors, whose debts amounted to about £800, under which 10s. in the £ was paid to certain creditors amounting to about £200, his friends' claims to the balance being allowed by them to stand over. No books of account had been, debtor states, kept since December, 1899." The Official Receiver said he had received a proof from Mr. Joseph Catford of £600, but he should want strict proof of that debt. An I O U had been produced, but it bore no date. The money was alleged to have been advanced in 1899. The only assets consisted of the debtor's furniture, and he had received an offer of £40 for it from Mary Catford, the debtor's wife, although debtor valued it at £50. In reply to the Official Receiver, debtor said his wife was raising the £40 on a reversion. He had no interest in the reversion personally. It was not marketable at the present time. He owed his wife £600 now, and he did not think she would advance him any more to pay his creditors a composition. The £600 was actually lent to him by his wife's father, but it would come out of her share of his estate, under his will. The £600 was advanced to him in two sums of £400 and £200 respectively. The larger amount was advanced when he commenced business. Mr. Bond's solicitor said the partnership between his client and the debtor was not a verbal one, and the debtor admitted that an error had been made in that respect. The partnership was dissolved by order of the Court, and the assets of the estate were handed over to Mr. Bond. Debtor said the £600 was lent to him personally; it was nothing to do with the partnership. He had no other property beyond what he had disclosed in his statement of affairs. He had lost everything. The Official Receiver said he did not know if the creditors wished to appoint an independent trustee to wind up the estate in bankruptcy; the debtor had no offer of composition to make to his creditors, and there was only the furniture to realise. In small estates of that kind it was usual to leave the estate in the hands of the Official Receiver. The meeting formally decided to leave the matter in the hands of the Official Receiver.

Recently, at the Town Hall, Southport, Alfred Traverse, fourteen years of age, of Boundary-road, was charged with stealing two sovereigns, the property of Mr. F. W. Marshall, Westfield-street, by whom he was employed as an errand boy. The prosecutor mised two sovereigns from a desk, and on Wednesday he saw the boy with a camera, which, it was ascertained, he had purchased for 21s. On being spoken to, he admitted his guilt, and produced 18s. 6d. from his pickets. The boy's elder brother promised to look well after the prisoner, who was bound over under the First Offenders Act.

Toning.—"Toning P.O.P.'s" was the title of the last lecture before the Newcastle and Northern Counties Photographic Association at the Y.M.C.A., Blackett Street, Newcastle-on-Tyne. Mr. Burton Graham, who was the lecturer, has a decided predilection for the combined bath for both professional and amateur use when properly worked, as the tones secured are much pleasanter and the time and trouble of the various operations of the separate bath much reduced, and if properly done and a bath rich enough in gold and hypo used the results are as permanent. Mr. Graham showed some prints done without special care, and in a hurry, some five or six years ago, which were every bit as good as the day they were finished, though he recommends that the bath be used more as a toner than a fixer; but the prints must be washed for a quarter of an hour between the operations or permanency and tone cannot be secured. The fixing bath also must not be too strong, about two ounces to the pint being a good strength. Five minutes' fixing should be enough at this stage, when the prints must be thoroughly washed by hand, as it is very little good putting such heavy papers as the ordinary P.O.P. into a dish and letting the tap run on to them, as they sink to the bottom, and the water never properly circulates between them. If they are so washed the probability is that uneven tones and fading will be the result. Mr. Graham also emphasised the fact that good tones can only be got from good negatives, and in damp weather h advises a sheet of celluloid being placed in the back of the printing frame instead of the usual blotting paper, as, being impervious to moisture, this is also better than indiarubber for platinotypes. For matt prints he prefers the ordinary P.O.P. squeezed on to ground opal previously waxed to the ready-made matt paper, as in the former case the image is more on the surface.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

January.	Name of Society.	Subject.
27	Camera Club	*Acetylene and its Uses.* J. W. Woodall M.A., F.G.S., and F. Windham.
30	Camera Club	*Concerning Rings and Brooches.* Cyril Davenport, F.S.A.
28	Birmingham Photographic	*Round about Plymouth with a Camera.* F. W. Pilditch.
29	G.E.R. Mechanics' Institution	Demonstration on Austin-Edwards' Film, &c., by W. W. Welford.
25	Glasgow and West of Scotland	Opening of Exhibition.
30	Liverpool Amateur	Lantern Lecture: *Morocco and Moorish Spain.* Mr. John Bushby.
31	Borough Polytechnic	*Platinum Papers: Developing for Tones.* Mr. F. W. Gregg.
30	Richmond Camera Club	*With Cycle and Camera in South Wales and the Border Counties* and *Bridges—Old and New.* Dr. Rodman and Mr. Cheese.
30	London and Provincial	Paper on *Actinometers.* Mr. W. Thomas.
29	Ashton-under-Lyne	Discussion on *Photograms of the Year.* By Members, in the Rooms.
30	North-West London	Members' Slides. Prize Night (Final of Competition).
29	Southsea Photographic Society	Lantern Night. *Animated Photographs* by Mr. L. Dyer, and Presentation of Medals.
29	Croydon Camera Club	The Sixty-second Public Lantern Show.
28	Newcastle-on-Tyne	*Carbon Printing.* By Roger Brady.
30	Rodley, Farsley, and District	*Ozotype.* Mr. T. Heaps. (Yorkshire Photographic Union Lecture)
28	Leeds Photographic Society	*Photographic Heresies.* Mr. R. Child Bayley (Editor of *Photography*).
	Darwen Photographic	1901 Prize Slides.
30	Oldham Photographic Society	Lecture and Demonstration. *Improving Negatives and Prints. Pictorial and Decorative Work.* Mr. Walter D. Welford (London).
31	West London Photographic	Lantern Night. *With a Tandem in Switzerland.* W. Collett.
29	The Photographic Club	*Round the Coast with Rod and Camera.* (Lantern Slides by members of the family.) Mr. J. W. Zaehnsdorf.
28	Thornton Heath Polytechnic	Lantern Night.
29	Redhill and District	Committee Meeting. Lantern Night.
28	Newcastle-on-Tyne	*Carbon Printing.* Mr. Roger Brady.
24	Croydon Scientific Society	Photographic. Lecture on *Home Portraiture.* Mr. P. R Salmon, F.R.P.S. Illustrated by lantern slides. Affiliation lecture.
31	Croydon Scientific Society	Photographic. Demonstration of *Pictorial and Decorative Photography,* with Warwick plates. Mr. Walter D. Welford.
29	Croydon Camera Club	Sixty-second Public Lantern Show at the Small Public Hall, Croydon, will consist mainly of members' slides. Supplemented by a Collection of Photographic Curiosities and Marvels, specially contributed by Sir Henry Trueman Wood, Dr. Vaughan Cornish and Professor Worthington, &c., which the President will explain.
30	Liverpool Amateur	Lantern Lecture. *Morocco and Moorish Spain.* Mr. John Bushby.

ROYAL PHOTOGRAPHIC SOCIETY.

JANUARY 14.—Ordinary meeting. Mr. Thomas R. Dallmeyer, president, in the chair.

NEW MEMBERS.

Nominations in favour of fourteen candidates were read for the first time, and eight gentlemen were elected members of the society.

PROGRESS MEDAL.

The President announced that the council had unanimously awarded the Progress Medal of the society to Mr. Joseph Wilson Swan, M.A., F.R.S., in recognition of his services to photography in connection with the carbon or pigment printing process and its applications.

FELLOWSHIP.

The President said that the council had received four applications for the Fellowship, and that they had admitted two of the candidates, viz., Mr. B. F. Howard and Mr. J. E. Middlebrook.

AFFILIATION.

It was announced that the Isle of Man Camera Club had been admitted to the affiliation.

SCRUTINEERS.

The following members were appointed scrutineers of the ballot for the ensuing election of officers, council, judges, and the selecting and hanging committees:—Messrs. H. C. Rapson, W. Atkinson, Drinkwater Butt, E. Clifton, W. E. Dunmore, T. E. Freshwater, T. K. Grant, Furley Lewis, C. P. Butler, Leslie Selby, F. T. Beeson, and W. C. Plank.

ST. LOUIS WORLD'S FAIR, 1903.

The President read a letter addressed to the council by Mr. J. C. Strauss, of St. Louis, in reference to the forthcoming World's Fair to be held in St. Louis in 1903, on lines similar, but on a more extensive scale, to that of Chicago in 1893. Efforts were being made to secure that a building should be devoted entirely to photography, and Mr. Strauss felt confident that if the directors of the Fair were made acquainted with a demand for the recognition of photography as an art, not classed as a mechanical process or product of manufacture, they would do what they could to adopt the suggestion. The President said that the aims indicated in the letter had the warmest support of the council, but it was thought that the society in general meeting should have an opportunity of signifying its approval. This approval was forthcoming, and the secretary was requested to convey the same to Mr. Strauss.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JANUARY 16.—Mr. Furley Lewis in the chair.

Mr. A. J. Brown brought up some prints on Mariona paper, made several years ago, in order to bear out by illustration some previous remarks he had made upon the unreliability of prints fixed in hypo and alum. One print was fixed without toning or previous washing, and was as good as new. Another print was fixed in hypo and alum after washing, and had gone a good deal. A third print, fixed in hypo and alum without previous washing, was much faded and very yellow.

Mr. S. H. Fry thought it curious that it should be admitted that hypo and alum was undesirable, especially in view of the fact that results by the hot hypo and alum bath were as permanent as those of practically any other process. He knew of no equally good alternative method to the latter for the treatment of bromide prints.

Mr. Mayall said that he made it a practice to utilise the virtues of the alum after all other processes were complete. He had worked with P.O.P. for some years, and, with due precautions as to temperature of solutions, he had no trouble with frilling. Speaking about the manipulation of P.O.P., he said that hypo was always a dangerous element. He considered that all formulæ that prescribed 3 or 4 ounces of hypo to the pint as the proper strength were on a wrong basis. The great principle with delicate prints such as P.O.P. prints was not to immerse them in strong hypo, but to use a weaker bath and fix for a longer time. It was only a question of time, and therefore he reduced the quantity to 1 ounce of crystals to the pint of water. Alum was used after fixing as a measure of precaution for the safe handling of the prints. He had used fixing baths made of 1 ounce of hypo to 40 ounces of water, yet the results were as good as ever. There seemed to be immense prejudice against P.O.P. in France. The better-class professionals used albumen paper. It would be remembered that he had shown results on P.O.P. by development some years ago to this association. The development method was undoubtedly the best way to deal with P.O.P.

Mr. A. Haddon said that 10 per cent. hypo solution was better than any other strength.

Mr. Mackie said that he used 2 ounces to the pint, and therefore agreed with the last speaker.

Mr. Haddon said that if the prints were washed for 20 or 30 minutes after fixing, and before putting them in the alum, there should be no trouble. The alum would, in that case, act on the gelatine, and not upon the image as it would otherwise.

Mr. T. F. Freshwater showed another of Mr. Ives' parallax stereograms by the kindness of Mr. Bolas, and members were allowed to examine it closely, the binding being cut away.

Mr. F. C. Kellow showed a spotty negative.

Mr. Brown said that it was due to moisture attacking the varnish. If the varnish were entirely removed, the negative would, he thought, regain its original condition.

PHOTOGRAPHIC CLUB.

JANUARY 15.—Mr. J. W. Zaehnsdorf in the chair.

Mr. Thomas K. Grant gave an account of "The Lumière Process of Colour Photography." This indirect process of colour photography depends upon the fact that all colours may be reproduced by mixtures of the three primaries red, yellow, and blue. Three negatives are made on different plates specially sensitised for the colour each has to reproduce. Colour filters are used in conjunction with the plates in order to isolate the particular colour each plate has to record. The Lumière series A plate is used with a green screen dyed with methylene blue N and auramine G. The Lumière blue label plate is used with the blue-violet screen dyed with methylene blue N. The third negative is made on the Lumière series B through an orange screen dyed with erythrosine and metonile yellow. The exposure is, of course, lengthened by the interposition of the screens, but the relation of the blue-label plate to the other two is as 1 is to 12. The negatives should be of a full range of gradation without stain. The next operation is the preparation of the positive prints which, stained and superimposed, form the complete result. Baryta paper mounted on a suitably-prepared glass plate is sensitised with a mixture of gelatine, glue, ammonium bichromate, alcohol, cochineal red and potassium citrate dissolved in water. When dry, the paper, stripped from its glass support, is printed under the negatives, and, as in carbon printing, an actinometer is the best guide to exposure. The paper is then immersed for 20 seconds in ice-water, with a glass plate specially prepared with a collodion and rubber substratum, and the two are brought together and squeegeed. After a further soaking for two hours in cold water, the plate and the paper are transferred to water at 100 deg. F., and in half-an-hour the paper leaves the print, which remains upon the glass. After develop-

ment—which is a process of dissolving away the soluble gelatine, leaving the portions acted upon by light—there remains on the glass a colourless image of insoluble gelatine in slight relief. These colourless gelatine reliefs, three in number, are respectively dyed in baths of red, yellow and blue. The red bath is made of erythrosine J, the blue of diamine F and hard glue, and the yellow of chrysophenine G. Experience and examination shows whether the print has taken up the proper quantity of dye. Errors may be adjusted by washing-out or longer soaking. Assuming, however, that the prints are correctly stained, the three are superimposed and bound up as a slide. Prints in colour may also be produced on paper; the operations are similar, but of a more delicate nature. Mr. Grant finally showed on the screen a number of slides, the excellence of which was freely commented upon.

Mr. George E. Brown, in the course of some remarks, said that it had been urged that correct colour photography was not desirable. The aim should be to convey the same impression by our colour photographs as that derived from the actual landscape, which was asserted to be quite a different thing from a correct colour photograph. The speaker was inclined to think that, when perfected, there would be plenty of latitude for the pictorial worker, just as there was now in monochrome photography. When colours could be reproduced *fac sim.*, then one might think of producing results which were pictorially satisfactory and imbued with the personality of the worker to any desired extent.

Mr. Grant, replying to Mr. J. R. Gotz, said that metallic surfaces were faithfully rendered. He referred to a photograph of a gold cup, and said that, with the electric arc lamp for projection, the metal was badly shown, due to the excess of blue rays; but with a limelight the result was greatly improved. Seen stereoscopically, however, and by daylight, the metallic sheen was excellently rendered. There was a subtle quality about metals that required that the picture should be seen by the light it was made by. The difference in lights closest resembling one another appeared to be sufficient to upset the delicate balance necessary for the reproduction of metallic surfaces. There was no difficulty, he added, in producing commercially any number of quite identical results.

CROYDON CAMERA CLUB.

The President, Mr. Hector Maclean, F.R.P.S., on Wednesday, 15th inst., demonstrated Gaumont's pocket chrono to the members of the above club. This ingenious little cinematograph is made in exceedingly portable form, and is a well-finished and efficient piece of apparatus. The pocket chrono, as the President explained, works in front of the condenser of any ordinary lantern, and either takes or projects pictures. For taking the pictures a clockwork arrangement is provided, though hand-turning might be employed. He much preferred the former, as avoiding possible vibration and unequal speed in operating the mechanism. Full particulars were given for developing the film and obtaining a series of miniature positives therefrom. Contrary to what might be expected, neither operation presented any difficulty if care was used. Mr. Maclean considered the instrument shown as the best of its type, and he had experimented with most on the market. He had intended to show subjects on the screen taken at night by means of Mr. Smith's oxy-magnesium lamp, but unfortunate circumstances had prevented this from being done. Much value, in his opinion, was to be attached to cinematographs for scientific purposes, as they were capable of reproducing a continuous record of certain phenomena with which the more familiar camera and lens could not hope to deal.

In consequence of the optical lantern which had been provided not being adaptable for use with the pocket chrono, the projection of the positives was postponed. Mr. Maclean showed and explained the folding Cyko No. 1, which was examined with much approval. Convention slides were shown by Mr. Councillor Noaks, also a number of landscape studies by other members.

SOUTHAMPTON CAMERA CLUB.

On Monday evening, the 13th inst., a good meeting of the above club was held at the Philharmonic Hall, presided over by Mr. G. T. Vivian, the occasion being a lantern slide competition, with "Landscape" as the subject. The competition was of the keenest nature, the contributions being both good and numerous, the difference between the winning and second sets of slides being but one point, and several others following very closely. The winning pair was produced by Mr. J. T. Compton, and consisted of excellent reproductions of two very pleasing views of Chilworth, Hants, in the vicinity of the Tower of the Winds. The winner was awarded the usual certificate of merit issued by the club.

LEEDS PHOTOGRAPHIC SOCIETY.

At the annual meeting, on the 14th inst., at the Philosophical Hall, Leeds, the report and balance sheet were adopted, and the following officers and committee duly elected for the ensuing year:—President, Mr. J. H. Addyman, B.A.; Vice-Presidents, Messrs. Godfrey Bingley and B. A. Barrell, F.I.C.; Hon. Treasurer, Mr. T. Carter; Hon. Secretary, Mr. R. Mackay, 69, Albion Street, Leeds; Hon Assistant Secretary and Librarian, Mr. A. Nicholson; Hon. Lanternist, Mr. A. W. Atkinson; Hon. Assistant Lanternist, Mr. F. Morfitt; Committee, Messrs. James Taylor, L.D.S., J. C. Coultas, R. Stockdale, M.A., and H. Adams. The following are extracts from the annual report:—"The most notable event of the year was the conversazione and exhibition of members' work, but the brilliancy of the function was shadowed by the announcement, as the guests were assembling, of the death of her Majesty Queen Victoria. To have closed the proceedings, however, would have involved the society in very serious loss; the meeting therefore continued very quietly, and dissolved at an early hour. The exhibition of members' work included 108 prints, and was a great success, and attained a higher standard than heretofore. The annual excursion, on May 18th, 1901, to Hardcastle Crag, was thoroughly enjoyed; twenty-six members attended, and at least one 'Royal' picture was obtained. At the Yorkshire Union excursion to York and Ulleskelf a most delightful day was spent, eleven of our members being present. Several other excursions were made, and the committee regret that so few members have availed themselves of their opportunities. The annual lantern exhibition took place before a large audience; 221 slides were shown (as against 197 last year), the work of sixteen members (as against thirteen last year), and a substantial improvement in quality was manifest. During the past year considerable work has been done by the members. Messrs. T. Carter, J. C. Coultas, W. M. Coultas, J. H. Gash, C. B. Howdill, A.R.I.B.A., R. Mackay and J. Taylor, L.D.S., were all successful in having works hung in the recent Royal Photographic Society's Exhibition, whilst the work of Mr. J. C. Coultas was purchased by the council of the R.P.S., to be added to their permanent collection. Mr. C. B. Howdill has devoted close attention to the investigation of the photography of colour with great practical success, which has been recognised by an invitation to demonstrate his results before the R.P.S. Eight of our members, as lecturers of the Yorkshire Photographic Union, have given numerous lectures to the societies forming the Union, and fifty-six lantern slides have been contributed to the Yorkshire Photographic Union series. Mr. Godfrey Bingley, one of our vice-presidents and honorary life member of the society, has contributed 203 prints to the National Photographic Record Association collection (lodged in the British Museum) and 65 prints to the British Association Geological Photographs Collection (deposited in the Geological Museum, Jermyn Street, London). Mr. J. Skilbeck has invented and patented a small portable furnace for firing ceramics—an invention which for the first time has rendered ceramic photography possible to the amateur. In order to add to the interest of the society two new movements are being instituted by the committee:—firstly, the circulation of portfolios of prints amongst members for the advancement of photography by criticism; and secondly, the opening of the library of the Philosophical Hall at 7.30 each meeting night for general conversation. It is hoped these measures may result in making members better known to each other, and afford an opportunity for social intercourse. The society's rooms, and the conditions under which the meetings are held, are comfortable and satisfactory in every way, and your committee hope that these new movements will materially benefit the society. Nine new members have been elected during the year, eight have resigned, and three have been deleted under rule 7. The society has to regret the loss of a prominent member, Mr. A. C. Beilby, deceased. The number of members at present on the books is 131. The library, which is at the service of the members, is quite up to date, several new works having recently been added. The society is specially indebted to Mr. Percy Lund for his generous gift of twenty volumes, many of which, being out of print, have become exceedingly rare and valuable. The prosperity of the society will be greatly enhanced by more active interest in its work, and by the introduction of new members. One of the earliest duties of the new committee will be to consider how the jubilee of the society (which was founded early in 1852) may most fitly be celebrated."

FORTHCOMING EXHIBITIONS.

1902.	
January 31–Mar. 1 ...	Dundee and East of Scotland Photographic Association in the Victoria Art Galleries, Dundee. Hon. Secretaries, V. C. Baird and Archibald Campbell, 39, High-street, Dundee.
February 13–15	Nottingham Mechanics' Institute Camera Club, Mechanics' Lecture Hall, Nottingham. Joint Secretaries, W. Ward, 14, Stratford-terrace, Nottingham; E. H. Atkin, 68, Blue Bell-hill, Nottingham; A. Black, 9, Bowers-avenue, Nottingham.
„ 15–Mar. 8 ...	Edinburgh Photographic Society, Society's Rooms, 38, Castle-street, Edinburgh. Secretary, J. B. Johnston, 52, Hollybank-terrace, Edinburgh.
„ 19–26	Croydon Camera Club, The Art Galleries, Park-lane, Croydon. Hon. Secretary, W. H. Rogers, 46, Bensham Manor-road, Thornton Heath.
March 1–8	South London Photographic Society, Public Baths, Church-street, Camberwell. Hon. Secretary, Frank Goddard, Woodlands, Vanbrugh-hill, Blackheath, S.E.
Mar. 1902	Corporation of Glasgow Photographic Exhibition and Competition. Hon. Secretary, Peter Macnair, People's Palace, Glasgow.

The Birmingham Photographic Society's seventeenth annual exhibition will be held at the Royal Society of Artists, New-street, from February 22nd to March 1st, 1902. The judges will be: Messrs. E. R. Taylor (Head Master of the Birmingham Municipal School of Art), F. M. Sutcliffe, and J. H. Gear, F.R.P.S.; the judges of the Survey Section, Messrs. J. A Cossins and W. J. Morgan, R.B.A.; and the Hanging Committee, Messrs. W. T. Greatbach, F.R.P.S., W. Smedley Aston, and H. Holcroft, M.A. (President Wolverhampton Photographic Society). The exhibition will be inaugurated on Saturday afternoon, February 22nd, at 3 p.m., and remain open from 10 a.m. to 10 p.m., from Monday, February 24th, to Saturday, March 1st, inclusive. The hon. sec. is Mr. H. Vooght-Cornish, Norwich Union Chambers, Congreve-street, Birmingham, of whom entry forms may be had.

Patent News.

The following applications for patents and other details are specially drawn for the British Journal of Photography by Messrs. Hughes & Young, patent agents, 55 and 56, Chancery Lane, London, W.C., who will give advice and assistance free to our readers on all patent matters:—

Patent Applications.—No. 155.—Carl Paul Goerz, 18, Buckingham Street, Strand. "Improvements in lens combinations for telephoto purposes."

No. 233.—Joseph Lambert, 6, Lord Street, Liverpool. "Improvements in portable dark chambers for photographic purposes."

No. 463.—Arthur Charles Smith and Albert Arthur Smith, 26, Hanover Street, Peckham. "Improvements in connection with photographic cameras."

No. 471.—Louis Lesueur, of High Holborn. "Improvements in or relating to cameras for colour photography and printing."

No. 526.—William Humphrey, 30, Lower Cathedral Road, Cardiff. "The rapid photographic developing machine."

No. 565.—Alexander Schmalenberg, Strand. "Improvements relating to negatives for the photographic production of ornamental borders on sensitised surfaces."

No. 575.—Arthur Lewis Adams, 26, Charing Cross Road. "Improvements in photographic cameras of the 'Reflex' type."

No. 579.—Solon Vathis, of Liverpool. "Improvements in processes for the production of multicolour photographic prints."

No. 775.—Arthur Lewis Adams, 26, Charing Cross Road. "Improvements in or relating to 'Daylight' or other changing of packages of photographic cut films or other sensitive surfaces arranged as a pack, and apparatus therefor."

No. 829.—Henry Rheinlander, Rosemount, Acacia Grove, New Malden. "Improvements in and connected with light filters or screens for photographic purposes."

Patents Illustrated.—No. 16,803. "Photomechanical Printing." Patentees: Mr. P. Charles and Mr. S. Faujat, both of 75, Kaiserstrasse, Frankfort, Germany. Relates to improvements on the Woodbury-type process, designed to increase the speed of production.

The plate with the relief mould is supported on a plate adjustable by levelling-screws from the plate. This plate is carried forwards on rollers at the same speed as the endless band. This band is made of metal slats joined by silk and steel bands at the edges, and squeezes out the excess of coloured gelatine from the moulds. The paper on which the gelatine image is to be mounted is drawn from a spool through a water trough and over rollers on to the endless band. Instead of the endless band an ordinary reciprocating press may be used.

No. 16,802.—Patentee: J. Schaub, Logan, Utah, U.S.A. "Cameras." Relates to a camera for taking a number of small photographs on a single plate.

The shutter is mounted on a detachable facing-board opposite the lens. Screening tubes fitted on the lens confine the light to the part of the plate covered by the image, the section being detachable, so that pictures of various sizes may be produced. The dark slide is inserted by pushing back the frame of the ground glass by radial arms turning on the axles, the ground glass being returned to the focal plane by springs when the obstruction is removed. The dark slide is mounted so that it can be moved by steps in a horizontal or vertical direction until the whole of the plate has been covered by photographic images. This movement is effected by two sets of racks and pinions, one set of which is shown. The length of each step is regulated by spring studs, which drop into equally-spaced holes in a plate.

No. 16,813.—Patentee: J. W. Dawson, Legrams Lane, Bradford. Relates to an instrument for determining the printing of negatives for ascertaining the density and colour of other bodies, and capable of being used as a photometer with a standard source of light.

The negative to be examined is placed in a slot behind a box. The light, passing through a negative at the aperture, falls on the ground, and is examined at the aperture. The light on the ground glass opposite the aperture is adjusted as to density and colour until it exactly corresponds with the light.

No. 17,205.—Patentee: B. M. Rogers, 32, Brunswick Square, London. Relates to a developing tray for films, fitted with clips to keep the films flat in the bottom of the dish.

The clipping plates, which are T-shaped, are hinged to the edge of the dish and pressed down by helical springs surrounding the hinge-pins. The clips are opened by pressing on the upper ends.

No. ——.—Patentee: W. E. Barras, 8, Durrant's Villas, Ponder's End. "Photography. Moulding Lenses."

A wooden mould is fitted with hinged covers, between the ends of which a space is left. The glass to be moulded is to be taken up on the end of an iron rod and partly shaped by hand, after which it is introduced into the mould and rotated until it assumes a lenticular form. The lens is then annealed and finished. Before being moulded the glass may be dipped into a molten mass of a coloured glass to produce, say, a lens with a flint core and a ruby shell or coating.

Abridged Specifications.—No. 16,957.—Patentee: Mr. H. O. Foersterling, Villa Victoria, Schlachtensee, near Berlin. "Printing; enlarging." Relates to an apparatus for printing, in which the light, say an electric arc light, is condensed on the negative by a lens.

A magnified image of the negative is thrown by a lens on the printing paper. A liquid such as benzene may be poured into the receptacle in which the negative lies, to render it transparent if necessary.

No. 16,958.—Patentee: Mr. H. O. Foersterling, Villa Victoria, Schlachtensee, near Berlin. "Printing." Relates to a machine for printing from negatives mounted on an endless band.

The negatives, whether plate or film, are mounted on the band passing round the rollers, the distance between which is adjustable. The light for printing is obtained from a number of electric lamps enclosed in a box, the bottom of which is formed by a glass plate. The negative on the band is pressed on the sensitive paper by pushing down the plunger attached to the box, by which movement the electric lamps are also turned on. In a modification the band with the negative is placed in a shallow dish, which may be filled with a liquid to make opaque negatives transparent. The light-box, in this case, is placed to meet the negative on the upper side of the band, and a pressing pad with plunger is used to force the paper down on the negative.

News and Notes.

Mr. J. W. Zaehnsdorf is announced to give a chat on "The Rod and the Camera," with slides, on Wednesday, January 29th, at 8 p.m., at the Photographic Club, Anderton's Hotel, Fleet Street. Visitors are cordially invited.

Messrs. Fuerst Brothers, of 17, Philpot Lane, E.C., write:—"We have pleasure in sending you a copy of our January wholesale photographic price list, and beg to say we shall be pleased to forward a copy of same to any dealer on receipt of trade card."

The new Patent Office in Southampton Buildings, Chancery Lane, has been opened to the public. The library is a fine apartment—139 ft. 3 in. long, 59 ft. 6 in. wide, and about 74 ft. high. It receives its light through two skylights and over 120 windows, while at night-time it is illuminated by electricity. The floor of the library is devoted to English patent specifications, indexes, etc., scientific textbooks and the current as well as the unbound numbers of English and foreign periodicals. On the lower gallery can be consulted the foreign patent specifications, as far as they are in the library, and the bound volumes of periodicals and magazines. The top gallery is reserved for books that are rarely used, and will for the present remain closed to the public. Both galleries are reached by an iron staircase at each end of the room, and an electric lift assists greatly in the moving of books from floor to floor.

"The Times" and the Royal Photographic Society.—The authorship of the following paragraph, which appeared in "The Times" last week is not difficult to guess:—"The persistent aspirations of modern photography to attain to something better than mere mechanical perfection have accustomed one seriously to try to gauge the measure of personal, artistic expression of which the process may be capable. But the clever photographs by Mr. Henry Stevens now occupying the walls of the Royal Photographic Society's rooms do not attempt anything but a mechanically exact reproduction of objects which by their nature seem hardly worthy of the patient care and manipulative skill of which every one of the prints bears evidence. Cats, dogs and rabbits grouped in a basket seem to be Mr. Stevens's favourite theme, and surpassingly well are they done, though why these, or the groups of orchids and ferns, should be done at all is not clear. It is, perhaps, surprising that the results of an amateur's harmless pastime should constitute one of the periodical house exhibitions of a scientific society; for these examples ably illustrate the precision and power of definition which the optician has placed within the reach of all who can afford to purchase a good lens and who acquire the knowledge of using it, at the same time exhibiting much of the faults of the indiscriminate focus and false colour values which the photographer with an art training or high perceptive powers has in these latter days gone a long way towards correcting. The exhibition is open free daily from 10 to 4 until February 15th."

A Mystery Explained.—Not only the London, but several of the provincial papers have expressed themselves as mystified by the lightning flash and the loud report which heralded the birth of the new year at St. Paul's. An account of the "phenomena" was cabled to America and Australia. As some of the writers in certain English papers express a hope that the mystery may be cleared up, I really must once more give the explanation. But this time, to remove all possible doubt, I will give it in such a way that it cannot be disputed. I was there. I saw the light—I heard the report, which was like the bursting of a cannon. People at Elstree saw the light, and wrote about it to the newspapers. People at Hounslow heard the report. Many people accepted it as an "omen." Here is the "official report" of Messrs. Cassell & Co., who are responsible for the "phenomena":—"Re 'Living London' and St. Paul's.— . . . Our photographer confirms the statement that it is the second year of the phenomena. He was responsible for the surprise last year. He is the only man who has ever photographed that particular scene. The boom on this occasion was rather heavier, because of the quantity of light necessary to illumine such an immense space. He quite believes it possible that the flash could be seen, as one correspondent asserted, at Elstree, over twelve miles off. The photograph was taken at considerable difficulty. He was in a room at the N.W.

corner of the Churchyard leading into Paternoster-row. The window-frame was removed, but he found it impossible to use a tripod. Just before twelve the crowd was surging and shouting, but about the fourth stroke of the midnight hour he seized his opportunity. The flash silenced everyone, and immediately afterwards the crowd cheered and clapped as if wishing an encore. He used the fastest plate which could be obtained, the result being most satisfactory. . . . ." Thus is another world's mystery set at rest for ever. Doubtless many more mysteries could be easily explained.—Dagonet, in the "Referee."

IDEAL Beauty and Sentiment.—The second address of Mr. Val Prinsep, the Professor of Painting, drew an unusually large audience to the Lecture Room of the Royal Academy last week, and the painters present included Mr. Henry Woods, R.A., Mr. R. W. Macbeth, A.R.A., Mr. Alfred East, A.R.A., and Mr. J. M. Swan, A.R.A. Mr. Prinsep opened his address by saying that it was impossible to define beauty from the painter's point of view. It was difficult to account for the origin of the modern artist's idea of beauty, but Mr. Prinsep said that to him it seemed that it was the result of education and tradition. The artist learned from seeing and following the work of his predecessors, he grew up surrounded by traditions that he could not as a rule shake off, and then only by a violent effort. Most artists made no effort to shake themselves free, but accepted the tradition of the beautiful as it had been handed down to them. In the case of physical beauty we had made the standard for ourselves, as we might judge by comparing the Chinese idea of beauty in woman with that, say, of Venus. The Japanese, again, had a different standard from ours, and in this connection Mr. Prinsep told his audience that some years ago, in their desire for civilisation, the Japanese sent a commission to examine and report on European art, and the only work that they admired was that of the Impressionists. Of course, said the lecturer, they liked it because it was the only work free from our traditions—traditions by which they themselves were untouched. The ideal, that which every true artist strove for but could never attain, because it existed only in his own mind, was even more difficult to define than beauty. But there was no doubt that our first notion of ideal beauty came from the Greeks, though now we had wandered from the Greek standard and Nature was more our guide. Mr. Prinsep traced briefly the decay of the Greek tradition, and its subsequent revival in the Renaissance, the history of which was the revival of the cult of beauty. The culture of the beautiful died again in the period of "the grand style," for it required a favourable soil. We moderns ought to nurse and tend it. Some artists had laid down laws of beauty incontrovertible from their own points of view. But the points of view were countless, for all the ideals of beauty must vary with the individuality of man, and the lecturer compared the widely-differing ideals of beauty of Titian and Michael Angelo. Who could venture to decide which was right of two such great men? For himself, he would venture to lay down no laws of beauty. Argument on such a matter was mere waste of time. Mr. Prinsep then turned to sentiment, which, he said, like charity, covered a multitude of sins. If the sentiment of form and movement are expressed in a figure, we condone faulty drawing. Reynolds was an example of an artist whose fine sentiment more than compensated for his weak draughtmanship. After another passing reference to Michael Angelo, a Titan, but not a man to be held up as an example for students to follow, Mr. Prinsep said he would mention one more painter, Millet, whose work he described as "the quintessence of sentiment." He discussed "The Angelus," with its commonplace subject and its uncouth figures almost destitute of faces, yet as a whole impregnated with sentiment. Walker, if he had treated this subject, would have painted graceful figures, but the lecturer expressed his preference for Millet's view as a realisation of the dignity of labour. Millet he compared in some respects with Michael Angelo, and pointed out in conclusion that even the great Italian was blind to those beauties of sea and sky that we had learnt to admire.—"The Morning Post."

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

CHEAP PHOTOGRAPHY.

To the Editors.

Gentlemen,—I hope many readers noticed the Editor's curt reply to "Business is Business." I would suggest sausages as a draw. They could be turned out at perhaps a bigger profit than "turning out" cabinet photos at 2s. 6d. per dozen.—Yours respectfully, H. G.

WEIGHING OUT.

To the Editors.

Gentlemen,—Apropos of Mr. Bothamley's timely note on the above, the remark is made "Whatever is used must, of course, be counterpoised, and here is one of the disadvantages of paper, since each fresh piece has to be counterpoised." One of the first things the embryo pharmacist is shown when he makes his acquaintance with the dispensing scales is, when weighing under such conditions as Mr. Bothamley mentions, to make his paper support and counterpoise, by the simple process of folding a piece of clean white demy paper, holding it firmly in one hand, while with the scissors several cuts are made off it, the result being that two pieces are left, with three, four, or five sides, as the case may be, each exactly the same shape and weight (this, of course, with the usual reservation). White demy is fairly thin and uniform, and there is not likely to be more than a mere fraction of a grain difference between two pieces cut as described.—Yours truly, J. PIKE.

January 3rd, 1902.

THE METRIC SYSTEM.

To the Editors.

Gentlemen,—In proof that England is rapidly awakening to the necessity for an improvement in her trade methods, I venture to enclose herewith a list of Members of Parliament who have promised to support the introduction of the metric weights and measures into Great Britain.

Our chief competitors in foreign trade are Germany and the United States. The former country has already adopted the metric weights and measures (thereby scoring a great advantage over us), and there is a probability of the United States doing so very soon; in fact, two Bills were introduced into Congress last month with this object.

In the interests of our foreign trade it is most desirable that we should at once carry this reform into effect, as is proved by the constantly reiterated statements of British Consuls that we lose much trade because our weights and measures are not understood in countries where the metric system is in force.

In Australia, Canada, and Cape Colony, the change would be welcomed, and seeing how easily so serious an impediment to commerce can be removed it is hoped that the Government will give more attention to the subject in the coming Session of Parliament than it has so far done.—I am, Sir, your obedient servant,

E. JOHNSON,
Secretary.

Botolph House, Eastcheap, London, E.C.
6th January, 1902.

List of Members of Parliament who have notified their approval of the compulsory adoption of the Metric Weights and Measures:—

Allen, C. P.; Archdale, E. H.; Arnold-Forster, H. O.; Balfour, Major K. R.; Banes, Major G. E.; Bell, Richard; Bhownaggree, Sir M. H.; Bill, Charles; Black, Alex. W.; Boyle, James; Brigg, John; Broadhurst, Henry; Brunner, Sir J. T.; Burt, Thomas; Cameron, Robert; Campbell, Rt. Hon. J. A.; Carew, J. L.; Carvill, P. G. H.; Cayzer, Sir C. W.; Channing, F. A.; Cohen, B. L.; Corbett, A. Cameron; Cox, T. E. B.; Craig, R. Hunter; Cremer, W. R; Crombie, J. W.; Denny, Col. J. H.; Dewar, John A.; Doogan, P. C.; Douglas, C. H.; Duncan, J. H.; Dunn, Sir Wm.; Edwards, F.; Fenwick, Charles; Ffrench, P.; Field, Wm.; Fielder, H. B.; Flannery, Sir Fortescue; Flower, Ernest; Foster, Sir H.; Fuller, J. H.; Furness, Sir Christopher; Goddard, D. Ford; Gladstone, Rt. Hon. H. J.; Godson, Sir A. F.; Gordon, Hon. J. E.; Graham, H. R.; Grant, Corrie; Gray, E.; Green, W. D.; Greene, Sir E. W.; Greville, Capt. Hon. R. H.; Guthrie, W. H.; Hall, F.H.; Hambro, C. E.; Hardie, J. Keir; Haslett, Sir J. H.; Hayter, Rt. Hon. Sir A. D.; Heath, J.; Hermon-Hodge, R. T.; Hickman, Sir A.; Houston, R. P.; Howard, Capt. J.; Hutton, A. E.; Jacoby, J. A.; Jameson, Major, J. E.; Jessel, Capt. H. M.; Jones, D. B., K.C.; Jordan, J.; Kennedy, P. J.; Kinloch, Sir J. G. S., Bart.; Labouchere, Hy.; Langley, Batty; Laurie, J. W.; Law, A. Bonar; Lawrence, Joseph; Lawrence, W. F.; Legge, Col. Hon. E. H.; Leigh, Sir Joseph; Leng, Sir John; Levy, Maurice; Lewis, J. H.; Lough, Thomas; Lundon, W.; McArthur, Charles; McCrae, George; McLaren, C. B. B.; M'Govern, Thomas; Macnamara, Dr. J. T.; Malcolm, Ian; Manners, Lord Cecil; Mappin, Sir F. T., Bart.; Mather, W.; Mellor, Rt. Hon. J. W. Trevelyan; Melville, Beresford; Middlemore, J. T.; Minch, M. J.; Molesworth, Sir L., Bart.; Mooney, J.; Moss, Samuel; Munro-Ferguson, R.; Murray, Hon. A. O.; Norman, Hy.; Norton, Capt. C.; O'Connor, James; O'Connor, T. P.; O'Donnell, Thos.; O'Dowd, John; O'Kelly, Conor; O'Shee, J. J.; Palmer, Sir C. M., Bart.; Parker, Gilbert; Parkes, Ebenezer; Partington, Oswald; Pearson, Sir W. D.; Perks, R. W.; Pierpoint, Robert; Pilkington, Col. R.; Pirie, V. D.; Priestley, Arthur; Pryce-Jones, Lt.-Col. E.; Pym, C. Guy; Quilter, Sir C., Bart.; Rankin, Sir James, Bart.; Rea, Russell; Reckitt, H. J.; Remnant, J. F.; Renwick, George; Rickett, J. C.; Roberts, J. B.; Roe, Sir Thomas; Rolleston, Sir J. F. L.; Sadler, S. A.; Samuel, S. M.; Sassoon, Sir E., Bart.; Scott-Dickson, C.; Scott-Montagu, Hon. J. W. H.; Sharpe, W. E. T.; Shaw, C. E.; Shaw, Thomas; Shipman, J. G.; Skewes-Cox, T.; Smith, H. C.; Soames, A. W.; Spencer, Sir J. E.; Stanley, Hon. Arthur; Taylor, T. C.; Thomas, D. A.; Thomas, J. A.; Thomson, F. W.; Tufnell, Lt.-Col. E.; Vincent, Sir Edgar; Vincent, Sir Howard; Walker, Col. W. H.; Walton, John L., K.C.; Walton, Joseph; Wanklyn, J. M. L.; Warr,

A. F.; Webb, Colonel W. G.; Weir, J. G.; Welby, Sir C. G. E., Bart.; White, G.; Whiteley, George; Whitley, J. H.; Willox, Sir J. A.; Wilson, C. H.; Wilson, John (Durham); Wilson, John (St. Rollox); Woodhouse, Sir J. T.; Wrightson, Sir T., Bart.; Young, Samuel; Yoxall, J. H.

THE PRESIDENCY OF THE ROYAL PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

To the Editors.

Gentlemen,—The terms of the letter addressed to me, and published by you in your last issue, are such as to leave me no course but compliance with the request of the signatories. Those who know my views of the society's constitution best, will appreciate the fact that to seek re-election as President for a third year has been furthest from my own desire. I fully expected that the measures suggested in my Presidential address would have been dealt with finally before the election of officers and council for 1902, and that they would thus have secured for my successor increased facilities for maintaining and extending the aims and objects for which the society exists.

While the support which those proposals have received from the membership at large has been most gratifying, I had expected that they would have met with more general support from the present council, with whom I had hitherto worked in harmony. Had this occurred, these proposals would have come into force some months ago, and the present request would have been unnecessary; on the other hand, had they not been so strongly supported by the members, they would equally have been rejected some months ago. Neither of these contingencies having arisen, I feel I am only doing my duty to the society in consenting to submit my name to the members for re-election, in the hope that during my next term of office the necessary changes will be completed, and the society's constitution once more put upon a stable basis. In conclusion, I desire to express my appreciation of the approval contained in the letter, and I sincerely hope to see the whole body of members of the society working together towards one common object, namely, to increase its power of advancing the science and art of photography and of benefiting photographers, and to exercise it.—Yours faithfully,

THOMAS R. DALLMEYER.

Woking.
January 18th, 1902.

[Mr. Dallmeyer's decision to accept nomination for the presidency of the society during the year 1902-1903 will, we are sure, be welcomed by the members at large. Our view of the matter was given in the "Journal" of November 29th last in the following words:—"Mr. Dallmeyer's appeal to the general body of members, 'by whose ultimate opinion of his action he is willing to abide,' should, and we believe will, attract to him a large volume of support in his renewed and conscientious efforts to improve the management of the society of which he is president. But the development and consummation of this policy cannot be accomplished in a few weeks or months, and therefore we are glad to find it is felt by many influential members of the society that it is incumbent—if not obligatory—upon Mr. Dallmeyer to pass a third year in office in order that he shall have the fullest opportunity of carrying out his reforms. That in this work he will have the support of the vast majority of the members we have no doubt at all; or that, following in the footsteps of his predecessor, Lord Crawford, he will be elected for a third time president of the society which he and so many others are unfeignedly anxious to see rise to the full height of its dignity, usefulness, and renown." We wish Mr. Dallmeyer the utmost success, and the support of all the members in the third year's work that awaits him.—EDS. B.J.P.]

"WHAT ARE WE HERE FOR?"

To the Editors.

Gentlemen,—When I sent you a copy of my latest baby I made up my mind that I would get from you the hardest rap that I would get from anybody, and out of the very large number of reviews the book has received, yours is certainly the one that roasts me the worst, so that you will understand I am not in the least bit disappointed; in fact, rather tickled at my 'cuteness, for I had sized you up as being psychologically about the date of the seventeenth century, this being as far as your mental guardians had permitted you to develop.

At the Gloucester Convention I gently hinted to a few manufacturers that English business methods were a little bit behind the age, and that in about two years they would be in an awful funk over the gigantic American invasion that was imminent. In their self-satisfied way they smiled scornfully, but I guess they know better now, and are laying awake nights trying to figure their way out. Now that you know a little of the economic development in the United States, it may dawn upon you that it has been accompanied by a tremendous mental change, and things to-day are viewed here in the light of the twentieth century, not the seventeenth, and that, as compared with the American people, you may mentally be as far back as is the English manufacturer mechanically. Put on your thinking cap, keep your eyes open, and possibly you may learn something.—Yours sincerely,

F. DUNDAS TODD.

The "Photo-Beacon," 409, Security Building, Madison Street and Fifth Avenue, Chicago.
January 8th, 1902.

[A slight acquaintance with history would probably have saved Mr. Todd from paying us the obviously unintentional compliment of association with the intellects of the seventeenth century, amongst whom, *cum multis aliis*, he will, no doubt, be surprised to learn were Bacon, Shakespeare, Raleigh, Kepler, Cromwell, Milton, Dryden, Descartes, Huyghens, Newton, Cervantes, Velasquez, Rembrandt, and Vandyck. If we refrain from saying precisely how we have "sized up" Mr. Todd, he will, no doubt, permit us to remark that if we had to make a choice of intellectual company we should, for reasons we would rather not state, select the seventeenth in preference to the twentieth century. The second paragraph of our friend's letter fortifies the inference that the answer to his book, "What are we here for?" is, or should be, "To extol the enterprise of American manufacturers of photographic apparatus, and depreciate that of the Britisher." Mr. Todd's enthusiasm for the country of his adoption has evidently robbed him of all faith in the progressive tendencies of the island that had the honour of giving him birth. We hope he will not find, in the long run, that he has "put his money on the wrong horse;" but, for our part, we are quite satisfied to stand the native competitor in what threatens to be a stern and severe race. In conclusion, we owe it to Mr. Todd to say that his book, which in many respects is readable and admirable, is obtainable, price one dollar, of The Photo-Beacon Co., 409, Security Buildings, Chicago, U.S.A.—EDS. B.J.P.]

THE NOTTINGHAM MECHANICS' INSTITUTE CAMERA CLUB EXHIBITION.

To the Editors.

Gentlemen,—I shall be obliged if you will call the attention of your readers to the date of closing for entry forms for our exhibition, viz., February 3. Frames, etc., to be delivered by February 6. Lord Henry Bentinck, M.P., has kindly consented to open the exhibition on February 13th, when we are expecting to have a large and influential gathering. Thanking you in anticipation,—I am, dear sirs, yours faithfully,

ARTHUR BLACK.

9, Bower's Avenue, Nottingham,
January 17, 1902.

A QUESTION FOR "COSMOS."

To the Editors.

Gentlemen,—I wonder if it ever occurred to "Cosmos" that perhaps, owing to the impetuous behaviour of his deceased chief, the raucous Yankee went home and made the "best apparartus himself."—Yours faithfully,

ANGLO-AMERICAN.

[Ah! We wonder!—EDS. B.J.P.]

COLD DARK ROOMS—A HINT.

To the Editors.

Gentlemen,—The unusually mild weather which marked the departure of the old year, and the ushering in of the new, has possibly made some of us forget that December and January are months which are usually accompanied by snow, and general climatic discomforts. Photographers, like most other people, dread to go to work under such conditions. Too often, although the reception rooms and other apartments are fairly warmed by artificial means, the studio is chilly, and the neglected dark room decidedly frigid. In cases where a mere cupboard is dignified by the name of dark room—and such dens are by no means rare—there is little space for any warming apparatus, and plates must be handled by chilly fingers, the developing bottles perhaps receiving a preliminary thaw at the fireplace of an adjoining apartment. But, when the dark room is of sufficient size to admit of it, it should certainly be furnished with an efficient warming apparatus, both for the sake of the poor operator and as a means of keeping the solutions therein at a good working temperature. A gas stove is a convenient form of heating apparatus, for it can be lighted or extinguished with trouble, and there is no fire to "lay," or cinders to be removed. But gas stoves, as a genus, are not beloved by those who have been accustomed to the cheerful glow of an open grate. Some, indeed, seem to be designed for the express purpose of mounting up the gas bill, without affording any compensatory advantage. A new form of gas stove, called the Clamond radiator, was, however,

shown at the recent gas exhibition at the Crystal Palace, which seemed to us to represent a great advance upon former models, and if, as its makers assert, the combustion is so perfect that it is free from all noxious fumes, it should prove invaluable in photographers' work-rooms. It certainly throws out a great amount of heat. Briefly described, it consists of a row of Bunsen burners, each crowned by a perforated clay cylinder about 7 inches high by 1 inch in diameter. These cylinders become red-hot a few minutes after the gas is ignited, and they diffuse a general feeling of comfort like that associated with a fire of hot cinders. At the same time, the colour of the glow is such that it would not be likely to affect even an isochromatic plate, unless that plate were held close to the radiator.—I am, yours, etc.,

A Fellow Feeling.

London.
January 18th, 1902.

SNAP-SHOTS—A QUESTION OF LEGALITY.

To the Editors.

Gentlemen,—I should be obliged if you can give me a little reliable advice on the following unpleasant incident, of which I have been a victim.

I carry on the business of a fancy goods dealer in this town, doing a considerably large business in local views. This last summer, finding the trade for local views falling off very much, and having a large stock in hand, I decided to take some "snap-shots" with my hand camera of children and people wading and bathing. I printed the same and put them in my window, and finding I had inquiries about them, decided to sell them, at the same time calling attention to my stock of local views, which was my main object in taking the snap-shots. Well, I sold a few of the snap-shots I had taken, when just at the end of the season I received a lawyer's letter from a firm in ——, saying that I had taken snap-shots of the wife of a client, and had printed and sold the same. The letter went on to say, I must withdraw all prints of their client, give up the negatives to them, apologise to them, and pay £2 2s. costs. I took the letter to another lawyer here, and told him to deal with the matter as he thought best; that I was sorry, indeed, to have caused any offence, that I would certainly withdraw prints from sale, and they could have the negatives, but that I would *not* pay any costs. The matter spread over a month or six weeks, when the lawyer I instructed said he had settled the matter, on the terms I had said, only that I should have to pay 10s. 6d. towards the expense of the other side, so, in sheer disgust, I closed the matter on those terms. Can you, Sir, give me a little advice as to whether I was doing anything illegal in taking snap-shots of people wading or bathing on the sands and rocks and publishing and selling the prints of same? It is a matter of some importance to me, for I must have about 200 negatives, that I wish to print from, and to sell the prints, if required. I have been told that the party who put me to this trouble had no grounds for an action whatever against me, because they were taken in a public place, and my action was quite legal in selling them; indeed, if the party had called on me and said they objected to the prints, I should most certainly have withdrawn them from sale at once, so can you give me the legal points on this matter, for I think it would be interesting to many of your readers?—I am, yours, etc.,

Snap-Shots.

[In reply, our correspondent was perfectly within his legal rights in taking the snap-shots and selling the prints from them. Were the matter otherwise, how would the topical illustrated papers manage to exist? "Snap-shots" should have refused to pay a single sixpence in expenses. He is quite safe in dealing with his 200 negatives as he may think best.—Eds. B.J.P.]

THE MEASUREMENT OF LIGHT.

To the Editors.

Gentlemen,—In as few words as possible permit me to reply to the article of Mr J. Dormer in your issue of December 13th, and to point out where he (and I think also Mr. Webster) has misunderstood one of my statements. Mr. Dormer speaks of my "reiteration that a plane surface can be uniformly illuminated by a point of light." I beg these gentlemen to notice that in my first article of September 27th, in offering the example of a small light one from a plane surface one square meter in area, I state that there would be a bright illumination near the light and a gradual approach to shadow (or less light) as the surface recedes in distance from that light. This certainly cannot be thought to mean that the surface would be "uniformly" illuminated.

Also in my last article of December 6th I plainly state that this class of light is typical of a small light shining on to receding surfaces, and gave as an illustration the common lamp that shines more brightly on that part of the table that is near it, and less as the edge of the table and the walls recede from it, and as another illustration the electric light in the street, whose graduations may be seen on the buildings as the distance increases between the light and the points illuminated. If I had claimed to believe that a point of light (especially if it be in close proximity), could illuminate "uniformly" a plane surface, I am quite sure that my first article would have gone directly to the waste basket, as the editors would certainly not have taken their valuable space for the exhibition of such gross ignorance. As to Mr. Dormer's first criticism, in which he says that the dimensions of space are unknown, I would say that there is space in the absolute, as to dimension, and "radial" space, as to the measurement of directions. It should not be necessary to say that colour is the mental recognition of certain "radial" action in nature, which action (as well as its effect in a general way) is called light, and in my illustration of the cylinder, mentioned by Mr. D., I refer to "radial" space, and not to space in the absolute, as expressed by the terms "length, breadth, and thickness," the infinite extension of which is certainly unknown, as Mr. D. asserts.

For example, a circle is complete, and measures all radial space that can exist on a plane, or all the directions that can exist outward along a plane in every direction from its centre. The radial space that is measured will be the same whether the circle be of any observable size, or infinitely large or small, and we recognise this to be true since we have said that a circle shall be measured by 360 degrees or divisions, the question of size not entering.

It is in a similar manner that the surface of a globe in relation to its centre is the measure of all "radial" space that surrounds the point its centre, and if this be true, then it is unavoidable that any fractional part of a globe surface, as ½, ¼, or "3-16" must measure an equal fractional part of all surrounding or all "radial" space in relation to its centre point, and this notwithstanding the size of the globe.

Thus we see that all "radial" space is known, and that the complete globe surface in relation to its centre is the natural physical constant for its measurement, and also represents the "entirety" of space as regards its "radial" character, just as the circle is the natural constant of all "radial" space or of all directions outward into space along a plane.

As to the incapacity of the eye to judge the actual value of light, Mr. Dormer is correct. This is acknowledged by all. The eye automatically adjusts itself to light intensities that it may reveal colour to the mind. A page illuminated by a candle seems to us brighter than the shadow of a building at midday. The human eye was not evolved to be as a "yard stick" or a measurement of any unit value, but to give us information as to our surroundings under greatly varying conditions of light, and for this reason it is left to us to discover and arrange with the intellect the character and measurement of that force.

In closing, allow me to say that if I am right (and I think this will not be disputed) that light is a "radial" force; then I claim that it works in nature according to the "radial" character of space, and if this is true then four of Dr. Stine's five physical constants mentioned in my article of December 6th can have no reference to light intensity, since they are measurements of space in the absolute, and not in the "radial" sense. If this is true the simple unit than can be "used like the multiplication table" need not be so far away as Mr. Dormer supposes. Believing in the correctness of this theory, and that I shall be able to prove the same to be true, I am, yours, etc.,

Frank M. Steadman.

STEREO-MICROGRAPHY.

To the Editors.

Gentlemen,—You describe in a recent issue under "Ex Cathedra" a novel method by Professor Birdwood, of McGill College, Montreal, of obtaining stereoscopic effects by taking two photographs of the same object, having recourse to tilting the object between the two operations. I enclose stereoscopic slide of a bumble bee taken by me about ten years ago in the above-described way, and mounted in the usual way. The claim of novelty by Professor Birdwood, therefore, falls to the ground.—Iam, yours, etc.,

99, St. John's Hill, S.W.

KODAK, LIMITED; THE DEALERS AND THE USERS.

To the Editors.

Gentlemen,—Once again the Kodak Company are forcing themselves into an unenviable prominence (unenviable, that is to say, except from an advertising point of view) by the imposition of terms which, however they may agree with American business methods, are obnoxious to the British sense of the right of freedom in trade. I think it is extremely probable that most of your readers will admit

that the company are acting strictly within the letter of their rights in making the conditions they have seen fit to announce in their recent circular, since anyone who makes an article is at liberty to please himself as to whether he will part with it or not, and as to the terms on which he will let it go out of his possession. He is also at liberty to say whether or not he will sell it to any particular person who may be willing to buy. Still, it is not to be forgotten that others also have their rights, and if the producer of an article offers it for sale, those to whom he offers it may, without straining any legal obligation, decline to purchase his article, however useful or excellent it may be, on the terms offered, or on any other that may be substituted. The Kodak Company appear either to ignore this public right, or to think themselves strong enough to ride over it and trample it down. How far their ignorance or their self-confidence is justifiable remains to be seen.

But surely something else besides legality enters into trade relationships. A man or a firm may in the course of business do nothing that is actionable, and yet may practice methods which are not to be commended on moral grounds. Take the case before us. There is, I take it, a very real sense in which dealers are the servants of the public. They profess by their position, at least implicitly, that they are ready to supply the public with what it requires. What it requires is, one supposes, the best article it can get for the money it is prepared to expend. It goes to its servant (the dealer) for this, but what security has it that it will get what it wants if its servant has been approached by a producer with a bribe in the shape of extra discounts and special terms to accept and offer his goods, and his only? For my part I should say there is no such security under such conditions, and I should dispense with the services of my dealer if I knew he had accepted the bribe. By doing so he has at once put himself out of all worthiness of confidence, for it is not at all likely that he will recommend any but the one particular article he has bound himself to offer to the exclusion of others, however superior the articles he has bound himself not to offer may be. The worst of it is that the position of the dealer who rejects the bribe is only less awkward than that of him who accepts it. For he is under the constant temptation to push other (and it may be inferior) goods because of his reduced profit allowed to him by the briber. I sincerely trust the British public will say with unmistakable emphasis to those who have brought about this condition of affairs, "We will have none of these things."

But what is to be said of the wholesale dealers and their action as represented by Messrs. G. Houghton and Son. In their letter to you as published in your issue of the 17th? It seems to call for some explanation. In their third paragraph they "propose to make a plain statement of antecedent facts." In the course of this statement, after referring to "the considerable and growing account" they have had with the original Eastman Company and the transformed Kodak Company, they make an interesting revelation, to wit:—"They commenced by giving us *very special terms* (the italics are mine) as wholesalers (sic) as an inducement to push the sale of their cameras, etc., through our travellers, and by other means." Then, after continuing the history of gradually lessening favour to themselves and increasing inducements to retailers till the last development, they naïvely say in their last paragraph: "Instead of being, as heretofore, not particularly anxious to introduce competitive articles, we are now forced in self-defence to do so, and we are glad to say that very shortly we, in common with other wholesale house and manufacturers, hope to put before you some specialities in the way of films and film-cameras of first-rate quality," etc. A question that occurs to me in connection with these two quotations thus brought together is, Why have the writers not brought out into greater prominence these first-rate films and film-cameras before now? Is it because of the "very special terms" offered by one foreign firm to push the sale of their goods? Only Messrs. Houghton and Son can answer that question. I hope, for their own sakes, they will be able to answer it in the negative. I will refrain from further comment other than to say that it seems quite evident that through this pushing of the sale of Kodak goods, however it may have been induced, other producers and would-be producers have not had the encouragement and support that one may reasonably suppose the merits of some of them warranted, and this seems to fully justify the position of those who claim that, however excellent the Kodak Company's films and cameras may or may not be, their procedure has not been such as to favour and promote further improvement in photographic apparatus and materials, but rather (and very much) the reverse. I enclose my card, and beg to subscribe myself,—Yours very sincerely,

January 18, 1902. T. W. J.

MORE AMERICANO.

To the Editors.

Gentlemen.—How does the enclosed letter (copy) bear out the remarks of "Cosmos" about the coolness of some American lecturers? The letter was received a year or two ago from an absolute stranger, and has been preserved as a curiosity. I remember when first reading it, the list of questions made my head dizzy.—I am, yours faithfully,

A PHOTOGRAPHIC PUBLISHER.

January 18 1902.

Cleveland, O., U.S.A.

Messrs. —— and Co.,

Gentlemen,—You may remember that two years ago I ordered some lantern slides of you and thought of ordering more, but found it cost me as much to import them as to buy of dealers in New York, so have ordered through McAllister since. I shall soon send another order through McAllister (Anthony), in which I will have mentioned that they are for me, and please select me perfect ones of medium density. A few questions answered very acceptably at that time has induced me to enclose another list, which please answer at your earliest convenience and oblige, very truly yours,

T. M. CORNWALL.

I have one of your slides of "Cast of Scott's Head." Where is the cast? Of what it is composed? By whom made, etc.?

Is Edinburgh University in the old town, and where located? What is the average attendance per annum, and how many professors employed?

Does the Queen spend any time at Balmoral? If so, what time of the year, and how long? Is it pronounced Bal-mor-AL, or Bal-MORAL?

How high is Scott's monument, Edinburgh? Of what is it composed? Who was the architect? How much did it cost? How high is the statue of Scott? Of what material, and by whom sculptured?

For what purpose is the room now used in which Scott died, and for what used before his death?

Prentice's Pillar, Roslin Chapel, seems to be a special object of interest. If so, why? Why is the locality thereabouts called "Lady Chapel"?

For what use was the Old Tolbooth appropriated originally, and what is it now used for?

If you will give me the above information, at your earliest convenience, I shall be much obliged, as I have no convenient way of obtaining it at hand.

T. M. C.

THE ALMANAC FOR 1902.

To the Editors.

Gentlemen,—Perhaps your numerous correspondents would be glad to know that I have about 30 paper copies on hand, and for further details will refer to your advertisement columns.—Yours truly,

H. CORNTHWAITE.

Imperial Arcade, Birmingham.
January 18, 1902.

A PORTABLE LANTERN STAND.

To the Editors.

Gentlemen,—All lanternists, at some time or other, find themselves face to face with the difficulty of procuring suitable means for elevating their lantern in the best position according to the height of their screen, and much ingenuity has from time to time been displayed in designing cabinets and attachments to lantern boxes whereby an increase of height may be obtained without resorting to the use of boxes and similar temporary supports, which at times are not at hand when required. Tripods for this purpose are quite out of the question with lanternists who have experienced the need of steadiness and absolute safety in everything connected with their outfit, and it is surprising that manufacturers should be found actually designing a form of tripod and advertising the same as a lantern stand. The objections to such will be evident to anyone who for a moment considers that the spreading legs of a tripod are always in the way, especially so in the dark, and when an operator has often to move about and around a lantern for hours at a stretch. No exhibitor of experience would think of running such a risk, and a tripod does not afford the required accommodation for slides, etc., which are always best placed on a firm support such as a good table supplies.

At most places where lantern entertainments are given a good table can generally be procured; if not, a visit to some kindly disposed person in close proximity to the hall will never fail in yielding a suitable table as the main support for the lantern box. The height of an ordinary table, however, may be taken as thirty inches, and this, even with the addition of a fairly large lantern box placed on top, will often be insufficient to yield the necessary elevation, even with a large amount of tilting. Hence recourse must then be had to piling up boxes underneath or on top of the lantern box to gain the necessary elevation for the lantern. Experienced lanternists contrive as far as possible to carry with them all really necessary attachments and accessories; in one case

known to the writer, a miniature studio camera stand forms part of an outfit, and a most excellent arrangement such proves to be, the one objection to its use being its non-portability.

Many excellent forms of lantern cases provide means for gaining additional height by means of having a double top attached to winged pieces that pass through apertures cut in the lantern box, and all rigidly held at any reasonable height by a well-arranged number of thumbscrews passing from the inside to the outside of the box. All lantern boxes are not, however, made of wood, and do not open at their sides (as all lantern boxes should do), and when they are not fitted with such conveniences then comes in the handiness of a really good portable stand, the designs for which are not too many, unattached to the lantern box. The plan about to be described was suggested to me on one occasion when face to face with the difficulty of overcoming a long distance projection on a screen elevated at a considerable height on the platform, when, on looking round for the most suitable article to use on the top of an ordinary table to elevate his box, a smart and intelligent waiter grasped the situation at once, and with the ejaculation, "Oh! I know what you want," proceeded at once to produce one of the most suitable articles imaginable for the purpose—viz., a substantial butler's tray, which proved to be just the thing required, and so impressed was the writer with the utility of this arrangement that he afterwards planned out what may be termed a miniature cross-legged stand of somewhat similar design, and constructed with a double top to provide a tilting movement when the lantern box is not used in conjunction therewith. In size a stand of this description can be made by altering the length of the legs or carrying two or more sets of such, seeing their bulk is not great, and when unscrewed are easily packed away along with the screw poles in the basket, nowadays used in preference to the old-fashioned long and heavy box, which for so many years did duty for packing the poles and screen. By substituting wickerwork for wood any additional weight on the metal legs of the portable stand is more than compensated for.

To provide rigidity, which is a sine qua non in all lantern stands, in this case the legs or supports are best made by means of malleable iron bars, one inch broad by a quarter inch thick. Four of these will be required for each stand, and a very useful size is made by cutting these lengths of malleable iron bars to twenty-four inches long. At the ends which are to form the top of the stand, holes are drilled half an inch from each end, the object of this being to permit of the legs being fastened by bolts and nuts to the wooden top, on the edges of which small brass or iron legs of half moon shape are screwed, these also having holes drilled through them for the bolts to attach each leg. Near the centre of each leg is likewise drilled a hole for the legs to be attached by means of a bolt and nut where they cross, exactly as in the case of a butler's tray. The bottom of each leg being bound together by a metal cross bar of rod iron, likewise passing through a hole drilled at exactly the same height in each leg, these cross bars are threaded at their ends to permit of their being firmly attached to the legs by a nut when screwed on. The top now falls to be considered. This consists of two good three-quarter inch pine boards, preferably cross ended, to prevent any warping. In all cases the size must be governed by the base of the lantern. When these tops are hinged together and a tilting screw inserted in the customary manner, any reasonable amount of tilting is provided for. The legs are of course screwed on to the under board of the top, and to which the metal legs are bolted on. Anyone desirous of making such an addition to their lantern outfit need only study a well-made butler's tray, from which, as before stated, this useful apparatus was copied. If the top is made to suit the base of the lantern it will stow away in the lantern box without trouble.—I am, yours, etc.,

LANTERN OPERATOR.

January 9, 1902.

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Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY, 24, *Wellington-street, Strand, London W.C. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

PHOTOGRAPHS REGISTERED:—

A. J. Robinson, Long Stratton, Norfolk. *Two photographs of exploded engine.*
A. Caney, Holly Lodge, Shoreham, Sussex. *Photograph of L. Rosbrook and G. Cook.*
A. C. Milne, 6, Castle Street, Brechin. *Photograph of Brechin Cathedral.*
F. G. Simpson, 17, Wharf Road, Grantham. *Photograph of Grantham Parish Church.*

J. M. B. (Leeds).—You must advertise. We do not undertake to answer letters by post.

T. K. C.—We are much obliged to you for your suggestions, the second of which will probably be acted on.

G. W. FRENCH.—You have no remedy, as British copyright protection does not extend to the United States of America.

E. T. PENFOLD.—The bad tones of the print seem to be due to a disordered condition of the bath. Possibly there was a minute trace of hypo in it; or, may be, a slight trace of it in one of the washing waters. Either would cause similar tones.

NON-RETURN OF NEGATIVES.—The only advice we can give you is to pay the account for the prints and demand the return of the negatives forthwith; then, if they are not sent, sue for their value in the County Court. Probably the firm consider they have a lien on the negatives until their account for the prints is paid.

REGISTRATION.—F. PERCY writes: "I wish to register the title of an article I am making for photographic use. Will you kindly tell me how to do this, and the cost?"—In reply: Write to Messrs. Hughes & Young, 55 and 56, Chancery Lane, W.C., who will probably undertake the matter.

MAGNESIUM MIXTURE.—W. B. asks: "Can you inform me of a good magnesium mixture for flashlight? You gave one some time ago, but have misplaced the number."—In reply: A number of flashlight mixtures were given in the monthly supplement of the JOURNAL for September last; that is what you probably refer to.

PHOTO BUTTONS.—H. HALL writes: "A customer of mine wishes to have a photo (on cheap brooch) reproduced in same style; it is the enamelled-button style of photo. Could you favour me with the address of a firm doing this kind of work? A few only would be required."—In reply: The Artistic Photographic Company, Kentish Town, would, no doubt, execute the order for you.

DAMAGED NEGATIVES.—"PYRO" writes: "I have a varnished negative badly damaged by water. How can I put it right? To remove varnish does not of itself seem sufficient."—In reply: If the gelatine film is badly damaged, we scarcely see how it can be put right, particularly without seeing the negative. Have you removed the varnish to see the real state of the gelatine film?

PHOTOGRAPHS WANTED.—"AGRI" writes: "I shall be extremely obliged if you can put me in the way of obtaining (1) a photo or lantern slide of the White Horse in Berkshire; (2) a photo or lantern slide of King Alfred's Tower, near Glastonbury. I do not want engravings."—In reply: Inquire of Messrs. Newton & Co., 3, Fleet Street, E.C., who may be able to supply you with such slides.

STAINING MICROSCOPIC SLIDES.—T. S. writes: "Shall be obliged if you can inform me where to procure chemicals for staining microscopic slides?"—In reply: Colours for staining microscopic objects may be had from any of the houses who make a feature of microscopes, such as Messrs. R. & J. Beck, Cornhill, or Messrs. Baker & Co., High Holborn; or in wholesale quantities from Messrs. Hopkin & Williams, Cross Street, Hatton Garden.

ADDRESS WANTED.—"NOSLUOC" writes: "Would you be kind enough to give me the address of a good wholesale firm where I can obtain picture-frame mouldings, as have consulted your journal and cannot find any advertised?"—In reply: "The Post Office Directory will give you the addresses of the whole of the moulding makers in London. We must refer you to that, as it is against our rule to recommend any particular firms.

ADDREES WANTED.—T. G. GAMLEN writes: "Can you, please, give me address of *makers* of "Robosal" blotting paper? A local dealer has asked me, and, being a dealer, he prefers to deal with the firm direct rather than through a middleman. Alas and alack! I cannot get a B.J. Almanac, 1902, and I ordered."—In reply: Some reader may be able to give our correspondent the address required. We do not know it.

ADDRESS WANTED.—E. R. T. writes: "Will you kindly say where Titan Scarlet S. can be obtained in London, or give me Messrs. Holliday & Son's address in New York?"—In reply: Probably the colour may be obtained from either the Badische Anilin and Soda Fabrik, 22, Bush Lane, E.C., or from the Actien Gesellschaft Fur Anilin Fabrik, 20, Eastcheap, E.C. We do not know the Messrs. Holliday & Son's full address, but possibly a letter simply addressed to New York would reach them.

DEVELOPERS.—NOTAC writes:—"I use a combined developer (which is quite clear) that does not stain. It is good for negatives, opals, and bromide paper. Can you tell me what it is made of, and how to make it? A sufficient quantity to cover one plate will develop a dozen or more plates, and will keep (corked) for any length of time."—In reply: We have no idea of the composition of the developer you have been using. How can we have, seeing that you give us no data? There are so many that answer your description. Probably it is one of the hydrochinone, or a metol-hydrochinone, type.

COPYRIGHT.—E. J. H. & Co. write: "We have a copyright photo which you copyrighted some time ago for us. We find it has been copied and published in a weekly paper, a few months ago, without our permission being asked or given. This paper is printed by A and published by B. Who is the responsible person, A or B, for making use of this copyright view without our permission? Will you kindly advise us the best course to take in the matter?"—In reply: Both are responsible, we believe, according to law; but you had better proceed against the publisher.

COLLOTYPE.—F. F. writes: "Can you inform me how to quicken or increase the sensitivenes of bichromates for Collotype plates without causing crystallisation? At present I am using 1 ounce to 3 ounces gelatine and 50 water, but the plates are a long time printing, even in bright weather. Is it possible to use "camphor" as in the bitumen processes? If so, what quantity?"—In reply: The only way is by increasing the proportion of bichromate of potash. You might try using the bichromate of ammonia instead of the potash salt, but then the plates will not keep so well. Camphor would be of no use in the Collotype process.

A "VULGAR" POSE.—SPOTTED PRINTS.—"PATIENCE" writes: "(1) I enclose a photo, and the father of the young ladies has told me that the position of the one sitting down is a vulgar position and I ought to know better than pose a young lady with her knees crossed. Shall be glad to know if such a position is vulgar. (2) Shall be glad to know if any of your readers knows of a formula for spotting P.O.P.'s before enamelling, so that the spotting does not come off when they are enamelled?"—In reply: (1) The pose of the young lady is exceedingly ugly; indeed, the group generally is most inartistically arranged, and we are not surprised that the father of the young ladies is dissatisfied. (2) Mr. Rudowsky, 22, Coleman Street, E.C., supplies a colour for the purpose; so do most of the dealers.

STUDIO ADAPTATION.—E. W. writes: "I should be pleased if you would give me your opinion on the following:—I have a room (size as on enclosed sketch), and I thought of making use of it as a studio. Would it be possible to do good work in it without any window in the roof, provided I made the window in the side larger and higher, and, if so, in what position would you place it? If you think it would not be possible to turn out good work without a top light, where would you fix it, and what size would you make it?"—In reply: So far as we can understand the sketch, we do not see how you could adapt the room for professional work, unless the whole of the west side were glass up to about 5 feet from the end proposed for the background. You might then be able to do with out a top light. The studio will be very short for general portraiture.

BREAKAGES IN TRANSIT.—"SUBSCRIBER" writes: "In answer to an advertisement in the BRITISH JOURNAL OF PHOTOGRAPHY for a portrait lamp in good working order, I had a reply from a photographer at Gloucester, and bought, on his writing it was in perfect working order. On arrival the stand proved to be broken, and on sending the battery to be recharged it was returned owing to too great leakage. The photographer says it must have been done in transit, but as he guaranteed it in good working order am I not entitled to have my money back and return it, as I cannot see why I should have to fight the railway company or receive an imperfect lamp? I should be pleased to have your opinion."—In reply: There is always some risk in buying secondhand apparatus. You should have opened the parcel in the presence of the railway-man, and then you would have seen the breakage, and then have refused to accept delivery. The parcel would have been returned to the sender, and he would have fought out the matter with the company if the breakage was caused by them. If you can prove that the apparatus was faulty when it was dispatched, your remedy is against the seller. If the damage was done by the railway company, your remedy is against them.

MAKING P.O.P. AND BROMIDE PAPER.—J. AVIS writes: "I am making my own P.O.P., but cannot get the gelatine to stand on paper; when it sets it sinks in as enclosed. Is it the fault of the paper or emulsion? The emulsion contains 120 grs. of hard gelatine per 4 oz. This is the paper I am writing on is the best I can get. I am thinking of giving the paper a coat of gelatine first(but then the paper always buckles up out of shape). How can I stop this? Can you also give me a recipe for bromide paper (medium speed), simple to make; and would same do for plates? And can you give me a recipe for gaslight paper? What kind of paper should I get if this is not suitable for P.O.P.?"—In reply: The paper is quite unsuited for the purpose. We should advise you to employ a proper photographic paper, such as the Steinbach make. It may be obtained from Messrs. Otto Konig & Co., Cross-street, Finsbury. If you turn to page 705 of the Almanac for 1896 you will find an article on emulsion for dry plates by Mr. G. T. Harris. The formulæ stands thus:—A Potassium bromide, 86 grammes; barium iodide, 3·5 grammes; gelatine, 16 grammes; water, 688 cc. 1 : 3 solution H.Cl., 2 cc. B. Silver nitrate, 104 grammes; water, 680 cc. C. Gelatin (Drescher's), 130 grammes. For the mode we must refer you to the article. The same emulsion, somewhat diluted, will do for paper; it be boiled for less time, also for a gaslight paper.

STUDIO BUILDING.—T. C. E. writes: "I enclose herewith a plan of studio reception and other rooms. Could you give me advice on the following points:—(1) In fig. 2 you will notice that the light commences 5 ft. from the studio floor, rises at an angle of 60 deg. for a distance of 8 ft.; it then runs back over flat portion of roof, a distance of 7 ft. being curved at the angle as shown in the plan. Do you think the 5 ft. of wall at B would materially hinder the procuring of a proper lighting on the sitter? (2) Also, do you think the parapet (which is clearly shown in fig. 3 and in the plan 2) would shut out the light to any harmful degree? The studio faces east. Do you think, therefore, the sun would trouble me much after 10 o'clock a.m.? (3) The tower which is shown in fig. 3 would, I think, act as a shade after 10.30 or 11 a.m. If you can make any suggestion which you would think helpful I shall be much obliged. (4) Would it be wise to have the angle of roof nearer 45 deg? I think, seeing that the studio will face east (and this, for several reasons, can't be avoided), an angle of 60 deg. would be more likely to keep out the sun after noon?"—In reply: (1) No, not at all. (2) No. (3) The tower will cast a shadow for some portion of the day, but we do not expect that you will find it very troublesome. (4) On the whole, we should rather prefer the angle of 45 deg., but, practically, in this case, one is about as good as the other.

THE CAUSE OF FOG.—"OPERATOR" writes: "I should be glad of your advice. About eight months ago the firm in whose employ I am as operator bought a new 15 x 12 outdoor camera, which worked quite satisfactorily until, during a very hot day, I had to take some views on the cliffs here. I exposed five plates out of the six, and on going home to develop them I found that on each of the five plates there was reproduced some part of the shutters of the slides. even to the grain in the wood, and so strong that it spoilt the negatives altogether. Out of curiosity, I developed the sixth unexposed plate, and got a perfect reproduction of the whole of the shutter, and so strong as to make a good print in P.O.P. The firm sent the slides back to the makers, but whatever they did to them has not cured the evil at all. I purposely left two plates in the slide during the recent cold weather for about six weeks, and then made a copy on one of them, when the markings appeared just as strong as ever. I enclose a print from the negative, showing these markings. I should esteem it a great favour if you could suggest a remedy, as the slides in their present condition are quite useless. I cannot see that the blacking is at fault, as surely by this time it ought to have properly dried. I have been in the profession for fourteen years, and have had many new cameras under my care, but I have never met with anything like this before."—In reply: The markings are due, no doubt, to some emanation from the wood of the shutters, or may be they are so thin that a bright light may penetrate them; both causes will at times cause similar trouble. The slides should be sent to the maker to do the needful to them.

ENLARGING AND HAND CAMERA MATTERS.—"SORDELLO" writes: "Having read the JOURNAL with interest and derived considerable help from it, I venture to put myself under a more personal obligation to you by consulting you in the following circumstances. I am an amateur, but find that a certain amount of work can be put in my way. I shall, however, if the connection is to be developed, require an enlarger. I do not know which pattern to buy—either an enlarging camera (such as you referred to in a leading article last year) or an enlarging lantern. I shall be much obliged if you will kindly inform me which of the two types you have found the more convenient and useful in practice. 2. I also need a hand camera of good quality for accurate work. So far as I have been able to go into the matter, my leanings are to one of the reflector type, but I should like to learn whether in actual work its advantages over the ordinary focussing hand camera outweigh the disadvantages of the type. If I might venture to ask, would you give briefly the points of advantage and disadvantage which you have found in working reflector, focussing, and twin-lens hand cameras? The information from such an authoritative source would help me much in arriving at a decision. 3. One point more, to trespass still further on your good nature. Is there any standard list of prices which should be charged for prints, and if so, where can it be obtained? Where I more especially need information is the case of an enlargement where the photographer makes not only it, but the original negative. I am determined, if my work is to sell, the sale will be due to its quality and not to undercutting, but am at a loss to know what charges to make."—In reply: (1) Either system is good; it is merely a question of convenience which you employ. (2) Most reflector cameras are focussing cameras, and the advantage of them is that the image can be focussed sharply on the plate whatever distance it may be away. Another advantage of a reflector, or a twin lens camera, is that the image shown on the ground glass is the same size as it is in the negative. (3) There is no standard list of prices. Every photographer fixes his prices according to what he considers his productions are worth.

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EX CATHEDRA.

Colour Photography. Last week, under the heading of the Lippmann Process and Colour Photography, we referred to a process for the direct production of colour photographs, upon which Dr. Neuhauss had been experimenting, and of which he had sanguine hopes of success. The Lippmann process, especially with gelatine as a vehicle, is beset with difficulties, and from the principle upon which it is based seems destined to be slow, and consequently applicable only to a limited range of subjects. Yet there is much to be done in the field to which it is adaptable, and we are surprised that the process has not received more attention from the large number of skilful amateurs, who are interested in photography and have leisure at their command. Perhaps the introduction of Lippmann gelatine dry plates as a commerical article may give an impetus to this branch of photography. Many difficulties have to be overcome in their preparation, but that was also the case with the gelatine plate now in universal use, and the skill which has produced the highly sensitive emulsions, to which we are now accustomed, should be equal to the task of making a Lippmann plate at a reasonable price. Photographers will not, however, think that their art has approached completeness, until a direct colour process has been discovered, that will enable them to make a picture with reasonably short exposure.

* * *

The Plymouth Exhibition. There are few photographic exhibitions in the West of England—below Bristol, at any rate—and that part of the kingdom is looked upon as almost out of it, in many matters besides photographic. But if there is little life in this way it may be excused when it is to be noted that the principal and best exhibition in Devon and Cornwall, that of Plymouth, is to be judged by men whose instincts and trainings are primarily artistic. The members of the Plymouth Photographic Society have not hitherto been aggressively assertive at the big exhibitions, as men of Birmingham, Leeds, Bristol, Bradford, Glasgow, and Edinburgh have, but it would seem that they are courting judgment and criticism so as to get their hands in for work in bigger spheres than they have hitherto occupied. At the last exhibition Dr. Emerson very kindly acted as judge, and his decisions, on the whole, were welcomed and appreciated. He has been asked to act again. With him will act Mr. Baragwanath King (a man whose name betrayeth his Cornish connection), an artist whose style is of the broadest and most "diffused." He has more than a local reputation, and is undeniably clever as a draughtsman and colourist; his pictures are always good in composition. Another of the trio is Mr. F. Shelley, also an artist; indeed, the master of the Plymouth Corporation Technical School of Art. These judges ought to be able to impress the members of the society with good ideas upon pictorial photography. We cannot call to mind a similar selection for adjudication, because usually there is the severely practical and technical photographer to come in, to hold in rein the artists. But Dr. Emerson is quite expert enough in that direction to satisfy the needs of all who will place their work for the criticism of these worthy men.

* * *

Dr. Neuhauss's Process. Since we drew attention to the paper in "Liesegang's Photographischer Almanach," we have received a copy of the German Photographic journal, "Der Photograph," containing an article descriptive of Dr. Neuhauss's process, signed "Rhenanus." In our opinion, Dr. Neuhauss has been over sanguine in the estimation of his process, and we entertain considerable doubt as to its value. If further experiment enables him to solve the problem and produce a good colour photograph by reasonable exposure in the camera, we shall be among the first to do him honour. Briefly stated the following is a description of the process, according to our contemporary. The aniline dyes and many others are bleached by exposure to light, but the action varies with the dye and the colour of the light. By mixing very sensitive red, blue, and yellow aniline dyes, a greyish black mixture is obtained. Upon exposure to red light, the blue and yellow are bleached, leaving the red. Exposure to blue light bleaches the red and yellow, leaving the blue, and yellow light bleaches all but the yellow. The primary colours are thus ob

tained, and these yield the mixed colours, as in the other three-colour processes. These facts were well known, but although sensitiveness could be increased by the presence of oxygen, such a colour process was too slow to be of use. Dr. Neuhauss has found that the sensitiveness may be improved by the addition of chlorophyll. The bleaching process, which depends upon oxidation, may also be accelerated by adding a small quantity of peroxide of hydrogen. Many of the aniline dyes will not stand the addition of peroxide, but Erythrosin, Uranin and Methylin-blue have been found suitable for the purpose. As collodion retains the oxygen in the film better than gelatine, it is to be preferred, and filter paper is the best support. The image may be fixed with sulphate of copper, or an ammoniacal compound of copper. The sensitiveness of the material is said to be about that of albumenised paper. Under these circumstances, it can only be described as a printing process.

* * *

The Hand in Portraiture. The difficulty of posing the hands, in such a manner that they are not obtrusive, is known to all who have attempted portraiture, but to make use of these members to give expression and charm to the picture is a power that photographers often fail to exhibit. The "Deutsche Photographen Zeitung" has an article by Max Lutz, of Munich, emphasising the value of the study of hands as a guide to the expression of character and phases of thought. The classification he gives, which is taken from Dr. Carns' work on the "Correlation of Mind and Body," is well worth noting. Carns makes four broad classes:—

1. The elementary, or hand of lowest grade.
2. The skilled, or average hand of men and the lower order of women.
3. The sensitive, or average hand of women and the higher order of men.
4. The psychic, or hand of highest perfection.

The elementary is that of the labourer, artisan, sailor, veteran soldier, agriculturalist and others. The fingers are nearly of the same thickness to the tip and the outline is only broken at the joints. The juncture with the arm is angular and bony. In women the elementary hand has similar characteristics, but the skin and flesh are rather softer. The bones are thinner, but the form is less pure and more irregular.

The skilled hand is that of the workman trained to higher handicrafts, the business man, the plastic artist, the painter, the musician, and those whose occupation has a mental basis. The bones are more delicate and the skin more elastic, but the form is still very pronounced. The fingers are thinner and taper at the tips. The length of the hand is greater in proportion to the breadth. It is soft and pliant.

The sensitive hand is really the highest type in men. The fingers are long and tapering, and the joints marked, without being prominent. The palm is rectangular, and the nails somewhat long and oval. It is the hand of the savant, the statesman, the poet, and those who do more by word than deed. The sensitive feminine hand is met with in women of mental ability.

The psychic hand is the ideal of a beautiful woman's hand and is scarcely found amongst men, excepting of high, mental, and moral power. Such a hand may be seen in Titian's picture of the "Tribute Money," and the artist at the same time shows the enormous difference between the masculine, psychic, hand of Christ, and the coarse, elementary hand of the Pharisee.

An Attractive Window. A good window is an important factor in attracting trade. This is proved clearly enough by the attention given it by successful business men. It is not likely that they would pay large salaries to expert window arrangers if their work were not regarded as important and its results remunerative. This applies in particular to the photographer. His window attracts readier and fuller attention than those of his fellow-tradesmen. Very few passers-by with a little margin of leisure can resist the temptation to look into it and criticise. The attraction is not due, as a rule, to any new idea embodied, or even to an old one in a new dress. It must be admitted that in nine cases out of ten they are unutterably orthodox. The attraction is more due to the human quality embodied in his wares. But there is no reason why this should not be heightened. It would be to his business advantage if it were. The character of the existing attraction should be held in mind when thinking of the best way of adding to it. It is such, for instance, that the popular working model would spoil rather than enhance. This may do very well in a chemist's window to call attention to the virtues of a patent medicine, but is altogether out of character with the kind of attention and thought in the mind of one looking at a display of photographs. The leading characteristic in the latter case is probably a critical one. Are the young lady's good looks brought out to highest advantage, or would a different pose suit her better? Would not the old man look better seated, the young man full instead of three-quarter face? Are black and white better than silver prints? Has the character and colour of the mount much to do with heightening the effect it is desired to produce? There is no opportunity of judging in the heterogeneous jumble of prints. An effort should be made to gratify the trend of unconscious thought in the mind of the looker-on. It can be easily accomplished by taking a pretty face and figure in different poses, and showing them side by side. The old man could be shown sitting and standing, the young man full as well as three-quarter face. The same figures might be shown in black and white, sepia, and ordinary silver print, and the value of mounts by mounting one of the same kind upon different kinds of mounts. The judicious arrangement necessary would, in addition, evolve system and order out of the existing chaos of the window contents. It would also assist in reducing the number of prints displayed, a matter which, from an artistic as well as a business point of view, we have oftentimes advocated. The resulting impression would be of a piece with the colour and pattern of the thoughts and feelings of the one looking on. This in itself is valuable, but is made more so by its practical business value. The prospective customer is more strongly attracted to the window; he is unconsciously gratified by the choice offered him, the field of choice being wider; he is more likely to see something that suits him, and the impression is conveyed that the photographer is fully up in all classes of work. The slight extra cost would speedily prove a most remunerative investment. This is but one way in which the great majority of existing windows could be utilised to greater advantage. There are many more that would suggest themselves naturally once thought is led into and interest aroused in the new direction.

THE work of preparing Bushy House for the National Physical Laboratory is now approaching completion, and, at the request of the President and Council of the Royal Society, the Prince of Wales has fixed Wednesday, March 19th, for the opening ceremony. The object of the laboratory is to encourage the applications of physical science to manufactures and industry. This it will do by undertaking researches into questions of importance to either, and by testing apparatus and material used in trade.

ABOUT LANTERN ILLUSTRATIONS.

We must all agree that the success of an experimental lecture depends in a great measure upon the neatness and exactitude with which the experiments are performed, as well as upon their suitability to the subject in hand. We have all heard lectures which were admirable from a literary point of view, but which continually hung fire because the experiments had not been properly rehearsed. On the other hand, most of us have listened to discourses of a most halting kind which were redeemed by the excellent manner in which illustrated experiments were shown to the audience. It is a happy state of things when both subject matter and experiments are so wedded that the action is suited to the word, and the word to the action.

The sheet anchor of the modern lecturer is most undoubtedly found in the optical lantern, for by its aid he can show experiments, of a limited kind, or can exhibit diagrams and pictures; moreover, he can, with instruments built for this kind of work, change from one to the other with great rapidity. We have noted that the experiments are somewhat limited, by which we mean that they must be of such a compass as to be comprised within the circle covered by the condensing lens. They must, too, be in one plane, or the effect upon the screen is greatly marred. There is, however, a compensating advantage in this matter of limit, for it means that small experiments, which would only occupy the fingers at the lecture table, can be magnified on the sheet to such a scale that the image, although it may be merely a silhouette, is plainly visible to a large audience.

Let us instance the experimental magnetisation of a piece of steel, *e.g.*, a knitting needle. The needle is stroked in the orthodox manner upon a magnet, and is then found to possess magnetic properties of its own. In other words, it will take up small nails, iron filings, &c. If performed at the lecture table, such an experiment goes for nothing, for the operation is far too small to be seen except by those in the front row. But when shown in the lantern, the knitting needle assumes the proportions of a scaffold pole, and the fragments of iron which cling to it are as chunks of coal. If the audience are allowed to see the neutral state of the needle before its contact with the magnet, the eagerness with which the pieces of iron rush to its embrace after magnetisation is still better appreciated. Experiments possible with the lantern also include a number in which a small tank is employed for the introduction of different liquids.

Another way in which the lantern can often be used conveniently as a demonstrator is to photograph an experiment which of itself would be ineffective if brought before an audience, and to show the photograph as a lantern slide.

We once had the pleasure of witnessing a demonstration in a lecture hall in which this system of illustration was carried out to great perfection. The lecturer had to describe a complicated piece of apparatus, the working of which required dexterous manipulation of various buttons and screws, and to make these various operations intelligible to a large audience was a matter of very great difficulty, chiefly because the entire apparatus was no bigger than a half-plate camera.

The lecturer, who was an experienced man, had foreseen this difficulty, and knew well enough that unless he took extraordinary precautions, not one-tenth of his audience would understand what he was driving at. So he took the unusual course of photographing another pair of hands executing each of the necessary movements, and these pictures, in the form of lantern slides, were thrown on the screen as he described each one. It was, of course, an irksome business to go through all this trouble, but he was rewarded by the enthusiastic manner in which the pictures were received and appreciated.

Some lecturers are so careless in the matter of quality of the pictures which they show in public, that they will copy the roughest woodcuts and make them do. This is often the case in dealing with scientific subjects, the pictures being borrowed from a text-book without any thought as to their crude nature. The roughly-cut lines of some of these woodcuts are terrible to see when magnified on the screen. A steel engraving, on the other hand, will often make a good lantern slide, and a well-printed picture from a half tone block is not to be despised if nothing better is available. But a woodcut, unless it is a very fine quality, or of such a size that in the lantern slide its lines are much reduced, should be avoided.

With a little trouble a text-book illustration of an experiment being performed, can, with the help of an assistant, be photographed from life. Take, for example, the well-known way of showing the phenomenon of refraction, by placing a coin at the bottom of a basin. The coin is invisible from a certain position, until water is poured into the vessel, when the rays of light are bent in entering the denser medium, and it comes into view. By photographing two similar basins side by side, one surmounted by a hand holding a jug from which it has just been filled with water, bringing the coin into view—a lantern slide can be made, which will make the matter plain. There are many other experiments in the region of physics which can be illustrated in the same way, and such pictures are far more effective and convincing than any woodcuts can be. Moreover, those which involve the use of glass, or porcelain, have a natural play of light and shade about them which invests them with an air of completeness and reality.

We are quite ready to admit the reasonableness of the obvious objection to carrying out lantern illustration in this complete manner. It does not pay. As a commercial speculation, such pictures would certainly not answer, for the demand would not be great enough to cover the cost of production. But in the many cases which must occur, where a lecturer will show the same illustrations to different audiences, it will surely pay him to do the work to the best of his ability. At any rate, there will be satisfaction about it, which is a reward in itself.

FLASHLIGHT WORK.

The present season is an opportune one for calling the attention of our readers to a class of work which, for some unaccountable reason, seems to be very greatly neglected. Many years have elapsed since what may be termed the modern aspect of flashlight photography was first described for practical working, and since then photographic literature may be said to have been flooded with descriptions of processes, pyrotechnic mixtures, apparatus, lamps, and every conceivable adjunct to flashlight working. For years past numerous excellent articles have found a place in our almanac, and yet at the present time how many photographers are there who professionally undertake the production of photographs by flashlight? Two reasons occur to us, as being possible explanations for this neglect to take up what has every appearance of being a lucrative branch of the profession. They are, first, the assumed difficulties and costs attendant upon the work; and, secondly, the dangers of explosion. First, considering the more easily disposed of objection, it should be understood that magnesium powder itself is not explosive, and is, in fact, with difficulty inflammable, except when reduced to fine powder, or to the form of wire or ribbon, with

a perfectly clean surface. The same, however, cannot be said of the many forms of what may be termed with propriety pyrotechnic compounds, such as magnesium and aluminium, mixed with oxygen, containing compounds, or mixtures generally, which contain within themselves the elements of quick combustion, which is another way of saying explosion. Some of these are liable to spontaneous combustion, others ignite with a very slight friction, while others again are not readily exploded, except by contact with flame or a heated body. This latter class should be handled and used with just about as much care as one would handle and use gunpowder. In point of fact, the extreme of care should be exercised in handling them, but painful experience has shown that carefulness has only too frequently been wanting, with the result of deplorable, and occasionally fatal, accidents. It is therefore obvious that to one not exceedingly familiar with the handling and storage of this type of mixture, that choice should be made of simple magnesium or aluminium, separately or mixed, as the illuminating agent for flashlight work.

As we write for those who may not be fully conversant with the subject, we may point out a desirable precaution to take with regard to the storing of the magnesium powder or aluminium. An essential condition for the rapid combustion of these powders is, that nothing should intervene between the oxygen of he air and the surface particles of metal. If, however, the metallic powder (and especially so when it is finely comminuted) be exposed to the atmosphere through being kept in a badly-corked bottle, or, as we have even seen it, screwed up in a piece of paper, the surface of the magnesium quickly gets covered with a coating of oxide, which, though it may be most slight, will seriously interfere with its ready combustibility. A similar difficulty has been alleged to arise from a slight coating of grease, rendered adherent in the progress of manufacture to the surface of the particles. It has been proposed to get rid of his by heating to dull redness in a closed crucible provided with a small outlet, to get rid of the slight products of the decomposition of this oily matter. A simpler plan, perhaps, would be to digest it with benzol to dissolve away the grease, and then to quickly dry and store in air-tight receptacles. With regard to the duration of the combustion in case of, say, magnesium powder, it might not unfairly be considered as a time which elapses between the arrival of the powder at the margin of the flame and its arriving on the other side of the flame. Granting for argument sake, a flame of the unusual dimensions of four inches in height or breadth, and remembering the velocity of objects falling through air is 32 feet per second, we should not be very far wrong in estimating *apriori* that such duration of exposure would be between $\frac{1}{80}$ and $\frac{1}{90}$ of a second. In taking portraits, therefore, with so brief an exposure as this, it is improbable the shock caused by the sudden flash could influence the nerves controlling the expression sufficiently quickly to enable them to alter before the flash was over.

With regard to the apparatus to be used, it would be invidious on our part to select one out of the very many designs which our contributors on various occasions have been so kind as to send us. We would refer to previous numbers of the JOURNAL AND ALMANACK.

With regard to the illumination, it should be pointed out at the outset that there is no difference whatever in the effects produced from an illuminating surface of given area, whether the illumination be the hundredth of a second or a hundred seconds. What has to be looked to is that the illuminating area be not confined to one or two points, but spread either by suitable reflection or considerable sub-division and spreading of light points over a space, which would be a fair analogue of such illuminated area as would be made use of under similar conditions, when, working by daylight in a studio, a private house, or indeed, any place where photographic portraiture is being carried on. We have endeavoured, in as few words as possible, to point out what might be called the underlying principles of flashlight photography, and we trust that our words may be the means of fostering an interest in a branch of the art at once lucrative and fascinating.

HALATION.

[A Paper read before the Birmingham Photographic Society, January 21st, 1902.]

THE object of this lecture is to give you, in a condensed form, what lawyers call a "digest" of the views and theories which are held at the present time concerning halation, and the principles to be considered in dealing with it in practical work. I do not propose to occupy your time in re-stating the details of formulæ which can be found in the text-books and annuals, but rather to put you in a position to judge between the good and the bad, and to decide what is the best procedure for any particular purpose. I am aware that such a lecture upon halation cannot be of absorbing interest to every photographer; pictorial workers, for instance, do not generally care to dive into a subject like this deeper than is sufficient for their immediate wants; and no doubt they are quite right. But it is one of the advantages of photography as a hobby or pursuit that there is ample room therein for all tastes, so that those of you who find their chief satisfaction in pursuing the pictorial side of photography will bear with me if I appeal specially now to those whose interest is mainly on the scientific and technical side. We have all of us more or less definite notions of what halation is, and have suffered from its effects, or rather, I should say, that some of our negatives have; the corresponding complaint in the human subject when things become somewhat blurred is perhaps more correctly described as "elation," and it is quite unnecessary for me to address you upon this topic.

Quite a number of unwelcome appearances upon the negative are popularly classed under the head of halation, but, strictly speaking, true halation should be traced to two causes only. (1) The first is the lateral spreading of light in the film itself; and (2) the second cause is the reflection of light from the internal back surface of the glass or other support of the sensitive film. Although it is convenient to consider these two causes separately, they have one common origin. Imagine that we have a black card with a small hole in it placed before the camera with a bright light behind the card. If now we focus this bright point of light upon a sensitive plate, we shall have the film illuminated with a bright spot. This bright spot becomes a centre of emission and radiates light in all directions; some rays travel forwards, and are, or should be, absorbed by the dead black interior of the camera, and concern us no further. Other rays travel backwards through the film itself into the glass plate, where they undergo partial or total reflection at the back surface of the glass, and cause the second variety of halation, which we will deal with presently. Other rays travel laterally from the bright spot for some little distance into the substance of the sensitive film, which is not very opaque, and produce an actinic effect like a halo about the image of the point. It will be obvious that the amount of halation must increase with the brightness of the image and also with the length of exposure. Therefore when both these are considerable, as is frequently the case in the photography of interiors, where there is a clear glass window in the field of view, together with dark details, which require a prolonged exposure, the halation must necessarily be at its worst. From a consideration of these rays which radiate laterally, it would appear that it is almost impos-

sible to have a clean image in any case; but fortunately in ordinary work their effect is slight enough to escape notice unless it is sought for. But even if the light is not very bright this form of halation is sufficiently obvious when, as in the present case, the bright point of light is adjacent to a dead black part of the image. The lateral spreading of light in the film is one of the reasons why it is difficult to copy a line drawing with perfectly clean lines such as process engravers require. This variety of halation, it should be noted, is chiefly in the upper layers of the film, and the best remedy appears to lie in the direction of increasing the actinic opacity of the film.

THEORETICAL CONSIDERATIONS.

The addition of iodides to the emulsion is one practical plan, which is in general use. Another plan consists in staining the film with non-actinic colours. Mr. W. K. Burton experimented with picric acid and picrate of ammonium with more or less success; he found that the chief drawback to their employment lay in the fact that the sensitiveness of the film was lowered. The practice of process engravers to get over the difficulty consists in clearing the lines with a reducer, intensifying afterwards if necessary to restore the opacity of the negative. The effects of this lateral spreading of light can also be minimised somewhat by painting the spot with a solution of an alkaline bromide during development, which allows the image to develop relatively faster than the halation. Let us now return to the image of the spot of light, and consider the second form of halation which is due to the reflection of the rays. In the ordinary practice of most photographers the effects due to this second cause are much more serious and obvious than those due to lateral spreading, since with glass plates of the usual thickness the reflected halation extends for a comparatively wide range round the point of light, whereas the lateral halation is confined more closely to it. It must not be overlooked that both forms of halation co-exist if the second form is present; that is to say, if the light does penetrate right through the film, it must also be able to spread laterally.

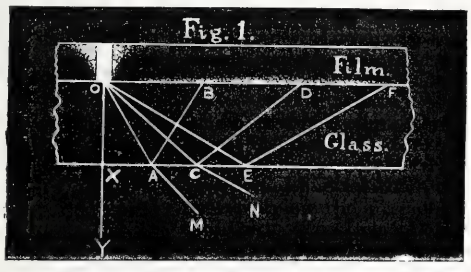


Fig. 1 shows the course of the rays which produce reflected halation. The dotted portions show the positions of the lateral and reflected halation.

The diagram No. 1, which represents an imaginary section of a dry plate highly magnified, illustrates the simple case of the path of some of the rays which diverge from the bright spot on the film marked O into the glass plate. The general law for these rays may be stated as follows:—When a ray of light passing from glass to air strikes the surface which is common to both perpendicularly, the ray is almost wholly transmitted; very little of it is reflected; but as the angle at which the ray falls differs from the normal, so does the proportion of the light which is reflected gradually increase, and that which is transmitted decrease. When, however, a certain angle dependant upon the refractive index, and called the critical angle, is reached, the light is suddenly entirely reflected. In the diagram the perpendicular ray OX passes almost completely through the glass, emerging in the direction of Y; very little of it is reflected. The rays OA, OC, OE are internally reflected in the directions B, D, and F respectively; but OA is also partially transmitted as well; the same is true of OC, but the reflected portion is greater, and the transmitted less. The ray OE is supposed to fall at the critical angle, so that the whole of it is reflected. Any rays falling beyond E are also totally reflected, but the more the rays extend in this direction, the longer is their path through the substance of the glass, so that they suffer considerable absorption and lose in actinic power. As the rays radiate in all directions round the point O, the result is a ring of halation round the point O which is slightest at the centre, vignetted at the circumference, and densest at some intermediate point. It should be noted that this second variety of halation, unlike the first, produces its effect entirely upon the lower surface of the sensitive film, and is clearly visible at the back of the plate before fixing; every photographer must have noticed it.

THE PRINCIPLES INVOLVED.

In explaining the theory of halation, the case of a single point of light has been taken for the sake of simplicity, but the reasoning can easily be extended by remembering that an image is but an aggregation of a number of points. A consideration of the diagram No. 1 will show the different plans of attack for preventing or minimising the halation from reflection. There are at least five principles which may be adopted:—1. The sensitive film may be made as opaque as possible, so that little or no actinic light is transmitted, consequently there is none to be reflected. This is done by the addition of iodides to the emulsion, or by increasing the thickness of the film (it is always well to see that the plates have a generous coating of emulsion), or the films may be treated with non-actinic dyes. Several distinct layers of film may be superimposed as in the Sandell plates; or an opaque or non-actinic substratum may be interposed between the film and the glass, as in Oakley's anti-halation plates, which substratum is cleared away during development or fixing, or afterwards. 2. As a second principle, reflection from the glass may be abolished by discarding the glass plate, using a paper support, stripping or otherwise, or a cristoid film which dispenses with a support altogether; or the amount of halation may be reduced by using a thin transparent material like celluloid as a support, which limits the spreading of the light by reflection. A moment's consideration of the diagram No. 1 will show that the thinner the transparent support, the smaller will be the area of the ring of reflected halation round any point. The converse also is true; a glass plate thicker than usual will be found to spread the halation over a wider area. In either case the total amount of halation is the same, but its intensity will vary inversely as the area if the absorption of light due to the support is neglected. When the support is very thin, the reflected halation practically coincides with the image and reinforces it. 3. As a third principle the amount of halation can be minimised by reducing the excessive contrast of light and shade falling upon the plate by covering up the high lights for a portion of the time of exposure. In photographing difficult interiors, when a window cannot be managed in any other way, a cloth is sometimes hung outside the building over the window for a part of the exposure. There is another way of effecting the same end, by means of a skeleton wire frame fixed a short distance in front of the lens, by means of which pieces of opaque paper cut to proper size and shape are fixed so as to cover up the high lights for part of the time; this method is described in "The Photogram" for April, 1897. 4. A fourth principle consists in taking advantage of the fact that the image is mainly on the front of the film, while the reflected halation is on the back surface. If the developer can be confined to the upper layer of the film the halation below will remain undeveloped. This is accomplished by a preliminary soaking of the film in plain water to saturate the gelatine and delay the entrance of the developer; then a strong developer is applied to the surface for the minimum of time; if necessary, the solution can be poured away before full density is attained and a physical developer substituted.

An addition of a colloid such as gum to the developer assists in confining the action to the surface. It will be seen that a full exposure is required, as the action of the developer must not be prolonged in the attempt to force out detail. 5. The fifth principle consists in what amounts to temporarily abolishing the back surface of the glass support, so that no reflection can take place therefrom, and substituting an absorptive body to trap the actinic rays. This is done by coating the back of the glass plate with a medium which is in optical contact, which has the same refractive index as the glass, and which is capable of absorbing all actinic light which reaches it.

BACKING THE PLATE.

This backing of the plate is perhaps the most useful method in general practice, and is carried out in a variety of ways. The ideal backing should answer to the following conditions:—

(*a*) It must be in optical contact with the glass.

(*b*) It must have the same refractive index as the glass, or a close approximation thereto.

(*c*) It must be capable of absorbing the actinic light which reaches it.

(*d*) It should contain nothing at all injurious to the sensitive film.

(*e*) It should not chip or scratch easily, so as to cause dust.

(*f*) It should be convenient in application and quick in drying.

(*g*) It should be easy of removal.

The first three conditions are absolutely essential; the others are highly desirable. I wish to emphasise the point that without the first three conditions the backing is absolutely useless. In the unbacked plate, the glass being in contact with air, internal reflection takes place; this is equally true even if the air be the merest film imprisoned between any badly-applied backing and the glass. If the backing is in absolute or optical contact, and is of the same refractive index as the glass, then we have virtually abolished the back surface of the glass, and any reflection of the rays that takes place must be from the back surface of the film of backing; we have therefore only to see that the backing is absorptive for the actinic rays to destroy this form of halation completely. If we omit any one of these three conditions our labour is in vain.

The varieties of backing in use are many, and of more or less efficiency. I will just mention a few of them, with short comments. Cornu's mixture of oil of cloves, turpentine, and lamp-black can be adjusted exactly to the refractive index of the glass, and is optically perfect, but it does not dry, and therefore is messy in use and inconvenient for work outside the studio; further, as it is well known that turpentine and such-like substances have fogging propensities if left in proximity with sensitive plates for any length of time, it is objectionable on this score. Collodion, mixed with some non-actinic dye, is fairly good, but not very pleasant to apply, and not too easy to remove. The best plan for removal is to leave the backing alone until development is nearly complete, when a patch can be scratched off with a small palette knife sufficient to judge density; after fixing, the remainder can be removed in the same way, which is now easy, as the collodion is somewhat softened. Washing under the tap, gelatine side upwards, prevents any fragments of the collodion lodging on the film.

Other quick-drying compositions are asphalt in chloroform, removed with benzine and a rag, or shellac varnish and lamp-black, removed with washing soda and sponge, or soap dissolved in alcohol, with the addition of some non-actinic dye; the last is easily removed with a damp sponge. Flexible backing pads made of gelatine, glycerine, and lamp-black or some other sticky compound, coated upon fabric or tough paper, are sometimes used. With these the great difficulty is to get them into perfect optical contact with the glass. Air bells are easily imprisoned, and as it is impossible to see whether any air bells are enclosed or not, this method cannot be recommended to serious workers. If you will try the experiment of rubbing down one of these pads upon a piece of plain glass, you will see how difficult it is to exclude all the air; the bells will plainly show their presence by the glistening spots seen through the glass plate. The best form of backing for general purposes is caramel, or a mixture of this with other things, usually burnt sienna and a little gum, the solvent being water or methylated spirit and water. The principal component, caramel, has nearly the same refractive index as glass, and is also strongly absorptive of actinic rays. The gum is used to give solidity to the backing. The burnt sienna is used to assist in absorbing the actinic rays, enabling a thinner layer of backing to be used. The spirit is added to facilitate drying, and as much can be used as will not precipitate the dissolved components. Sometimes a little golden-syrup is useful to toughen the film when it is inclined to be brittle or dusty. The mixture is easily made with a medium-sized pestle and mortar, without any formula, by testing it on a strip of glass, adding more of such of the components as is seen to be necessary, in small portions at a time, testing between each addition. It is not a long affair to make the mixture, which should coat evenly with a flat hog-hair brush. When dry, the backing should stand rubbing with the finger-tip without soiling it, and should resist a reasonable amount of scratching with the finger-nail. There are other ways of applying the backing, but the brush answers as well as anything. As to the drying, if you have not the proper drying cupboard, any old case or box made light-tight with brown paper and glue will do very well.

The thickness of the layer of backing requires some attention. For all ordinary outdoor work a thinnish coating is sufficient, but for difficult subjects, such as are often met with in the photography of interiors, the coating must be much heavier, so as to provide increased absorptive power for dealing with the greater contrasts; and more care also should be exercised in adjusting the refractive index of the backing to that of the glass. The caramel backing is easily removed before development with a damp sponge; this is better practice than allowing the backing to dissolve off in the developing solution. For orthochromatic plates burnt sienna or any coloured pigment will not do; it is essential to use a fine black pigment, such as lamp-black, if the best results are desired.

SOME FALLACIES EXAMINED.

Before we leave the consideration of the ways of preventing halation, let us notice one or two fallacious proposals. The first is grinding the back of the glass plate with emery. Where the halation is caused by reflections from the back surface of the glass it is quite evident that while the ground glass modifies the distribution of the halation, it does not reduce its amount at all; the incident rays are simply scattered irregularly, instead of being regularly reflected. Another fallacious proposal is to expose the negative with the glass side towards the lens. This procedure actually aggravates the evil; the reflections inside the glass plate must be precisely the same, as they are quite independent of the position of the plate; but there is the important difference that in this case the rays which are reflected have not had to pass through the substance of the sensitive film at all, and, not having therefore suffered any absorption, are much stronger than when the exposure is made in the usual way. A third plan for preventing halation is by exposing two sensitive plates film to film, using the first merely as a screen, and giving a proportionately longer exposure so as to obtain the negative on the second plate. This is said to reduce halation,

but I fail to see why it should do so, and as it is an inconvenient plan for general work, I have not troubled to test it. A piece of black velvet pressed into contact with the plate is absolutely useless as a preventative of halation. It is not in optical contact at all. It may be slightly better than the usual black separating card as an absorbent of the stray light which escapes through the back of the plate, but it has no effect upon the true halation. Of course, where the dead black varnish of the separating division of the dark slide is worn off, or is of inferior quality, that part of the rays of light which escapes right through an unbacked plate may be reflected by the card or metal division in sufficient amount to produce the same effects as halation, but this is not true halation; it owes its presence to defective apparatus, and backing the plate with caramel prevents its occurrence at the same time that it prevents the real halation. In forming an opinion as to the relative efficiency of various ways of preventing halation, it is not well to trust too much to ordinary experience. Careful comparative tests under equal conditions should be made repeatedly, and noted for future use; and the experimenter should keep a most vigilant guard against the bias in favour of what we wish to prove which is inherent in human nature.

It is for lack of such care, and because of the want of a proper understanding of the theory, that so many indifferent or worthless suggestions are made. Although I do not wish to offer them to you as perfect models of what experiments should be, an extract from my note-book will give some indication of the way these experiments should be conducted. The object was to compare the amount of reflected halation in an ordinary unbacked plate, a plate backed with caramel and sienna, and an ordinary plate exposed with the glass side towards the lens.

EXPERIMENTAL NOTES.

The brand of the plates used was "Phœnix"; three plates were taken from the same box, but it would have been still better to take a large plate and cut it into three parts. The plates were uniformly coated and opaque, and not prone to halation, and the films were all of sensibly equal thickness. To roughly test the thickness of the films, each edge of each plate was compared with those of the others, by covering up a one-inch hole in a piece of opaque paper with the edges of two plates, and comparing the luminosity of the flame from the red lamp on each half. The subject upon which the exposure was made was an interior with a well-lighted window facing the sky; this was chosen because the necessary length of exposure permitted of accurate timing, and also because it furnished a sufficiently-severe test for ordinary work. The intensity of the light was practically uniform, as the exposures were made rapidly one after the other on a day when the light was steady and of a value of 20 seconds as shown by a Watkins' meter used outside the window. The value of the light was tested before and after the exposure of the plates. The time of exposure for each plate was 40 seconds at F.32. The composition of the developer was:—

Pyrogallol	1 grain.
Ammonia	2 minims.
Bromide of ammonium	½ grain.
Water	1 ounce.

The plates were all developed together in the same dish for 6½ minutes. Plate No. 1, which was backed with caramel, sienna, and gum, showed some little halation at the back, which was not surprising, considering the severity of the test and the fact that the coat of backing was not so liberal as it might have been. Plate No. 2, which was exposed in the ordinary way, showed much more halation at the back than No. 1. It would have been considerably worse with a plate of lower quality. Plate No. 3, which was exposed with the glass side towards the lens, showed much more total halation than No. 2. In this case the lateral and reflected halation were upon the same side of the film. These experiments tend to show that backing the plate with caramel, &c., lessens halation, and that exposing the plate glass side towards the lens increases it, which is in agreement with theory. We now pass on to consider how halation is to be cured if it already exists in the negative. One plan is to rub away the surface of the film with the aid of methylated spirits. This is unscientific, and no remedy at all, for the variety of halation which is due to reflection from the back of the glass plate. The image is on the front, and this halation is on the back, so that rubbing the film away simply removes more or less of the image, and does not touch this halation. All that is accomplished is a reduction of the total opacity of the spot at the expense of the quality of the image. The proper course is to strip and reverse the film, when the halation can be rubbed away, leaving the image intact.

CHEMICAL AND PHYSICAL REMEDIES.

The other remedy for reflected halation is to convert the silver image into chloride or bromide; then, after washing and exposing it to light, the image is reconverted into the metallic state by ordinary development; but the action of the developer must be closely watched and stopped before the action reaches the halation at the back, when a bath of hypo will remove the halation while it is in the state of unaltered chloride or bromide of silver. The complete success of these two remedies largely depends upon the thickness of the film; it will be obvious that in a thick film the reflected halation can be completely removed before the finer details of the image are reached, whereas, in a thin film, the image and the halation may overlap or interpenetrate to some extent. Diagrams Nos. 2 and 3 represent the

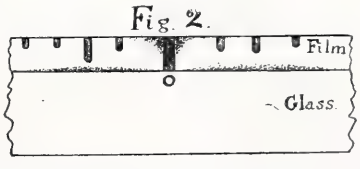


Fig. 2 shows the relations of the details of the image to the halation in the case of a thick film.

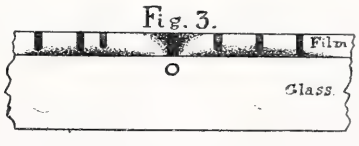


Fig. 3 shows the relations of the details of the image to the halation in the case of a thin film.

relation of the image and the halation in a thick and thin film respectively. For that variety of halation, which is due to the lateral spreading of light in the film, there is no real cure. Rubbing the surface with the aid of methylated spirits will remove some of it, but will also reduce the details of the image at the same time; still, it may be better than nothing, particularly if the retouching pencil is used to repair the damage done to the image. In practice, when both varieties of halation exist together, as they usually do, the surface should first be rubbed, but only a little; the retouching pencil should then be used to repair the image; afterwards the film should be reversed and rubbed again upon the other surface to remove the reflected halation. One effect which is frequently confounded with real halation is noticed when the air is misty or dusty; the light which is reflected from the particles in the air impairs the depth of the shadows. This is not always a defect, as the effect of mist has often a pictorial value, and if not desired can be controlled to a considerable extent by the use of yellow screens and colour-sensitive plates. With the other defects which are wrongly attributed to halation, such as result from dirty lenses, or internal reflections in the camera, or in the dark slide, I do not propose to deal. There is one curious fact which should be men-

tioned, viz., that it is not an invariable rule that the more translucent the film, the greater the halation. Probably some films, which appear to be very translucent to the eye, may have a great effective actinic opacity, or the actinic radiating power of the particles in the film may be so low as to more than counterbalance the extra translucency.

At some future time, when my experiments have reached a more advanced stage, I hope to give a further contribution towards the problem of a clean image.

HAROLD HOLCROFT, M.A., F.C.S.

SCIENTIFIC OBSERVATIONS AT HIGH ALTITUDES.

[A Paper read before the Society of Arts, and reprinted from its Journal.]

THREE years have elapsed since I had the honour of laying before this society such results as I had obtained in a series of balloon voyages undertaken for scientific research. In the interval, which I have been able largely to devote to aerial exploration, I have been fortunate in meeting with varied experiences never altogether barren of results, and not unfrequently leading to surprises. A succinct account of such experiences I will beg to read to-night, witholding nothing that has seemed of any importance, and frankly owning where difficulties or apparent inconsistencies have presented themselves. I will state at once that my observations are not only varied, but cover a wide field, and this almost unavoidably so. I have long since given up the idea that an aeronaut can map out for himself a definite programme, feeling confident that he is going satisfactorily to carry it out in its entirety, and in the way he proposed to himself. There constantly arises in my mind the recollection of how in the first scientific aerial voyage worthy to be so-called, MM. Robinson and Sacharof found the balloon-car to be a sadly less convenient observatory than they anticipated. Its gyrations interfered with their deflecting magnet; its cramped quarters made other observations difficult; fog interfered at inopportune moments, and when they came to earth their instruments were broken. Again, I am not likely to forget the advice which Professor Hergesell gave me when I first essayed scienific work in connection with balloons. It amounted to this:—"Don't attempt more than a very limited scheme of work in any ascent, or you will find that you will not get it done." Thus I have persuaded myself that the right attitude of the aeronaut who, with due equipment, starts on a voyage of exploration over English soil, is, while endeavouring to follow up some definite quest, to look out for all chance contingencies, to be prepared for surprises, and to neglect nothing of possible importance that may come his way. I would like in the first place to discuss some noteworthy phenomena which have presented themselves with respect to upper air currents met with up to a height not exceeding two miles. The most skilled observer below has little knowledge of these. Such an observer was Mr. Glaisher, and he speaks with astonishment of the manner in which his balloon on one occasion crossed the Thames, then re-crossed it, moving in an entirely opposite direction, till near the earth it again resumed its former course. I may, then, here cite two experiences of my own, different in character, though occurring on very similar days of heavy, overcast weather, when the sky was completely veiled. On the first occasion, starting from the Crystal Palace with only a light air, we entered mist at less than twice the height of the North Tower, at which point we determined our course as lying over the body of the Palace and on into the West. Then, mounting rapidly, we emerged in a new world at an altitude of about 4,000 ft., cut off from all view of earth by a tossing, sunlit cloud-floor. After an interval of two hours we descended, expecting to land in Hants or Berks, but landing there was none, for we found ourselves near the sea at the mouth of the Thames. We had been headed back by a fast upper current diametrically opposed to that on the ground. Another occasion gave a record of continuous travel in the upper air probably without a parallel in English annals. The balloon had by mischance passed out of control, and for ten hours we were drifting at a height between 4,000 and 9,000 ft. above a universal cloud stratum, our start having been from Newbury, and our final descent taking place near the coast at Neath, Glam., where the wind was blowing half a gale. In this voyage we must have been either blown out to sea and brought home again, or else for the first sixty miles the wind at our high altitude can have been only blowing at a rate of less than eight miles an hour.

Differences in the drifts of upper currents and quick transitions from one drift to another are among some of the most noteworthy experiences of balloon voyages. It was on a still August afternoon that the intelligent following up of two diverse currents resulted in our steering our balloon, which I had equipped for signalling purposes with a "collapsing drum," across the entire stretch of Salisbury Plain, so that almost beyond my hopes I passed immediately over the military camps on the Plain, and exchanged signals with them. Not unfrequently it is possible to determine that the course of horizontal air currents, even up to a considerable height, are being influenced by the nature or conformation of the surface of the earth immediately beneath. I have, for example, met with numerous examples of such definite air streams following the windings of an estuary or river valley, and on one occasion at a height of a thousand feet over Kent, it was impossible to resist the conviction that we were for some miles strictly following a chalk ridge. But in addition to such broader streams as may be traced without difficulty, it would seem that lesser rills or rivulets take devious and more uncertain courses through the upper air, at least, when this is not in rapid motion. In the voyage across Salisbury Plain, described above, while the balloon was being carried with the more sluggish current, a number of small parachutes were dropped out at frequent intervals and carefully watched. These would commonly attend the balloon for a little while, until getting into some minor air-stream, they would suddenly and rapidly diverge at such wide angles as to suggest that crossing our actual course there were side paths, down which the smaller bodies became wafted. Supporting this view of the motion of air streams, we have important evidence supplied by the wind gauges on the Forth Bridge. Here the maximum pressure measured on the large gauge of 300 square feet is commonly considerably less than that on the smaller gauges, suggesting that the latter must be due to "threads of air of limited area and high velocity." Coming, as one must do, to temperature measurements, one becomes almost lost in a maze of results from which perhaps the most obvious and assured deduction is that there are regions often unsuspected, and not necessarily associated with visible cloud, where in ascending the decrease of temperature in day hours becomes arrested. This phenomenon was first noticed nearly a hundred years ago by Gay Lussac. The broad results obtained by Mr. Glaisher in his lofty climb, when there was no halting in the ascent, and, comparatively speaking, but little lateral motion, can best be shown graphically. On entering cloud at 5,700 ft., the temperature drops quickly; then remains practically stationary till, on emerging from cloud at 7,200, it rises. The usual law of decrease is then resumed till 17,600 is reached, from which altitude to 19,100 the temperature is sensibly stationary, after which, through a layer of 500 ft., a great drop is experienced, followed by a rise. This was virtually a confirmation of Welsh's results in 1852. And the modern kite has told practically the same tale, revealing that currents of warmer air are constantly to be met with at varying altitudes, holding their courses above colder streams within all accessible limits, and in all conditions of weather. The most remarkable case of variation of temperature within a cloud is probably that experi-

enced by Barral and Bixio, who recorded on penetrating cloud mass, a sudden fall of temperature from 15 deg. to 39 deg. But the view assigning to the presence of cloud the cause of an anomalous pause or rise in the thermometer in balloon ascents would seem less correct than that which regards the meeting of the warm and cold currents as the cause of cloud. I think, however, that, as I have hinted, we should picture something more than broad air streams of varying temperatures holding determined sway aloft. If an air thermometer be taken up, specially designed for sensibility, and giving readings on a large scale; if this be slung in the clear some distance over the side of the car, and the whole attention be given simply to the play of the index, its behaviour, consisting of fitful sudden and rapid changes, will suggest that warmer currents are making their way in slender wandering rills, similar in fact to the lesser but distinct streamlets of air that were detected by the small parachutes over the level of Salisbury Plain.

I have spoken of restricted air streams, even at a considerable height, following a channel or river valley. On those occasions when I have been able to make satisfactory temperature readings of such currents, I have found them to be comparatively colder streams, suggesting justification for the somewhat quaint remark of Dr. Jeffries, in his memorable passage of the English Channel, only two years after the invention of the balloon, when he found a loss of buoyancy in crossing the sea, due, as he supposed, to the "power of attraction over the water." Probably, intimately connected with the commingling of air streams just referred to, are the phenomena of haze. Let me give some typical examples which I have met with. I will indicate by photographs how a summer's afternoon, which allowed of a brilliant picture being taken in the grounds of the Crystal Palace at the time the balloon was about to be liberated, gave but the haziest image at no greater height than that of the neighbouring North Tower. Again, on another summer afternoon, when a fairly uniform altitude of about 1,500 feet was maintained, a haze which lay heavy over the suburbs worked itself out completely as the open country was reached. Once again, a sail across the entire length of London from the south-west to north-east on an afternoon of last August showed quarters of the town which varied widely between the limits of great clearness and strongly-marked haze. The sky meanwhile was not entirely clear, as may be seen from a cloud mass photographed drifting over the city. I have also a note made as the balloon hovered over the neighbourhood of Smithfield at an altitude of about 3,000 feet, to the effect that though the region of St. Paul's was hazy, as also that to the north and east in a less degree, yet in a narrow view to the south-east there was a limitless stretch of town and country of surpassing visibility. Two considerations must mainly affect this manifestation of haze—(1) actual particles in suspension in the lower air, capable of reflecting the illumination of the sky, (2) the commingling of such air streams as we have been considering. These must surely favour the formation of water dust in the atmosphere. We see evidence of this on the mountain side; again in those belts of mist lying across open country where opposing air currents meet and mingle; possibly, too, in the murky veil which gathers about a thunder-cloud, and due presumably to the conflict of those contrary currents of widely differing temperature which have been held to be in part at least the cause of such storms. Here I may mention as once having been entrapped aloft in the heart of a thunder-storm, which met us across a clear sky, coming up rapidly against the wind that bore us, that as the storm broke around us, a pitiless cold down draught descended with hail and spread a thin blue curtain on all sides, which reached apparently to earth. On the other hand it is well established that total absence of haze permitting great visibility is generally a concomitant and forecast of special conditions of weather. With reference to isobars it is said to be noticeable on the east side of a wedge-shaped area. Having given examples of varying atmospheric states in and about London, I may here add very valuable testimony. Mr. W. Ellis has stated that "at Greenwich there is extensive view towards the Isle of Dogs and Blackwall. Very generally the prospect in this direction is obscured by haze, but on rare occasions there is remarkable distinctness, at which times, no matter how fine the weather may apparently be, rain has almost universally followed before the next morning. This has been noticed for very many years." During night hours we have different atmospheric conditions aloft. The warmer air has then ascended. You find it, so far as my own experiences go, lying in strata at varying heights at least up to past midnight on a clear autumn night, while in a cloudy sky on a November night, as far advanced as 4.30 a.m., I have found the cloud layer, at an altitude of 2,000 feet and more, many degrees warmer than the ground temperature, but on ascending to the upper margin of the cloud, where it was vaporating into the clear sky, intense cold was experienced. On the other hand, in the early morning hours of an August night, under a clear sky, I have found the temperature up to 1,000 feet sensibly the same as on the earth, until the sun began to rise, when at 1,500 feet the air very rapidly grew warmer, while below the level of the balloon a curtain of mist commenced forming over the surface of the earth, doubtless there giving rise to the well-known chill of dawn. I will give photographs taken from a balloon showing what the camera will reveal as to the formation of mist up to the last available moment as night comes on, and again as light returns in early morning. Let me also show a series of pictures taken with long exposures from a considerable elevation during night hours in London. From these it will be seen that when the temperature of the lower air had become equalised, haze which had hung about the town at nightfall disappeared in a marked degree, only to reassert itself at dawn.

As to the presence of dust up to the altitude of a mile I have certain results to give. These results, however, only refer to what Tyndall defines as "floating matter of the air, whose particles are so coarse that their individual motions can be followed by the eye." I have used both Mr. Aitken's dust counter and an apparatus for aspirating air through spirit carefully freed from floating particles, a method which answers well for comparative readings, and for balloon travel. I commenced with collecting samples of dust from air which had passed over a large tract of sea. For this purpose I chose the Scilly Isles, where, never mind whence the wind might blow, it was easy to find a rocky rampart, which caught the first blast off the ocean. Keeping these as standard results labelled according to the directions of those winds which had given them, I next compared them with results similarly obtained inland on open commons, in different quarters of London, and so on, finally transferring the experiments to the car of the balloon. As may be supposed, the sample freest from matter in suspension was gathered in the Scilly Isles. It is likewise true that the most dust-laden sample was also collected from the opposite cliff of the same island (St. Mary's), the explanation of which when discovered was instructive. The Island of St. Agnes lay a mile to windward, but its whole area was so small that I had regarded it as negligible. On visiting the island, however, I found it entirely carpeted with flowers grown for market and then in full bloom, whose pollen, borne on a fresh breeze, had not only loaded, but stained the spirit in the test bottle. One of the clearest samples in the whole series was secured at the open end of the Aldersgate platform of the Metropolitan Railway, the explanation presumably being attributable to the passing trains attended with volumes of steam, which, emitted under the roof, would entrap and cleanse out the dust. But another state of things was found aloft. On a still afternoon on May 1st, at 2,000 feet above Kingston, the air was found far more heavily charged with dust than that of the London streets the next day. So again at half a mile above the City in August last the dust, though somewhat less in quantity, was far more abundant than on the ground within the

enclosure of Stamford-bridge in the forenoon of the following day. One can hardly introduce the subject of the visibility or otherwise of the atmosphere without at the same time discussing the circumstances which determine its transparency to sound, and here we are faced by problems which have admitted of no easy solution. Extraordinary instances of the extinction at short range of powerful sounds specially designed, for warning signals are too numerous to be lightly passed over, and they are only matched in mystery by the equally numerous examples of sounds reappearing in strength at distances beyond what might be counted the limit of audibility. I can best show graphically some suggestive results obtained from a balloon, which I submit is in many important and obvious ways admirably adapted for a sound observatory. But first I should discuss some preliminary trials which led up to the experimens I refer to. Guns or detonating fog warnings are necessarily among the commonest sound signals, and a unique opportunity for gauging the penetration of heavy gun firing was afforded by the measured salutes at sea, on the occasion of the late Queen's funeral. A rich harvest of reliable observations was obtained, which can be readily shown on a diagram. Desiring to gather further results under varying conditions, I devised the following experiment. Standard four-ounce gun-cotton fog signals were fired at night singly from the ground, and also by rockets in the air. On the first occasion, the firing station being an elevated open heath, and the observers being planted at distances not exceeding six miles, it was noticed that the several detonations differed greatly, both in the initial report and in the after sound, as though, in spite of the fact that the wind on the ground registered dead calm, there was a variable atmosphere capable of affecting results. I next, on a night with a light air from the north-north-east, arranged for similar experiments from two elevated observing and firing stations, eighteen miles asunder, but within view of each other, these stations being respectively the Beacon Hills of Hants and Wilts, the former east-north-east of the latter. The hour chosen was from 10 to 11 p.m., and though the exact moments of firing were pre-arranged, not the faintest distant report was detected at either station. It should be mentioned that the night was hazy.

In contrast with the negative results of this trial the next assumes importance. Through the press the co-operation of a large number of observers was enlisted. The night and hour (the same as before) were announced, but the moments of firing were unknown to anyone save the firer. The firing station was the Hants Beacon Hill, lying fairly midway between the two military camps at Bulford and Churn respectively, and about eighteen miles from each. On this night, which was without trace of haze, the wind blew strongly at right angles to the line joining these camps, and it was not surprising that few observations were received from distant stations, none at all from Churn, and one only as far as ten miles down the wind. The surprising fact, however, was that a staff-captain of Royal Artillery, who, by direction of the commanding officer, had stationed himself on the Wilts Beacon Hill, sent me in course of post a perfectly accurate and complete record of all the reports, not one of which he had missed. I now varied the experiment by arranging to fire the same gun-cotton charges over London from a balloon, inviting observations through the Press as before. The trial was carried out on August 13th last, about 5.30 p.m., when, sailing over the heart of London, I fired two charges, one over Soho Square, at an altitude of 2,000 feet, the second four minutes later over Gray's Inn Road. We were travelling wih a gentle breeze from the south-west, and at our altitude the air had grown more humid with an accession of moisture that declared itself in copious rain the next day. Depicting on a map the localities whence observations were subsequently sent me, some curious deductions are at once obvious. (1) In the case of each report the number of observations recorded across the wind greatly exceed those recorded up or down the wind; (2) The longer sound ranges were chiefly in directions lying athwart the balloon's course; (3) Certain quarters neither particularly near nor particularly quiet would seem to have been accessible to the sound waves as by some special channel. One more fact should be noticed, namely, that from the open quiet parks, where foot passengers should have had more leisure to watch and listen, practically no observations at all were communicated. Possibly, however, sounds would be dissipated, and therefore fainter in the open than within the environment of houses. If from the last two detailed series of experiments it should appear that sounds are sometimes more audible across the wind than in its direction, it will be remembered that this is in accordance with a view expressed by Professor Stokes, who, regarding sound waves received directly as commonly reinforced by others reflected from the earth, pointed out that this reinforcement would be greatest in the direction in which the direct and reflected waves enclosed the smallest angle, and this he proceeds to show theoretically would be the direction at right-angles to the wind's course. That there are, in certain conditions of atmosphere, at least what we may conceive to be aerial sound channels through which sounds are momentarily conveyed with abnormal intensity, has seemed to me abundantly proved in observations during balloon travel. The silence prevailing aloft is in favour of such observations; and moreover, in air flocculent with acoustic cloud, avenues of audibility would more readily shape themselves in upward directions, just as a bright reflection off the earth will sometimes find a chance path through cloud upwards to the aeronaut who is looking down on an apparently impervious barrier. Or, as in a London fog which obscures the opposite side of the street, and seems to blot out all the sky, a chance ray of light may be reflected off a lofty vane or finial down to an observer below, betraying that a momentary avenue had been formed leading up to the sunlight above. A remarkable instance of the casual passage of sound was afforded as day broke in one of the voyages already referred to. It was over the quiet pastures of Kent, with no sounds in the air save the first awakening of bird life. Suddenly, and for a brief second only, voices engaged in conversation whispered (I can use no other expression) in our ears, yet we were a quarter of a mile in the sky, and the speakers were not within view. As this paper deals with various observations from high altitudes I would mention another made at the place and period just referred to. The blast of a horn blown in the car was returned in a double echo. The first return from the earth immediately below was but a repetition of the blast, while the second and feebler echo thrown back, presumably from sloping ground at some distance, was raised a major third in pitch. This tallies with experiments recorded in "Comptes Rendus" to the effect that of two notes of the same vibration the weaker gives an impression of higher pitch, and that a watch held at the ear sounds a third lower than when held at arm's length. I would like to ask if aeronauts as especially high altitudes have noticed alteration in the *timbre* of the voice. This is very noticeable when air is compressed, and a striking example may be found in the workings of the electric railway now in progress under the Thames. In the tunnel shown in the photograph under ordinary conditions the voice sounds normally, but when air is compressed to something more than two atmospheres the voice is altered in quality, appearing strangely unnatural alike to the bystanders and to the speaker himself. I have asked the above question seeking enlightenment; may I ask another? On several occasions I have been far aloft at cock-crow. The air has been calm and equable, and silence profound, and then in the darkness I have heard a challenge from a farm-yard below. It is answered from a score of others in close neighbourhood, and then further afield—further yet, much further, till from almost infinite distance the shrill, penetrating calls still fall on the attentive ear. Well, the open country is to the eye of the aerial voyager without breach of continuity so far as neighbourhood of farmyards is concerned.

From the fowl-roost point of view, all the land is a connected whole. When, then, at night, any one single cock may crow, does a wave of crowing spread throughout all England? I can see no escape from this.

REV. J. M. BACON.

ROYAL PHOTOGRAPHIC SOCIETY: THE COUNCIL ELECTION.

THE ballot-papers for the election of officers and Council of the Royal Photographic Society for the year 1902-3 will this week be sent out to members. We are informed that at a largely-attended private meeting, held on Monday evening last, it was decided to issue the following list to the whole of the members, with a recommendation to vote for the candidates named on the forthcoming ballot-paper:—

President:—Thomas R. Dallmeyer, F.R.A.S.

Vice-Presidents:—Sir William Abney, D.C.L., F.R.S.; The Earl of Crawford; Dr. P. H. Emerson; and Professor Raphael Meldola.

Honorary Treasurer:—John Sterry.

Council:—

W. Smedley Aston.	A. Haddon.
H. Walter Barnett.	Sir William Herschel.
F. Bishop.	F. Hollyer.
James Cadett.	F. Ince.
St. L. Carson, B.Sc.	M. Jacolette.
W. L. Colls.	Dr. G. Lindsay Johnson.
Clinton Dent.	E. B. Knobel, F.R.A.S.
Douglas English.	J. C. S. Mummery.
Dr. E. C. Fincham.	E. Sanger Shepherd.
T. E. Freshwater, F.R.M.S.	Prof. W. C. Unwin.

RECENTLY ELECTED OFFICERS OF SOCIETIES.

(*Received too late for the* ALMANAC.)

AUCKLAND CAMERA CLUB.—Established 1881. Meetings held at Queen Street (over A. Jones and Co., dealers). *President:* Dr. J. Logan-Campbell.—*Vice-Presidents:* R. B. Walrond, Josh Martin, E. Payton, and D. Goldie.—*Committee:* R. Pheney, M. Trenwith, A. Coomer, and A. Jones.—*Secretary and Treasurer:* H. R. Arthur, c/o Auckland Gas Company, P. O. Box 81.

CHESTER SOCIETY OF NATURAL SCIENCE, LITERATURE, AND ART (PHOTOGRAPHIC SECTION).—Affiliated to the R.P.S.—*Headquarters and Dark Room:* Grosvenor Museum. Meetings held about every three weeks. *Chairman:* Dr. H. Stolterfoth, M.A., J.P.—*Hon. Secretary:* J. A. McMichael, B.A., B.Sc., Grosvenor Museum, Chester.—*Council:* E. G. Ballard, Lt.-Col. Dowdall, H. Davison, F. Garside, A. E. Goodman, F. W. Longbottom, S. M. Webster, W. F. Shepheard, and J. D. Siddall.

CHRISTCHURCH PHOTOGRAPHIC SOCIETY.—Established May, 1901. Meetings held at 154, Worcester Street. *Patron:* A. E. G. Rhodes (Mayor of Christchurch).—*President:* R. C. Bishop.—*Vice-Presidents:* T. G. Strange and Henry Allison.—*Committee:* W. E. Suckling, C. R Woledge, J. Griffiths, H. K. Allison, and W. G. Crawford.—*Treasurer:* G. A. Bunz.—*Secretary:* H. E. Gott, Box 110, G.P.O., Christchurch, N.Z.

DAI-NIPPON SHASHIN KYOKWAI (PHOTOGRAPHIC ASSOCIATION OF JAPAN).—Established 1893. Meetings held at Kwazoku-Kwaikan, Uchiyamashitacho, Tokyo. *President:* H.E. Prince M. Nijo.—*Vice-President:* H.E. Viscount M. Nagaoka.—*Committee:* Count U. Toda, Count S. Omura, Viscount B. Enonomoto, Viscount C. Okabe, Baron Hanabusa, D. Kikuchi, S. Toya, K. Ogawa, Dr. T. Kato, J. Tanaka, M. Nakajima, Dr. Marumo, R. Konishi, S. Kiga, H. Shigyo, and S. Kajima.—*Treasurers:* S. Ohashi and K. Ikeda.—*Secretary:* K. Ogura, 77, Minami-enokimachi, Ushigome, Tokyo.

DUNEDIN PHOTOGRAPHIC SOCIETY.—Established 1890. Meetings held at Liverpool Street, Dunedin. *President:* A. J. Barth.—*Vice-Presidents:* R. Chisholm and W. Melville.—*Committee:* J. C. Thomson, R. A. Ewing, C. O. McKellar, Dr. W. S. Roberts, J. Laing, and H. Gamble.—*Secretary and Treasurer:* J. Skottowe Webb.—*Recording Secretary:* W. Livingston.—*Secretary:* J. Skottowe Webb, National Insurance Company, Dunedin.

FOOCHOW CAMERA CLUB.—Established March 2nd, 1892. Meetings held at Foochow, China. *President:* Wm. Muller.—*Vice-President:* L. A. Mackinnon.—*Committee:* President, Vice-President, Treasurer, and Secretary.—*Secretary and Treasurer:* Wilbur T. Gracey, Foochow, China.

GORDON COLLEGE AMATEUR PHOTOGRAPHIC ASSOCIATION.—Established 1889. Meetings held at Gordon College, Geelong. *President:* H. G. Roebuck.—*Vice-Presidents:* R. J. Smith and T. Lord.—*Committee:* Messrs. Thacker, Price, McPhillimy, Mockridge, and Brinsmead.—*Treasurer:* S. R. J. Mawson.—*Secretary:* J. Hammerton, jun., "Burngreave," 73, Little Kyrie Street, Geelong, Victoria, Australia.

HAWKES BAY CAMERA CLUB.—Established April, 1895. Meetings held at Napier, N.Z. *President:* F. W. Williams.—*Vice-President:* J. Vigor-Brown.—*Committee:* Dr. Jarvis, H. J. Bull, F. G. Cox, S. E. Cooper, R. J. Duncan, and C. Saunders.—*Secretary and Treasurer:* T. Bruce Bear, Napier, N.Z.

MARITZBURG CAMERA CLUB.—Established 1893. Meetings held at 4, Hardy's Chambers, Pietermaritzburg. *President:* D. M. Eadie. *Vice-President:* S. S. Watkinson. *Committee:* D. M. Eadie, S. S. Watkinson, P. F. Loney, A. R. Hopkins, A. Allerston, P. Levy, and O. Swete.—*Treasurer:* P. F. Loney.—*Secretary:* A. R. Hopkins, Telegraph Department, Pietermaritzburg.

NELSON CAMERA CLUB.—Established 1889. Meetings held at Club Rooms, Nelson, N.Z. *President:* C. Y. Fell.—*Committee:* H. Brusewitz, H. V. Gully, F. Hamilton, and A. Sclauders. *Treasurer:* F. W. Hamilton.—*Secretary:* A. H. Patterson, Nelson, N.Z.

NORTHERN TASMANIAN CAMERA CLUB.—Established 1889. Meetings held at Launceston, Tasmania. *President:* Rev. F. J. Nance, M.A.—*Vice-Presidents:* William Aikenhead, M.H.A., R. C. Kermode, and H. B. Brownrigg.—*Committee:* C. Hart, J. E. Heritage, and J. H. Lithgow.—*Secretary and Treasurer:* F. Styant Browne, 112, Brisbane Street, Launceston.

PHOTOGRAPHIC SOCIETY OF NEW SOUTH WALES.—Established 1894. Meetings held at School of Arts, Sydney. *President:* His Honour Judge Docker.—*Vice-Presidents:* Sir James Fairfax, E. T. Davis, R N. Kirk, and J. S. Stening.—*Council:* H. T. Blake, M. V. Murphy, James Heron, H. R. Curlewis, and W. E. Gates.—*Treasurer:* W. C Fisher.—*Secretary:* A. C. Hanson, Box 829, G.P.O., Sydney, N.S.W

QUEENSLAND PHOTOGRAPHIC SOCIETY.—Established 1883. Meetings held at the Technical College, Brisbane. *President:* Arthur W. Pigott (1901).—*Vice-Presidents:* Dr. John Thomson and Dr. Wilton Love.—*Committee:* C. J. Pound, A. W. M. Clark, and Dr. Wheeler.—*Treasurer:* Jas. L. Kinloch.—*Secretary:* W. C. Voller, Queen Street, Brisbane.

WANGANUI CAMERA CLUB.—Established June, 1894. Meetings held at the Studio, Avenue. *President:* S. S. Griffiths.—*Vice-President:* A. A. Gower.—*Committee:* T. W. Downes, F. J. Kersley, F. J. Denton, T. Allison, and G. Pownal.—*Secretary and Treasurer:* C. W. Babbage, Roto Kawau, Wanganui.

SCIENCE IN 1901.

[From the "Times Literary Supplement."]

In a review of the scientific work of 1901, astronomy, as the oldest of the sciences, may fitly claim first mention, especially as it fell to the astronomers to make what was, on the whole, the most exciting discovery of the year. This was a new and brilliant star in Perseus, which appeared to spring into existence in a remarkably sudden manner. That portion of the heavens in which it was situated was photographed at Harvard on February 19, and no sign of it was to be detected on the plates when they were developed; yet only a day or two afterwards it was seen by Dr. T. D. Anderson, of Edinburgh, and by other observers as a star of between the second and third magnitude. The suddenness of its appearance was equalled by the rapidity with which its size varied, and this inconstancy, together with the extraordinary changes that took place in the character of its spectrum, provided astronomers with a theme for speculation, the resources of which are yet very far from being exhausted. In April a new comet, said to be the brightest since that of 1882, was discovered in the southern hemisphere by several observers. In May its tail, which at first was 10 degrees in length and curved slightly to the south, split into three parts. On May 18th, there was an eclipse of the sun, the line of totality passing across the Indian Ocean through Sumatra, Borneo, and New Guinea. The party from Greenwich selected their station in Mauritius, where the duration of totality was only three and a-half minutes, and enjoyed the advantage of good weather. Other observers who took up their positions in Sumatra had a longer (six minutes') duration of totality, but were not quite so fortunate as regards weather.

In pure physics, perhaps the most interesting single achievement of the year was the experimental proof that light, as predicted by Maxwell and by Bartoli, exerts a mechanical pressure. Many observers have already attempted to detect this phenomenon, among them being Sir William Crookes, who at first thought he had succeeded in so

doing with his radiometer, until it was found that his effect was many thousand times too great. Curiously enough, success was announced almost simultaneously in two different quarters, by Professor Lebedew, of Moscow University, in Europe, and by Messrs. Nicholls and Hull in America. The work of the latter observers appears to be the less precise of the two, for they do not claim that it does more than prove the existence of a pressure, not due to gas-molecules, of the nature and order of magnitude required. Professor Lebedew's measurements are, however, in close agreement with the amounts as calculated from the theory; he finds that the pressure per square metre is 0.4 millegramme for absolutely black bodies, and double as much for perfect reflectors. This experimental verification of one consequence of Maxwell's wonderful electro-magnetic theory suggests reference to another which is gradually passing out of the experimental stage and becoming of practical utility. It is only a few years since Principal Lodge astonished the British Association by showing that the electric waves in connection with which Hertz's name is famous, could be propagated to a distance of half a mile or so; yet already the wireless telegraphy so initiated has become a recognised portion of the equipment of ships in all the important navies of the world. In the mercantile marine, too, it is making way, so much so that Lloyd's, in the course of the year, contracted to have it fitted in a number of their signal stations round the British coast. Almost every country can show workers who are engaged, with more or less success, in perfecting its appliances, among them being Popoff in Russia, Slaby in Germany, Guarini in Belgium, Ducretet in France, and Marconi in England. The last-named, by using waves a thousand feet long, succeeded in detecting electro-magnetic radiation which had travelled 1,800 miles from the source that produced it, and he is looking forward to the early establishment of a commercial system of sending messages across the Atlantic by wireless telegraphy, and later to opening up communication with the Cape. But while the performance of such feats in long-distance transmission is certainly a legitimate object of ambition, it must not be forgotten that very much remains to be done in perfecting wireless telegraphy for comparatively short distances. If ever it is to become of real commercial importance, means must be found, not only to enable two parties to communicate with each other without fear of their message being overheard, but also to prevent a third party from making communication impossible altogether by the simple device of working his own apparatus and thus rendering the signals unintelligible. Even before these refinements comes the necessity of ensuring certain transmissionof simple signals over moderate distances. The imperfections of present methods are sufficiently illustrated by the experiences of the "Ophir" and her consorts, and by the difficulty which the Admiralty have found in obtaining coherers that can be trusted to respond satisfactorily over their test-distance of seventy miles—a difficulty which has induced them to take the manufacture of these delicate pieces of apparatus virtually into their own hands.

The wide field of inquiry which lies in the borderland between physics and chemistry is attracting an ever-increasing number of workers. Though no discovery of outstanding importance was made, the Cambridge school can point to a year of solid work on the phenomena of ionisation and the existence of bodies many times smaller than molecules, and, in spite of the protests of some chemists, the ionic dissociation hypothesis continues to find increasing favour among the great body of physicists. In France progress was made in the investigation of the radio-active bodies by M. and Mme. Curie, Becquerel, and others; the first-named inquirers made the observation that the rays emitted by radium exercise a burning and eroding effect on the skin. In Germany, Bredig, and Ikeda continued their remarkable experiments with "inorganic ferments," in particular following out the analogy between the catalytic action of colloidal platinum and that of organic ferments in regard to the action of poisons. They find that the rate of decomposition of hydrogen peroxide in presence of colloidal platinum is influenced to an extraordinary degree by substances like prussic acid, hydrogen sulphide, and mercuric chloride, even in minute quantities. Thus the catalytic effect of a platinum solution is halved by prussic acid, even when the concentration of the latter is only 0.0014 milligramme per litre; the effect of this substance is, however, only temporary, and the solution gradually recovers in course of time. A large number of substances exert this poisoning action to a greater or less extent, but there are some which intensify the catalytic action of the colloidal platinum,among them being formic acid and dilute nitric acid. Experiments have also been tried with a colloidal solution of gold obtained in a manner similar to that employed in the case of platinum, by passing an electric current between gold wires in a dilute solution of sodium hydroxide. This gold solution, which is bluish-violet in colour and contains one gramme atom of gold in 1,360 litres, on the whole resembles colloidal platinum in its action, but it is remarkable that the same agents are not poisonous to both. Thus mercuric chloride, one of the strongest poisons for colloidal platinum, exerts an opposite influence on the catalysing power of colloidal gold in alkaline solution.

The men of science who died during the year include three who took high rank among physicists—Professor Tait, of Edinburgh, Professor Fitzgerald, of Dublin, and Professor Rowland, of Baltimore. The first-named had reached the age of three score and ten, but the other two were both comparatively young men, from whom much good work, in addition to what they had already achieved, might confidently have been expected had they lived. Both education and science were the poorer by the death of Principal Viriamu Jones, of University College, Cardiff, in succession to whom another physicist has been appointed in the person of Mr. E. H. Griffiths. On the other hand, two veterans of science—Virchow in Germany and Berthelot in France—celebrated the completion of fifty years of scientific work.

THE TESTING OF LENSES AND "POINTS ABOUT LENSES."

(Abstract of a paper read before the Hull Photographic Society, January 16th, 1902.)

The lecturer having stated the reasons which had influenced him in devoting some little time and attention to the subject under consideration, then dwelt upon the difficulties experienced by the amateur photographer when choosing a lens, and pointed out that it did not necessarily follow that the value and efficiency of a lens was in all cases in a direct proportion to its cost, nor was it always safe to depend too much upon the particulars as to "equivalent focal length," "covering power," etc., etc., as stated in the dealers' catalogues, and expressed the view that in his opinion the makers would themselves ultimately reap "the benefit" if they took the necessary precautions to employ some standard of measurement in describing their lenses. Mr. Strong then described the very simple apparatus he had constructed with a view to testing lenses for the several well-known defects or aberrations, but before proceeding to thoroughly demonstrate its uses he endeavoured by the aid of a large number of lantern slides specially prepared by himself (together with several kindly lent to him by Messrs. Taylor, Taylor, and Hobson) to make clear to the members the several important points about lenses which he considered should be carefully studied by those who wished to thoroughly appreciate the value of a first-class lens, and its many auxiliary attachments, as well as to understand the principles upon which the correct working of the testing apparatus depended. He therefore made clear the principles and application of the physical or "wave" theory of light action as applied to both positive and negative lenses, and followed this up by showing the geometrical method of delineating the direction of light rays through space and through the lens, and explained the true meaning of the term "spherical aberration."

The next point dealt with was that of "refraction," the lecturer explaining the direction taken by the "incident," "refracted," and "emergent" rays, and the method of determining such paths by the principle and application of the "sine" theory, as applied to a sheet of plain glass and also a "positive" lens. Having then defined an "ideal photographic lens" as one giving with a large aperture a clearly-defined, stigmatically perfect, flat, distortionless, truly collinear image of a flat object, he proceeded to explain the defect known as "astigmatism," and endeavoured to explain its origin, pointing out at the same time how the astigmatic fields were in many cases "crossed" or made of "negative" character in endeavouring to correct the lens for other photographic defects, and that by the use of the stop or diaphragm the several aberrations were very materially lessened. The "principal points" of a lens were then defined, and the method of determining the positions of the "optical centre," "nodal points," "nodal planes," clearly demonstrated, as was also the theory recently propounded by Professor Silvanus P. Thompson that the "nodal planes" of the Gauss theory were more truly curved "surfaces," and not "planes." The principle upon which the "Alvista" and "Panorama Kodak" cameras were constructed was then explained, as also its adaption to the production of panoramic pictures by the ordinary camera. The principle and symmetrical focii of a lens were then explained, and the true definition and determination of "focal length" made clear.

The points of "conjugate focii" and the geometrical and mathematical proof of the law of their relationship were then duly dealt with, as well as the geometrical proof of the "formation of an image" by the lens. The application of the law of "conjugate focii" to enlargement and reduction of photographs was clearly shown, and proof given that for near objects the size of image obtained is not absolutely proportionate to focal length. The lecturer then made clear the application of the foregoing principles, to the selection of "truly equivalent" pairs of lenses for stereoscopic cameras, to the use of "magnifiers" or "planiscopic" lenses, and the theory and use of telephoto lens attachments was then carefully explained and demonstrated, and, after showing the degree to which the focal lengths of the oblique rays must be lengthened out in order to ensure a flat field, a chart was shown on which was delineated the fields of several lenses as ascertained by tests.

Several other important points were briefly touched upon, viz.:—The position of the "nodes" in Dallmeyer's stigmatic lenses, marginal distortion of image, working aperature. By the aid of a simple home-made lens-testing apparatus the following points were clearly demonstrated: "Nodal points," "equivalent focal length" of both positive and negative lenses, "back focus," "curvature of field," enlargement

of image at margin of field, relative depth of definition, astigmatism—positive and negative—the crossing of astigmatic fields, angle of illumination, diameter of illuminated circle, spherical aberration, chromatic aberration, use of "magnifiers," 'planiscope," or other supplementary lenses, use of telephoto lens attachments. A series of lantern slides, kindly lent by Messrs. Taylor, Taylor, and Hobson, illustrating many interesting features in connection with the lecture were then put through the lantern and explained by the lecturer, one of the most interesting being two slides showing the superiority of the "Cooke" lens over the ordinary "R. R." lens when photographing a test screen, and the same firm were good enough to loan for exhibition various specimens of "Cooke" lens, parts at various stages of manufacture as well as the tools used in their manufacture; and these proved a source of much interest to the members.

GEO. H. STRONG.

Exhibitions.

GLASGOW AND WEST OF SCOTLAND AMATEUR PHOTOGRAPHIC ASSOCIATION.

Last Saturday the annual exhibition was opened in the rooms at 180, West Regent Street. The exhibition—which cannot be called a large one—will remain open till Saturday, 8th February, and every evening during the intervening time the competitive lantern slides and illustrated lantern lecturettes by the members will take place. Admission is free.

The society is to be congratulated on the general appearance of the walls and the quantity of the work generally, which is, we think, in advance of any former display made by the members, and in respect of merit as well as in regard to variety of subject it should hold its own alongside that of any other association.

The number of exhibits is 190, and so equal is the quality that we have no doubt that the judges had considerable difficulty in making the awards. The gentlemen who kindly undertook this task were Messrs. Macdonald, Glasgow; Ferguson, Kilmarnock; and Robb, Gourock.

The following is a complete list of the awards:—

Class A (landscape, seascape, architecture, flowers, etc., half-plate size and under).—Silver medals: No. 15, "Swamp," Jas. Douglas; No. 19, "A Hampshire Hedge Row," A. J. Kay. Bronze medals: No. 4, "Tranquil Waters," Jas. Douglas; No. 24, "A Highland Loch," N. G. Reid; No. 40, "Evening, Bardowie," J. S. Wilson.

Class B (landscape, seascape, architecture, flowers, etc., over half-plate size).—Silver Medals: No. 108, "Break of Day," Cameron Todd; No. 91, "Reflections, Aberdeen Harbour," James Douglas. Bronze medals: No. 106, "Interior Bath Abbey," R. Burnie; No. 110, "Silver Birches," G. S. Bryson; No. 112, "Grapes," Cameron Todd; No. 61, "Looking down Loch Long in Winter," G. S. Bryson.

Class C (portraiture, figure studies, and animals).—Silver medals: No. 129, "Come awa', Peggy," Jas. Douglas; No. 133, "Threading the Needle," J. Hepburn. Bronze medals: No. 151, "A Study," A. Allan, jun.; No. 140, "Morning Prayers," J. Hepburn.

Class D (pictures taken at out-door meetings in 1901).—Silver medal: No. 160, "A Bit in Melrose Abbey," Thomas W. Robertson. Bronze medal: No. 157, "Doorway, Dryburgh Abbey," J. Hepburn.

Lantern slides (sets of six).—Silver medal: Set No. 177, "Landscapes," A. J. Kay. Bronze medals: Set No. 176, "Landscapes, etc.," Jas. Douglas; set No. 165, "Glasgow Exhibition," Cameron Todd.

THE KODAK AMATEUR COMPETITION.

The following is the list of prize-winners and awards:—

CLASS A.—1, L. Selby, 8, Minford Gardens, W., £15 in cash; 2, C. Cesares, Piazza Grande, Trieste, No. 5 Cartridge Kodak; 3, G. A. Towkes, 233, Normanton Road, Derby, No. 4 Cartridge Kodak; 4, W. L. Fletcher, Stoneleigh, Workington, No. 4 Special Bullet Kodak; 5, Miss T. Pike, Panton, Wragley, Lincs., No. 4 Special Bullet Kodak; 6, Miss G. Nash, Glenfall Lawn, Cheltenham, No. 3 Cartridge Kodak; 7, A. L. Herst, Montpellier, E. Twickenham, No. 3 Folding Pocket Kodak; 8, R. Benson, 3, Orwell Park, Rathgar, Dublin, No. 3 Folding Pocket Kodak; 9, G. H .Blacklock, Overthorpe House, Banbury, No. 4 Panoram Kodak; 10, Maler-Niestlé, Karlsruhe, Baden, Akademistr. 71, No. 4 Panoram Kodak; 11, R. Collins, Fromtons House, Sydenham, No. 2 Folding Pocket Kodak; 12, W. C. Crofts, 9, Worthwick Terrace, Cheltenham, No. 2 Special Bull's-Eye Kodak; 13, Mrs. L. Marshall, Charterhouse, Godalming, No. 1 Panoram Kodak; 14, Mrs. E. Munro, Strathfieldsaye Rectory, Mortimer, Berks, No. 1 Panoram Kodak; 15, Mrs. H. Guhl, Armgard St. 4, Hamburg, No. 1 Folding Pocket Kodak; 16, C. H. Grindon, 1, Alloa Road, Deptford Park, No. 1 Folding Pocket Kodak; 17, Miss H. Hampkins, 12, Hillsdrop Road, Camden Town, No. 1 Folding Pocket Kodak; 18, Paul Meller, Charlottenstr. 43, Berlin, N.W., No. 1 Folding Pocket Kodak; 19, Dr. Wiles, Parkside, Bowes Park. No. 2 Folding Bull's-Eye Kodak; 20, G. Tanner, 66, Albany Gardens. N.W., No. 4 Zenith Camera; 21, W. W. Saxe, 81, Underhill Road, Dulwich, No. 4 Zenith Camera; 22, R. C. Sprouls, 7, Ashby Place, Hoole, Chester, No. 2 Bull's-Eye Kodak; 23, A. G. Robertson. Public School, Johnstone, N.B., No. 2 Bull's-Eye Kodak; 24, H. Rix, Headland Court, Limpsfield, Surrey, No. 3 Zenith Camera; 25, Miss Walters, Forthampton Terrace, Tewkesbury, No. 3 Zenith Camera; 26, E. T. Russell, 22, Stratford Road, Birmingham, No. 3 Zenith Camera; 27, F. M. Comrie, Eglington Street, Ardrossan, N.B., No. 3 Zenith Camera; 28, Miss Fortunee de Lisle, Foydene, Cranbrook Road. Wimbledon, No. 3 Zenith Camera; 29, S. Guildford, Romany Lodge, Edinburgh, No. 3 Zenith Camera; 30, Sergt. Summerfield, Police Station, Brixton, No. 2 Plico Kodak; 31, Mrs. L. H. Leonard, 13, Millbury Mansions, Kensington, No. 2 Plico Kodak; 32, Miss M. Jörgensen, Bexley, Kent, No. 2 Plico Kodak; 33, Rudolph Kolmen, Altona, Reichenstrasse, No. 2 Plico Kodak; 34, Countess Hanna Kanitz, Milkof in Mecklenberg, No. 2 Plico Kodak; 35, Fürst Lidoff, Westminster Hotel, Berlin, No. 2 Plico Kodak.

CLASS B.—1, Otto Rosenheim, 68, Belsize Park Gardens, N.W. £15 in cash; 2, Herr Bruno Boettger, Untermain, 30, Frankfort-on-the-Main, No. 5 Cartridge Kodak; 3, Mr. T. Puhonny, Artist, Baden-Baden, No. 4 Cartridge Kodak; 4, J. Dunbar, Sydenham House, Bridge of Allan, N.B., No. 4 Special Bullet Kodak; 5, H. Light, 37, Branston Street, Birmingham, No. 4 Special Bullet Kodak; 6, J. C. Stockholm, Bredgode, Copenhagen, No. 3 Cartridge Kodak; 7, J. B. Cameron, 135, Campside Street, Springburn, Glasgow, No. 3 Folding Pocket Kodak; 8, R. C. Davison, Beechcroft, East Molesey, No. 3 Folding Pocket Kodak; 9, Paul Fischer, Hohenheimerstr. 30, Stuttgart, No. 4 Panoram Kodak; 10, H. Harding, 23, Park Square, Regent's Park, N.W., No. 4 Panoram Kodak; 11, W. C. Roosevelt, Villa Roosevelt, Baden-Baden, No. 2 Folding Pocket Kodak; 12, Miss L. Hurtzig, 50, Alleyn Park, Dulwich, S.E., No. 2 Special Bull's-Eye Kodak; 13, E. Sharpe, c/o. J. G. Ramsbottom, 32, Fairfax Road, N.W., No. 1 Panoram Kodak; 14, W. Turnham, Winslow, Bucks, No. 1 Panoram Kodak; 15, E. Thiel, 92, Knesebarsk, Charlottenburg, Germany, No. 1 Folding Pocket Kodak; 16, W. H. H. Wiswall, 10, Stanley Villas, Runcorn, No. 1 Folding Pocket Kodak; 17, G. Watson, Holdenhurst, North Finchley, N., No. 1 Folding Pocket Kodak; 18, G. Lopez, 44, Park Lane, W., No. 1 Folding Pocket Kodak; 19, Miss L. M. Dunn, Trent Vale, Stoke-on-Trent, No. 2 Folding Bull's-Eye Kodak; 20, Mr. F. Potyka, Aathen, Templer Graben, Vienna, No. 4 Zenith Camera; 21, A. G. Hebblethwaite, Devonshire Street, Keighley, No. 4 Zenith Camera; 22, W. L. Fletcher, Stoneleigh, Workington, No. 2 Bull's-Eye Kodak; 23, Mrs. M. C. P. Cotton, 29, Cornwall Gardens, S.W., No. 2 Bulls'-Eye Kodak; 24, J. W. Loftus, Park Avenue, Blackpool, No. 3 Zenith Camera; 25, Miss E. S. Reed, Charley Lodge, Tewkesbury, No. 3 Zenith Camera; 26, C. J. Reade, Seabright House, Tottenhall Wood, Wolverhampton, No. 3 Zenith Camera; 27, L. Rosevinge, 98, Rye Hill, Newcastle-on-Tyne, No. 3 Zenith Camera; 28, J. G. Ramsbottom, 32, Fairfax Road, Hampstead, No. 3 Zenith Camera; 29, Mr. W. Kaste, Wielandstr. 3, Bremen, No. 3 Zenith Camera; 30, J. Burns, 28, Comely Bank Avenue, Edinburgh, No. 2 Plico Kodak; 31, H. Kraft, 3, Grosvenor Gardens, Muswell Hill, N., No. 3 Plico Kodak; 32, Robert Lillie, 66, Doddington Grove, Kennington Park, No. 3 Plico Kodak; 33, Miss I. Knight, Colonnade House, Blackheath, No. 2 Plico Kodak; 34, Mrs. Charlotte Speyer, 88, Adlerflychtyplatz, Frankfort-on-the-Main, No. 2 Plico Kodak; 35, Miss J. M. Smith, 14, Lilybank Gardens, Glasgow, No. 2 Plico Kodak.

CLASS C.—1, Alwine Türpe, Marien Strasse, 16, Dresden, £15 in cash; 2, Dr. Neumann, Vienna, No. 5 Cartridge Kodak; 3, Miss Taylor, 5, Grand Parade, Brighton, No. 4 Cartridge Kodak; 4, Mrs. Rochefort C. Daunt, India, No. 4 Special Bullet Kodak; 5, Dr. F. C. Grindrod, Wychside, Malvern, No. 4 Special Bullet Kodak; 6, Mr. W. Kaste, Wielandstr. 3, Bremen, No. 3 Cartridge Kodak; 7, W. McClean, Ponsonby Avenue, Bristol, No. 3 Folding Pocket Kodak; 8, C. J. Reade, Seabright House, Tattenhall Wood, Wolverhampton, No. 3 Folding Pocket Kodak; 9, J. C. Stockholm, Bredgode, Copenhagen, No. 4 Panoram Kodak; 10, W. E. Dowson, 10, Mapperley Road, Nottingham, No. 4 Panoram Kodak; 11, E. Sharpe, c/o. J. G. Ramsbottom, 32, Fairfax Road, N.W., No. 2 Folding Pocket Kodak; 12, Eustace Young, Aberdeen Terrace, Blackheath, No. 2 Special Bull's-Eye Kodak; 13, Mrs. J. Cordiner, St. James's Vicarage, Croydon, No. 1 Panoram Kodak; 14, E. Weininger, Queen Street, Gloucester, No. 1 Panoram Kodak; 15, Miss Ruby Davison, Beechcroft, East Molesey, No. 1 Folding Pocket Kodak; 16, E. B. Owen, The Grove, Whittington, Oswestry, No. 1 Folding Pocket Kodak; 17, Mrs. M. Cooper, Acacia House, Taunton, No. 1 Folding Pocket Kodak; 18, H. Mikolasch, Lemberg, No. 1 Folding Pocket Kodak; 19, Emil Hoppe, Halensee, by Berlin, No. 2 Folding Bull's-Eye Kodak; 20, W. C. Crofts, 9, Northwich Terrace, Cheltenham, No. 4 Zenith Camera; 21, Miss W. Grienstan, 24, South Eaton Place, S.W., No. 4 Zenith Camera; 22, Otto Rosenheim, 68, Belsize Gardens. N.W., No. 2 Bull's-Eye Kodak; 23, W. F. Dawson, Barrow Hill,

Uttoxeter, No. 2 Bull's-Eye Kodak; 24, A. W. Yeo, Rosslyn, Reigate, No. 3 Zenith Camera; 25, S. E. Cooke, Rothley, Macaulay Road, Clapham Common, No. 3 Zenith Camera; 26, L. Rawlins, The Chantry, Wilton, Salisbury, No. 3 Zenith Camera; 27, A. G. Hebblethwaite, Devonshre Street, Keighley, No. 3 Zenith Camera; 28, H. Robinson, Brenton Cottage, Canonmills, Edinburgh, No. 3 Zenith Camera; 29, Leonard Marshall, Charterhouse, Godalming, No. 3 Zenith Camera; 30, H. B. Rodcliffe, 43, Queen's Road, Brownswood Park, N., No. 2 Plico Kodak; 31, W.B. Tod, 23, Herriot Street, Pollokshields, Glasgow, No. 2 Plico Kodak; 32, G. E. Hardwick, 38, Trumpington Street, Cambridge, No. 2 Plico Kodak; 33, P. G. R. Wright, Fernhill, Fillebrook Road, Leytonstone, No. 2 Plico Kodak; 34, J. G. Ramsbottom, 32, Fairfax Road, Hampstead, No. 2 Plico Kodak; 35, A. H. Robinson, Troutsdale Hackness, Scarby, Yorks, No. 2 Plico Kodak.

The prize-winning photographs will shortly be on view at 40, West Strand, S.W., together with a large selection of other prints and enlargements sent into the competition. Full particulars and date of opening of the exhibition will be announced in due course.

Studio Gossip.

A CORRESPONDENT of the "Standard" states that members of the Royal Academy and other painters are much concerned over the wholesale pruning and trimming operations now being carried on in Burnham Beeches, which beautiful forest was acquired nearly twenty years ago by the Corporation of London for the benefit of the people, and which is now, it is alleged, being ruined by the present Committee of Management insisting that, because the old trees do not possess symmetrically-rounded tops, they are to be cut down. The most lovely beech-trees are being cut down by the hundred, and sent out of the woods by cartloads, to be sold for what they will fetch. It is stated by a number of artists who make Burnham Beeches a favourite venue for sketching and painting that, if the present course be persisted in, there will be soon nothing more than a carefully laid-out park, instead of one of the few old forests remaining in Great Britain. It is expected that the matter will be brought before the Royal Academy.

THREE-COLOUR Work in England.—Messrs. Carl Hentschel & Co. write to the "Publishers' Circular":—"We notice in your last issue an interview with Messrs. Hutchinson & Co., in the course of which mention is made of the three-colour process of illustration. We were surprised to read that this firm had been unable to place their orders for three-colour illustrations in England. We have recently produced the whole of the illustrations for Mr. Mortimer Menpes' two works, 'Japan' and 'War Impressions,' Mr. Marcus Huish's 'Samplers and Needlework,' the souvenir of 'Twelfth Night' at Her Majesty's Theatre, all of which have secured from the leading papers of the United Kingdom universal praise. For many houses in the front rank of the publishing world the Hentschel-Colourtype Company has carried out extensive orders, which have given every satisfaction, not only to the artsts whose originals have been faithfully reproduced, but also to the publishers and the reading public. We regret that Messrs. Hutchinson should have seemed in any way to imply that British firms were not fully awake to the new developments in the illustration of books. As a matter of fact, books with illustrations reproduced by our process have been published nearly every week throughout the autumn publishing season. We trust you will be able to find room for this short defence of English work, for we feel convinced there is no reason why three-colour work should be sent to France."

THE Discovery of the Future.—In the course of his recent lecture at the Royal Institution, Mr. H. G. Wells observed:—"If I am right in saying that science aims for prophecy, and if the specialist in each science is, in fact, doing his best now to prophesy within the limits of his field, what is there to stand in the way of our building up this growing body of forecast into an ordered picture of the future that will be just as certain, just as strictly science, and perhaps just as detailed as the picture that has been built up within the last hundred years to make the geological past? Well, so far and until we bring the prophecy down to the affairs of man and his children, it is just as possible to carry induction forward as back. It is just as simple and sure to work out the changing orbit of the earth in the future until the tidal drag hauls one unchanging face at last towards the sun as it is to work back to its blazing and molten past. Until man comes in the inductive future is as real and convincing as the inductive past. But inorganic forces are the smaller part and the minor interest in this concern. Directly man becomes a factor the nature of the problem changes, and our whole present interest centres on the question whether man is, indeed, individually and collectively incalculable, a new element which entirely alters the nature of our inquiry and stamps it at once as vain and hopeless, or whether his presence complicates indeed, but does not alter, the essential nature of the induction How far may we hope to get trustworthy inductions about the future of man? Well, I think, on the whole, we are inclined to underrate our chance of certainties in the future just as I think we are inclined to be too credulous about the historical past. The vividness of our personal memories, which are the very essence of reality to us, throws a glamour of conviction over tradition and past inductions. But the personal future must in the very nature of things be hidden from us so long as time endures, and this black ignorance at our very feet, this black shadow that corresponds to the brightness of our memories behind us, throws a glamour of uncertainty and unreality over all the future." Dealing with the influence of individuals on the community, Mr. Wells said:—"Everybody does not believe in the importance of the leading man. There are those who will say that the whole world is different by reason of Napoleon. But there are also those who will say the whole world of to-day would be very much as it is now if Napoleon had never been born. There are those who believe entirely in the individual man and those who believe entirely in the forces behind the individual man, and for my own part I must confess myself a rather extreme case of the latter kind. I must confess I believe that if, by some juggling with space and time, Julius Cæsar, Napoleon, Edward IV., William the Conqueror, Lord Rosebery and Robert Burns had all been changed at birth it would not have produced any serious dislocation of the course of destiny. I believe that these great men of ours are no more than images and symbols and instruments taken, as it were, haphazard by the incessant and consistent forces behind them, they are the pen-nibs Fate has used for her writing, the diamonds on the drill that pierces through the rock. And the more one inclines to this trust in forces, the more one will believe in the possibility of a reasoned inductive view of the future, that will serve us in politics, in morals, in social contrivances, and in a thousand spacious ways. And even those who take the most extreme and personal and melodramatic views of the ways of human destiny, who see life as a tissue of fairy-godmother births and accidental meetings and promises and jealousies, will, I suppose, admit there comes a limit to these things, that at last personality dies away, and the greater forces come to their own. The great man, however great he be, cannot set back the whole scheme of things. What he does in right and reason will remain, and what he does against the greater creative forces will perish."

Commercial & Legal Intelligence.

THE Patent Acts.—Replying to Sir John Long, in the House of Commons, recently, Mr. G. Balfour, the President of the Board of Trade, said that he purposed at an early date to introduce a Bill to give effect to the recommendations of the Departmental Committee, presided over by Sir Edward Fry, on the working of the Patent Acts.

AT Clerkenwell Police Court last week, an adjourned summons, taken out by Inspector Cowling, was heard against Parke's Drug Stores, Ltd., of 173, High Street, Camden Town, for selling at 251, Upper Street, Islington, liniment of soap containing methylated alcohol, which had been substituted for the alcohol (*spiritus rectificatus*) prescribed in the British Pharmacopœia. Mr. Bramall prosecuted on behalf of the Islington Borough Council, and Mr. Beck defended. In the course of the case considerable evidence was adduced to show that the article was not sold to the prejudice of the purchaser, and that it was a household remedy which had a commercial standard. Mr. Beck asked permission to call evidence as to a commercial standard. Mr. D'Eyncourt refused to admit such evidence on the ground that decided cases excluded it. He held that liniment of soap compounded with methylated spirits was sold to the prejudice of the purchaser, notwithstanding that it was sold at a less price than an article compounded according to the British Pharmacopœia. He imposed a fine of £20 and £10 10s. costs, declining to grant a case. Mr. Beck intimated his intention of proceeding by mandamus.—"Standard," January 25th.

MERCHANDISE Marks Act Prosecutions.—Last week there were two prosecutions under the Merchandise Marks Act that may be interesting to some photographers, although they were in no way connected with photography. The cases were similar. In the first one a provision dealer and his shopman were proceeded against in the North London Police Court for selling an American ham falsely described as an English one. The owner of the shop was fined £10, and £3 5s. costs, and the shopman who actually sold the ham was fined a similar sum, with 2s. costs, or two months' imprisonment each. The magistrate, in deciding the case, said that he did not know that a good Canadian ham was much worse than an English one, but it was a fraud upon the public to sell an American one for an English ham. In another case, in the Westminster Police Court, a firm were proceeded against for causing a false trade description to be applied to an American ham—to wit, an Irish ham—and for selling a ham to which such false trade description had been applied. In this case, too, a fine of £10, with £3 5s. costs, was inflicted. The reason that we call attention to the above cases is that we know that some unscrupulous photographers supply bromide prints, falsely describing them as platinotypes, to their customers, and they may not be aware that they are liable to be proceeded against under the same Act as the sellers of the hams in the cases referred to, and mulcted in similar penalties, or higher, for the maximum is £20 or four months' imprisonment. Anyone can institute the proceedings who has been deceived by the pictures. We have not heard of any prosecutions with regard to palming off bromide prints as platinotypes, but possibly we may before long. In the case where a number of fraudulent articles are supplied, the penalty is for each one, and with photographs it would be for each individual print, and not for the lot. This would make the penalties amount to a considerable sum where a dozen or more have been supplied.

THE Metric System.—Last week we published a letter from Mr. E. Johnson, the Secretary, Botolph House, Eastcheap, giving a list of the Members of Parliament who are in favour of the compulsory adoption of the metric weights and measures. We here append a report of a meeting of the members of Convocation of the University of London, which appeared in the "Standard" on Tuesday, last week, deal-

ing with the same subject:—"The general meeting of the members of Convocation of the University of London was held yesterday afternoon in the East Conference Hall, South Kensington. Sir E. Busk, Chairman of Convocation, presided. Mr. W. Pringle brought forward the subject of the metric system, and moved:—'That this House is of opinion that, in the interests of commerce, science and education, legislation should be promptly undertaken to make compulsory in this Kingdom, after a proper interval, the use of the metric system of weights and measures for all purposes.'" He urged that the adoption of the system was of the highest interest to the educational efficiency and national prosperity of the country. The present system in vogue in this country sets up three independent and inconsistent standards of weights and measures, and was, in his opinion, most absurd. The metric system would not be universally adopted except after years of strenuous effort. Yet it was in use by 483 millions of civilised beings, and had been adopted by France, Germany, Austria, Spain, Holland, Belgium, the Balkan States and in many other countries. The "splendid isolation" of this country in the matter, he contended, was neither desirable nor necessary. There was a concurrence of opinion in favour of its adoption in most commercial circles in this country. Mr. H. Hanford seconded the motion. He held that the question was a non-Party one, and ought to obtain support from all classes of commercial representatives in the general interests of the Empire. Sir Philip Magnus supported the motion. He thought it was a healthy sign of the reconstituted modern character of their University that such a subject had been brought forward. Although on previous occasions they had considered many proposals with regard to education and science, he was not aware that on any prior occasion had a question relating so largely to the commercial interests of the country as the adoption of the metric system been discussed by them. As they had now a Faculty of Economics, it was most important it should embrace questions of commerce. (Hear, hear.) Mr. Thomas Wilson said he was not prepared to vote for the compulsory adoption of the system. He thought its use should be left optional in this country. Sir Albert Rollit, M.P., thought the compulsory teaching of the metric system in elementary schools would have a beneficial effect in popularising the metric system in this country. He rejoiced that the Chambers of Commerce had unanimously approved of a change from the present system. There could be no doubt that the trade of this country was greatly hampered and impeded by the system of weights and measures now in force. The question was whether it was now wise to delay the adoption of a compulsory system. That entirely depended upon the force of public opinion which could be brought to support departmental influence on the subject. He was a member of the Senate of that University, and he proposed to move on Wednesday next that a Degree in Commerce should be conferred. (Hear, hear). Mr. Pringle replied on the debate, and the resolution was carried by a large majority."

News and Notes.

At the Röntgen Society's ordinary general meeting, on Thursday, February 6th, 1902, at 20, Hanover-square, a paper will be read by Mr. E. W. H. Shenton, M.R.C.S., L.R.C.P., on "A System of Radiography."

The Photographic Club (Anderton's Hotel, Fleet Street) announce that Mr. H. M. Lomas will on Wednesday, February 5th, at 8 p.m., lecture on "Photography in the Hunting Field." Any who are interested in the subject will be welcomed at the meeting.

At the last meeting of the South London Photographic Society Mr. C. J. Marshall, A.R.I.B.A., gave a lecture on Egypt, tracing by means of photographs the history of Egypt from the Palæolithic period to the time of the Pharaoh of the Exodus. The lecture showed some remarkable flashlight photographs of bas-reliefs and paintings on the interiors of pyramids and tombs taken during several tours in Egypt.

The South Shields Photographic Society's annual exhibition will be held on Wednesday and Thursday, March 12th and 13th, in the Congregational Hall, Ocean Road, South Shields. The judges will be Messrs. Edgar G. Lee and W. Parry. There will be competitions in the following classes:—Federation Classes—open to members of all the Societies in the Federation of Photographic Societies of Northumberland and Durham (including South Shields): 1.—Prints, any subject. 2.—Lantern Slides (sets of four). Silver medal, bronze medal and certificate in each class. Any further information or entry forms may be obtained from the hon. secs., Messrs. A. W. Hoare, 53, Wouldhave Street, South Shields, and R. Brady, Albion Terrace, South Shields.

Cripplegate Photographic Exhibition.—This exhibition will open its doors to the public on February 25th next, remaining open until Thursday, February 27th. Twenty-one gold, silver and bronze medals are offered for competition. The successful exhibitors will be presented with their medals by the Right. Hon. the Lord Mayor at the opening ceremony, on Tuesday, February 25th, at 1 p.m. It is not often that we can record such promptness in the distribution of awards, and this fact should appeal to intending exhibitors, with the result that a large entry should be recorded, with a fine display of work. Messrs. John H. Gear, A. Horsley Hinton and J. B. B. Wellington are to be the judges. Entries close on February 10th, and early application for entry-forms is advisable, as only a limited number will be issued. The hon. sec. is Mr. Alfred T. Ward, Cripplegate Photographic Society, Cripplegate Institute, Golden Lane, E.C.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

January	Name of Society.	Subject.
3	Oxford Camera Club	Annual General Meeting.
3	Southampton Camera Club	Lantern Slide Competition. Subject: *Still Life.*
3	Camera Club	*An Address.* Sir W. de W. Abney, K.C.B.
4	Melbourne Working Men's Col	*Picturesque Melbourne.* Mr. C. R. Du Rieu.
5	Southport Photographic Society	Paper. W. Rose.
5	Maritzburg Camera Club	*Lantern Slides (Dry Plate).* B. Benson.
5	Edinburgh Photographic	*A Summer Holiday in Orkney.* Illustrated. F. P. Moffat.
5	Rotherham Photographic	Prize Slides.
5	Southsea Photographic Society	Lecture and Demonstration—*Improving Negatives and Prints, and Work on Austin-Edwards' Films and Warwick Plates.* Mr. W. D. Welford.
6	Brentford Photographic	Lantern Evening.
6	Röntgen Society	Mr. E. W. H. Shenton. A paper.
6	Liverpool Amateur	Lecture: *Architectural Photography.* Dr. J. W. Ellis.
6	Richmond Camera Club	Lantern Evening.
6	London and Provincial	Annual Supper.
6	North-West London	*A Week-end on the Continent.* Mr. W. Kilbey.
6	Liverpool Amateur	Lecture. *Architectural Photography.* Dr. J. W. Ellis.
7	Leicester Literary	Lecture. *Picturesque Northern France.* Illustrated by Lantern Slides. Mr. G. Bankart.
7	Bognor Photographic Society	Monthly Competition: Architecture "Exterior." Prints for Criticism.
7	Sutton Scientific and Literary	Lecture on *Printing and Toning.*
7	Borough Polytechnic	*Clouds: their Production and Printing In.*

ROYAL PHOTOGRAPHIC SOCIETY.

January 21.—Lantern Meeting. Mr. J. J. Vezey, F.R.M.S., in the chair.

A very entertaining chat was given by Mr. Henry Stevens, who showed a large number of slides of his flower, animal and figure studies. Special interest attached to the occasion because of the lecturer's "one man" show now on view in the Russell Square Rooms, and upon which the members and their friends had not before been addressed by Mr. Stevens. The audience—a good proportion of which was composed of ladies—seemed to thoroughly appreciate what was put before them, both in pictorial and anecdotal directions, judging by the frequent applause and other usual signs of approval. The feline studies and those of Mr. Stevens' clever dogs were, perhaps, responsible for most of the demonstrations of appreciation, but they were closely followed by the excellent flower studies and the landscape and figure photographs.

Prints in carbon and platinum of most of these photographs are hanging on the walls at 66, Russell-Square until February 15th, and the Society will be pleased to admit anybody desirous of examining the work on presentation of visiting card, daily from 10 to 4, and on Wednesdays until 8 p.m.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

January 23.—Mr. J. E. Hodd in the chair.

Mr. R. P. Drage said that he had complained of an inability to get good black tones on the Columbia gaslight paper when using alum in the hypo bath. It had been suggested to him, however, that the difficulty was due to over-exposure, and that was practically the case. Further experiments he had made produced good blacks.

Mr. Ernest Human demonstrated Messrs. Wellington & Ward's S.C.P. or slow contact paper. This paper is one of the gaslight or daylight printing variety, or, as the demonstrator styled it, "the fireside printer." It is made in two grades—smooth (matt) and glossy—and it is claimed for it that it gives rich blacks and fine gradation. Mr. Human made several prints before the members, and a large number of others were passed round. Amongst these were several prints of a warm tone, by a variation of development dealt with by the demonstrator, and extending into the reds and sepias. There was a long conversational discussion regarding the purity of the warm tones secured, the influence of longer exposure than normal, with diluted development, the characteristics of the paper in the direction of its length of scale, and other little points that arise at such a demonstration.

PHOTOGRAPHIC CLUB.

January 22.—Mr. A. Mackie in the chair.

Mr. Edmund A. Robins, on behalf of Kodak, Limited, demonstrated several of the firm's specialities. "Dekko" paper was one of the articles introduced and prints upon it were made in the course of the evening. It is made in four grades—glossy, matte, egg-shell matte and matte antique—with glossy and various degrees of matte surface respectively. "Dekko" paper may be handled in safety at 8 or 10 ft from a full-flame

artificial light, and thus comes under the generic name of gaslight papers. It is slow, and can be developed in the same light. A good deal of exposure is required to produce the developable image, but if magnesium ribbon be used 1 in. at a distance of a foot is enough for a normal negative. More or less exposure should be given by varying the distance of the negative from the ribbon, and not by altering the quantity of the magnesium that is burned. The developer recommended is hydroquinone and metol in strong solution in order to complete development before fogging can commence. The use of bromide was important. The image should appear in three seconds and be complete in thirty seconds. The paper was one that appealed particularly to the amateur and to any who did not care to work more than was needful in a dark room.

Some discussion took place regarding the assertion in the circular relating to the paper that ordinary gaslight was slightly weaker than incandescent electric light. Mr. J. W. Zaehnsdorf said that the incandescent electric bulb of 16 c.p. was less actinic than a gas-burner of the same power. He advocated a series of experiments to accurately determine the relative actinic value of the various forms of artificial light, and promised to take up the question himself.

Mr. Robins then showed the "Stereo-Weno," a folding stereoscopic camera for pictures 3¼ in. square. Photographs made with the instrument were brought up and examined with the stereoscope. The No. 3 Folding Pocket Kodak for ¼-plate pictures was also described and passed round.

CAMERA CLUB.

It has often been pointed out that a man who takes up photography as a pastime will find it to his interest to give some definite direction to his work. One may prefer to link his camera with the microscope, another will use it as a means of illustrating some branch of natural history, and so on. Mr. C. H. Bothamley, whose name is generally associated with the scientific side of photography, has employed his leisure and his camera in tracing the architectural features, and through them, somewhat of the history of the grand old castles which are dotted about our country in such profusion. A year ago he addressed the members of the Camera Club on the subject of the Norman castles of Britain. Last week he gave a lecture, which may be regarded as the sequel of the other, dealing with castles after the twelfth century.

Mr. Bothamley has the rare faculty of putting together the materials of a lecture in a manner which is at once concise, instructive and interesting, and the way in which he handled the subject at present under discussion was no exception to the rule. Moreover, the illustrations, all of which were of his own production, were not only calculated to bring out the particular points which he wished to emphasise, but were, many of them, highly artistic in treatment. Some of the pictures, as he explained, were extremely difficult to procure, owing to want of light, but in showing them he had the satisfaction of knowing that no one previously had had the patience to give an hour or more's exposure to a single photo.

Mr. Bothamley first showed how the original type of Norman castle—the chief feature of which was its massive "keep"—gradually became modified as time went on. At first the builders of later times were content to add outworks so as to extend the original area of such castles, but later still they worked independently of such trammels, and constructed buildings *de novo*. A chief feature of these buildings was the development of "the hall," which became, within the castle precincts, the chief living room. Several examples of these halls were shown, gathered from different castles in Yorkshire, Durham, etc. In one case it was shown how the windows were glazed—at a time when glass was very expensive—with removable frames, so that when the place was not occupied the precious windows could be taken away and replaced by shutters. In other examples the windows were set high above the flooring, so as to protect the animals against arrows and other missiles, while a passage-way ran through the walls, on a level with the windows, for the accommodation of armed defenders.

Chepstow Castle afforded the lecturer an opportunity of showing how these buildings were often divided into separate wards, each with independent kitchens, etc., so that if one gave way to attack, the defenders could still retain possession of the others. Details of door-construction and the method adopted of flanking such entrances by loopholes and protecting them by portcullis were noted and illustrated in a most striking manner.

Towards the end of the fourteenth century a more complete system of castle building came into vogue, and as an instance of it photographs of Caerphilly were shown. Huge gatehouses now took the place of the old Norman "keep," and there were, in certain cases, successive lines of defence, one within the other. Buildings thus designed were known as concentric castles.

Edward I. marked the conquest of Wales by the erection of many castles, which were known as Edwardian castles. Among these Conway must be first named, for it is the finest example of mediæval architecture in this country. A large number of photographs were devoted to Conway, its general and internal arrangements being described in much completeness. In the towers at Conway were situated the ordinary dwelling rooms, and some of these were furnished with elegant fireplaces and window seats. Carnarvon Castle came next under review. It was begun by Edward I., but completed by Edward II. It represented the most perfect example of the fortification of the time in which it was built, and the work throughout was so good that it should prove a model for the jerry-builder to weep over. Carnarvon and Conway were not concentric castles. For the most perfect example of a concentric castle we must visit Beaumaris. An interesting point to notice was that up to the fourteenth century the doors of castles opened inwards; after that it was usual to make them open outwards.

Alnwick, in Northumberland, gave us another instance of an Edwardian castle, but one which was quite different in construction to those already described. It was the largest castle in the country, with the exception of our sovereign's noble home at Windsor. The gateway and barbican were of most imposing elevation, and although the residential parts of the building were modern, the work had been so well done that it was difficult to say where the old ended and the new began.

Other castles which afforded food for much interesting criticism on the part of the lecturer were Bolton, Warkworth and Raglan, the latter being described as the most beautiful ruin in Europe. It grew and grew up to the time of the Parliamentary war, and made a gallant defence under the Marquis of Worcester. With a fine view of Windsor Castle a most interesting and entertaining lecture was brought to a close. The usual vote of thanks terminated the proceedings.

PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION (LIVERPOOL BRANCH).

At a meeting held on Friday, January 17th, Mr. G. Watmough Webster in the chair, the hon. sec. read communications he had received from London, and after a thorough and animated discussion it was resolved to bring the matters mentioned forward at the next meeting. Mr. M. A. Priestly proposed and Mr. W. Warrington seconded that an annual subscription of 2s. 6d. by each member be paid for local expenses. The chairman proposed and Mr. H. A. Morrison seconded that Mr. A. F. Mowll, the hon. sec., be appointed treasurer.

It was proposed and seconded that in the circular convening the next meeting there be given a notice that a discussion will be invited as to the desirability of the Liverpool Branch bringing before the parent association their determination to pledge themselves to resist all rings and combinations detrimental to the interest of professional photographers.

Recently-Elected Members of the Association.

Joseph Augustin Bellinger, Fore-street, Sidmouth.
George Thompson, 70, Northgate, Canterbury.
George R. Lawson, 102, South-bridge, Edinburgh.
John Brown, 36, Rockville-street, Rock Ferry, Birkenhead.
Tom Reveley, Market-place, Wantage.
James Phillips (J. Phillips & Sons), Market-square, Biggleswade, Beds.

CROYDON CAMERA CLUB.

"A Chat on Hand Cameras and Their Use," by Mr. W. E. Dunmore, proved a capital draw on Wednesday last, a large number of members being present. In dealing with his subject, Mr. Dunmore stated that a hand camera was, from its nature, a compromise, and that the perfect or ideal instrument had not yet been placed on the market, and, he thought, never would be. Lightness and compactness were desirable, and for serious work, using fronts, a first-class modern lens and focussing arrangement were essential. These conditions, as Mr. Dunmore showed, were amply fulfilled in the "Tella" fitted with a Cooke lens, and much admiration was expressed by the members at the ingenuity and precision of its mechanism, especially the film-changing device.

Amongst the many hints Mr. Dunmore gave, perhaps the most useful was in connection with winter photography. He strongly advised the snap-shottist to work against the light, provided the sun was not brightly shining at the time, better results could be obtained in this way than in any other. February, in his opinion, was a grand month for obtaining transient artistic effects, and squally or even wet weather should not deter the worker.

A selection of snap shots of first-class quality, from negatives taken with the "Tella" camera, were then exhibited on the screen, and, at the instance of the President (Mr. Hector Maclean, F.R.P.S.), a hearty vote of thanks was accorded the lecturer.

SOUTHSEA PHOTOGRAPHIC SOCIETY.

Last week the Southsea Photographic Society held its fifteenth annual general meeting at the Rooms, Pembroke-road. There was a big attendance. The business included the reading of the Treasurer's annual statement, which showed a good balance in favour of the Society. The hon. sec., in his annual report, congratulated the Society on its great progress, and on the fact that it had become the leading organisation of its kind in the South of England, and had raised the art of photography to a considerable degree in the town. The membership had increased by leaps and bounds, and the admission of professional photographers had been largely taken advantage of. The summer excursions had been very successful, and had done much to make the Society popular. The exhibition had proved an unqualified success in every way. It was the largest as regards number of entries and class ever held by any provincial society in England, which was a record to be proud of. The year's work also on the part of the members had been highly satisfactory. The hon. sec. (Mr. F. J. Mortimer) then read the balance-sheet of the exhibition. The expenditure had been £45, and the total income £75, showing a balance of £30 in favour of the Society. The members were aware that the exhibition had been a great success, but were hardly prepared to hear that the result was so highly satisfactory as this, and the announcement was greeted with rounds of applause, after which a

special vote of thanks was given to Mr. Mortimer for his untiring energy on behalf of the Society. The election of officers for 1902 was then proceeded with, and, after some exciting voting, the result was declared as follows:—President, Mr. W. G. Lewis; Vice-President, Mr. H. A. Canning; Hon. Sec., Mr. F. J. Mortimer; Assistant Hon. Sec., Mr. J. H. Franckeiss; Hon. Treasurer, Mr. F. S. Hoyte; Hon. Lanternist, Mr. E. H. Purvis; Council—Colonel Barrington Baker, Mr. H. T. Lilley, Dr. C. H. Newby, Mr. George Stanford, Mr. A. Fisher and Mr. G. Wood. The new President sketched out the course he proposed to adopt during the ensuing year, and hoped to be able to promise a visit from the Photographic Convention of the United Kingdom, which would not only be a good thing for the Southsea Society, but also for Portsmouth generally. It was also announced that the Mayor of Portsmouth (Major Dupree) would present the medals awarded at the recent exhibition on Friday, January 31st, when a special photographic lecture, entitled "A Trip up the Rhine," would be given by Mr. P. Slater, of the South London Photographic Society. The new medals just struck for the Southsea Society are from designs by Mr. F. J. Mortimer, the obverse representing the old *Victory* in Portsmouth Harbour, and the reverse the borough crest and laurel wreath, and suitable inscriptions.

LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

THE following is the judges' report on this exhibition, which was unavoidably omited from our last issue:—

"In Class A, which is naturally the most important, there are several sets which would have been worthy the gold medal, but, however, the judges were unanimous in awarding it to Mr. Joseph Appleby, and with very few exceptions all the entries in this class are of a very high order of pictorial merit.

"In both Classes B and C many prints exhibit good taste in selection, considerable sympathetic feeling in treatment, and, accompanied by excellent technique, constitute a very creditable collection of work.

"Class D, for those who had not previously won an award, contained only one entry, but one print in the set—a snow scene—was deemed especially worthy.

"In Class E, also for those who had not previously been winners, a much more numerous entry was made, and whilst even in those to which medals have been awarded there is a want of uniformity, yet the work is distinctly creditable.

"The lantern slides, in their way, possess as great a degree of merit as the prints, and some of the winning sets are particularly fine.

"On the whole, the judges can heartily congratulate the Association upon a remarkably good exhibition.

"(Signed) THOMAS HUSON, R.I.
"G. WATMOUGH WEBSTER
"A. HORSLEY HINTON
} Judges.

"LIST OF AWARDS. (Liverpool, January 14th, 1902.)

"Class A.—Gold Medal—Mr. Joseph Appleby.
"Class B.—Silver Medals—Mr. J. H. Canevali, Mr. J. Crichton Timpany.
"Class C.—Silver Medals—Mr. W. E. Inston, Mr. Charles Gostenhofer.
"Class D.—Bronze Medal—Mr. J. Selkirk.
"Class E.—Bronze Medals—Mr. T. W. Quirk, Mrs. Lister.
"Class F (Lantern Slides).—Gold Medal—Mr. Fred Anyon.
"Class G (Lantern Slides).—Silver Medals—Mr. E. N. Ellis, Mr. J. W. Towers.
"Class H (Lantern Slides).—Bronze Medal—Mr. Joseph Marples.
"Class I (Stereoscopic Slides).—Silver Medal—Mr. H. J. Houghton.
"Class J (Lantern Slides) (Scientific Section).—Silver Medal—Dr. C. Thurstan Holland.
"Class K (for Lady Competitors).—Silver Medal—Miss Harvey."

UNDER the presidency of Mr. Albert Parker, a popular lecture on "Photography: Some of Its Uses," of extreme interest and highly appreciated by a large audience, was given Mr. George Dickinson, before the Guild and Literary Society at Trinity Wesleyan Church, Wood Green, on January 24th, 1902. The lecturer encouraged amateur photography for pleasure and profit. He explained how great an industry the art had grown to within fifty years, and to how many important uses it can be put. Then by a great variety of beautiful limelight views he made his teaching visible. There were admirable pictures of warships, cathedrals, rural views, choice flowers, etc., some being prize pictures by Mr. E. Dockree, and the North Middlesex Photographic Society, which won applause. He explained how useful the art is to record home festivals and baby's growth, as well as places visited and matters of local or historical importance. Some unique microscopic slides by Messrs. Alfred S. Spratt and E. Dockree of diatoms, insects and a bee's eye showed the beauties of things once invisibly small. Instantaneous photos of things in rapid motion, taken in 1-400th of a second, included a rifle bullet in flight, with the air-waves distinctly seen. Telephotography gave some examples of birds too timid to be approached, but photographed at a distance. Some really superb pictures by Sanger Shepherd, Esq., and Messrs. Lumière Bros., of Paris, by the triple-colour process, astonished the audience by their natural and magnificent representation of flowers, jewellery and interiors of Chateau Chantilly. The great use of Röntgen-Ray pictures in surgery was referred to, and examples shown. The lecturer then introduced an ample series of animated pictures, which, he said, on the films were 1 in. by ¾ in., and were taken at fifteen to forty per second. These displayed scenes on the cruise of the *Ophir* and the war in South Africa, etc. His humour, instruction and earnestness rose to eloquence as Mr. Dickinson advocated the Alexandra Palace being made a centre of technical advance, with a photographic institute as a prominent item.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

THE SALE OF POISONS FOR INDUSTRIAL PURPOSES.

To the Editors.

Gentlemen,—Will you kindly allow me to bring under the notice of your numerous readers the action that is being taken by and on behalf of a number of important traders who are interested in the sale of poisons for other than medicinal purposes? Agricultural agents, farmers, agriculturists, fruit-growers, seedsmen, ironmongers, drysalters and many others are concerned, and to some of these the subject of this letter may not be unfamiliar, while to others, who have not had their attention directed specially to it, it may be both new and interesting as well as important. To put it briefly, the question at issue is the right and the desirability of poisonous compounds required for trading and industrial purposes being sold by other than dispensing chemists and druggists. The latter possess, under the Act of 1868, the monopoly of all such sales, and occasionally the Pharmaceutical Society, acting in their behalf, institutes prosecutions for the recovery of penalties, with the object of asserting this monopoly; but, as a matter of common practice, the law is not generally regarded as having the effect that the Pharmaceutical Society contends for, and many retail dealers habitually disregard its alleged intention—of course, at the risk of being proceeded against. It is for the purpose of relieving traders of this liability, and thereby meeting the convenience of the public at large, that an organisation entitled "The Traders in Poisons or Poisonous Compounds for Technical or Trade Purposes Protection Society" has been formed, and the action that this society is now taking in the interests of all such traders throughout the country (and not merely its members) is what I am anxious to disclose to your readers. The society of which I have the honour to be secretary was formed in March, 1900, since which date it has been very successful in organising the various traders who are directly concerned in the sale of poisonous compounds for industrial purposes. Upon the eve of the last General Election it communicated with most of the Parliamentary candidates, and 90 per cent. of the replies received were favourable to the society's objects. Briefly put, the object is to secure an amendment of the existing law. Those traders who are continuing the sale of the various articles in which they have been accustomed to deal will be gratified to learn that effectual and energetic steps are being taken to vindicate their position, and secure their immunity from prosecutions. This is largely due to the great and sustained interest taken in the Protection Society by its treasurer (Mr. G. H. Richards), whose strenuous exertions have done much to inspire confidence in the classes of traders who are directly concerned in this subject, and who may confidently rely upon a continuance of energetic action in their behalf until the object is attained.

There are many reasons why the Pharmacy Act of 1868, already alluded to, should be amended. In the first place, it is evident, from the preamble, that it was intended more particularly to ensure the safety of the public, by insisting that only competent persons, having practical knowledge of the properties of poisons, should have the dispensing of the same. That is reasonable enough; but in the days when the measure became law there were not in existence the multitudinous packages and bottles of preparations, compounded by the manufacturer ready for immediate use, for horticultural, agricultural, and other trade purposes, which are now to be met with all over the country. As regards these the ordinary chemist and druggist has no more practical knowledge than the man in the wood. The manufacturer tells him, and the public at large, by advertisement, that this or that mixture, or sheep-dip, or powder, is an excellent remedy for this or that disorder, and the purchaser, like the chemist, takes it on trust for some specific purpose, the chemist being merely the channel through which the manufacturer reaches the customer. There is no skilled practical knowledge of poisons required to dispose of a sealed packet or vessel which the chemist receives from the manufacturer, who alone undertakes the responsibility of declaring that a compound of poisonous articles, of a certain strength, is effective for a certain purpose. The purchaser might just as well buy what he wants from any other tradesman so far as the skilled knowledge of the chemist is brought to bear upon the article disposed of. Indeed in most cases, it would be distinctly advantageous to the buyer if he went to some person who had practical experience of the preparation required. Take, for instance, the case of an insecticide, (such as XL All) containing poison. Would not a seedsman or horticultural agent be more likely to give valuable advice to a purchaser based upon practical experience, than a chemist whose principal employment is the dispensing of drugs intended to cure all the ills that flesh is heir to? The one has probably used the poison himself, and is in

a position to say how best to apply it; but the chemist would, from his different occupation, have had no opportunity of acquiring such knowledge.

The same argument applies to sheep-dips, weed-killers, etc. If there is any risk to public safety involved in the proposed freer sale, it is not increased by disposal through a seedsman, nor minimised by being handed over a chemist's counter. Again, how few pharmacists have the most remote knowledge of the best means of destroying aphis, mealy bug, or mildew so destructive to the fruit-grower—compared with the seedsman or agricultural agent? The new vapourisers and insecticides which have come into such general use in recent years have been invented by members of the horticultural trade, and people who are accustomed to their application are naturally the best advisers of purchasers—not chemists, who know nothing of them beyond the label on each packet. Indeed, the skilled knowledge of the pharmacist, which may be of the utmost service in making up a bottle of medicine for a human being, is not brought into use in the sale of a sealed packet or vessel; hence the very reasonable demand that the sale of poisonous compounds, for purposes already indicated, shall not be confined to chemists and druggists, but be legally extended to other tradesmen, who can then meet the convenience of the public without incurring risk of prosecution. A measure such as is contemplated would also enable photographic requisites containing poison to be sold by others than chemists.

It is to the benefit of traders in all parts of the country that the society to which I have referred is exerting itself, and I am glad to inform you that the reasonableness of its demand has been admitted by the Privy Council, who last year appointed a Poisons Committee to investigate the matter and report on the evidence submitted to them. Already that committee has held three sittings, at which witnesses were heard on behalf of the Pharmaceutical Society, on the one hand, and our Protection Society on the other, besides some independent skilled and departmental witnesses, and there is good reason for believing that the committee may recommend the adoption of a third schedule to the Pharmacy Act, which will provide where poisonous compounds are sold in sealed packages for agricultural, horticultural, disinfecting, and other trade or technical purposes, by persons other than chemists, who shall be duly licensed, and being respectable and responsible individuals, they shall be lawfully entitled to sell such articles. It must be understood, however, that this desired result can only be obtained by the traders concerned bestirring themselves and bringing pressure to bear upon the members of Parliament in their respective districts, pointing out to them the desirability of the Government being urged to bring in an amendment Bill for the purposes above indicated. For every fully qualified chemist, there must be a large number of agricultural agents, horticulturists, seedsmen, oil and colourmen, ironmongers, hardware dealers, and the like, who would benefit by an amendment of the law which enabled them to sell, without fear of prosecution, many articles in great demand in town and country alike. I therefore hope that this Trade Protection Society will receive their cordial support. It already has the sympathy in a practical form of the Ironmongers, the Tar Distillers, and the Photographic Societies, and it is hoped that the success which has attended its efforts, so far, in its attack upon the monopoly, will attract the continued and extended interest of all those who wish to see that monopoly broken down. In saying this allow me to add that we in no case advocate, or desire to bring about the indiscriminate sale of poisons. We urge that all retailers of them should be registered and licensed, and that those who are not pharmacists should sell only in sealed packages or vessels, without breaking bulk. By these precautions being observed, we contend that the public safety would be safe-guarded quite as much as it now is, while the public convenience would be vastly increased. If other information is desired on this important subject it will be readily furnished by yours faithfully,

THOMAS G. DOBBS,
Secretary.

24, Sansome Street, Worcester,
January 28, 1902.

P.S.—Since writing the above, according to the *Chemist and Druggist* (the trade organ of the Pharmacists) of the 25th inst., it is admitted, to use their own words, "That the Report (of the Poisons Committee of the Privy Council) will be to some extent opposed to the Pharmacy Act View of the Sale of Poisons."

TITAN SCARLET.

To the Editors.

Gentlemen,—As one of your correspondents desires the address of Messrs. Read, Holliday, and Sons, Ltd., the makers of the Titan series of dyes, I enclose herewith copy of their advertisement, giving the full addresses of their factories and branches.—Yours faithfully,

C. F. SEYMOUR ROTHWELL.

15, Skerton Road, Old Trafford, Manchester (near the station).
January 27, 1902.

[The factories of Messrs. Read, Holliday, and Company are at Huddersfield, England, and Brooklyn, U.S.A.—EDS. B.J.P.]

THE COLOUR CLUB.

To the Editors.

Gentlemen,—I beg to hand you enclosed my cheque for 13s., on the London and Westminster Bank, Lothbury, E.C., in payment of this year's subscription to the "British Journal."

I read in your last issue of the 17th inst, that a "Colour Club" has been formed lately in England. I should feel extremely obliged if you would inform me to whom I am to apply for becoming a member.

For the last three years I have been busy with three-colour process, as an amateur, forming thus stereo slides, and, as I am working here quite isolated, I should be happy to exchange views occasionally with members of the new club.—Thanking you beforehand, I remain, yours faithfully,

VICTOR SELB.

42, Rue des Drapiers, Bruxelles.
January 22nd, 1902.

[The Hon. Sec. of the Colour Club will communicate with Mons. Selb in due course.—EDS. B.J.P.]

THE MEASUREMENT OF LIGHT.

To the Editors.

Gentlemen,—I must express my regret if I misunderstood Mr. Steadman in the matter of uniform illumination of a plane surface, but it is somewhat difficult to comprehend what his theory is. Clearly, however, he assumes the earth to be at the centre of a luminous spherical sky. Under such circumstances, the intensity of the light received from equal areas, cæteris paribus, would be constant, however oblique the incidence. But it is demonstrable that Lambert's Law of Cosines applies to the light received from the sky, vertical illumination being of maximum intensity, and illumination of great obliquity of minimum intensity. In other words, such illumination corresponds to that received from a plane surface, and not from a spherical one, with the earth centrally situated. Given, then, this luminous plane, any particular area of it cannot be expressed as a fraction of the whole when the area of the whole is unknown. Obviously, however, one can express the size of a luminous or other surface in terms of what Mr. Steadman calls "radial space" (i.e., the visual angle subtended), but sphericity of the surface cannot be deduced therefrom.

In short, a more careful study of Dr. Stine's admirable little book on Photometrical Measurements will probably persuade Mr. Steadman to abandon his theory. For theories are merely the glue which stick facts together, but, if he will forgive me for saying so, Mr. Steadman's glue bears a suspicious resemblance to nitroglycerine.—I am, yours, etc.,

J. DORMER.

January 24, 1902.

PAPER FOR MODERN BOOKS AND PERIODICALS.

To the Editors.

Gentlemen,—During the past week or two there have been several letters in the "Standard" complaining that the highly glazed paper now so generally used for books and periodicals makes reading for any length of time trying to the eyesight, and there is some truth in the complaints. But this class of paper is really imperative where photo blocks are used for the illustrations. The present perfection of process block illustrations is largely due to the paper upon which they are printed. If the old kind of paper, such as some of the writers advocate, were again adopted good process illustrations, with their truthfulness, would be an impossibility. We should then have to go back to the old and costly wood engravings—that is, if we could now get the work done at all. The art of wood engraving has, practically, become a thing of the past since process work has been brought to its present state of perfection. However, there is much to be said in favour of good wood block engravings, as compared with photo-process blocks, good as they may be. I expect that all the letters that may be written protesting against the use of the modern highly glazed papers will be of little avail when process blocks are the illustrations, and there is no early prospect of their being supplanted by any other.—I am, yours, etc.,

WILLIAM HOBSON.

January 22, 1902.

KEEPING PLATINUM PAPER DRY.

To the Editors.

Gentlemen,—I have often wondered why calcic chloride is always used for this purpose instead of quicklime. I have more than once seen the former get damp enough to run and spoil nearly a whole tube of paper, whereas the latter is always dry, no matter how much water it may absorb. It is a common thing for the analytical chemist to keep a lump of quicklime in the glass cases containing his very sensitive balances, to protect them from rust. Why should not the platino type worker adopt similar means for keeping his paper dry? I have tried it myself, and it appears to answer perfectly, and if a little dust from the lime should happen to get on to the paper it could be brushed or dusted off before the paper is put into the bath. I should like to know if any of your readers have tried this, and with what result?—Yours truly,

J. H. BALDOCK.

Croydon.

PHOTOGRAVURE.

To the Editors.

Gentlemen,—The remarks made by judges, and sometimes by counsel, when a photographic case is before the court, are often very amusing, even to those having but a superficial knowledge of photography. The most amusing that has come under my notice for crass ignorance of photography for some time is a case that was reported in your last issue, which was tried in the Lutterworth County Court. The defendant was sued for £3 3s. for an enlargement. The claim was resisted on the ground that it was not ordered, and the defendant stated that he could have got the enlargement done anywhere for 5s. 6d. But here comes the amusing part, and I here quote from the report: "The enlargement was here handed to the judge (unframed) who, after critically examining it, remarked, 'Why, this is a photogravure; one of the sort that an artist in Paris reckons to do for the cost of the packing case only.' Possibly the learned judge had in his mind the man 'Tanquerey,' who has been so frequently exposed in this country. But it is the first time that I have heard his work styled "Photogravures." So far as I am aware, the man whom the judge called an artist has not yet had the assurance to style it as such—and the man has assurance for almost anything.—I am, yours, etc.,

January 28, 1902. BURIN.

STEREO-MICROGRAPHY.

To the Editors.

Gentlemen,—I often think that nothing is more futile than "claiming priority" in scientific matters, and under the above heading I see an amusing instance of this futility. As I have nothing to claim for myself on this occasion, I will e'en lay the matter before you.

So far as I see from a letter in your yesterday's issue you had characterised as novel a method by a Canadian Professor of getting "stereoscopic" views of microscopical objects, by placing the objects on a tilting stage and making photographs of the two "aspects" consecutively, with one lens. Now a correspondent (whose name seems to have been omitted through a printer's *lapsus*), knocks the wind out of the Professor's sails by recounting what he himself did "about ten years ago."

Not less than 15 years ago, Dr. R. L. Maddox—whom not to know argues oneself unknown—sent me a tilting stage, which he had made and used *many years previously* for that very purpose; and he also sent me several beautiful "stereo." negatives produced on that stage with wet collodion. As Dr. Maddox was the first practical worker with gelatine emulsions, and as he used these emulsions for photomicrographic work almost from his first discovery of them, I am afraid to say how far back we may date his tilting stage; I should surmise that 35 years is not too long a time to go back.

I fear that Professor Birdwood's claim—if he made any, of which I have no knowledge—is not the only one that "falls to the ground."—I am, yours, etc., ANDREW PRINGLE.

Basing House, Banstead, Surrey.
January 25, 1902.

[The author of the letter to which Mr. Pringle replies was Mr. E. Fenskè, whose name was accidentally omitted by our printers.—EDS. B.J.P.]

NEW FORMULA FOR GASLYT PLATES.

To the Editors.

Gentlemen,—We beg to inform you that we are now publishing a new formula for the development of our Gaslyt plates, by which very rich colours may be obtained in a more uniform manner than with our old method. The recipe is as follows:—

FORMULA FOR DEVELOPER.

(Solution No. 1.)

Water	24 ounces.
Metol	4 grains.
Sodium sulphite crystals	75 ,,
Potassium bromide	8 ,,
Hydroquinone	16 ,,
Sodium carbonate crystals	280 ,,

(Solution No. 2.)

Ammonium bromide	1 ounce.
Ammonium Carbonate	1 ,,
Water	1 pint.

For rich red colours exposure should be from 8 to 12 minutes to a 16 c. p. light, holding the frame a distance of about 6 inches. For development, to every ounce of No. 1 solution add from 8 to 10 drops of No. 2 solution.

For warm brown tones exposure should be from 5 to 8 minutes, and only from 5 to 6 drops of No. 2 solution for each ounce of No. 1 The development is complete in about 6 minutes for brown tones; about 10 minutes for red. It will be seen from above that considerable patience is required, but the resulting tones are so superior that the extra trouble is justified.—Yours faithfully,

JOHN J. GRIFFIN & SONS, LTD.

20-26, Sardinia-street, Lincoln's Inn Fields,
London, W.C. January 22, 1902.

A MYSTERIOUS SUPPLEMENTARY FIGURE.

To the Editors.

Gentlemen,—I am enclosing for your inspection a photo taken as a trial plate from a sample box of extra-rapid plates issued by well-known makers recently. You will see the figure of a soldier plainly inside the bust of lady, though no face is visible outside of any figure.

It is possible, though unlikely, that the makers had exposed this plate and omitted to develop it, and packed it. So, it certainly was not exposed twice by us; or is it the figure of a man that had been there on a collodion plate, but cleaned off for coating. I have seen such in old collodion days. Perhaps you can solve the problem. Was it J. Trail Taylor or George Dawson used to write on spirit photography? We cannot confer with them now on this.—Yours,

PROFESSIONAL.

[Clearly, we think, a case of double exposure, but how or when made it is impossible for us to determine without more evidence. We reject the collodion plate theory, as we do not for a moment suppose that modern dry plate makers use old wet plate glass for gelatine coating purposes. Our correspondent's query with reference to spirit photography reminds us that many years ago a late friend of ours, who was interested in the subject, half-seriously promised us that when he had gone to "that bourne whence no traveller returns," he would in a sense "re-visit the glimpses of the moon" by putting in a "supplementary appearance" on our negatives. But the very large number of negatives we have developed since the promise was given have failed, so far, to substantiate its redemption.—EDS. B.J.P.]

THE WOOLWICH PHOTOGRAPHIC SOCIETY.

To the Editors.

Gentlemen,—Our annual Exhibition is to take place on March 13th, 14th, and 15th next. Will you kindly make an announcement in a future issue to that effect?

The Exhibition, as usual, will be of members' work only, and will be held at St. John's Schools, Wellington-street.

On Thursday last "Some Notes on English Gothic Architecture" was the subject of a lecture delivered by Mr. J. Borthwick Panting, F.R.P.S. The lecture was illustrated with many first-class slides.

Our next meeting will take place on February 13th, when Mr. W. H. Dawson will have some "Photo Chemical Chat" with the members.

The membership has increased nearly 50 per cent. since the beginning of the present session.—I am, yours truly,

WILLIAM H. NICHOLLS,
Hon. Secretary and Treasurer.

30, Heavitree-road, Plumstead Common.
January 25, 1902.

THE SOUTHSEA EXHIBITION.

To the Editors.

Gentlemen,—Two small pictures by Mrs. R. M. King were packed by accident in a box not their own at the conclusion of our recent Exhibition, and dispatched. Whoever received them by mistake will greatly oblige by communicating with me.—Yours very faithfully,

F. J. MORTIMER,
Hon. Secretary.

Pembroke Road, Portsmouth.

THE ROYAL PHOTOGRAPHIC SOCIETY.

To the Editors.

Gentlemen,—Will you permit me, through your columns, to thank those gentlemen who have nominated me for various offices in connection with the R.P.S., and to express my regret that my present residence abroad renders impossible my acceptance of such nominations—I am, your obedient servant,

W. B. FERGUSON.

Hotel Bristol, Arosa, Switzerland.
January 25, 1902.

PRINCESS Christian has consented to allow some of her photographic work to be shown at the Photographic Exhibition which is to be held under the patronage of the King and Queen at the Royal Albert Institute, Windsor, on Tuesday and Wednesday, February 18th and 19th.

TYNESIDE Camera Club.—On the 24th inst., the President, A. B. Gardiner, presiding, Mr. Purvis gave a demonstration of contact printing on bromide paper. Bromide paper he characterised as the most simple and expeditious method of producing prints—prints delicate in tone and vigorous in the shadows. For successful work he pointed out that the grade of paper should be chosen to suit the negative to be used. If this was not attended to, bad results would follow. Of course, there was a class of negatives which gives the best results with small labour. The negatives used in the demonstration he exhibited as illustrating this Correct exposure was necessary, he said, and dwelt much on developing and fixing and cleanliness in both. The prints produced possessed softness and vigour most pleasing.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY, 24, *Wellington-street, Strand, London W.C. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

G. M.—We are obliged for your suggestions.

COL. GUBBINS.—"Synthol," obtainable on order from your dealer, should answer your purpose.

ADDRESSES WANTED.—"SMALL" writes: "Would you please give me one or two addresses of firms that do stamp photos?"—In reply: Messrs Wells & Co., Southgate, N.

ADDRESS WANTED.—"PROTALBIN" writes: "Can you oblige me with the manufacturer's name and address of the 'Protalbin Paper,' or where it can be got? I understand it is quite a new paper, coated with grain albumen."—In reply: Protalbin paper, we believe, is supplied by Mr. C. A. Rudowsky, 22, Coleman Street, E.C.

BLEACHING BROMIDE PAPER.—F. R. writes: "May I kindly ask you if you could tell me of a solution that will bleach bromide paper quick? If possible, to take less than a quarter of an hour to bleach."—In reply: A solution of bichloride of mercury. The stronger the solution the more rapid will be its action. A saturated solution will bleach the print in less than a quarter of an hour.

COLOURING SILVER PRINTS.—X. Z. writes: "Would you be kind enough to inform me of the best way to remove paper from the back of silver print squeezed on to glass for colouring on back?"—In reply: One of the best ways is to rub the paper away with fine glass paper. With care, the whole of the paper may be removed without injury to the picture.

ADDRESS WANTED.—"OAK GROOVING" writes: "Could you give me the address of any person making oak grooving for making draining racks? Would much oblige."—Any manufacturer of photographic apparatus who makes plate boxes will doubtless supply you with oak grooving to order. We know of no one who makes a speciality of it.

COPYRIGHT QUERIES.—S. F. C. writes: "Will you kindly inform me under what conditions I may copyright photos taken by myself. In case I wish to copyright five or six photos, may I paste them on a board, take one photo of the lot, and copyright the result—would it protect the five or six photos?"—In reply: Each picture should be registered separately. The cost for registration is only one shilling each.

COPYING LENSES.—"TWYNHAM" asks: "(1) What is the most useful lens to employ for cabinet-size pictures in the studio? (2) Are the new stigmatic lenses replacing the portrait lenses, such as Dallmeyer's No. 2 B?"—In reply: (1) Both lenses are good. (2) The stigmatic has the advantage of having a perfectly flat field, which the other has not. The No. 2 B is not well suited for cabinet portraits; it is only about 8 in. focus, and intended for cartes. The No. 3 B would be better, or the No. 4 stigmatic, for cabinet pictures.

GUMMING STAMP PHOTOS.—COPYRIGHT.—"SARAPHICK" writes: "(1) Will you please tell me the best gum to use for gumming stamp photos? (2) Will you also tell me the price of copyrighting photographs and the way to proceed?"—In reply: A solution of dextrine (British gum) is what is generally employed. A very little glycerine may be added, though it is not really necessary. (2) If you send us 1s. 7d. in stamps, and two copies of the photograph, our publishers will effect the registration for you.

PAINTING IN OIL.—H. H. writes: "Is the ordinary P.O.P. paper suitable to make prints for painting in oil, or is the albumenised paper more suitable? What should the P.O.P. be coated with to make it take the oil-colour?"—In reply: Yes, we should say. We should think that oil-colour would "take" upon it without any coating. If the surface of the print be rubbed over lightly with an ink-eraser it would give a little more tooth for the paint. Albumen paper is also suitable for oil-colour.

LIGHT FILTERS.—H. B. B. writes:—"In the Almanac a Mr. Davenport recommends Mandarin G. in solution for this purpose, and speaks of dissolving four grammes in 500 c.c.—presumably of water. But I find that 500 c.c. will not dissolve anything remotely approaching four grammes, and conclude that something must be added to effect the solution, or that the quantity given is wrong, which latter I think more likely. Can you help me?"—In reply: Mr. Davenport, who residds abroad, will probably favour our correspondent with a reply through these pages.

STUDIO BUILDING.—F. W. G. writes: "Having recently started a bit of photography, I feel I should like a studio, but do not feel justified in making such an outlay as would be necessary by purchasing one complete from regular makers. Could you kindly give me any information as to height, length, breadth; position as to north, south, etc.; lighting (what area of glass in roof and sides); best colour for inside?"—In reply: We should recommend you to get Bolas' book on Studio Building, published by Marion & Co., Soho Square. That will give you all the information you require. Space is too limited in this column to give such information as would be of practical value to you, as you seem to be quite unacquainted with studio construction.

A BUSINESS QUESTION.—"MATERIAL" writes: "Would you be kind enough to tell me how much the materials should cost to turn out £50 worth of photographs (cab., 12s. 6d. to 15s.; c.d.v., 6s. 6d. and 8s. 6d.; mid., 2s. 6d.); silver prints. I am a widow trying to carry on a business until my son is of age, under the management of an operator, and I find my materials cost nearly as much as the takings."—In reply: We are sorry that this is a query we cannot answer. We may say, however, that if the material costs nearly as much as you get for the pictures, at the prices quoted, there must be great waste somewhere. If you get the price-lists of some of the trade printers, they will give you an idea of what prints should cost to produce.

COPYRIGHT.—M. D. writes: "Some time ago a city photographer wrote asking us for the loan of a negative of a local view, from which a client of his wished an enlargement. He said he would give us the customary fee (10s. 6d.), and that he would be pleased to oblige us in the same way at any time. We consented, received fee, and the negative was returned in eight days. It has just come to our knowledge that his name is on the mount of an enlargement here. Would you kindly tell us if he had any right to do that? I do not think he would have allowed us to do so, had we made an enlargement from a negative of his?"—In reply: As the photographer paid for the use of the negative to make an enlargement from we do not see that you can prevent his putting his name upon it, as he made the enlargement. Had you stipulated that your name should be mentioned as the producer of the original picture the case might be different, but that you do not seem to have done.

THE Blairgowrie and District Photographic Association, at their monthly meeting on Tuesday, received for their library "The Barnet Book of Photography" from Messrs. Elliot, Barnet, and "The British Journal of Photography Almanac for 1902," from Mr. John B. Maclachlan. The meeting heartily thanked the donors. The awards in the competitions were announced as follows:—"Landscape" (Class B), 1, 2 and 3: W. D. M. Falconer; "Post Card" (prize by Mrs. Geekie): D. G. Monair.

A MISUSED Photograph.—We have just received a copy of a letter written by Mr. N. Pern, principal medical officer at the Bloemfontein Refugee Camp, concerning the photograph of a little emaciated Boer girl which has been used by Pro-Boers at home and abroad as "evidence" against the British method of dealing with the Boer refugees. Mr. Pern's letter entirely destroys the force of this piece of Pro-Boer "evidence," and shows that it is in reality—as it was intended to be—testimony to the gross neglect of their family duties exhibited by some of the Boer women. Mr. Pern states that it was he who had the photograph taken. Two Boer women reported to him that the child's mother used to go down to the dam daily and remain there all day wasing clothes for money, leaving her seven children, the eldest of whom was only thirteen, to look after themselves. The child in question was admitted to the hospital at once, and was found to be "a living skeleton." The photograph was taken a few days later. Every effort was made to save the child's life, but within a few weeks she died from pure weakness. At the time when she was admitted to the hospital she was quite an idiot, and she never recovered full possession of her senses. Mr. Pern found in the same woman's tent shortly afterwards another child half-starved and dying. The daily ration at the time was a pound of fresh meat and a pound of bread, with allowances of jam, coffee, pepper, salt, sugar, milk and vegetables, and the woman in question could have received every day eight of such rations for herself and her seven children. In her tent was discovered a sack containing a hundred pounds of meal, but, according to another Boer refugee, she would not take the trouble to bake bread.—"The Morning Post."

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*** *The Editor can only be seen by appointment.*

*** *We do not undertake to answer letters by post.*

EX CATHEDRA.

A Peculiarity of Over-exposure. Dr. Eugen Englisch, who edited the "Archiv für Wissenschaftliche Photographie," has had the courtesy to send us reprints of two papers, of which he is the author, concerning a phenomenon of over-exposure. These papers were published in the "Physikalische Zeitschrift" and the "Photographisches Centralblatt." A bromide print from two of the negatives was enclosed. After a plate has received exposure sufficient to give the maximum of opacity by development, prolongation of the action of light tends to diminish the opacity of the deposit, until we reach the stage known as reversal. The investigations to which Dr. Englisch draws our attention, refer to this period between maximum opacity and reversal. He finds that the diminution is not regular, but periodic, or, in other words, light and dark tints recur. The print to which we have referred is from two negatives on Colby plates. The exposures were made by burning magnesium ribbon at a distance of 20 c.m. from the plate. A metre of the ribbon weighed 63 grammes, and the exposures were of 2, 4, 6, 8, 10, 12, 14, and 16 c.m. each. According to the print, the bands representing 6, 10, and 16 c.m. exposure must have been distinctly thinner in the negative, and in a descending scale. The plate was developed for one minute with metol and then fixed. The second negative is quite opposite in its character, and may be described as a corresponding positive. This is due to the fact of the plate having been immersed, before development, for three minutes in a 20 per cent. solution of hyposulphite of soda, thus destroying part of the latent image. The experiment of treating the plate with hyposulphite of soda before development was partly suggested by Luther's theory of reversal, which implies that this peculiar effect of over-exposure may be due to the film being tanned.

* * *

Over-exposure and Reversal. A superficial examination of the print, sent to us by Dr. Englisch, might suggest that we have evidence here of reversal and re-reversal of the image. Professor J. Janssen, of Meudon, appears to have been the first to maintain this recurrence of positive and negative images, by prolonged exposure, in a communication published in the year 1880. The same view was also enunciated some years ago in the British Journal of Photography, by Hugh Brebner, but although several attempts to repeat the experiment were made by members of photographic societies in this country, they could not obtain confirmation of the fact. The maximum exposure given by Dr. Englisch in these experiments of over-exposure, is, however, far short of that required for simple reversal. But he incidentally states that he experimented for two summers, and exposed over 300 plates to daylight, to obtain the reversal of the image affirmed by Janssen, but only in two instances, with exposures of 100 minutes each, did he obtain the desired result. It is evident that the phenomenon is quite exceptional in its nature, and we should like to see further confirmation of it.

* * *

Over-exposure and Development. The rise and fall in the curve, representing the opacity of deposit in a negative, when the maximum has been exceeded, reminds one of the discussion concerning development, that took place after the publication of the Hurter and Driffield theory. The late Professor Burton sent over to this country two prints, one from a normally exposed and the other from an abnormally exposed plate. The development had been modified, and the prints were approximately alike. Prints were also shown by Mr. Teape at the London and Provincial, taken from negatives that had received widely different exposures. It was scarcely possible to decide which print was from the over-exposed negative, and from the pictorial side of the question, over-exposure gave the more harmonious result. It was acknowledged that it was necessary to give very excessive over-exposure to obtain this effect. The question arises, whether these results may not have been due to coincidence of the exposure with a phase of the periodicity disclosed by Dr. Englisch, and less to tinkering with the developer.

* * *

Collodio-chloride Paper for Platinum Toning. In the manufacture of collodio-chloride, or celloidin-paper, the chlorides of calcium, strontium, and lithium are mostly used, but even with a combined method of toning, first with gold and then with platinum, the colour of the image has a brownish tinge. Dr. Valenta publishes in the "Photographische Correspondenz," directions for an emulsion by which this difficulty may be avoided, and prints obtained that can scarcely be

distinguished by their colour from platinum prints made by cold development. He has arrived at this result by reducing the quantity of calcium chloride to a minimum and substituting an alcoholic solution of hydrochloric acid. As nitric acid is liberated by the action of the hydrochloric acid according to the equation:—

$$AgNO_3 + HCl = AgCl + HNO_3$$

the quantity of nitrate of silver, used in making the emulsion, is reduced and replaced by ammonia-nitrate of silver. This is formed by dissolving the nitrate in the smallest quantity of water possible, and adding strongest ammonia, drop by drop, until the precipitate formed is re-dissolved. The solution is then diluted with the necessary quantity of alcohol for making the emulsion. Emulsions containing about 18 to 20 grammes of silver nitrate per 1,000 c.c., sixty per cent. of which is in the form of ammonia-nitrate, give a very sensitive paper of good gradation and keeping quality. When toned with gold and platinum the prints bear the strongest resemblance to English cold bath paper.

* * *

Backgrounds. Old text-books on the art of painting tell us that a picture, like an old-time sermon, must be divided into three heads, or parts—namely, the foreground, the middle distance, and the background. When photographic portraiture came to the fore the same tradition, to a certain extent, survived, the foreground and background being retained as indispensable adjuncts to a successful picture, the middle distance being, perforce, left to take care of itself. It was a vague term, wanting in tangibility; no one knew exactly how to construct or adjust a middle distance in the limited confines of a photographic studio, and so it was left out in the cold. But the foreground and background remained, very much in evidence, in every studio which had a care for its local reputation. An old carte de visite album, where the pictures have not all succumbed to the ravages of yellow fever, will afford examples of the horrors perpetrated under these heads. It would seem that the old-fashioned photographer regarded his studio much in the same light that a provincial stage manager of the same period regarded his stage. He must be provided with so much "stock scenery," so that he could, at short notice, mount any play. A cottage, a street, a prison, a palace, a landscape, and a drawing-room would meet all ordinary needs. In the same way a photographer had to be prepared for the arrival of all sorts and conditions of men, women, and children. In a seaport town jolly mariners must pose in front of storm-swept seas and recline on foreground accessories in the shape of coils of rope, anchors, capstans, or anything else with a briny flavour. "Props" of a military character must be provided where the town boasted a garrison. For ordinary work among civilians the *mise-en-scène* need not be of such extensive scope, but no one could do without a balustrade and a window through which could be seen a park-like domain, with lake and swans, for amid such surroundings, recalling as they do their daily environment, 'Arry and 'Arriett love to be "took." We may still possibly find such studio appointments in out-of-the-way places, but a glance at the showcases of the average photographer indicates that a great and wholesome change has come in the matter of backgrounds. The modern photographer has learnt to depend for his effects more upon careful lighting, and to make the portrait the principal object in the picture, to which all else is subordinate. Hence he looks askance at the scenic background.

* * *

Acetylene. We are not yet in a position to know how far this gas, which gives such a beautiful light, will be useful to photographers. Of one thing we may rest assured, and that is that, by means of modern appliances, the gas has been robbed of that element of danger which at one time made everyone chary of employing it. The circumstance that it has now been generally adopted for the lighting of omnibuses is at once a testimonial in its favour, for it is certain that this course was not taken until careful trials had convinced the authorities that the gas could be employed without risk to vehicles or passengers. In another column we report a paper read at the Camera Club on acetylene, and it is a matter for regret that this latest contribution to our knowledge of the subject is too general in its scope, and did not dwell more upon the applications of the gas to photographic purposes. The very scantiest information was afforded as to the photometric value of the flame, and the measurements made some years back by Molteni were quite ignored. According to that authority, the place of acetylene in the list of illuminants which he tried comes between the incandescent gas mantle and the most inefficient form of limelight, *i.e.*, the oxy-spirit jet. Giving incandescent gas a value of 1.0, Molteni credits acetylene, used with a picked form of burner, with a luminosity of 4.50, and the oxy-spirit light with 5.80. We have no reason to doubt these figures, indeed, experiments which we have made confirm them. This means, briefly, that acetylene gives a far better light for lantern projection than mineral oil, but is inferior to the worst description of limelight. The small area of its flame, as well as the whiteness of its light, should make it valuable for enlarging purposes where speed is not a desideratum, and where the electric arc-light is out of reach. It is perhaps natural that the advocates of acetylene should pass over its drawbacks with a light hand. They say nothing about the necessity of periodically clearing the gas generator from its particularly evil-smelling residue of spent lime. We may also note, in passing, that the insurance offices apparently regard acetylene with some misgiving. We were informed at the recent gas exhibition at the Crystal Palace that the reason why the lamps at one stall were thrown out of action was because of some difficulty with the insurance people. It is, however, right to add that at an adjacent stall the lamps of another maker were shown charged, and alight.

* * *

Astro-Photography. In an article contributed by Dr. A. W. Roberts, of Lovedale College, South Africa, to the current number of *Chambers's Journal*, on "Astronomical Problems, Solved and Unsolved," the writer gives a most interesting review of the state of knowledge concerning the "Orbs of Heaven" at the beginning of the 19th century compared with what we know at the end of that eventful period. It goes without saying that he attributes much of the advance which has been made to the use of the photographic dry plate, both in conjunction with the telescope and the spectroscope. The cumulative action of light from the more distant realms of space, rendered possible by extremely long exposures, has brought many stars within our ken which are quite invisible to the eye even when sight is aided by the most powerful telescopes. It is generally believed that the longer these exposures of the plate are protracted the greater is the number of star images secured, but Dr. Roberts tells us that this is not the case. Exposures lasting for twenty or thirty hours—spread, of course, over different nights—do not reveal many more stars than plates exposed for much shorter periods. But they exhibit a curious background of "wisps and streamers and whorls of nebulous matter," and the astronomer asks whether it be possible that we are thus seeing beyond the stars into "that lumber room where world stuff is stored"? Dr. Roberts further tells us that at the Royal Observatory

at Capetown this long-exposure photography has been carried to a point undreamt of twenty years ago, and he sees no reason why a twenty-five-hour exposure should not give place to exposures of twenty-five days. He seems to think that these greatly extended periods might reveal new wonders, but there are difficulties in the way of reversal of some of the brighter star images, and others in connection with the keeping qualities of the sensitive surface, which we think would be likely to influence the success of the experiment. With all the help that photography and the use of the spectroscope has brought to the study of astronomy our present knowledge concerning our neighbours in space is really very small, when we consider the vast numbers of stars visible to us and to the photographic plate. Dr. Roberts tells us that the great Chicago refracting telescope reveals, it is estimated, 25 million stars, and of these we know the distance of about 100, the weight of 10, the composition (by means of the spectroscope) of about 300, the size of 5, and the absolute movement of 20. He may well conclude his interesting article thus:—"One is apt to get inflated with the idea of what great things are being done in our day; but the twenty-five million stars have a sobering effect."

MOUNTS AND MOUNT TESTING.

Looking through a number of very old photographs the other day, taken in the late fifties and early sixties, one could not help speculating as to whether the silver prints of the present day will prove to be as stable as those in question. Some, it may be mentioned, showed a slight change, but many did not in the slightest degree. Yet the pictures that had not changed served to prove that silver prints can be produced that are to all intents and purposes permanent. If a print, after forty years, shows little or no deterioration, it may fairly be looked upon as being practically stable. With those that exhibited a change, was only a yellowing of the lights, and no actual disappearance of the image, so that after that long period it may fairly be assumed that the change during the next forty years will only be proportionate to that of the previous period. The prints, it may be mentioned, were for the most part of the carte-de-visite size, and were mounted on white cardboard of an excellent quality, and the mountant, we were told, was in many cases gum, a mountant that is now generally condemned. Scarcely a week passes but we are consulted as to the causes of fading, spots or stains. As a matter of fact, almost every letter includes a query to this effect: Do you think the mounts are the cause? Sometimes mention is made of the fact that some prints that have been kept unmounted have remained unchanged, and some of the mounted ones have become spotted or stained. When that is the case, it is not infrequently taken as *primâ facie* evidence that the mounts are the cause. But that is often not the case, as most know that some prints out of a batch may, and do, after a brief period develop yellowness, spots, or stains, while others do not, whether they are kept mounted or unmounted, showing that all the prints in the lot were not manipulated under precisely the same conditions, though apparently they were. There is another reason why some mounted prints may have faded, while unmounted ones have not; the mountant employed may really be the cause of the change, and not the mounts at all.

It not infreqently happens, when queries of this class are put, that mounts are also sent with the letters, with the modest request that we should test them and give our opinion thereon. Of course, such work is quite without our province, even if we had time to undertake it. If the photographer will not take the trouble to do it himself, he should put the work in the hands of an expert. We may say, however, that at the present time there are some very common mounts on the market—that is, common as regards the cardboard—the result of a demand for cheapness. It does not follow, however, that because the mounts are composed of common materials that they, necessarily, will have an injurious action on the pictures mounted on them, for that is not always the case, as we have frequently proved. An exception, however, must be made in the case of cheap mounts that are embellished with bronze powder in place of gold. Particles of bronze powder, as most are aware, are liable to produce spots on silver pictures. Bronze powder, however, is easily detected from gold by simply touching the lettering with a dilute solution of nitrate of silver, when it will be blackened, while, if it were gold, it would remain unchanged. The testing of mounts to see if they are likely to have any injurious action on the prints mounted upon them is a very simple matter, and it may be carried out by anyone who will take the trouble to do so; and, furthermore, it requires no chemical knowledge. The method to be described was published some few years ago by Mr. E. W. Foxlee. The method is this:—A portion of a print is kept for a time in a semi-moist condition in contact with the suspected mount, while the other part is protected from it with an impervious material. Then, if that portion of it that is in contact with the mount shows a change before the other which is not, it is clear that the mount is the cause.

In practice, the test is made as follows: On one half of the mount is put a piece of waterproof material, such as a thin piece of celluloid, or three or four thicknesses of paraffined paper. Then on this is laid the print—preferably a light one—face downward, and on that a piece of pure paper, such as the Rives photographic paper, very slightly damped, and on that three or four thicknesses of moist, though not wet, blotting-paper, the whole secured together at one end with paper fasteners. The lot is then put into a pressure frame, with a glass plate on top to prevent evaporation of the moisture, and screwed tightly together, and then put away in a warm room. Now, it will be seen that the print is kept in precisely the same physical condition all over except that one half of it is in close contact with the mount, while the other is insulated from it by the protecting medium. Any silver print, in time, will succumb to this drastic treatment, but it is manifest that if the half which is in contact with the mount changes first, the hastened change must be due to it, and it only. Sometimes a change may be noticed in the course of two or three days when the mounts are very faulty. In others, when the mounts are inert, no difference in the two halves of the print will be seen at the end of several weeks, although the print throughout may have changed considerably. Such mounts may always be relied upon. The above is a simple and ready way of proving the suitability of mounts for their purpose, and if photographers would adopt it with each batch of mounts they receive they would then not be in any doubt as to whether any fading of their prints were due to them or not. In this method of testing it is assumed that the photographer is not interested in knowing what is really the nature of the deleterious matter the mounts may contain, but simply to ascertain if they contain any at all.

Royal Photographic Society of Great Britain.—The annual general meeting will be held at 66, Russell Square, London, W.C., at 8 p.m., on Tuesday, February 11th, 1902, when the report of the council and the treasurer's balance-sheet will be submitted to the members, and the result of the ballot for the election of officers and council, and the exhibition judges and selecting and hanging committees will be announced. General business also will be transacted. The exhibition of photographs by Mr. Henry Stevens, at 66, Russell Square, W.C., is open daily, 10 to 4 (Wednesday, 10 to 8), and will be closed on February 15th. At the lantern meeting, on Tuesday, February 18th, at 8 p.m., Mrs. Catharine Weed Ward will give a lecture on "The Real Dickens Land," illustrated by her own photographic lantern slides. Ladies are specially invited.

JOTTINGS.

The first-hand information given under this heading three weeks ago as to the formation of the Colour Club, of which I have the honour of being a member, is, I observe, filtering through the lay Press, daily and weekly. Some of the writers acknowledge the source of their information; others do not. There is an unwritten rule amongst honourable journalists that when they borrow from one another they own the indebtedness in a manly way by quoting their authority. I have not the smallest doubt that those of my brethren, near and far, who will do me the honour of reading these "Jottings" this year will find in them many an item likely to interest their readers, but I respectfully suggest that they should observe the rules of the game, and not pass off as original that which is not. I suppose it was my reference to the lay Press on January 17th which provoked a person signing himself "A Dealer" to indulge in a gratutitous jeer at the photographic Press in "The Optician" of January 24th. The writer proceeds: "A still funnier position is created when the photographic Press assume a knowledge of business as between photographers, dealers, and manufacturers." As this cap fits me, perhaps "A Dealer" (who is plainly no dealer at all) will be interested to know that I "went through the mill" of a large photographic manufacturers' and dealers' many, many years before he entered the trade. The writer then refers to some kind of "cudgelling" of this JOURNAL. I assure him that it is only the prudent but cowardly suppression of his own name which has saved him from such a cudgelling that after it no manufacturer, dealer, or photographer could possibly have anything more to do with him. He then makes some ungenerous and libellous references to the Professional Photographers Association which will possibly be dealt with officially by the executive of that body. From internal evidence, and from evidence also in my possession, I assert that "A Dealer" is no more a dealer than I am. His letter is signed all over with his own name and personality, and I regret that the writer should have sheltered himself behind the cloak of anonymity for such mean ends. In all sincerity I warn him that he is playing with edged tools, and that he is not likely to improve his own position or benefit the interests he represents by conduct which is uncalled for and unmanly.

Who is the oldest living professional Daguerreotypist? I have been asked that question by a gentleman who, I believe, enjoys the distinction himself. I allude to Mr. John Werge, now nearly eighty years of age, and in possession of such mental vigour that not very many months ago he published a readable novel called "The Northern Belle," and is even contemplating further incursions into the alluring land of fiction. Mr. Werge, to whom I am indebted for several photographic curiosities, with which I shall never part, has had the uncommon experience of being photographed at an interval of 50 years. First of all, he Daguerreotyped himself half a century ago, and the image to-day is so beautifully bright and flawless that it might have been made at the beginning of the twentieth instead of the middle of the nineteenth century. The second photograph was taken quite recently, and is, of course, a silver print. Will the latter last as long as its forerunner? I think not. The author of a volume entitled "The Evolution of Photography," Mr. Werge is one of a very small band of living veterans qualified from knowledge to deal at first hand with the history of his subject; that is to say, their lives have been contemporaneous with photography itself. Others who mght be named are Mr. James Alexander Forrest and Mr. F. H. Wenham, both, I believe, octogenarians. The literature of the microscope bears witness to the latter gentleman's labours in this great field of work. He was, he once told me, the first to make a photographic enlargement, and in the early fifties he undertook a wet-plate expedition to Egypt. Those of us who, like myself, have confined their wet-plate experiences to their own *pied à terre*, may conjecture, but scarcely realise, the difficulties which photographers of two generations ago had to surmount in their work. The question put to me by Mr. Werge is not inspired by curiosity, but for purposes of evidence. Some of the older readers of these pages may be able to say if their is any living senior in professional Daguerreotypy to Mr. Werge, who is laudably anxious not to wear a badge to which he may not be entitled. But I fancy there is nobody to contest his claim.

"Where is the advance?" asked one of the leading and most artistic professional photographers of the day as I recently turned over before his eyes the leaves of Hill and Adamson's sumptuous volume of calotype portrait and group studies published over 50 years ago. This book, of which not many copies exist, contains about a hundred prints in an excellent state of preservation, and looking, but for a slight extra richness of colour, not unlike toned platinotypes of to-day. But in simplicity, dignity and breadth of treatment, in mastery of composition, light and shade, these early Victorian portrait studies are not approached, or, at any rate, they are not excelled by any portrait work that is produced at the present time. I write as one who has made it his business to know what kind of work is produced by the world's chief amateur and professional photographers. I would advise every earnest young photographer to study Hill and Adamson's book. I heard of a copy for sale recently at ten or fifteen pounds. It would be cheap at the price. By the way, some specimens of the very latest outcome of progressive professional portraiture were lately in my possession; I allude to the "Lytrit" studies of Mr. J. C. Strauss, St. Louis, Mo., which have been seen by the leading professional men in London. These pictures are on plate-marked Whatman-like paper, and the photographic image blends into what appears to be a very delicately-etched background. The effect is not unlike that of a mezzotint, and certainly the results are striking and novel. Of all the photographers who have seen Mr. Strauss' work one only, Mr. Martin Jacolette, the well-known and gifted artist of Dover and London, has divined the secret of "Lytrit." Mr. Jacolette has shown me some exact imitations of the Strauss photographs produced at the first experiment in his South Kensington studio, and has also imparted to me the secret of the method. But as I observe from the American magazines that Mr. Strauss does not wish to give this away, I refrain from doing so unless an authorisation should reach me from the fine St. Louis studio, where I read that Mr. Strauss gets one hundred dollars a dozen for his "Lytrit" prints. Say £20 a dozen for 9 by 7 platinums on 12 by 10 mounts. Humph!

Unaided by any drum-beating or the brass-band blaring of the yellow journalism of Alsatia (which of my readers knows his London and Sir Walter Scott so well as to tell me where Alsatia is?), the "Photographic Art Journal" published monthly, price fourpence, at Saint Martin's, Leicester, "pursues the even tenour of its way." A fine old crusted piece of journalese that! As I see the "P.A.J." aspires to be "The Studio" of photography, I shall hold my copies for a rising market. I omitted to do this with the early numbers of "The Studio," which introduced Aubrey Beardsley to a startled and not wholly inappreciative world, and so I lost my chance of making a handsome profit. As a small appreciation of the "P.A.J." may hasten the date when it will be worth five shillings a copy, I congratulate the editors on its get-up, the beauty of the reproductions, and the diminishing quantity of ineffective "criticisms" of the youthful ever-circulator kind. The "Postal Photographic Club for Beginners" should be abolished forthwith, brothers Quilter and Shardlow. It is indescribably silly. To atone for this, some of the other writing has ideas, though the literary part is not yet up to the level of "Camera Notes," which occasionally contains some really thoughtful articles. My special object in referring to the current number of the "P.A.J." is to commend Mrs.

Barton for her exquisite little child studies therein reproduced. I saw these photographs when helping to judge the "Teb" competition, and I was much struck by their painter-like qualities. They are the most pleasing amateur studies of children I have seen for a long time. I look forward to meeting more of Mrs. Barton's work. By the way, perhaps the lady will not think me ungallant for suggesting that as she won a money prize, she can hardly be classed as an "amateur." To step at once from the particular to the general: Last year, in round numbers, something like a thousand pounds was distributed in competitions, mainly through the medium of that photographic Press of which the chivalrous "Dealer" referred to in another "Jotting" entertains such a high opinion. Of that thousand pounds, two-thirds—at a guess—was won by "amateurs." Can these good people any longer fairly describe themselves as such? I am not saying anything against the competitions, which are at least good for trade, but I object to the classification, and I suggest it should be abolished. In the matter of photographic competitions, everybody is a professional nowadays in that everybody goes into them for profit. To point a case: The ex-honorary secretary of the R.P.S., Mr. John A. Hodges, who won a £10 Teb prize, is, in my opinion, just as much a professional as is Mr. Crooke, Mr. Barnett, or Mr. Fellows Wilson. He certainly makes money out of his photographs, and if that is not professionalism I don't know what is. I hope I shall be interpreted as arguing this case on its merits, and not with any desire to cause offence.

COSMOS.

STUDIO-BUILDING.

SOME two or three years ago I was compelled to say in these columns that I received so many private letters from strangers, asking for advice on the above and other subjects, that I could not possibly give the time required, but that if any query was of sufficient importance for the answer to be useful to others I would reply through this journal. I have broken my rule in several instances; but again letters are coming so thick upon me that I must once more state my inability to spare the necessary time, much as I desire to help any brother photographer. The following letter is just to hand, and possibly it may be considered typical enough to be reproduced with my comments. I have numbered its clauses for reference:—

"Dear Sir,—Will you allow me—a stranger—to ask your advice and guidance on one or two photographic matters? From your wide experience I am sure you could give me wise counsel, and, if not troubling you too much, I should be most grateful. I am about to have a studio built to commence business myself, and before it is too late I want to make sure that I have the best plan possible.

"(1) I shall have almost a due west light. Do you think me wise or unwise in choosing to have the east side closed altogether? I once had a studio to work with light both sides—top and sides—and found it rather a nuisance.

"(2) I am restricted in width to about 10 feet 6 inches inside measurement. I will try for every inch I can get more. I am having the ridge not quite in the centre about one foot more glass, that is, the light side extending about a foot further to the shadow side.

"(3) Then I propose to have the ridge 14 feet high, and the eaves 8 feet, the glazed parts (top and side) about 12 feet long. Can you suggest anything better? I should be so much obliged to hear, if so.

"(4) I have read your article in the almanac, but fear I do not quite grasp the 'false ceiling' idea. It seems to me, if I could, that it would help me, seeing that I anticipate difficulties by reason of the sun's rays entering the studio, especially in summer. Pardon me pointing out my difficulty, but it lies in its being called a 'solid obstruction.' I presume it is a transparent one?

"(5) My idea for blinds is to have some dark material on spring rollers running up and down, close up to the window-bars; then, hanging from wires in the ordinary way, running from end to end of glazed portion, full white curtains. It occurred to me that I might thus cut off the direct rays of the sun when necessary, and also be able to soften or modify the lighting as desired. I do not know whether you think my idea a good one. May I ask your opinion? At the same time I should be so glad to know exactly about your idea of the 'false ceiling,' so that if I find I really shall need the protection, I may avail myself of your plan, which you are so good as to offer for appropriation by any photographer.

"Please excuse my troubling you so much, but your advice would be gratefully received by yours sincerely, ————."

(1) By having a dominant light possible from either side of the studio, it is in the photographer's power to have the main illumination directed to either side of a sitter's face. Remembering the usual great want of symmetry in faces, this is an important advantage; but in view of the disadvantages of such an arrangement, it may be pointed out that a similar power of directing the illumination may be obtained, if the studio be long enough, by taking the sitter at either end. If it were decided not to use the one (the east) side as a main light it would be useful to glaze a space about five feet wide in the middle of the length, so as to obtain any time, and without trouble, special effects of light. With the aspect named, it must be remembered that, as summer approaches, the sun will pour into the studio, and lead to heat and closeness an hour or two before and after mid-day (unless the studio be built up against a lofty building). If a sectional elevation of the proposed studio be drawn to scale and a vertical line erected as a continuation upwards of the south wall, a line drawn upwards from the extreme north end of the ridge, and forming an angle of 60 deg. with it when produced to cut the vertical line, will sufficiently exactly indicate at the point of intersection the height a building or wall or screen must be to keep out the sun at any time. If such building is not available, a line drawn from the top of the south wall, say the point of the ridge, to the floor of studio, making an angle of 60 deg. *with the floor*, will show how much of the studio will be in shade and how much will receive sunlight over the ridge. A similar construction will show to what extent the sun will creep over the ridge (the east side being assumed to be unglazed) and throw its beams into the studio in the hours before noon. Late in the afternoon the sun, getting low down, will shine almost directly into the room, unless there be any adjacent building to hide it, and provision will have to be made against this contingency.

(2) On the whole, it will be an improvement to have the ridge, as suggested, on one side of the medial line of the studio; but the more it is carried to one side the greater the height of ridge necessary to keep the sun's rays out. By placing the ridge as proposed, a more equable illumination of groups will be possible, due arrangement of light screens being pre-supposed.

(3) This query is partly replied to in (1). The sun will, when at its highest, reach to about four feet from the eaves down the wall in the studio, though it would then come at a considerable slant. Nothing is said of the actual length of the studio; if the sitters are all to be taken posed at the south end, the glazing indicated would suffice, leaving about eighteen inches from the background or south end unglazed and well covered with slate or lead, so as to be sure of the backgrounds being out of danger of leaks. Few builders seem to be able to make a glass roof quite free from leakage. If the studio is to be a very long one, so that sitters can be taken from either end, it would suffice to have ten feet from each end glazed.

(4) The false-ceiling screen.—The studio I built with this addition was about 15 feet square, the background end being, as in the present case, the south. It was a sloping front shape and built against a tall building, the camera travelling into a species of ante-studio, which had a further length of 15 feet. Notwithstanding the building at the back, the sun came into the room in summer-time Its ill effect was obviated entirely by a light

wooden framework, attached by hinges, immediately overhead, and projecting into the main studio several feet, just enough to catch the sunbeams and prevent them falling between sitter and lens. The hinged side was about seven feet from the floor; the opposite side could be raised or lowered according to the distance of the camera. With a ridge roof, it could be just as easily applied, the eaves being, as is stated, eight feet high. The exact dimensions and position of this screen could also be set out on the sectional elevation referred to, making use of the same angle. The south wall of studio would be advantageously carried up beyond the eaves to the ridge, but unless there be a further building backing it the false ceiling would not be feasible.

(5) Blinds.—The dark material for light effects would, presumably, be far oftener used than the blinds for softening the sun's rays; hence it is most desirable for them to be easily moved. Roller blinds are good in their way, but, personally, I have the greatest objection to rollers and cords for general use. They are so apt to go wrong at the critical moment. By all means let the wires be used for the dark blinds and the rollers for the more occasional sun-softening purposes. The tracing-cloth often mentioned by me is superior to everything else, and keeps clean a very long time; further, it does not go yellow, except by collection of dust and grime. It can also be readily cleaned by a clean dry cloth. The kind glazed on both sides should be asked for, as the cloth with one dead surface is usually stocked, that being most used by draughtsmen. The cost is (I write from memory) about eighteenpence per square yard, and the material can be had in various widths.

I think the above comments contain more than the questions asked for, and in conclusion I would again ask that other writers personally unknown to me will not force me to put a strain on my feelings in compelling me to decline writing treatises on photographic subjects in private letters. Queries put to me through the pages of this journal come under another category, and will always be replied to.

G. Watmough Webster, F.C.S., F.R.P.S.

THE TIED HOUSE SYSTEM IN AMERICAN TRADE: "THE PHOTOGRAPHIC TRUST."

The photographic materials industry is one which has been built up on patents and trade-marks, and, as naturally the goods issued by the various makers differ from one another only in minute particulars, each manufacturer must rely for his profits on his individual reputation and the degree to which his trade-marks become known. A trade-mark which has achieved celebrity in one line of such articles can, it is plain, be extended with advantage to others, and the reputation which has been gained, say, in making cameras will be taken as a guarantee of excellence if the same firm turns to making photographic papers. This truth seems to lie at the bottom of the recent transformation of Kodak, Limited. This company was established in 1898 for the sale in England of the well-known cameras of the Eastman Kodak Company of America, similar companies being formed in Germany and France. The English company has a capital of £1,600,000, and the American, French, and German companies a united capital of £1,616,900. Harmonious control was obtained by the American company holding £250,000 of ordinary shares in the English company, and the latter holding 98 per cent. of the American shares, besides a proportion of the issue of the other two companies. Kodak, Limited, has paid 15 per cent. on its ordinary shares, and the surplus in Europe and America amounted to £330,000 on 31st December, 1900. At the meeting on November 11th, 1901, it was decided that the English company should sell out all its stock to the American company in return for shares in the latter, on terms which would give the shareholders 25 per cent. on their present holding. The reason assigned for this was the attempt of the Income Tax Commissioners to charge income tax on the undivided profits of the American company, which were retained in the States to pay dividends due to American shareholders. As the legal advisers of the company were of opinion that the claim could be resisted, there does not appear to be here a sufficient reason for the change. We may suspect a desire to make the control of the different businesses more efficient, just as it was found expedient to unite the twenty-six different Carnegie companies into the Carnegie Steel Company, and to bring the various Harvey steel companies under one head. The same thing was done, it will be remembered, when the dynamite companies were brought into the Nobel Dynamite Trust.

The chairman made one very important announcement at the Kodak meeting:—"The success which had been accomplished by amalgamation in 1899 of the photographic printing-paper businesses, under the title of the General Aristo Company, they desired to accomplish in respect of some competing dry-plate and photographic businesses in Europe and America, which, from their standing in the trade, they considered to be of great commercial importance. Balance-sheets and profit-and-loss accounts had been produced, showing large reserves of tangible assets, and the total earnings of the businesses for 1900 were about £250,000." When the new company was formed, he added, a dividend of 10 per cent. on the ordinary shares and an annual carry-over of £150,000 was to be expected. It is easily to be understood that the liability to payment of both British and American taxes on the profits would be a serious hindrance to the achievement of this combination. In the report for 1900 there appears to the credit of the American company £426,446, "investments in sundry photographic materials manufacturing companies," part of which is in the General Aristo Company. We can thus contemplate a gigantic twin-combination covering the whole field of photographic supplies and operating practically all over the world. Its probable methods are therefore a matter of common concern, and since the success of one branch, the General Aristo Company, is quoted, perhaps something may be learned from its mode of conducting its business.

The General Aristo Company was formed in 1899 by the fusion of six companies making photographic papers, including the branch of the Eastman Company engaged in that business. Its capital was 5,000,000 dols., of which 4,800,000 dols. has been issued, half in 7 per cent. preferred stock, half in common stock. The capitalisation of the original companies was 450,000 dols., but all, except two bought cheaply, were flourishing concerns with valuable patents and secret processes, and since 15 per cent. has been paid on the ordinary stock of the new company we may conclude that the enhanced capitalisation was not excessive for the earning power of the company. The first noteworthy point is in the securing of the raw material, paper, which cannot be made of sufficient fineness in America, but must be obtained from Europe. Two companies, at Steinbach in Germany, and at Rives in France, have made the standard papers for forty years, their merit lying in the use of glacier water. These firms are under an agreement to sell all their output to the General Aristo Company, and the latter contracts to take no supplies from any other source. The vice-president of the Aristo Company explained that when they want "a distinctive kind of photographic paper" they have to "educate the foreign mill in the production of that particular quality," and spend a large amount of money in sensitising experiments before they get it quite right; then "they feel entitled to the exclusive use of that paper, otherwise a rival could come right in and buy that same paper, and avoid all the pioneering experiments that the first factory went through with." This sounds reasonable, and it is on the control of that paper that the strength of the company is based. But it has worked out disastrously for the "independent" makers; they have obtained independent supplies, but the price has gone up over 100 per cent. since 1898.

It is in the sales department, however, that we shall receive most enlightenment about modern ways of doing business. The General Aristo Company does all its sales through its trade-agent, the Eastman Kodak Company, and here we may just bear in mind what the Aristo vice-president said:—"Everybody hopes they will be consolidated some time, as they properly belong together." Lovers of the art of drawing neat verbal distinctions may be recommended to study the evidence given before the United States Industrial Commission by Mr. Hubbell, the counsel of the Eastman and Aristo companies, and Mr. Abbott, the vice-president of the latter. The Aristo Company claims to do "considerably over half" the paper trade in the States, and the Eastman Company has a monopoly of flexible films, and "feels" that it is the largest supplier of photographic goods. Every dealer, consequently, must stock at least some of their lines. Where, then, does the independent manufacturer come in? Mr. Hubbell said: "I understand that the Eastman Company says to a dealer, 'We will give you special inducements if you will confine yourself exclusively to the sale of our goods.'" Mr. Abbott said: "As I understand it, the Eastman Kodak Company offer their goods and the goods which they represent to a dealer at a straight trade discount of 15 per cent. Then, if the dealer handles their goods exclusively, they allow him an additional discount of 12 per cent." Further questioned, "Now, suppose that a dealer handling Mr. Carbutt's paper wanted some other article—say a camera, for example—from the Eastman Kodak Company; could that dealer procure it?" he replied, "Why, I doubt whether the Eastman Kodak Company would sell that dealer unless he was handling their whole line exclusively." And again, "the Eastman Kodak Company's policy is to make exclusive agents in their line, but it does not aim to prevent any other manufacturer from doing the same thing, and there is an ample field for them to do it." A copy of the declaration required to be signed by a dealer before becoming entitled to the extra 12 per cent. discount was put in evidence. The substantial portions of it are as follows:—"I, ———, hereby state that I have not within the four months next preceding the date mentioned below, bought, sold, carried in stock, or disposed of, either directly or indirectly, any collodion printing-out or gelatine printing-out bromide or developing-out papers, other than those manufactured by the General Aristo Company's factories. I further state that all such papers have been sold by me strictly at their respective list prices."

The second part of this contract refers to a practice which is becoming more and more common. The manufacturer, recognising that there is a certain community of interest between himself and the retailers, seeks to prevent cut-throat competition among the latter by making it a condition of getting supplies or special discounts, that the retail trade shall be done at fixed prices. The retailers generally take the initiative in bringing about such agreements, and we find abundant instances of this practice among the trusts which supply the domestic wants. In England the Proprietary Articles Trade Association applies similar methods in the drug trade, and the grocers are slowly moving in the same direction. Retail tobacconists as well are at the present moment busy negotiating with the manufacturers contracts of much the same nature. Needless to say, the consumer is not benefited by the fixed price. In the case of the Aristo Company the retail prices are unnecessarily high, since, after providing a discount of 27 per cent. to the retailer, besides 2 per cent. for cash, they allow the very handsome dividend of 15 per cent. to be paid on the ordinary stock.

Mr. Carbutt—a name well known throughout the photographic world—gave evidence as to the injury to his trade in photographic papers through the competition of the General Aristo Company. Perhaps he may be able to comfort himself with the excellent advertisement given to his goods in the official reports! Despite his reputation, and the fact that he offered 25 per cent. unconditional discount, he found it impossible to retain his old customers. Both he and another manufacturer stated that the Aristo Company, in order to secure the exclusive custom of a dealer, would buy up his stock of "independent" papers. It was further alleged, a case being given, that a dealer who was ready to sacrifice the 12 per cent. discount was practically refused supplies of cameras and films by the simple process of postponing fulfilment of his orders; but, of course, it might very well happen that the delay was unavoidable, and yet it would appear to such a person intentional. It is interesting to observe that the legality of those special discount contracts has been successfully defended in the courts of New York in other trades. The Mogul Steamship Company case in the British courts, on which depends the legality of our "shipping rings," is a classic case in trust law. The decision runs that traders "have a right to endeavour, by lawful means, to keep their trade in their own hands, and by the same means to exclude others from its benefits if they can. Amongst lawful means is certainly included the inducing, by profitable offers, customers to deal with them rather than with their rivals. It follows that they may, if they think fit, endeavour to induce customers to deal with them exclusively by giving notice that only to exclusive customers will they give the advantage of their profitable offers." But legality does not always produce contentment; in cases like the present it just as often causes revolt. In the sugar, whiskey, oil, and photographic trades we find an active tendency to deal, wherever possible, with indepndent manufacturers. One of Mr. Carbutt's customers, in a delightful letter, after denouncing one of the Aristo travellers as a "vandal" and a "liar," indignantly exclaims: "These suckers are endeavouring to get me to handle trust goods." This spirit contains the germ of the civic objection to trusts, that it does not consort with the dignity of a citizen to be under the economic power of a private monopoly, even when the monopolists use their might with discretion.

HENRY W. MACROSTY.

NOTES ON THE DEVELOPMENT OF INTERFERENCE PHOTOCHROMY.

XIV.—WIENER (continued).

IF the phase-variation were the same with sensitised gelatine as with pure gelatine, then that distance with plates well dried under the desiccator would average O.205 wave-lengths; with plates dried in air it would be noticeably different in the blue and red parts of the spectrum, namely, a smallest of about O.20 in the blue, a greatest of about O.24 in the red. Under certain circumstances it can nearly attain the value O.25 at the red end of the spectrum.

Wiener next investigated the phase-variation on reflexion at an "elementary mirror" (1). By "elementary mirror" Wiener did not mean a geometrical plane, but a layer of finite thickness which contains the photographic deposit which arranges itself symmetrically round the geometrical loop-plane (Bauchebene) of the stationary light-waves. This plane is, therefore, the symmetry-plane of the elementary mirror. By the "phase-variation on reflexion at an elementary mirror" Wiener meant the difference of phase of the wave reflected from the elementary mirror with respect to the light-waves incident in its plane of symmetry.

Lippmann (2) has put this phase-variation equal to zero in the theory of his method, not certainly because he considered this value to be the correct one, but because in every theory which does not pay attention to the reflexion at the surface that phase-variation disappears from the differences of path.

In the same way the statement of Nieuwenglowski (3) may be

(1) Loc. cit., pp. 492-503.
(2) "Journ. de Phys." (3), iii., 1894, 97.
(3) Eder's "Jahrbuch," viii., 1894, 81.

regarded, who, without giving his grounds in more detail, put it equal to half a wave-length.

It is not easy to say beforehand anything definite about this phase-variation before one is more accurately informed about the optical constants of the deposit and the manner of its distribution.

There are in essentials two suppositions which one can make. Both shall be discussed more accurately. They lead to different values of the phase-variation, and one can, therefore, decide the question experimentally. The decision for the photographs with which Wiener experimented can actually be made by means of an experiment given later. Nevertheless, one can say with certainty that the other supposition must also occur for definite kinds of colour photographs.

The last supposition (called I) presupposes that in essentials the differences of the indices of refraction in the layer alone cause the reflexions.

This supposition was already denoted by Lippmann (4) as possible "au moins dans certains cas." In any case he understood by that his colour photographs with chromo-gelatine, whose state he had explained before in this manner (5), and by which another possibility is, in fact, excluded.

This explanation was also laid down by Schütt (6) as the only possible one for bromide of silver plates.

Before this Wiener had also placed himself at this point of view in his researches on body-colour photographs, and on its supposition proved (7) that when the phase-variation at an elementary mirror must amount to a quarter of a wave-length, and he had had a second proof in view which shall soon follow here.

Lippmann (8) has placed another supposition at the foundation of the extensive theory of his colour photography. There the reflexions are to be brought about by means of "Molécules refléchissantes disséminées." In this case one need not take the word "molécules" too literally; the "molécule" plays no essential part in the theory, it suffices that the photographic deposit is divided into parts whose dimensions are small compared with a wave-length, at least in the *thickness* of the layer, while the dimension parallel to the surface of the layer may be arbitrarily large.

Further, it is not requisite that the divided particles consist of pure silver, at least not of metallic silver; it can also be molecular silver or a silver combination. But it is essential that the deposit is like a metal, in so far as its power of reflection may not depend only on the indices of refraction, but must be conditioned also by means of its power of absorption. The supposition so limited will be denoted by II.

Firstly, the supposition of reflexion by means of differences in the indices of refraction alone was considered. This has already been made by Schütt (9) a starting-point of a theory; but his theory confines itself to the rather schematic supposition that in the plate layers of constantly lower and constantly higher indices of refraction and each of a thickness of a quarter wave-length alternate. Thus he made the two simplifying suppositions that, firstly, the elementary layer is just a quarter of a wave-length in thickness, and that, secondly, the index of refraction is constant on both sides of the latter (10).

PHILIP E. B. JOURDAIN.

(4) Loc. cit., 107. (5) "Compt. rend.," cxv., 1892, 575. (6) "Wied. Ann.," lvii., 1896, 533. (7) "Wied. Ann.," lv., 1895, 255. (8) "Journ. de Phys." (3), iii., 1894, 97. (9) Loc. cit., 547.

(10) Unfortunately, Schütt started falsely. In his endeavour to find combinations of two planes which reflect a kind of light required with *coincident* phases, he overlooked the fact that the same kind of light can be reflected at other planes with *opposite* phases. For the two cases that the planes considered are an even and odd multiple of a quarter of a wave-length of the active colour apart, he found that light λ' and λ'' are reflected with the same phase if they respectively satisfy the conditions $\lambda' = \frac{n\lambda}{2m}$, $\lambda'' = \frac{n\lambda}{2m-1}$ (n, m integers); *e.g.*, put in the first $n=4$, $m=3$; in the second $n=2$, $m=2$; then $\lambda' = \lambda'' = 2\lambda/3$, and thus light of this wave-length must be favoured by interference. In actuality it will be completely set aside by the interference from planes $\lambda/2$ apart. So all consequences of this theory los their force, although, as will be shown, it contains a usable kernel.

THE ROYAL PHOTOGRAPHIC SOCIETY: A BATCH OF ELECTION LITERATURE.

I.—The Ballot Paper.

Extract from Article 37.—"A balloting paper, containing no names but those of the members nominated and eligible to serve, shall be sent to every member of the society at least seven days before the annual general meeting, with instructions to erase all names of members nominated except those for whom he desires to vote. Every balloting paper shall be invalid on which more than one name as president, four names as vice-presidents, one name as treasurer, and twenty names as ordinary members of council, are left unerased, or where there is any indication of the identity of the voter. The balloting paper shall be placed in an envelope provided for the purpose, which shall be enclosed in another envelope bearing the voter's signature, and forwarded to reach the secretary not later than noon of the day preceding the annual general meeting. Votes given to any member nominated in two capacities, and not elected to the higher, shall be counted to the next office, but no balloting paper shall be allowed to count as recording more than one vote for any nominee."

Members are requested to erase the name of any candidate for whom they do not desire to vote, and, in any event, to erase not less than the number of names indicated under each heading.

President (erase one name).—Thomas R. Dallmeyer, F.R.A.S.; Chapman Jones, F.I.C., F.C.S.

Vice-Presidents (erase not fewer than two names).—Sir W. de W. Abney, K.C.B., F.R.S.; the Right Honourable the Earl of Crawford, K.T., F.R.S.; P. H. Emerson, B.A., M.B. (Cantab); the Rev. F. C. Lambert, M.A.; Professor Raphael Meldola, F.R.S.; Joseph Wilson Swan, M.A., F.R.S.

Treasurer.—John Sterry.

Notice.—Members are requested to note that in cases where the name of a candidate appears in more than one capacity (as, for instance, Vice-President and Ordinary member of Council), the name should be struck out in one or other of such capacities. This ballot paper can only record one vote in favour of a candidate, and in cases where a candidate for a higher office is not elected thereto, his votes will be credited to him in the lower office if his name also appear there.

Ordinary Members of the Council (erase not fewer than thirty-six names).—Sir W. de W. Abney, K.C.B., F.R.S., H. Walter Barnett, Arthur C. Beard, Frank Bishop, Thomas Bolas, F.I.C., F.C.S., C. H. Bothamley, F.I.C., F.C.S., George E. Brown, F.I.C., James Cadett, St. Lawrence Carson, B.A., B.Sc., Walter L. Colls, the Right Hon. the Earl of Crawford, K.T., F.R.S., Clinton T. Dent, Hubert J. Elliott, Douglas English, B.A., Ernest C. Fincham, M.R.C.S. Eng., L.R.C.P. Lond., Thomas E. Freshwater, F.R.M.S., William Gamble, W. E. Gray, A. Haddon, Sir W. J. Herschel, Bart., H. J. Hissett, Frederick Hollyer, W. J. Holt, F. H. Ibbetson, Thomas Illingworth, Francis Ince, Martin Jacolette, G. Lindsay Johnson, M.A., M.D., B.Sc., F.R.C.S., E. B. Knobel, F.R.A.S., the Rev. F. C. Lambert, M.A., Harold W. Lane, Paul Lange, Alexander Mackie, J. W. Marchant, Professor Raphael Meldola, F.R.S., Ernest Morgan, J. C. S. Mummery, Wilson Noble, M.P., Edmund A. Robins, Lyddell Sawyer, George Scamell, Leslie Selby, H. C. Shelley, E. Sanger Shepherd, William F. Slater, John Spiller, F.I.C., F.C.S., John Sterry, Joseph Wilson Swan, M.A., F.R.S., Alexander A. K. Tallent, Walter Thomas, Professor William Cawthorne Unwin, B.Sc., F.R.S., W. M. Warneuke, Walter D. Welford, Alfred Werner, Benjamin Gay Wilkinson, Herbert Young, M.A., B.C.L.

The council have decided that the ballot for the judges, and for two-thirds (ten) of the Selecting and Hanging Committee, in each section, shall be conducted according to the regulations contained in the articles of association of the society for the election of officers and council.

Judges—Pictorial Section—(erase not fewer than sixteen names).—W. Smedley Aston, H. Walter Barnett, W. R. Bland, Robert Beckett, J. S. Bergheim, Edgar Clifton, Archibald Cochrane, Walter L. Colls, W. Cooke, P. H. Emerson, B.A., M.B. (Cantab), Lieut.-Col. Joseph Gale, John H. Gear, the Rev. F. C. Lambert, M.A., Fred Marsh, H. S. Mendelssohn, Llewellyn Morgan, M.D., J. C. S. Mummery, Lyddell Sawyer, A. E. Smith, Walter Thomas, R. Fellows Willson. Technical and Scientific Section (erase not fewer than six names).—Sir W. de W. Abney, K.C.B., F.R.S., Thomas Bolas, F.I.C., F.C.S., George E. Brown, F.I.C., Douglas English, B.A., William Gamble, Chapman Jones, F.I.C., F.C.S., Reg. B. Lodge, E. Sanger Shepherd, Joseph Wilson Swan, M.A., F.R.S.

Selecting and Hanging Committee—Pictorial Section—(erase not fewer than twenty names).—E. R. Ashton, H. Walter Barnett, Redmond Barrett, Robert Beckett, Henry W. Bennett, J. S. Bergheim, W. R. Bland, W. J. Byrne, W. J. Croall, J. Page Croft, W. Crooke, W. E. Debenham, E. Dockree, Miss Catherine Edmonds, W. Friese-Greene, John H. Gear, John Gunston, H. Vivian Hyde, the Rev. F. C. Lambert, M.A., Alexander Mackie, Hector Maclean, F.G.S., Henry Thomas Malby, H. S. Mendelssohn, Ernest Morgan, J. C. S. Mummery, Charles H. Oakden, Lyddell Sawyer, J. C. Warburg, Eustace

Young, Herbert Young, M.A., B.C.L. Technical and Scientific Section (erase not fewer than eight names).—Sir W. de W. Abney, K.C.B., F.R.S., S. B. Bolas, Thomas Bolas, F.I.C., F.C.S., John Bulbeck, James Cadett, W. E. Debenham, Douglas English, B.A., Thomas Illingworth, G. Lindsay Johnson, M.A., M.D., B.Sc., F.R.C.S., Chapman Jones, F.I.C., F.C.S., Cherry Kearton, E. B. Knobel, F.R.A.S., the Rev. F. C. Lambert, M.A., Charles H. Oakden, E. Sanger Shepherd, Joseph Wilson Swan, M.A., F.R.S., William Taylor, Professor William Cawthorne Unwin, B.Sc., F.R.S.

Balloting papers may be posted at any time, but only those will be counted which are received at No. 66, Russell Square, London, W.C., by 12 noon on Monday, February 10th, 1902 (the day preceding the annual general meeting).

II.—The Reform Circular.

The following is the text of a circular issued to the members of the Royal Photographic Society:—

At a meeting of members of the Society interested in its reform, it was decided to send to every member a short statement of the changes which it seemed desirable should be brought about in the Society's management, together with a list of those gentlemen whose election it was proposed to support, in the belief that it would be best calculated to promote real reform.

It was unanimously agreed:—

(1) That steps should be taken to limit the selection of Fellows to those who possess a higher qualification than hitherto.
(2) That the Society's premises should be kept open during much longer hours than at present, so as to meet the needs of members other than those living in the immediate neighbourhood.
(3) That the Journal should be brought out punctually and in a better form.
(4) That proxy voting should be permitted.
(5) That a greater supply of important papers and more interesting meetings should be provided.
(6) That the dark rooms and laboratories be fitted with such apparatus as enlarging lanterns, lockers, reducing apparatus, etc., and be put and kept in order.

Without concerted action by the members it is impossible to secure the election of a sufficient number of fresh representatives on the Council to insure the Society from stagnation. The gentlemen on this list are none of them aware that this action is being taken by us, and we believe that they are actuated by a sincere desire to do their best for the Society. To secure their election, the splitting of votes must, as far as possible, be avoided, and we hope therefore that we shall have your co-operation to the greatest extent possible.

Whether we have this or not, we are quite sure that you will recognise that in taking this step we are actuated, like yourself, by a desire to do our best for the Society of which we are all members.

The signatures to the circular are:—R. Child Bayley, Samuel J. Beckett, Thomas Bedding, Francis T. Beeson, S. Herbert Bentley, Drinkwater Butt, Leslie E. Clift, C. Churchill, C. J. Kirk, J. McInham, S. H. Fry, T. K. Grant, W. G. Holman, S C. Mote, C. H. Oakden, J. H. Oliver, J. Borthwick Panting, F. W. Parsley, William C. Plank, R. R. Rawkins, P. R. Salmon, James A. Sinclair, C. Harold Smith, T. E. J. Stephenson, J. S. Teape.

The list of the proposed Council is identical with that published in the Journal last week, except that the name of Mr. Wilson Noble is substituted for that of Mr. W. Smedley Aston.

III.—A "Pictorial Wing" Manifesto.

The following circular has also been sent to members by Mr. J. C. Warburg:—

We, the undersigned fellows and members of the Royal Photographic Society, realising the importance to the Society's pictorial exhibition of capable, broad-minded judges and selection committee, who shall have the confidence of all schools of pictorial photography, have pledged ourselves to support the following gentlemen at the forthcoming election. In view of the fact that a large number of esteemed judges have refused to serve at the forthcoming exhibition, we have decided to collectively support only a small list. We ask your votes for the following candidates as being worthy of your suffrages:—

As Pictorial Judges:—W. R. Bland, Esq., F.R.P.S.; J. C. S. Mummery, Esq.

For the Pictorial Selection and Hanging Committee:—W. R. Bland, Esq., F.R.P.S.; J. Page Croft, Esq.; Llewellyn Morgan, Esq., M.D.; J. C. S. Mummery, Esq.; J. C. Warburg, Esq.

We would urge on every member of the Royal Photographic Society, whether supporting our list or not, the importance to the society of voting for candidates who are capable and broad-minded.

J. T. Ashby, Loughton; J. S. Bergheim, London; W. R. Bland, F.R.P.S., late Vice-Pres. Derby Photo. Society; Evelyn Boden, F.R.P.S., Derby; Francis A. Bolton, F.R.P.S., Staffs; Robert Bourke, Past President Leeds Camera Club; S. R. Brewerton, F.R.P.S., Tunbridge Wells; S. L. Coulthurst, Vice-Pres. Manchester Amateur Photo. Society; J. Page Croft, Birmingham Photo. Society; Alice M. Dumas, Bromley; J. H. Gash, Leeds Camera Club; John Gunston, Wimbledon; Maude A. Craigie, Halkett, Edinburgh Photo. Society; Elena Hellmann, F.R.P.S, London; Harold Holcroft, Wolverhampton; W. G. Jamieson, Aberdeenshire; Percy Lund, Editor "Pract. and Jun. Photo."; Hector Maclean, F.G.S., F.R.P.S. Pres. Croydon Camera Club; J. W. Marchant, F.R.P.S, Vice-Pres. North Middlesex Photo. Society; Llewellan Morgan, M.D., Past Pres. Liverpool Amateur Photo. Association; Harry Quilter, F. C. Shardlow, Editors "Photo. Art Journal"; Leslie Selby, Past Pres. W. London Photo. Society; Percy Sheard, Pres. Batley and District Photo. Society (Judge of the Yorks. Photo. Union); M. Thompstone, Manchester; Harry Wade, Manchester; Louisa Wakeman-Newport, Tenbury; J. C. Warburg, London; H. Snowden Ward, F.R.P.S., Editor "The Photogram"; W. D. Welford, F.R.P.S., London and Prov. Photo. Association; Jeannie A. Welford, London; T. E. Corney Wilson, Liverpool Amateur Photo. Association; Eustace Young, London; J. C. Warburg, Hon. Sec. R.P.S. "Pictorial Wing' Movement.

IV.—Another Special General Meeting.

The following official notice has been issued to members:—I beg to inform you that an extraordinary general meeting of the Members of the Royal Photographic Society will be held at 66, Russell Square, London, W.C., on Tuesday, February 11th, 1902, immediately after the annual general meeting called for the same day, in pursuance of a requisition, and at which meeting the resolutions at foot will be proposed to be passed as special resolutions with a view to amending the Articles of Association of the Society.—I am, sir, your obedient servant,

John A. Hodges,
Hon. Sec.

66, Russell Square, London, W.C.,
January 30th, 1902.

1. To substitute for Article 21, the following:—

"The officers of the Society shall be a president, four vice-presidents, a treasurer, a solicitor, an editor of the Journal, and a secretary. All the officers, except the secretary, shall be elected from the members. The secretary may be a member. All offices shall be honorary, except those of Editor of the Journal and of the secretary, either or both of which may be honorary or not at the discretion of the council."

2. To substitute for Articles 25 and 26, the following article with the heading:—

"The Secretary.

"The Council shall appoint a secretary, whose duties shall be to attend all meetings of the Society and Council, to take minutes of the proceedings, to conduct the correspondence of the Society, to read the papers presented to the Society, if requested by the authors library, and to discharge such other duties as the Council may direct. Should the office be an honorary one, the secretary shall retire annually at the first meeting of the newly-elected Council. Should the secretary be a paid one, the regulation as to his compulsory retirement at the first meeting of the newly-elected Council shall not apply."

3. To substitute for Article 28, the following:—

"The Council shall appoint an Editor of the Journal. Should such office be an honorary one, he shall retire annually at the first meeting of the newly-elected Council."

4. To substitute for Article 29 the following:—

"The Council shall consist of the officers of the Society and twenty ordinary members of Council. At least one-half of those elected on the Council shall be Fellows of the Society."

5. In Article 36, to substitute for the sentence commencing:—

"Except the Assistant Secretary"

the following words:—

"Such officers and other members of Council as are elected by the members shall retire annually and shall be eligible for re-election."

6. To omit Article 41.

7. In Article 42, to substitute for the words:—

"One or more properly qualified Auditors"

the words:—

"One or more chartered accountants or other auditors with professional qualifications."

8. To re-number the Articles as may be necessitated by these changes.

The house to which President McKinley was taken after the fatal shot had been fired happened to be near the store of a druggist named Kingston, who, in consequence, was called on to supply many of the necessaries. The bill amounted to over sixty-eight dollars, and was, of course, paid in due time. The enterprising druggist thought it would be a good idea to photograph the cheque and circulate the photos by way of advertisement. The United States Government did not see it in the same light, and pronounced the proceeding to be a forgery. No action was taken, however, as it was quite plain that Mr. Kingston was not aware that he was breaking the law.—The "Pharmaceutical Journal."

Exhibitions.

DUNDEE AND EAST OF SCOTLAND PHOTOGRAPHIC ASSOCIATION.

This Exhibition was formally opened in the Victoria Art Galleries, Dundee, on Friday afternoon. There was a good attendance at the opening ceremony, when Lord Provost Hunter presided, and briefly introduced Sir W. Ogilvy Dalgliesh, who, in formally declaring the Exhibition open, spoke of the many pleasures accruing from the pursuit of photography. The first photographic exhibition in Dundee, he said, was held in 1854, and the last one, prior to the present, was held in 1888, just eight years after the association was founded. The association was now a power in their midst, numbering 130 members. If they compared the pictures on the walls with those of 20 or even 10 years ago, they could not fail to be struck with the marvellous improvement that had been made. The large attendance present showed a growing artistic taste in Dundee, which was a most pleasing feature. (Applause.) Mr. W. F. Hill, president of the association, in a few remarks said the essentials of a photographer's character were precision, perseverance, and carefulness. The exhibition was a venture, and he hoped it would be a success. They hoped the result would enable them to hold such functions at lesser intervals than they had done in the past.

The exhibition has been hung in three of the galleries in the Victoria Art Galleries, and as the rooms were primarily designed for the display of works of art, it is needless to say that they are splendidly lighted; the hanging, however, might have been improved, as here and there we have pictures directly opposed in their treatment hung together, the one spoiling the other. The entries number over 550, from over 150 exhibitors, not including trade exhibits. These are divided into 15 classes. The rules contained a clause to the effect that no title was allowed on the front of the picture; we have no special sympathy with this restriction, but in spite of it, a number of the works hung had the title inscribed on the mount, and in many of the cases it was a decided improvement. The judges were, for the pictures, Messrs. W. Crooke and J. Craig Annan; for the lantern slides and lecturette, Mr. A. Horsley Hinton; but as these entries were away at the judge at the time of our visit, and the results are not to hand at the time of going to press, we cannot deal with them now.

The strongest class was naturally the champion class, in which 20 entries competed for the gold medal offered. Three pictures, however, stood out by themselves, viz., "The Quarry Team," by Archibald Cochrane, to which the gold medal was awarded (this picture, it will be remembered, gained the R.P.S. medal at this season's exhibition); and "Venice" and "A Street in Chioggia," both by Percy Lewis. These two pictures are splendid specimens of that undefinable something, known as "quality"; the composition is pleasing, and the latter presents quite a stereoscopic effect. There were other prominent exhibitors in this class, but those mentioned stand in a *primus* position. In Class II.—Landscape (open): Percy Lewis proves his ability and wins the silver medal with "The Quayside, Chioggia," another of these delightful Venetian pictures; the grouping of the figures is pleasing, the glimpse of distance gives depth, and the whole picture hangs well together. W. J. Croall gains the bronze medal with "Evening," a sand-dune picture, in which the lights seem forced. Some critics prefer "The Sentinels," by Ralph R. Rawkins, a strong picture of some gaunt trees on a hilltop, silhouetted against the sky. Class III.—Architecture: We have the two medalled pictures standing clear ahead of the other pictures in this section. "The Gallery Staircase," with which H. C. Leat takes the premier award, is delightful as ever; it is one of these pictures that never pall, no matter how often one sees them—a good example of simplicity *in excelsis*. The bronze medal picture, "St. Apollinare in Classe," by E. G. Boon, is also a beautiful piece of work, satisfying in composition, and containing a mastery treatment of marble. Class IV.—Flowers and Fruit Studies: This is not a large class, but it maintains a high level of excellence. The first prize picture is John M. Whitehead's well-known "Autumn Fruit," a little hard, perhaps, but pleasing in arrangement and lighting. Mary C. Eames gains second place with a charming study of "Chrysanthemums," in fact, not a few prefer it to the first prize picture. In this class, Edgar Scamell shows "The Growth of a Dwarf Nasturtium," a monument of painstakingness; good work is shown by J. C. Warburg, Mary S. Maclachlan, Ban Bunlop, T. E. Corney-Wilson, H. C. Leat, and others.

Class VI.—Animals: In this class we have one of the best animal pictures we have seen for years in the silver medal picture, "Bull Dogs," by W. J. Croall. Mr. Croall has the credit of many first-class "doggy" pictures, but this is the most successful work we have seen from his camera. It is a masterpiece, although super-criticism might say that the white puppy in front was if anything too obtrusive. The second prize picture, "Cornered," by J. B. Johnstone, is a telling study of a fox at bay. Class XI.—Figure Studies (members): The mixed nature of the entries in this class leads us to believe that a careful study of the pictures in the exhibition will do much to better the work of the members. The first prize picture, however, is a gem, and betrays the artistic instinct to seize on a suitable incident, and suitably transfer it to paper; "Friend or Foe," by J. Smith, represents a wee child holding out a stick to a cat that peeps from the doorway to see if it is a "friend or foe"—a charming picture. The second prize picture, "Industry," by Archibald Campbell, shows an old woman spinning at her cottage door; technically it is good, but the arrangement is too precise. Class X.—Landscape and seascape (members). A big class. Archibald Campbell takes first place with "Dreary December," a bleak streamlet, with gaunt trees; second prize goes to William Bruce for "'Tis Winter Now," which carries out the title well. Class VII.—Portraiture (professional). Contains 60 entries, and no one can question the first award, "Thomas Carlyle, 1874," by John Patrick. We have before alluded to this picture in these pages, though we do not know that it has previously been seen in competition. It is a compliment to photography to say that such a telling delineation of the "Sage of Chelsea" should owe its origin to photography, and it says much for Mr. Patrick's skill that a portrait taken nearly thirty years ago is good enough to win premier award in an open competition to-day. The question at once arises, "Are we improving?" Two bronze medals are awarded, one to "Portrait of a Young Lady," by Andrew Paterson, and one to "Profile Study of a Young Girl," by Robert M. Scott; leaving entirely out of the matter the subject of merit, the question arises, What did the committee mean by "portraiture," as these pictures can hardly be classed under the heading of portraiture pure and simple, for instance, in the same degree as the first-prize picture can; they would certainly not be turned out in the ordinary course of business from the producers' studios. There is no special definition of the term in the prospectus of the exhibition. This is unfortunate, as we have already heard complaints on this matter. John Spark shows some good, honest portraiture in this class, his "John A. Dewar, Esq., M.P.," being a strong bit of work, while his "The Old Fashion" is a quaint figure study. Frank Ingham shows a delightful "Child Study"; Graystone Bird shows "Good-night" and "Happy Childhood," charming as ever; E. Fraser, J. Peat Millar, W. B. Mercer, W. Illingworth, and P. D. Nairn all show good work, of which space forbids more detailed notice. Class VIII.—Landscape or seascape (amateurs): "Amongst the Pumpkins," by Arthur W. Wilde, to the surprise of not a few, takes first prize. The picture represents a man stooping amongst some stooks; the lines compose well, but there is an unsatisfactory flatness that conveys an impression of errors in manipulation. This same fault appears in another picture in this class by the same worker. The bronze medal is gained by "Sunset on the Eden," a pretty little picture, with an irritating high light on the water. Class IX.—Figure study (amateurs): Originality probably weighed largely with the judges in awarding first place to Captain E. H. Haig's "In Contemplative Fashion." Here the head of a young girl is shown on a white background, a suggestion of clothes being given by a line or two drawn on the print. J. C. Warburg takes second place with "Reproaches (Holland)." The grouping is good, but the title is a puzzle. Class XII.—Enlargements (members): Silver medal, "Dinant Cathedral: Interior," by Walter H. Tittensor; bronze medal, "A Woodland Path," by J. H. Williamson. Class XIII.—Landscape or seascape (amateurs in the counties of Forfar, Fife, and Perth). This class does not indicate widespread merit in the district included. Some of the work shows considerable promise, but some of it is crude in the extreme. Silver medal, "Spring Sunshine," by J. C. Robertson; bronze medal, "Wtih Murmurs of Soft Rills" and "Whispering Trees," by J. Allworth Courts. The non-competitive section contains specimens of the work of Wm. Crooke, J. Craig Annan, T. and R. Annan and Sons, Valentine and Co., William Rawlings, R. Demachy, Archibald Cochrane, and others. The trade section included exhibits from André and Sleigh, T. and R. Annan and Sons, R. and J. Beck, P. Feathers, J. J. Griffin and Sons, Ltd., Kodak, Ltd., Lennie and Thomson. George Lowden, Thornton Pickard Manufacturing Co., Ltd., the Warwick Dry Plate Co., Ltd.

FALKIRK PHOTOGRAPHIC ASSOCIATION.

This society held their annual exhibition in the larger hall of the Y.M.C.A. Institute, Falkirk, on Friday and Saturday last. The exhibition all over cannot be described as otherwise than an excellent one, highly creditable to the members, and giving evidence of the great strides photography is making to be regarded as an art. The quality of the work generally is very satisfactory, and is in advance of that of any former year. So far as merit, variety of subject, and quantity is concerned we venture to say that it can hold its own alongside that of many larger societies. The loan collection of enlargements of Egyptian subjects by the hon. president, George Sherriff, of Carronvale; Italian scenery, by John Silken, and Australian views and scenes by Robert Gibson, of Victoria, N.S.W., lends added interest to a most excellent collection of work that ought to prove instructive to lovers of art in the district. The large attendance of

visitors goes to show that the general public are beginning to take more than a passing interest in the artistic possibilities of photography. Messrs. Gray and Duncan, Glasgow, kindly made the awards, and have evidently given entire satisfaction. The full list is:—Class I.—Landscape and seascape: 1, Robert Sinclair; 2, W. P. Crosbie; 3, Frank Currie. Class II.—Outings, pictures taken at outdoor meeting in 1901: 1, John Wilson; 2, W. P. Crosbie. Class III.—Genre and figure studies: 1, Thomas Easton; 2 Thomas Easton; 3, Robert Sinclair; 4, John Wilson. Class IV.—Instantaneous class (evidence of motion must be shown): 1, John Wilson. Class V.—Lantern slides: 1, W. P. Crosbie; 2, J. Wilson. Class VI.—Enlargements: 1, John Wilson; 2, W. P. Crosbie; 3, W. Hamilton; 4, J. Wilson. Class VII.—Architecture: 1, Robert Sinclair; 2, John Wilson; 3, John Bacon. Class VIII. (open to amateurs resident in the district, non-members of the association), any subject: 1, A. Macdonald, Falkirk; 2, J. G. Ure, Bonnybridge. Cup for best exhibit in the collection (presented by Robert Sinclair, chemist, Falkirk).—Thomas Easton, for winning print in Class III.

MR. FRED. HOLLYER'S EXHIBITION OF PLATINOTYPE REPRODUCTIONS.

The exhibition which Mr. Hollyer is now holding in the Drawing Room, Egyptian Hall, Piccadilly, W., is indeed an interesting one. Naturally the majority of the work shown consists of copies of paintings, and, failing the opportunity of viewing the originals, it is a privilege to be enabled to study such faithful reproductions of them in monochrome as are here displayed. The reproductions are all in platinotype, and, in addition to a very complete series of the works of Sir E. Burne-Jones, D. G. Rossette, and G. F. Watts, there are a number of examples from the works of Botticelli and other masters which are to be found in Florence, The Hague, and other places. An important collection of portraits of eminent men by various painters is included, and there are a few photographs from life. The particular skill which Mr. Hollyer displays in that branch of photography which he has almost made his own has been the subject of some discussion. If photography is a purely mechanical process, all photographers of equal expertness could produce equally good results when the subject is uncomplicated by the possibility of difference of arrangement of light and shadow; but it is a very patent fact that in copying pictures there are comparatively few who excel, and among these Mr. Hollyer undoubtedly holds the premier position. It has been suggested that Mr. Hollyer imposes some of his own individuality into his reproductions, that, like the engraver who, necessarily, in his translation of colour into monochrome, renders tone values according to a personal estimate, which may or may not be generally acceptable. This is probably the fact in the sense that Mr. Hollyer has an acute perception of the artist's ideas, and what seems to be the introduction of the individuality of the copyist is in reality only individualistic, inasmuch as it is uncommon in work of a similar nature. It is no disparagement of Mr. Hollyer's work, but quite the contrary, to say that the exhibition is one of a series of examples of supreme technical skill in photography applied in one particular direction. In his own branch Mr. Hollyer undoubtedly studies his subject, forms an idea of what it should be when translated into monochrome, and then introduces that idea by the ordinary process of photography. This should be the method of procedure in every branch of photography, but few seem to realise the importance of following it, hence the common reproach of those who fail to understand its possibilities that photography is simply mechanical. Included in the exhibition are several portraits photographed from life, but they are not altogether a favourable sample of Mr. Hollyer's productions in this direction. Some are admirable, but, on the other hand, there are a few which seem to display a crudity which is the more noticeable when a comparison is made with the reproductions of the work of the portrait painters. The catalogue contains, as a preface, an excellent appreciative article on Mr. Hollyer's work, signed "J. S. R." There is a charming quaintness about the gallery. It is quite unlike anything one can conceive to be in the heart of the West End of London, and an ideal place to while away an idle winter's afternoon.

FINCHLEY CAMERA CLUB.

The Finchley Camera Club held an exhibition on the 30th ult. at the Congregational Church schoolroom, North Finchley. One can hardly criticise the first exhibition of a young society upon the same lines that would be reasonable in the case of an established annual exhibition. The successful organisation of an exhibition is a difficult enough task, even when there has been the experience of previous ones to point the way, and there is nothing discreditable, in a first attempt, in not achieving a complete success. The Finchley Camera Club, indeed, made a creditable show. Their mistakes, such as the impracticable method of suspending the pictures and other little matters, which were obvious will no doubt be rectified in their second attempt. There was a fair proportion of interesting work, and some of more than average merit; but, in addition, there was a considerable proportion of very immature attempts. A method was adopted, which is rather curious nowadays, of making all the classes open, a chance that the notorious medal-hunters seem to have overlooked, and two of the four medals were awarded to members of the club. The judges were Messrs. J. C. S. Mummery and George Scamell. The awards were:—Silver medal for the best picture in the exhibition: J. J. Westcott. Class A.—Portraiture figure and animal studies, bronze medal: Howard Hazell. Class B.—Landscape and seascape, bronze medal: J. J. Westcott. Class C.—Architecture, bronze medal: G. Watson.

SIR WILLIAM ABNEY ON COLOUR PHOTOGRAPHY.

It is unfortunately not often that the Camera Club gets a glimpse of its president, for Sir William Abney is a very hard-working public official, whose duties keep him at the grindstone early and late. This was his apology on Monday evening last for his difficulty in selecting a subject for his presidential address to the Club. He had, he said, several subjects on the stocks, and as one of them seemed somewhat more advanced towards completion than the others, that one he took for his text. It might be called "Spectacle Lenses as applied to Colour Photography," and although he was well aware that many of his hearers knew more about optics than he did, he ventured to hope that some of his remarks might be of assistance to the less knowing ones.

He considered that one great desideratum in the production of colour photographs, by either the Ives or the Sanger-Shepherd process, was the presentment of three negatives taken simultaneously. If we attempted to take these negatives by separate operations, the difficulty of movement came in. He might cite the case of a pot of flowers, in which the movement of the leaves might seriously affect the finished result, the flower-pot alone remaining immobile. In the kind of weather which we are now enjoying the necessary exposures are very long, and the chance of movement is much increased, even when one had the great advantage of using such excellent tools as the Sanger-Shepherd screens and the Cadett spectrum plate. With these appliances the relative exposures were, for the blue, 1; for the green, $2\frac{1}{2}$ and for red, $12\frac{1}{2}$. This means that in taking simultaneous negatives we must reduce the lens aperture for the red f 12, for the blue f 60, the green taking an intermediate place between them.

Now there was no need to have an elaborately corrected lens for this class of work. If a rich man liked to pay £10 apiece for the three lenses, by all means let him do so; but there were others so circumstanced that they would find it far more convenient to pay, say, eightpence for the three glasses. Spectacle lenses were very cheap, and single lenses of this type gave excellent results when used with mono-chromatic light.

Spectacle lenses of certain forms, namely, the double convex, the double concave, the plano-convex, and the plano-concave, were easily obtained. A meniscus was not so easily found, and more money must be paid for it. With regard to the double convex lens, on account of its spherical aberration and astigmatism, unless used with a very small angle, it must be placed out of court. With a plano-convex lens we were much better off, for the astigmatism was not so marked, and three-quarters of the aberration disappeared. By taking a plano-convex and a plano-concave lens and cementing them together, by their plane surfaces we obtain a meniscus lens, which will well answer our purpose. A 6 in. plano-concave and a 3 in. plano-convex will make a good combination.

But a single lens was of no use for colour work. If it is in focus for the blue, it will be out of focus for the other two colour screens. The construction of a doublet is more complicated, for particular care must be devoted to the distance apart of the two lenses, and the adjustment must be made for each colour. In order to get over this difficulty he would show a form of experimental lens mount, consisting of three sliding tubes. In the central one was the diaphragm, while the outer and inner tubes carried the two lenses. With such a tube it was easy to obtain the right position of the lenses, with regard to the diaphragm, for each colour in turn, and the permanent mounts could be made from the data thus obtained. With lenses of the focus stated he had found that for the green the components must be 2 in. apart, for the red 1.82, and for the blue 2.18 in. apart. These figures could be arrived at by the "trial and error" method if one wanted to spend a long afternoon over the job, but he preferred to work out the problem by mathematics (formula shown on blackboard) in five minutes. Flare spots will appear unless the lenses are the right distance apart.

Having constructed the lenses and taken a triple negative, the question will present itself, "Has the exposure been correct?" Is there any means of ascertaining this without going to the trouble of making transparencies? He has found that if the white, the orange, and the yellow portions of the picture are right, the other colours may be left to take care of themselves. That is to say, you will get a truthful picture, or, at any rate, one which will not be found out.

His own plan of testing the three negatives is to put them in a

projecting lantern made on the Ives principle. Of course, the colours shown will be complimentary to the correct colours; for instance, the image of a tree will appear to be purple, but if it is purple, you may be quite sure that the corresponding positive, when made, will show green, and that the other colours of the picture will fall in their right positions. One of the transparencies might be regarded as the key and the others were superposed upon it. Under such conditions microscopic sharpness was impossible, but the difference of plane of the three films was so slight that for ordinary projection purposes the want of sharpness would not be appreciable.

The discussion was opened by Mr. Sangyer-Shepherd, who said that long ago he had advocated the use of monochromatic light for microscopists, many of whom seemed unaware of its advantages. Sir William's paper was most valuable in showing how good results could be obtained with cheap tools. The three transparencies taken by his own method were in almost absolute contact, certainly not more than 1-400 of an inch apart. He considered that the lecturer's plan of testing his negatives by use of the 3-colour projecting lantern an admirable idea.

Mr Cadett considered that anything which cheapened a process helped it on commercially, and therefore we must all feel grateful to Sir William Abney for his papers. He was very glad that the lecturer advocated the method of taking the three negatives simultaneously. It was most annoying when taking a landscape to find that a cloud, on the left-hand side of the picture in the first negative, had drifted to the right-hand side before the third negative was completed.

Dr. Lindsay Johnson asked several questions with regard to the lenses, which the lecturer at once answered. He advocated the use of the "crossed lens." Sir William Abney replied that he avoided all mention of such a lens, for the simple reason that he wanted his hearers to benefit by easily-procured lenses for home construction. Dr. Johnson further remarked that the members of the club would be interested to know that a long series of experiments had for some time been in progress in Vienna, with a view to ascertaining the best aniline dye formulæ for colour screens. These costly experiments were now concluded, and their details had just been communicated to him. He proposed to publish these in the next number of the Club JOURNAL, and he would, in the meantime, send Sir William Abney a copy of the formulæ.

On the motion of Sir H. Trueman Wood a hearty vote of thanks was given to the President for his interesting address.

New Books.

"Jahrbuch für Photographie und Reproductionstechnik. 1901." Edited by Dr. Josef-Eder. Halle a/S: Wilhelm Knapp.

This work reached us much later than usual, and we were thus unable to draw the attention of our readers to it at the time of publication. The book is a most valuable record of the progress of the year in relation to photography and the various graphic processes dependent upon it, and the volume likewise contains a number of original articles by writers of worldwide reputation. We notice an error in the section devoted to photographic lenses, which Dr. Eder may be glad to see corrected. An illustration is given of Wray's Platystigmat, but the remark that it has been changed from that given in the Jahrbuch for 1897 is misleading. The combinations have each, from the first, been formed of three elements, and the description given in 1897 was incorrect. We always turn with interest to the collection of photogravures, collotypes and other illustrations given at the end of the volume. Some specimens of colourwork are included, and the three-colour etching by J. G. Schelter and Gieseck deserves special attention.

"Practical Retouching." By Drinkwater Butt, F.R.P.S. 78 pp. Price 1s. London: Published by Iliffe & Sons, 3, St. Bride Street, E.C.

Mr. Drinkwater Butt is, or should be, qualified to write on the subject of retouching, as before his journalistic career—which, we understand, has terminated—he was a professional photographer. The book consists of a revised reprint of articles from our contemporary, "Photography," and the matter is clearly written and expressed. A publishers' note thus indicates the scope of the book:—"The aim of the author of this little book has been to give just such hints as can be conveyed in writing by a practical worker. He deals not merely with the retouching of portraits—which is, after all, the direction in which retouching is most widely used—but with work on the negative generally, both for improvement of special details and for the correction of tone-values—an application of growing importance, especially to amateur photographers. The question of the legitimacy of hand work upon a photograph is referred to, but the author, while avoiding any charge of depreciating the value of hand work, is not slow to point out that the photographer should first strive to master all the possibilities of the process, only giving further aid with his skilful fingers when such possibilities have been exhausted." The passages on the use of the knife (Chapter IV.) strike us as extremely helpful, and many excellent hints on varnishing are given. It is really a sound and reliable little volume.

"An Index of Standard Photograms." A guide for authors, editors and publishers of illustrated books and periodicals; collectors of pictures and extra-illustrators; lecturers and teachers who use lantern slide illustrations." Arranged by H. Snowden Ward and compiled by the staff of "The Photogram." 650 pp. Price 30s. nett. Issued to subscribers only, by "The Photogram," Limited, Effingham House, Arundel Street, Strand, London, W.C.

Criticism must necessarily be almost wholly replaced when dealing with a work of this kind, which represents three years of continuous compilation labour. Such a book, in the nature of things, can never be complete, quite accurate or entirely up to date. Every hour the compilers are at work, vital changes, as in the cases of directory canvassing and census taking, are in progress, as it were, amongst the subject matter dealt with. In these regards the most that can be said of the "Index" before us is that, at the moment of writing, it is approximately authoritative. But this must be always so until that far-off time when there shall be virtual synchronisation of the swing of life's pendulum and the printing press. We have made several haphazard dips into the sea of references before us, and have not found any inaccuracy. Some of the principal contents of the "Index" are thus indicated by the publishers' note:—"General Directory, giving names, addresses, outline of subjects photographed, sizes and prices, and similar information. In this section each photographer is here entered once, under an 'indicator' (a reference letter and number), and no particulars are given in the body of the book, save the titles of subjects, with the 'indicators' as guides to the photographers who have them. Portraits of Celebrities, etc. (207 pages), is divided under Royalty (about 900 entries, referring to portraits of 470 persons), Aristocracy (5,700 entries, 4,800 persons), Religious (9,400 entries, 7,300 persons), Musical and Dramatic (7,250 entries, 5,120 persons), Naval and Military (3,100 entries, 2,300 persons), Sporting and Athletic (1,350 entries, 1,050 persons), Miscellaneous (14,200 entries, 12,800 persons), Groups (451 entries, 431 groups). Landscape and Local Views (32 pages, 7,600 entries, dealing with 3,200 districts). Copies of Paintings, Statuary, objects of Art, etc. (179 pages, 7,200 entries, referring to about 14,760 separate pictures, statues, etc., including the works of some 4,300 artists, national and private collections, museums, etc.). Indexed under artists' names, and also (so far as seems necessary) under titles of subjects, names of galleries, etc. Nautical, Naval and Military (21 pages, 6,300 entries, 3,700 subjects). Literary, Historical, Archæological and Architectural (20 pages, 3,000 entries, 2,600 subjects). Sport, Athletics, Country Life and Natural Science (30 pages, 6,450 entries, 3,900 subjects). Miscellaneous (6 pages, 475 entries, 450 subjects). Lantern Slides (30 pages, 7,400 entries, 3,450 subjects)." The volume should be found of the very highest value by the classes appealed to on its title page, and, as Mr. Snowden Ward reminds us, will, no doubt, be very useful to the photographers whose lists are abstracted in its pages. As we are asked for suggestions with a view to the improvement of future volumes, we beg Mr. Ward, before it is too late to repent, humbly to admit the error of his ways, and banish that dreadful word "photogram" from his printing press. Yet we have little hope of such a conversion. Apart from this, the "Index" is sincerely to be commended for the vast amount of work that has been put in it and the enormous field of usefulness which it covers.

RECEIVED.—"Early Work in Photography." By W. Ethelbert Henry, C.E. Third edition (revised). 104 pp. Price 1s. London: Dawbarn & Ward, 6, Farringdon Avenue, E.C.

AT the Newcastle-on-Tyne and Northern Counties Photographic Association's last meeting, at the Y.M.C.A., Blackett Street, on Tuesday, Mr. Roger Brady gave a lecture demonstration on the carbon process. Mr. Brady brought to the meeting several pieces of exposed tissue, which he mounted and developed in the room on both single and double transfer paper, and the ease and absence of all the paraphernalia so often recommended was a revelation to several members. Mr. Brady did some really artistic work, and the only apparatus used was two metal dishes and a squeegee, with a jug of hot and cold water. One "tip" which he gave, and which was new to several regular workers, was to safe-edge a piece of glass the size of the negatives used, and to use this in the printing frame in front of the negative, thus doing away with the necessity of safe-edging every negative before printing. An interesting discussion followed the reading of the paper, in which several well-known carbon printers took part.

THE Sunderland Photographic Association, after fourteen years of its existence, made a new venture last Wednesday, when it instituted its first annual dinner. Mr. William Milburn presided over a large gathering. The toast of the evening, "The Sunderland Photographic Association," was proposed by Mr. James Wallace in a very humorous speech. He gave some of his experiences of how he had been victimised by amateur photographers in carrying portions of their heavy kit when climbing steep hills and how readily he always found amateurs promised him some prints, and how, in every case, they had failed to redeem their good intentions, and he could not help thinking that photographers were somewhat strangers to the truth. The chairman, in his reply, referred to the flourishing condition of the Association. They started in a very humble way, and now the membership totalled over 90. He believed that association had not only done good in helping forward the practice of photography, but it stimulated a hobby which not only was a pleasure in itself, but was the means of doing good and bestowing pleasure upon others.

Commercial & Legal Intelligence.

WEST'S "Our Navy," Limited.—This company was registered by Waterlow & Sons, Limited, London Wall, E.C., with a capital of £10,000 in £1 shares (2,000 preference). The objects of the company are to acquire the business carried on by A. J. West, and to carry on the business of proprietors of operatic, theatrical, and photographic enterprises, etc. No initial public issue. A. J. West is permanent governing director. Special qualification, £4,000. Registered office, The Anchorage, Vicarage Road, Southsea.

PHOTOGRAPHIC Mechanism Development Company, Limited.—This company was registered with a capital of £1,210 in £10 shares. The objects of the company are: to acquire, purchase, develop, work, advertise, and sell, either by royalty or fixed payment, and otherwise deal in and with photographic and other inventions; for the purposes of the company, to erect any machinery, plant, apparatus, etc. No initial public issue. Table A mainly applies. The directors are W. F. Greene, G. W. Irons, R. M. Andrews. Qualification, £20. Remuneration not specified. Registered office: 4, Redburn Street, Chelsea.

A CIRCULAR has been issued calling attention to the formation of a body bearing the title of the "Acetylene Association," which is intended to promote "the advancement of acetylene gas engineering and manufacture, and to facilitate the interchange of information amongst the members of the Association, and the publication and communication of information on such subjects." A list of honorary members is appended, which includes the names of Prof. Boys, Major-Gen. Sir Owen Burne, Mr. H. E. Jones, Prof. Lewes, Sir Hiram Maxim, Dr. Boverton Redwood, Sir David Salomons, Mr. Alfred Spencer, Mr. Swinburne, Capt. Thomson, and Sir Henry Trueman Wood, while the members of council are men connected with the carbide or acetylene trade.

ELECTRIC Photo Company, Limited.—This company was registered by Jordan & Sons, Limited, 120, Chancery Lane, W.C., with a capital of £500 in £1 shares. The objects of the company are to carry on the general business of photographers, frame makers, picture and print dealers, engravers, makers of and dealers in all kinds of apparatus and instruments used by artists and engravers and photographers; as jewellers, watch and clock manufacturers, and dealers in fancy goods; to acquire and turn to account any patents, patent rights, and inventions, real and personal property. No initial public issue. Table A mainly applies. The directors are J. Goulding, T. R. Guthrie, J. Price, and W. Maddison. Qualification, £10; remuneration, £10 per annum, divisible.

AT the Clerkenwell County Court, on Thursday last, Mr. S. Clarke came from Canterbury to answer a summons issued by the Warwick Trading Company in respect of an undischarged debt of £7 9s. 6d. for films, etc., supplied by them to Clarke for purposes connected with the working of his cinematograph. Plaintiffs alleged that defendant had been carrying on a flourishing business with cinematograph exhibitions, and for three months had been earning as much as £20 per week. Defendant admitted that he had done very well at Southampton, but there were many expenses connected with the show. He did not get more than a quarter of the proceeds for himself. Replying to the judge, defendant said he was now showing at Canterbury.—How much did you take last night?—About £7. Plaintiffs' representative: He is getting over £40 a week. The Judge: We will allow for fluctuations of business, and say £20. Defendant: After this week I might not get another engagement for some time. The Judge: Your bank book and receipts show that you are well able to pay.—An order was made for payment of £5 per month.

LAST week, at Westminster Police Court, by direction of the Commissioners of Police, Mr. Arthur Bucknill, the occupier of No. 1, Sloane Street, and Mr. E. H. Benson, advertising agent of 1, Tudor Street, E.C., were summoned under the County Council by-laws for permitting and causing a flash-light to be exhibited at the above premises which was dangerous to traffic. Mr. Fleetwood Pritchard was counsel for the defence. Inspector Croston said that the complaint was made in respect to an illuminated advertisement produced by 214 electric lamps changing in colour from white to red. The lights faded away and grew again to *maximum* intensity with an interval of about four seconds of absolute darkness. Notwithstanding the gradual changes, the light was dangerous. Horses were startled by it. Mr. Pritchard contended that it was not a flash-light within the meaning of the by-law. Mr. Sheil: I hold that this is a flash-light coming within the words of the by-law "altering suddenly in intensity," and I think it is dangerous to traffic. This is a test case, so I shall only impose a fine of 20s. and 23s. costs.—Mr. Pritchard: Will you state a special case?—The Magistrate: No. How can I do that? I have decided it entirely on a question of fact.

WITH the February number, "The Artist"—a shilling monthly, published at 27, Chancery Lane, London, W.C.—has commenced a new series. The magazine appears now with a new cover, designed by Mr. Paul Woodroffe and engraved by Miss Clementine Housman. The seven special supplements include two photogravure plates—the first instalment of "The Artist" Portrait Gallery"—two colour plates, and a special drawing by Mr. Byam Shaw.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

February	Name of Society.	Subject.
8	Glasgow and West of Scotland	Close of Exhibition.
9	Woolwich Photographic	*Control in Printing.* Mr. H. W. Bennett.
10	Glasgow and West of Scotland	Technical Meeting. *Toning Bromide Prints.* Demonstrator, Mr. Wm. Goodwin.
10	Newcastle-on-Tyne	Prize Slides.
10	Darwen Photographic	1901 Prize Slides.
10	Croydon Scientific Society	Mr. Rudler's 4th Lecture, 7.45.
11	Croydon Scientific Society	Geological. Committee, 8. Section, 8.15.
11	Thornton Heath Polytechnic	*Combination Printing.* By W. H. Rogers, Esq.
11	Stonehouse Camera Club	Elementary. *Improving and Preserving Negatives.* Mr. Bayley.
11	Leeds Photographic Society	Conversazione and Annual Exhibition of Members' Work.
11	Birmingham Photographic	Open Lantern Evening.
12	Southsea Photographic Society	Annual Dinner or Dance.
12	Photographic Club	*Kinetic Photography.* Part I. Mr. A. S. Newman.
13	Rodley, Farsley, and District	*The Ure, from Mouth to Source* (Lantern Lecture). Mr. F. Brundrett.
13	Liverpool Amateur	Lantern Lecture: *Evesham and Warwick.* Mr. W. A. Taylor.
13	Richmond Camera Club	*Improving Negatives and Prints.* Walter D. Welford.
13	Oldham Photographic Society	Lantern Lecture. *Tour through Yorkshire.* Mr. T. Burton.
13	Woolwich Photographic	*Photo Chemical Chat.* W. H. Dawson.
13	London and Provincial	Open Night.
13	North-West London	Exhibition.
13	Liverpool Amateur	Lantern Lecture. *Evesham and Warwick.* Mr. W. A. Taylor.
14	Borough Polytechnic	*Enlarging on Bromide Paper.* Mr. Geo. Fisher.
14	Croydon Scientific Society	Lantern Lecture. *The Production of Different Tones in Lantern Slides.* Mr. Hoole.
14, 15	West London Photographic	Annual Exhibition.

ROYAL PHOTOGRAPHIC SOCIETY.

THE following are extracts from the report of the council for the year 1901:—

"THE MEMBERSHIP.

"The following table shows the changes that have taken place in the number of the fellows and members of the Society during the year:—

	Honorary Fellows.	Life Fellows.	Fellows.	Life Members.	Members.	Non-resident Members.	Total.
During 1901—							
Enrolled	1	3	9	2	103	6	118
Transferred from other columns	0	0	0	3	1	5	7
	1	3	9	5	104	5	125
Died	1	0	3	2	4	0	10
Resigned	0	0	6	0	23	6	35
Transferred to other columns	0	0	4	2	14	0	20
	1	0	13	4	47	0	65
On January 1st, 1901	9	44	207	64	502	19	845
To add as above	1	3	9	3	104	5	125
Total	10	47	216	67	606	24	970
To subtract as above	1	0	13	4	47	0	65
On January 1st, 1902	9	47	203	63	559	24	905

"There has been a net increase during the year of sixty members. Those lost to the Society by death are:—T. M. Brownrigg, George Mason, W. Child, Otto Kitzerow, J. W. Saunders, G. Shadbolt, and Matthew Whiting.

"THE ROYAL PATRONAGE.

"Early in the year the Society had to mourn, by the death of her late Majesty Queen Victoria, the loss of one who was its continued patron since its foundation in 1853. The council recorded a vote of sincere condolence with the King and the Royal Family, and caused the same to be engrossed and presented to his Majesty the King, who, as Prince of Wales, had graciously bestowed on the Society his patronage since 1863. His Majesty has been graciously pleased, at the request of the council, to continue his patronage; and subsequently her Majesty the Queen also graciously consented to become a patron of the Society.

"FINANCE.

"The total receipts for the year, including the balance of £526 8s. 8d., brought forward from 1900, amount to £2,580 12s., and the expenditure

to £2,041 12s. 6d., leaving a balance of £538 19s. 6d., less the liabilities as shown. The subscriptions received amounted to £974 9s. 6d., being the largest amount received in one year since the Society was established. The exhibition was not so well supported as in the previous year, the receipts being £733 15s. 8d., as against £818 5s. 10d.; but there was a net profit of £29 10s. 1d. on this item. Entrance fees and life composition fees amount to £103 19s., an increase of £2 2s. The general expenses, notwithstanding an increased membership, have been £129 4s. 10d., showing a decrease of £25 2s. 6d., while £295 1s. has been invested. The affiliation shows continued progress, the amount received during the year being £118 8s., being an increase of £16 15s.

"The council regret to announce that Mr. G. Scamell is unable to accept nomination as hon. treasurer for the ensuing year, and desire to record their high appreciation of the valuable services he has rendered to the Society during the last ten years.

"The Honorary Fellowship.

"Colonel Joseph Gale has been elected an honorary fellow of the Society in consideration of his long services to photography. Mr. H. P. Robinson, who was elected an honorary fellow in the year 1900, has been removed by death. The council delegated Mr. John Spiller and Mr. F. A. Bridge to represent the Society at the funeral.

"The Fellowship.

"The council have reconsidered the granting of the fellowship, and the following is a brief outline of their decisions. The existing procedure is to be continued, but the committee intend in future to be more stringent regarding the qualifications submitted by applicants. The receipt of the Society's medal will not be regarded as a sufficient sole qualification. Candidates will be asked to supply a list of subjects upon which they will be prepared, if desired by the council, to write a thesis. The council consider that this will be a step in the direction of the examinational method. With regard to the students' applications, the honours stage of the City and Guilds Institute examination in photography will be regarded as the chief recommendation for admission. Whenever notice of admissions to the fellowship is made the number of applications will also be communicated. Applications will in future be considered three times per annum.

"The House Exhibitions.

"These exhibitions, commenced in the year 1900, have been continued at intervals, the following gentlemen having contributed the work that has been shown:—Mr. Frank Meadow Sutcliffe, of Whitby; Colonel Joseph Gale; Monsieur Robert Demachy, of Paris; and Mr. Henry Stevens. The thanks of the Society are due to these gentlemen for their kindness in taking the great trouble involved in bringing together for exhibition collections such as have been shown, and for the welcome addresses they have prepared and delivered to the members. The house committee have arrangements in hand for continuing these exhibitions, which will in future remain open for a somewhat longer period than has hitherto been customary, in order to afford all who may be interested an opportunity of seeing the works shown.

"The Journal.

"The council have decided, upon the report of a committee appointed to inquire into the matter, to adopt a superior paper to that previously in use, in order that half-tone illustrations may, if necessary, be printed with the text. The volume will in future commence with the January number in each year instead of with the Exhibition Catalogue number, and the latter will be issued as a supplement that may be bound up with the volume or not as the members may prefer. It has been decided also that, commencing with the new year, the Journal shall bear the volume number of bothold and new series. The thanks of the Society are again due to Major-General Waterhouse for assistance in the abstracting of foreign periodicals.

"Progress Medal.

"The progress medal has been awarded by the council to Dr. R. L. Maddox for his discoveries in connection with the gelatino-bromide of silver emulsion dry plate. Letters acknowledging the bestowal of the award have been received and printed in the Journal. The council have resolved, if possible, to secure photographs of all recipients of the progress medal, and to exhibit them in the Society's House.

"The Society's Standards.

"A committee has been appointed to consider certain suggestions for the improvement of the Society's standards for lens diaphragms, fittings and mounts as originated in 1881 and amended in 1891. The committee has reported in favour of several modifications, with which the council have agreed. An amended schedule has been drawn up and published in the Journal, and it is hoped that the standards as now in force will still further commend themselves to manufacturers and users of photographic apparatus, to whom copies of the schedule will be sent on application. It has been thought desirable, in view of the errors that have been found to exist in the specimen screw gauges made after the Society's standards, that they shall be no longer considered as standards. For the present the Society maintains only the schedule of standards.

"Special Meetings.

"In the latter part of the year, following the president's annual address, a requisition was received from twenty members of the Society calling for an extraordinary general meeting, whereat it was proposed to submit to the members certain suggested amendments to the articles of association. Such a meeting was called by the council, and a report of the meeting has been published in the Journal. A second requisition having a similar purpose was handed in and a further meeting was called, the report of which has also appeared in the Journal. A third requisition has been received, containing further proposals to alter and amend the articles of association, and on its receipt the council addressed and issued a circular to the members, which was subsequently printed in the January Journal. With this circular the council submitted the details of a well-considered scheme drawn up by them, in conjunction with the Society's honorary solicitor, whereby members unable to attend any special general meeting of the Society would be able to record their votes on any question submitted as if they had been present. These proposed changes were, however, not accepted by the special general meeting called to consider them.

"The Library and Museum.

"Exchange, purchase, and donation have added largely to the number of volumes in the library during the past year. The periodical literature has been provided with storage cases, in order to free the table of the large mass of papers that accumulates during the twelve months, and all but the current numbers are now kept within the bookcases. The new library catalogue referred to in the last report is in the hands of a professional librarian, and will soon be ready for printing. The Royal Society are about to publish a catalogue of scientific literature, and the council have subscribed for the volumes on Physics and Chemistry, which will deal with the subject of photography. Mr. Horace Wilmer having resigned the office of honorary librarian, the council wish to take this opportunity of expressing their regret at his determination, and desire to place on record their appreciation of his services to the Society. Several additions have been made to the articles comprising the museum, all of which have been referred to in the Journal. The council agreed to a request from the authorities of the Alexandra Palace for the loan of certain articles from this collection to supplement a photographic exhibition arranged at the palace on its reopening as a place of public recreation. The council has provided the funds necessary to procure cases for the proper display of the various objects forming the museum.

"The Dark Rooms, etc.

"In order to meet a request that the dark rooms shall be available until a later hour than at present, the council have decided that an extension of the hours may be granted under special circumstances upon application to the hon. sec. It is hoped that this arrangement will meet present requirements. Under the existing regulations, the rooms are open daily from 10 to 4, except on Saturdays, when the hours are 10 to 1, and on Wednesdays from 10 to 8. On meeting nights the rooms may be used until 10 p.m.

"An enlarging lantern is now being made for the Society, and an enlarging room will shortly be available for the use of members. At the outset an apparatus with a condenser of 8 in. diameter will be installed, whilst for the enlargement of negatives of larger dimensions than half-plate the apparatus will be adaptable for use with daylight.

"The use of the exhibition galleries was again granted to the Traill Taylor Memorial Committee, on October 23rd, when Professor Silvanus Thompson delivered the fourth of the series of lectures on "Zonal aberration and its consequences." The use of the meeting rooms has also been granted for the general meetings of the Professional Photographers' Association. A request from the Röntgen Society for permission to conduct some tests of tubes in the Society's house was also received, and, permission being given, a room was set aside for the purpose. A committee has been appointed to report upon the draft of a Bill which the Traders in Poisons Protection Society proposed to introduce. Acting on the committee's report, the council intimated that, while they cannot endorse the draft submitted, they are in favour of and will support a well-considered method which will enable dealers in chemicals for photographic purposes to retail them under proper regulations. The council have given instructions for the acquisition of portraits of past presidents of the Society where still possible, and for their exhibition in the Society's House with those of the recipients of the progress medal previously referred to."

Balance Sheet of the Royal Photographic Society.

For the Year ending December 31st, 1901.

Cash Account.

RECEIPTS.

1901.	£	s.	d.	£	s.	d.
To Balance from last year				526	8	8
,, Subscriptions, 1900	104	16	0			
,, ,, 1901	867	11	6			
,, ,, 1902	2	2	0			
				974	9	6
,, Entrance Fees				39	18	0
,, Life Members				64	1	0
,, Affiliation				118	8	0
,, Dividends on Consols				19	0	7
,, Guarantee Fund				2	2	0
,, Exhibition—						
Admissions	269	11	0			
Catalogues	108	5	6			
Advertisements	110	0	0			
Wall and floor space	232	3	10			
Commission on sales	12	18	0			
Carriage	0	9	4			
Sale of blocks	0	8	0			
				733	15	8

RECEIPTS *(continued)*.

	£ s. d.	£ s. d.
Brought forward:—		733 15 8
Journal—	£ s. d.	
Sales	12 7 0	
Advertisements	90 0 0	
		102 7 0
,, Carriage		0 1 7
		£2,580 12 0

PAYMENTS.

1901.		
By Assistant Secretary	120 0 0	
,, ,, Clerical	30 2 6	
		150 2 6
,, House Expenses—		
Rent, £142 10s.; fire and lighting, £39 3s. 3d.	181 13 3	
Housekeeper, £115; uniform, £5 16s. ...	120 16 0	
Insurance, £4; rates and taxes, £26 14s. 6d.	30 14 6	
Window cleaning, repairs, and sundries	31 11 2	
		364 14 11
,, General Expenses—		
Printing, £33 19s. 3d.; stationery, £34 6s. 7d.	68 5 10	
Postage, £34 5s. 9d.; do. affiliation, £6 16s. 8d.	41 2 5	
Refreshments at meetings	8 2 0	
Bank charges	1 1 5	
Law charges	1 6 0	
Progress medal	1 4 3	
Sundries	8 2 11	
		129 4 10
,, Exhibition—		
Rent, new gallery	200 0 0	
Wages, £17; lighting, £33	50 0 0	
Refreshments for soiree, judges, Press, &c.	45 11 5	
Advertisements, £68 10s. 6d.; printing, £23 1s. 3d.	91 11 9	
Postage, £24 12s. 4d.; clerical work, £25	49 12 4	
Catalogues	192 14 9	
Engraving medals, 13s.; judges, £5 17s. 6d....	6 10 6	
Lanternist, £8 8s.; frames, &c., £7 9s. ...	15 17 0	
Fitting electric lights	19 10 0	
Carpenter's wages and materials... ...	13 7 10	
Hire of chairs, £5 5s.; cartage, £4 17s. 6d.	10 2 6	
Hire of plants and sundries	9 7 6	
		704 5 7
,, Library and permanent collection		52 15 1
,, Journal—		
Printing	229 1 8	
Blocks	8 4 0	
Reporting	6 18 5	
Translating and sundries	3 4 4	
		247 8 5
On account of affiliation		78 4 7
Special meetings		12 13 4
Invested in Consols	195 1 0	
On deposit at bank	100 0 0	
		295 1 0
House exhibitions		7 2 3
Balance		538 19 6
		£2,580 12 0

ASSETS.

1901.	£ s. d.
Balance at Bank	538 19 6
Property (estimated)	695 0 0
Consols (nominal value)	700 0 0
On deposit at bank	100 0 0
One quarter's dividend	4 10 8
Subscriptions (outstanding estimate)	70 0 0
Due on account of wall space (exhibition)	10 0 0
	£2,118 10 2

LIABILITIES.

1901.	£ s. d.
Harrison, Journal	25 0 0
Due to affiliated Societies	72 10 3
Enlarging lantern on order	25 0 0
Catalogue of library	40 0 0
Balance	1,955 19 11
	£2,118 10 2

GEO. SCAMELL, Hon. Treasurer.

We have examined the foregoing account and have compared the same with the vouchers in the hands of the treasurer, and find the same correct.

January 18th, 1902.

FRANK E. SEARY,
WM. E. DUNMORE, Auditors.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JANUARY 30.—Mr. R. P. Drage in the chair.

Mr. W. Thomas opened a discussion on actinometers and their use, referring, in the first place, to the paper by Mr. Randall that had been read a month or two before. Actinometers, he said, could be divided into two distinct classes: one, in which an average has been worked out by repeated tests and development, taking the form of the exposure tables. Such an aid was more or less useful, but to anyone who required that his exposures should be reasonably successful, and that blank failures should be of the lowest proportion, it became a matter of importance that the guide upon which he relied should be reliable in the best sense of the word. Every set of exposure tables he had been able to put hands upon always had a fatal fault, and they were such as he would be very loth to depend upon if he valued his work at all. He thought he need only refer to one of the records shown by Mr. Randall to induce all who placed any reliance upon these tables to re-examine the question before going further. It was a record covering a long period of light action on a normal standard sensitive emulsion on paper, but it showed that extreme variations were occurring incessantly in the light action during a time of day when it might be ordinarily and reasonably taken that the light was of a somewhat standard character. These fluctuations of light activity occurred not at given times of day or year, but all through the day and year. The danger of basing exposure tables upon averages of these records was manifest. He preferred, therefore, to base his exposures upon that second class of instrument which gave the result of an actual test of the light itself the moment before exposing the plate. The actinometers before him were all of that character. As regards the difficulty of matching the exposed paper with the standard tints in this class of actinometer, due to fluctuations in colour as the atmosphere is moist or dry, he believed that quite recently Watkins had produced a paper that was reasonably permanent in character. The mere use of an actinometer of this class, however, was not all. When the light was tested one still had to apply the information thus gained before the exposure was to be read. One had to learn to decide when a subject could be called one of an average strength, and, lastly, when it could be similarly classed as regards colour. Mr. Thomas showed at this juncture three sketches, the first being one that would come under the term normal in the photographer's understanding. The exposure suggested by the actinometer test and calculations would be about correct for such a subject. The building up of a subject, however, must be taken to exercise a strong bearing upon the requisite exposure. Whether loosely built or closely compacted together was a vital question. The next sketch was of a subject which, under ordinary conditions, would require about half of the exposure required for the first; while the third, a panoramic view with no near objects, would require still less. What applied to landscapes such as these applied also to marine views, and here Mr. Thomas put in three typical sea pieces, which he again styled normal, medium, and abnormal as regards exposure required. The first sketch—waves and a cloudy sky—was the starting-point of normal. The second sketch differed in the presence of a barge at anchor. As a rule, photographers took no account of the non-actinic colour of such an object, with the result that its rendering was heavy and untrue, whereas the exposure to be given should have been based upon the presumption that the barge was to be rendered at its proper value. In another sketch, representing a squally day with a boat in the distance, everything was of an uniform grey tone, so that colour was less troublesome a factor, and the presence of the boat need not be taken into account. So much for strength of subject. The other factor to be accounted for was colour, and at this stage two oil sketches were displayed as typical of open landscapes. Yet, while being both open landscapes, the exposure that would admirably suit the one would be absurdly insufficient for the other, so different were they in the prevailing colours. Mr. Thomas proceeded to describe some tests of plates of different colour sensitiveness, and, in concluding his remarks, said that it was purposeless to suppose that one could separate any one part of his work from the others. Everything had to proceed together, and therefore the bearing of colour, strength of subject, and so forth, upon the adaptation of the actinometer as a guide to exposure was far-reaching. As regards colour alone, it was very important, because he looked to the time when they would have papers that were sensitive to more rays than ordinary bromide paper, similar, in fact, to the present dry plates, and thus acquire the power to gauge the exposure required from the point of view of colour as well as luminosity of subject.

Mr. P. Everitt, speaking of the Hurter & Driffield form of actinometer, said that he found it very satisfactory. As regards the Watkins meter and others of its kind, it had to be borne in mind that the light test given was for the time that was past, and not for the time during which exposure was proceeding. With the H. & D. system one had, truly, to make a calculation of the light, but that calculation was made at the instant of exposing, and therefore more likely to be reliable The H. & D. system was spoiled, as regards general use, by the fact that it was dealt with in papers of a scientific instead of a popular character; but if the instructions with the instrument were read, anybody could easily follow the system, which had a more solid basis than Watkins'.

Mr. A. Mackie said the essential difference between the H. & D. system and that of Watkins was that in the latter an actual test of the light value was made, and from that the exposure was calculated, whereas in the H. & D. system the exposure for a particular subject is calculated and the light guessed. He thought that a combination of the two systems would be the best solution of the problem.

Some further discussion ensued regarding the confusion in the matter

of the H. & D. marking of plate speeds by different makers. Mr. *Everitt* criticised a recent work of Dr. J. M. Eder, of Vienna, in which he dealt with a system of actinometry that was practically that of Hurter & Driffield, while withholding everything that would credit them with the initiation of the method. He described the method as H. & D. Germanised, and thought that some protest should be made.

PHOTOGRAPHIC CLUB.

JANUARY 29.—Mr. W. R. Stretton in the chair.

The hon. sec., in drawing attention to his programme, alluded to the gratifying fact that, since the reduction of the subscription to half-a-guinea, there had been an accession of twelve new members. He again urged upon the members that if every one amongst them would introduce but one new member the new policy of the Club would be amply justified. The fact that visitors also were always welcome at the meetings of the Club was one to which, he said, he could not give too much prominence.

Mr. J. W. Zaehnsdorf accompanied an exhibition of slides with a few comments on the very appropriate relationship between

THE ROD AND THE CAMERA.

As a fisherman and photographer of many years' standing, he had been able to prove the fact that the pursuit of fishy sport brought one into contact with charming scenes that the ordinary photographic tourist never chanced upon. All the photographs shown were taken by himself or one of his sons when on fishing excursions. Mr. Zaehnsdorf's remarks were of a particularly racy nature, not entirely free from the spirit of exaggeration which piscatorial pursuits, above all others, are supposed to induce in mankind. The pictures were of a wide variety of subject, and embraced salt as well as fresh water views in Ireland, Devonshire, Deal, and nearer home.

At the close of the photographic part of the evening's entertainment he showed upon the screen some specimens of scales from a variety of large and small fresh-water and salt-water fish. Some of the scales had been stained, the better to show their structure, and the instructive comments that accompanied them were very welcome.

A hearty vote of thanks to Mr. Zaehnsdorf closed the meeting.

CAMERA CLUB.

On Monday, the 27th ult., the subject brought before the Club was that of acetylene gas, and Messrs. Woodhall and Wyndham, members of the club, shared the duties of lecturer between them. The first-named gentleman opened the ball by giving a *résumé* of the history of acetylene, from its discovery in 1836 by Davy, to the synthetical production of calcium carbide between the poles of the electric arc. He showed how analysis of the gas gave 92.3 per cent. carbon and 7.7 per cent. hydrogen, and explained that acetone would take up 30 volumes of it. It was at one time suggested that the gas should be stored in this form, but one or two serious accidents gave warning that it was unsafe, and the mixture is now forbidden to be made. The lecturer next alluded to various experiments by Prof. Vivian Lewes, showing that the gas combined with several different substances with interesting results. The same experimenter had, by photometric trials, decided the light-giving value of acetylene as compared with sunlight, incandescent gas-light, etc. Particulars of these experiments are contained in the Cantor lectures given a year or two back by Prof. Lewes.

The synthetical production of calcium carbide dates from 1892, when Wilson procured it in the electric furnace instead of the metallic calcium which he hoped to find. Since that time large works had been installed in various countries for its commercial exploitation. There were extensive works at Leeds, and at the Falls of Foyers in Scotland. Central Europe found a home for many such factories, and large works were also to be found at Sweden.

Calcium carbide had its over-zealous friends as well as its enemies. It was perfectly safe if ordinary precautions were taken to keep it free from water, or damp in any form. There was no substance more greedy of water. By adding acetylene to oil-gas in the proportion of 20 per cent. the illuminating power of the oil-gas was doubled. He believed that acetylene had a great future before it, especially in country places where there was no coal gas, on board yachts, and for replacing oil-lamps on steamers.

It now fell to Mr. Wyndham to describe the different forms of generators and lamps which crowded the lecture table, some of which were shown in action. He divided these into two classes—automatic and non-automatic generators. In the automatic class the space for gas is limited, and therefore there must be some device for bringing the carbide away from the water when a certain quantity of gas has been evolved. In the non-automatic form of generator the containing vessel will hold the entire charge of gas which the carbide supplied to it will yield.

The essential points to attend to in dealing with the generation of the gas comprised low temperature, low pressure, and complete decomposition. The lecturer proceeded to point out how these conditions could be assured in generators of proper construction. Theoretically, one pound of carbide required for its full decomposition only half-a-pint of water, but, practically, much more liquid was required, principally because the operation was attended by the evolution of much heat. There were two ways by which calcium carbide could be treated, which rendered its use far more convenient than it would be otherwise. In the first of these the carbide has deposited upon it what the lecturer described as a hydro-carbon skin, but he did not explain the process by which this result is brought about. By the other system the carbide has added to it glucose, forming with the water a saccharate of lime. Calcium carbide so prepared is almost indestructible, is much safer to handle and to carry about from place to place.

Many questions greeted the lecturers at the close of their remarks, principally dealing with details of no general interest. Mr. Humphery, who occupied the chair, had used one form of lamp shown, on his yacht on the Norfolk Broads, and he spoke highly of its efficiency and ease of working. He also had a high opinion of a certain signalling lamp for the use of soldiers in the field. This was a bullseye lantern, comprising a generator for the acetylene and a convenient form of shutter in front. A hearty vote of thanks to the lecturers brought the proceedings to a close.

Mr. Cyril Davenport is always worth listening to, and is therefore able to secure an appreciative audience, even when the climatic conditions are as unsympathetic as they were on the last Monday of January. His subject, "Rings and Brooches," was not one which appealed to everyone, but there is no doubt that several of his audience were attracted by the beauty of the photographic illustrations; for Mr. Davenport has the way of going at any subject which he takes up with the vigour of an enthusiast, and illustrating it in unique fashion. That is to say, he obtains photographic transparencies from the original objects and colours them by hand by a process peculiar to himself. In this way he obtains very remarkable effects upon the lantern screen, and his audience may be said to be far better off with such pictures than if they had the original objects before them, for the pictures he shows are, in the process of projection, both highly magnified and brilliantly illuminated.

It is always a matter of interest to trace back the origin of any article in common use, to see how necessity for it arose, and to watch its gradual evolution from primitive forms until it reaches its modern perfected shape. We can trace such a growth in the brooch. When savages began to clothe themselves with the skins of animals, the necessity arose for some kind of fastening, and the pin, made of a fishbone or of wood, came into common use. Later on, bone pins gave place to pins of metal, and possibly many a prick and stab was suffered before it occurred to some inventive mind that the point of the pin might be protected by a chain or other device depending from the head of the contrivance. Hence, the pin gradually assumed the form of a brooch, and we may note that the common nursery or safety pin was, in the process of evolution, fashioned many thousands of years back. Mr. Davenport showed photographs of these early contrivances, and demonstrated in a very interesting manner their gradual elaboration, some of the examples being fine specimens of the goldsmith's and jeweller's art. More particularly was this seen in the handsome shoulder brooches, three or four inches in diameter, which have been found in various places and are greatly prized by collectors.

With regard to rings, Mr. Davenport pointed out that there was some difficulty in classifying them, and he had adopted a classification of his own. He roughly divided them into rings "official" and rings "personal," and these were again reduced to many sub-headings—the official rings, for example, including ecclesiastical, military, coronation rings, etc., and the personal comprising a number of different kinds too numerous to tabulate.

It is curious to reflect that the use of jewellery in the form of rings was long anterior to the adoption of clothing. Mr. Davenport did not venture on the suggestion that Mother Eve wore a nose-ring, or ear-rings, or toe-rings before she took to vegetarian raiment, but he was confident that savage humankind in general made use of such adornments before they began to run up their primitive milliners' bills. Before the use of metals and precious stones became comparatively common, these rings were comprised within narrow limits, but later on they were elaborated, both in design and with regard to wealth of material, until they assumed very gorgeous proportions. Some of the ecclesiastical or papal rings were of a huge size, for they were designed to be worn outside a thick glove. Most of these had a big sapphire as its principal feature, the cold colour of that gem stone being typical of the frigid attitude of the wearer towards all worldly temptations. The photograph of the coronation ring placed on the finger of our late lamented Queen aroused much interest. Here again the principal stone was a huge sapphire, but it was bridged by a St. Andrew's cross made of rubies. By some mistake the jeweller made it only big enough to go comfortably on the little finger, but the archbishop insisted that it should, according to ancient custom, be placed upon the middle finger. This was done, but at the cost of much suffering to the poor Queen, who, after the ceremony, had to place her finger in ice water before the ring could be removed.

Many such interesting anecdotes in Mr. Davenport's discourse served to give point to his remarks, just as the gems in the rings which he showed gave sparkle to the goldwork. We understand that he will shortly give an extended review of the same subject, in the form of a Cantor lecture, at the Society of Arts.

CROYDON CAMERA CLUB

THE above Club's lantern show, held on Wednesday evening, 29th ult., drew a good attendance at the Public Hall, Croydon.

The President (Mr. Hector Maclean), as usual, acted as spokesman for the slides, and generally "bossed" the show. In the first part notable sets were those by the following:—Councillor J. Noaks contributed a most interesting series, taken in connection with the Photographic Convention, illustrating the Oxford Colleges and Warwick Castle, etc. Mr. Maclean was represented by a series of focal plane shutter studies representing diving, leaping, tennis, etc. He explained that

they were taken with a Goertz-Anschutz hand camera, using an extra rapid Ilford plate, some of them receiving as little as 1-600th of a second.

A number of remarkable science photographs, lent by Sir Henry Trueman Wood and Professor Worthington, aroused much interest, as well they might, picturing, as some of them did, photographs of phenomena invisible to the eye, taken in 3-1,000,000ths of a second.

In the second part the chief points of attraction were Mr. H. E. Holland's refined pictorial scenes taken in Devonshire, Yorkshire, and on the Rhine, and Mr. J. Gregory's splendidly-rendered cacti and orchids. Other members who were worthily represented were Messrs. Thorp, Aris, Harpur, Tallack, Edgar, and Kenneth Mees.

Part the third was occupied by a really brilliant exposition by Mr. T. K. Grant of the Lumière tricolour process applied to lantern transparencies. Mr. Grant, in unusually clear and commendably condensed language, explained the underlying theories of the process, and also described how the photographs were produced. The examples which were shown on the screen were, without doubt, the best which have as yet been exhibited in Croydon, and the audience, by their frequent applause, indicated that they were much pleased with these delightful colour photographs. At the termination of Mr. Grant's display those present approved of a hearty vote of thanks by unusually sustained applause.

SOUTHSEA AMATEUR PHOTOGRAPHIC SOCIETY.

There was a very large attendance at the Southsea Amateur Photographic Society's Rooms in Pembroke road, last week, when the medals for the year were presented by the Mayoress (Mrs. W. T. Dupree). There were also present the Mayor (Mr. W. T. Dupree), Mr. G. Lewis (President of the Society), Colonel Barrington Baker, Dr. Newby, and others. The first part of the programme was a lecture given by Mr. W. F. Slater, late secretary to the South London Photographic Society, who gave an interesting account of a journey up the Rhine, which was taken by that society some time ago. The views were much admired, the splendid scenery and Germany's beloved river showing up extremely well in the photos. In the interval, Mr. G. Lewis introduced the Mayoress, who presented the medals and certificates. The gold medal, given by the ex-Mayor (Alderman A. L. Emanuel) was won by Mr. L. J. Steele. The other medals are very handsome, the design, which embraces the historic old Victory on one side, and the Borough Arms on the other, being the work of the courteous and energetic secretary, Mr. F. J. Mortimer. At the close of the presentation, Mr. Lewis asked the Mayoress to hand to Mr. Mortimer, on behalf of the members of the club, a handsome camera in token of their warm appreciation of the work he had done for them and the Society. Mr. Mortimer having responded with becoming modesty, Mr. Lewis proposed a hearty vote of thanks to the Mayoress for having so kindly consented to distribute the medals that evening. The Mayor, in responding, caused some amusement by the relation of his experiences as an amateur photographer whilst on an excursion down the Mediterranean, when he spoilt a huge number of plates. In conclusion, he promised a gold medal to the society for competition in the coming year.

NORTH MIDDLESEX PHOTOGRAPHIC SOCIETY.

January 29.—Mr. C. H. Oakden gave a lecture on "Architectural Photography."

In dealing with the apparatus required, the lecturer said that a reversing back working all round was very useful in cases where one had to be close up against a wall or in awkward corners.

A rising front with a great range was necessary. To obviate the reflection of a bright object near the margins of the plate that one sometimes gets, the framework of the back should be bevelled, so that the reflection is turned off inside the camera instead of on to the plate. The focussing screen should be ruled in squares, which helps towards getting the subject true on the plate. A lens of a focus equal to the base of the plate was very useful in this work.

When halation is to be feared, develop quickly, and keep the image upon the surface of the plate

Backed plates were essential.

Mr. Oakden showed a large selection of prints of architectural subjects, and a number of slides, among which were many examples of ancient Irish ruins, and a fine selection from English cathedrals.

News and Notes.

The Last Total Eclipse and the Corona.—In "Knowledge" for February, Mrs. Walter Maunder, who, with her husband, journeyed to Mauritius to observe the last eclipse, describes some peculiarities of the corona. Mrs. Walter Maunder writes:—"The corona of 1901 was of the most pronounced minimum type, its form was simpler than any of which astronomers have had experience since 1889. This circumstance, though it may seem to detract from its beauty and interest in some respects, is not without its advantages, as the relations of many of its details can be more distinctly followed and their significance better appreciated. Especially is this the case with regard to the structures immediately round the two poles of the sun's axis. At times of maximum, the great synclinal rays are found, not merely in the neighbourhood of the sun's equator, but all round the limb, and the polar rays are obscured by the more conspicuous type of formation. But in an eclipse like that of last May, the polar regions are left absolutely free except for the beautiful and regular tufts of light which have earned for themselves the appropriate name of 'plumes' or 'panaches.' . . . The indications of relief in the corona, slight though they may be, are of importance, as they tend to remind us that the corona, in spite of that essentially flat appearance which it generally presents, must in reality have a great extension in the line of sight. In the coronæ of 1900 and of 1901—and we might add, also, in the more complicated one of 1898—the great mass of the corona was comprised in a very few striking formations of the character known as synclinal groups. In 1900, three of these were recognised; in the other two years, four. On all three occasions these structures had the most enormous extension, reaching on the average a distance of about three solar diameters from the centre of the sun. It is clearly not conceivable either that the structures which were visible were exactly where they appeared to be—in a plane at right angles to the line of sight—or that the moon concealed from us at the most more than two or three structures of similar character and extent. The picture, therefore, that is conjured up to our mind of what would be visible to us, could we look down upon the sun and see the corona on all sides at once and in full relief, is that of about half-a-dozen or so of these monstrous excrescences distributed irregularly round the sun; whilst about one-tenth of the solar surface—that immediately surrounding the two poles, would be given up to a few 'plumes'—few, that is to say, relatively to the area engrossed by them."

Burnham Beeches.—Twenty years ago the London City Corporation chuckled and was puffed up with pride. It had "blockhoused" the ubiquitous villa-builder out of Burnham, and the famous Beeches, pride and glory of our last remaining true forest lands, were safe within an area of 380 acres, dedicated to the public for ever. To-day this same Corporation is allowing the delicious wilderness of copse, sapling, underwood, and giant tree to be tinkered at by someone who has a taste for the Noah's Ark forest of red spindles and nice round or conical tops painted green; or mayhap he is smitten by the charms of a Dutch polled avenue laid out with a T-square and spirit-level. A Press interviewer got a gentleman who knows his beeches and his beauty spots of English woodland by heart to utter caustic sentences on the lines indicated, only with more "bite" in them. "The Corporation," he said, "after saving Burnham from the moths are letting it be destroyed by vandals." Someone with a fad for rounded tops to trees has been meddling with the beeches. The process has all the simplicity of genius. "You can't have well-rounded tops if the trees are too close together; therefore, fell trees without rounded tops, and so give room for the survivors to copy the mushroom." Readers of 'Alton Locke" know what magical duty can be revealed to the town dweller in even a tangle of brier-bush and fern and long grass. The "expert" improvers of Burnham go on the line of bill-hooking out of existence brushwood, undergrowth, "and all such rubbish, which can never make good timber. Also hew down a dozen graceful birches to ensure better chances for one beech sapling." To destroy the birch, that slender pillar of glistening silver or warm crimson, is to wipe out a part of the delicate charm of Burnham. Birch trees, however, are desperately stupid. They do not develop well-rounded tops. Hence they are going in cartloads to the timber dealer. The Press artist informant was wild. He wants to know if the public desire the "vagrom freedom" of Burnham Beeches and the preservation of such an unique relic of Saxon days, or if taste runs to weird round-top trees at so many paces intervals. If the former, he calls on the public to protest loudly against this spoliation of our matchless forest ere it had been cut and carved down to the level of a suburban front garden. We do not want a park at Burnham. It is expected that the Royal Academicians will at their meeting this week raise the voice of the artist against the "trimming" process, and appeal to the Corporation.—"Staines and Egham Times."

Patent News.

The following abridged description is specially drawn for the British Journal of Photography by Messrs. Hughes & Young, patent agents, 55 and 56, Chancery Lane, London, W.C., who will give advice and assistance free to our readers on all patent matters.

Patent Applications.—No. 1,130.—J. H. Dallmeyer, Limited, and Edgar Clifton, Chancery Lane. "Improvements in photographic cameras."

No. 1,145.—John Henry Smith, Chancery Lane. "Improvements in photographic exposure meters."

No. 1,178.—John Edward Thornton, Rokeby, Altrincham. "Improvements in the manufacture of cameras."

No. 1,226.—Erich Ehlermann, Chancery Lane. "An improvement in the production of grained photographic pictures."

No. 1,977.—Charles Jesse Ashworth, Chancery Lane. "Improvements in photographic camera apparatus."

Patents Illustrated.—No. 15,767.—Stands, photograph and the like. Patentee: H. Allday (trading as Horton & Allday), Warstone Lane, Birmingham.

A frame or stand for displaying pictures, photographs and the like has an opening to receive the photograph, etc., the opening being closed at the rear by a hinged or jointed backing. The backing is provided at the centre with an aperture, in which is fitted a disc to which the leg or support is hinged, the disc having a flange or flanges at one or both sides, and being adapted to be rotated so that the frame may rest with the longitudinal axis in the vertical or horizontal position. The disc may be square or it may be replaced by a bar having its ends curved to the

same radius as the bearing aperture, and more than one leg may be used. The hinged end of the leg is bevelled to serve as a stop.

No. 17,429.—Tripod camera-stands. Patentee: G. W. Hall, 221, E. Street, Northwest, Washington, Columbia, U.S.A.

Relates to a ball-and-socket joint for the top of a tripod stand to enable the camera to be set at any required angle. The ball to which the camera is attached by the screwed peg is placed in a cup fixed to the head of the tripod stand. When the camera is set at the required angle, it is clamped by a lever pivoted to a ring forming the top of the cup, the lever being actuated by the cammed end of another lever. A modification is described, in which the ball is gripped between the pivoted levers.

No. 17,581.—Photo-mechanical printing. Patentee: A. Brandweiner, 20, Sudstrasse, Leipzig-Oetzsch, Germany.

Relates to a method of producing half-tone negatives or positives for photo-mechanical printing. The effect is produced by gradually enlarging and reducing the lens diaphragm during exposure, the usual hatching-screen having been placed in front of the photographic plate in the camera. The aperture of a diaphragm of the iris type is regulated by a ring with a toothed periphery into which the toothed end of a lever gears. The lever is pivoted and is actuated by a peg which can be clamped at different distances from the axis of a uniformly-rotated disc. The time in which the diaphragm is opened or closed is regulated by setting the pin by means of the scale alongside the slot, or by changing the starting-point of the disc by means of the curved scale on the top.

No. 17,986.—Patentees: A. A. Borooks and G. A. Watson, both of 23, Tower Buildings, Liverpool. Relates to a change box or dark slide chiefly applicable for use with films, but which may also be used with plates.

The films are placed in an inner box or envelope, the lower end of which is normally closed by a removable cap. The envelope or is pushed into a box or shutter, and fastened by a screw and nut. The box slide in the outer frame of the change box or dark slide, and acts as a shutter by closing the exposure opening in the front of this frame. The front film has a perforation near the bottom, a little to one side of the centre line.

No. 18,007.—Photography. Patentee: Kodak, Limited, 43 Clerkenwell Road. Relates mainly to folding cameras, in which the lens is adjusted upon the door hinged to the frame.

The lens frame is adjustable vertically upon the uprights by spring humbs, catches engaging with the annular grooves. The lens may be placed in a central position by placing the lower end of the springs in the notches. The uprights are carried by a slotted plate, which may be adjusted laterally on the carriage. The plate is clamped by a loose cam-plate, which may be rotated slightly between the grooved head of a pin and a fixed plate. The cam plate is rotated by a spring lever with a thumb-piece. The carriage slides longitudinally on the plates, which are fixed together, and is clamped in position thereon by cam-plates on the pin in a similar way to the plate. A tubular screw with a milled head clamps the way.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

THE SALE OF POISONS.

To the Editors.

Gentlemen,—It is not improbable that a Government Bill will be introduced into the House this session dealing with the sale of poisons. Under the Pharmacy Act of 1868 no one is allowed to sell any of the poisons enumerated in the Act unless he is a pharmaceutical chemist, under a penalty of £5, which goes into the pockets of the Pharmaceutical Society, and that body is always on the alert to enforce its rights, as many photographic dealers and others know to their cost. The Privy Council have now appointed a Poisons' Committee to take evidence on the subject and report. The committee is composed of the following gentlemen:—Sir Herbert Maxwell, M.P. (chairman), Mr. Alex. Cross, M.P., Professor T. E. Thorpe, Professor W. A. Fielden, Dr. Thos. Stevenson, Mr. William Martindale, and Mr. J. H. Harrison, of the Privy Council Office. The Pharmaceutical Society have presented witnesses for examination before the committee, so have the Traders in Poisons and Poisonous Compounds for Technical and Trade Purposes Protection Society. Several independent skilled witnesses, and departmental witnesses, have also been examined. Last year you called attention to the formation of the latter society and its objects, and that it had framed a Bill for presentation to Parliament. The object of this Bill was to enable anyone, duly licensed by the Privy Council, to sell poisons employed for trade or technical purposes upon his complying with the terms of the Pharmacy Act of 1868, as regards entry in books kept for the purpose, labelling, etc., precisely the same as the pharmaceutical chemist has to do. One cannot well see that any person, duly licensed, cannot do this as well as a pharmaceutical chemist, when the poison is required for trade or technical purposes, and not for therapeutic or medical use, nor for the preparation of medicines. Of course, the Pharmaceutical Society do not look with favour on the proposal, as it will take away from the chemists some of the monopoly they now enjoy. Photographers and many others would not be sorry to see this, or a similar Bill, carried, as they would then be enabled to obtain such scheduled poisons as they require for their work at a more moderate price than they now often have to pay for them to pharmaceutical chemists.—I am, yours, etc.,

A Photographer and Dealer.

January 25, 1902.

[This letter was unavoidably held over from last week.—Eds. B. J. P.]

To the Editors.

Gentlemen,—I have received Mr. Dobbs' long letter, and though I earnestly desire to see established soon absolutely free trade in scientific and technical poisons, I desire to state why I do not see my way to support the movement with which this gentleman is associated. He proposes to substitute one monopoly for another. He proposes to license and register non-pharmaceutical retailers of poisons in sealed packages. He advances the plea of the safety of the public with the same ardour as the philanthropic druggists. I contend that there are far more casualties through the sales of poisons by druggists than there are by all the wholesale and retail sales of poisons for scientific and technical purposes. There is no additional safety conferred on the purchaser of a bottled or sealed poison by the benediction of a druggist or a licensed grocer.

The danger lies in the careless and ignorant handling of the poison after purchase. Neither the Privy Council nor the Pharmaceutical Society can prevent the free access of the public to poisons whenever it wants them, nor can these august institutions, with all their powers, very materially help or hinder the education of the public in their proper use. The same risk attaches to a poison whether sold in a sealed package or in bulk. It becomes bulk when the package is broken for use, and to the user, his family, or his assistants it matters not what manner of vendor sold it when an accident happens through its misapplication. I am for no half-measures. It is only when a united effort is made by an aroused public that we shall see the last of the monstrously absurd monopoly now enjoyed by the druggists, and we shall then have what is so much needed.

Free Trade in Poisons.

PLATES DEVELOPED BY TIME.

To the Editors.

Gentlemen,—I have read with much interest Mr. Harold Baker's article in your issue for January 24th. There is no doubt that knowing the speed of plate in use, and giving the correct exposure, it is possible to develop in the way Mr. Baker says. I hardly see, however, how the system is to be used in everyday studio work. In the first place, as Mr. Baker is aware, it is impossible to always give the correct exposure in studio work. There are so many things to take into account. Nervous people, children, groups, white dresses and black dresses, sometimes both together, sitters in failing light, and so on. In a busy studio one is bound to get all sorts of exposures in a day's work, and a little judicious forcing or holding back makes all the difference at times. Then Mr. Baker says it does not seem to make any difference whether the developer is concentrated or diluted, but I think it is the experience of most operators that it makes all the difference in the world where strong contrasts are to be dealt with. Take an everyday sitter, a lady in a white dress, and a large black "picture" hat. In the first place what is the correct exposure? The hat says ten seconds, the dress says two. You cannot give both, but you must give enough to get detail in the hat, so to your certain knowledge the dress is over exposed, and brains mixed with your developer will remedy it. I really cannot see how anything but judgment can give best results in studio work.—I am, yours, etc.,

H. E. S.

Watford,
February 1, 1902.

A SUGGESTION.

To the Editors.

Gentlemen,—I enclose a cutting from last week's "People." It seems to me a very good suggestion for any photographers who are dissatisfied with their lot, to start either a tobacco store or soap store with very little outlay.—Yours truly,

"Wide Awake."

Camden Studio.
Adjoining New Theatre,
Cambridge, January 29, 1902.

THE ARTIST'S REPLY.

"A funny story about Phil May is going the round of artistic circles. He received not long ago a circular letter from an American business house engaged in the sale of dried fruit, inviting him to

compete for a prize to be given for the best design to be used in advertising their wares. Only one prize was to be given, and all unsuccessful drawings were to become the property of the fruit men. After reading the circular Phil May sat down and wrote the following letter:—

"The Manager, ——— Dried Fruit Company.

"Gentlemen,—I am offering a prize of half a crown for the best specimen of dried fruit, and should be glad to have you take part in the competition. Twelve dozen boxes of each kind of fruit should be sent for examination, and all fruit that is not adjudged worthy of the prize will remain the property of the undersigned. It is also required that the charges on the fruit so forwarded be paid by the sender. Yours very truly, ——."

"ALFRED TOWER."

To the Editors.

Gentlemen,—We see a correspondent enquiring for views of King Alfred's Tower. We have photos in all sizes, lantern slides, etc., of King Alfred's Tower, and numerous other views of Stourhead and Stourton Estates, etc., etc We are the nearest photographers, and shall be pleased to supply any views in any process or lantern slides at very moderate prices. Thanking you, we beg to remain yours truly,

E. Goodfellow.

47, High Street, Wincanton,
and Sturminster Newton,
January 28th, 1902.

THE PLANCHON DAYLIGHT SPOOLS.

To the Editors.

Gentlemen,—We herewith send you pricelist of the Planchon brand of Daylight Loading Spools, which we are now placing on the English market. These spools would have made an earlier appearance in England but for the fact that the manufacturer has hitherto been unable to cope with the Continental demand; a difficulty which has now disappeared through the erection of a new factory. The advantages claimed for these spools lie in the patented "Enamelled Paper," which is fully the protection to the film surface claimed, and the Lumière Emulsion, which requires no recommendation from us. Samples, which we are now awaiting for your trial, will be sent you in the course of a few days. In the meanwhile we should be much obliged if you would do us the favour of drawing the attention of your readers in a preliminary notice to the advent of the Planchon Daylight Spools upon the British market.—We are, yours truly,

L. Gaumont and Co.

25, Cecil Court,
Charing Cross Road, London, W.C.
January 29th, 1902.

STEREO-MICROGRAPHY.

To the Editors.

Gentlemen,—As Mr. Pringle says, the method of obtaining stereo-micrographs by means of a tiltable stage is considerably older than this century. Professor Wheatstone originally suggested it in the Transactions of the Microcopical Society for April, 1853, together with the alternative, but less practicable method of rotating the tube about the object.—I am, yours, etc.,

J. Dormer.

January 31st, 1902.

To the Editors.

Gentlemen,—Possibly a few words from me may tend to set the tilting stage nearly level. My friend Mr. Pringle, in his felicitous communication in your last issue, has, I think, made a very shrewd guess. On referring to Dr. Beale's excellent manual, "How to Work with the Microscope," for the frontispiece of which I was responsible in 1864, I found several paragraphs relating to the methods for obtaining stereo-photomicrographs; also how I constructed my tilting stage on the principle enunciated by Professor Wheatstone, Trans. London Mic. Society, April, 1853. Mr. Pringle has quite correctly stated that it proved effective in the hands of your old correspondent.—Yours faithfully,

R. L. Maddox.

Greenbank, 45, Belmont Road,
Portswood, Southampton.
February 1st, 1902.

MYSTERIOUS SUPPLEMENTARY FIGURES.

To the Editors.

Gentlemen,—The letter in yesterday's Journal, signed "Professional," reminds me of a similar experience which occurred to me some years since. Before starting for a tour, I ordered a stock of plates direct from the makers—a well-known firm. I tested those for my stand camera, and finding them quite satisfactory, omitted to do the same with the quarter-plates for hand camera. Fortunately, from a photographic point of view, illness obliged me to return home after having exposed only a few plates in the hand camera, for they developed mottled all over, and fogged round the edges. I wrote to the makers, suggesting that they had sent me old stock, but they assured me that the plates had been coated expressly for my order. I used the remainder of these plates for cloud negatives, exposing from one of the upper windows of my house. On many of the negatives there appeared at one end the ghost of the side of a house with, in some instances, a portion of the roof. There is nothing of the same shape near which I might have inadvertently included; and, besides, the clouds show through. The strongest believer in spiritualism can scarcely contend that there are spirits in brick walls, departed or otherwise. Allowing the statement of the plate makers to be true, there seem to be but two ways of accounting for the appearance—either the image was on the glass before coating, or it was caused by mirage; though the latter is scarcely probable, as the plates were not all exposed on the same day.—I am, yours, etc.,

J. Tilfor.

231, Elgin Avenue, Maida Vale.
February 1st, 1902.

THE ACETYLENE ASSOCIATION.

To the Editors.

Gentlemen,—Under instructions from the Executive of the Council, I have the pleasure to hand you a preliminary copy of the book containing the Memorandum and Articles of Association, with list of the original honorary members and original members of the Council.

A perusal of this small handbook, with the accompanying printed résumé of the proceedings in the initial stages of the Association, will give a general idea of the constitution and aims of the Association. Any further information you require I shall he happy to afford you, also to co-operate with you towards attaining any object in which we may be jointly interested with your readers.—I have the honour to be, your obedient servant,

Lacey Downes,
Secretary pro tem.

11, Ironmonger Lane,
Cheapside, London, E.C.
January 21st, 1902.

[An explanatory paragraph on this subject appears in another column.—Eds. B.J.P.]

MESSRS. CLEMENT AND GILMER'S LONDON BRANCH.

To the Editors.

Gentlemen,—We beg to inform you that owing to the greatly increasing demand for our specialities, and for the greater convenience of our customers, we have found it advisable to open a show-room in London, and suitable central premises have been taken at 1, 2, and 3, Holborn Circus, E.C. We have secured the services of Mr. C. M. Gibson as our agent and representative.—We remain yours faithfully,

Clement and Gilmer.

140, Faubourg St. Martin, Paris,
February 3rd, 1902.

Answers to Correspondents.

*** *All matters intended for the text portion of this* Journal, *including queries, must be addressed to* "The Editors, The British Journal of Photography, 24, *Wellington-street, Strand, London, W.C.' Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* Messrs. Henry Greenwood & Co., 24, *Wellington-street, Strand, London, W.C.*

Photographs Registered:—

W. B. Bates, 17, Northgate, Sleaford. *Photograph of a Centenarian.*
G. Boucas, 120, Mile End Road, E. *Photograph of J. Cooke.*
J. W. Powell, 8, Swan Terrace, Penygraig. *Two Photographs of Rev. D. C. Jones.*
W. Rochard, Tranquil Place, Bodmin, Cornwall. *Photograph of Mayor, Aldermen, and Town Council of Bodmin presenting Address.*

Copyright.—J. W. P. asks: "1. In copyrighting a photograph, does that reserve the sole right of publication to myself, for all sizes and processes? 2. Can I give permission to any person to reproduce? 3. Which is right, Copyright or Registered, to mark the cards?"—In reply: 1. Yes. 2. Yes. 3. Both optional, and neither imperative.

Address Wanted.—J. H. writes: "On Page 682, in your Photographic Almanac List of Text Books, I have tried to get 'Artistic Lighting,' by James Inglis, price 4s. 6d., but can't get it; they say it's not known. Would you be kind enough to say, through your weekly Journal, where it can be got?"—In reply: The "Photo-Beacon" Publishing Company, Chicago, U.S.A.

THIN NEGATIVES.—G. CLAYDON.—The thinness of the negatives sent is not due to the plate or to the developer used, but doubtless to the cold weather. When the developer is cold, the development is very slow, and a long time is necessary to get density. See that the developer is not less than 65 deg. F., with the remainder of the plates, and we have little doubt they will yield as good negatives as those you have done before.

TONING BROMIDES.—H. H. asks: "What formula would you recommend for toning bromides to sepia?—In reply: The hot alum bath will yield sepia tones. It is as follows:—Hyposulphite of soda, 9 ounces; alum, 1 ounce; water, 100 ounces. It must be used warm, from 110 deg. to 115 deg. Fah. Or the Uranium bath may be emplayed—Potassium Ferridcyanide, 20 grains; water 20 ounces; acetic acid, 1 ounce; 10 per cent. solution of nitrate of uranium, 4 drachms.

KEEPING CARBON TISSUE.—"BICHROMATE" writes: "I saw your notice of the Autotype Company's preservative case. Would it not do as well to keep the tissue in a platinotype preservation case with chloride of calcium, as I have one?"—In reply: The tissue would keep as well in it, but you would probably find a difficulty in unrolling it for use without its cracking on account of its dryness. The advantage of the case referred to is that the tissue is retained perfectly flat, so that it need not be bent in putting it on the negative.

COPYRIGHT QUERY.—F. H. writes: "I have been requested to copy the enclosed photograph, but as it is marked 'copyright' I do not quite know what to do. Could you give me the present address of the publishers? If not, what would you advise me to do?"—In reply: The photograph is marked "copyright," and we have but little doubt but that it is. We should not advise you to copy the picture until you have assured yourself that it is not copyright. The name and address of the publishers is stamped on the mount, and we are not aware that they have changed it.

DISSIMILAR PHOTOGRAPHS ON ONE PLATE.—W. E. S. writes: "I have a negative with two different photos on the one plate, which is a ½ plate. Will you kindly state how this is obtained, and whether it can be done with a ½ plate camera?"—In reply: Simply fit a diaphragm in the camera, as most modern half plate cameras that are adapted for stereoscopic pictures are fitted with. Then fit a sliding front, carring the lens, on the front of the camera, so that when half the plate has been exposed the lens is slid forward, and the other half exposed. Or a repeating back can be used.

COPYRIGHT QUERY.—"CHURCH" says: "In the autumn of last year I took, for a clergymen, four views of a church and its surroundings, charging him thirty shillings for the work, nothing being said at the time about copyright. I now find that the pictures have been published in an illustrated paper, and no mention made of my name or my permission asked. If I were to register copyright now, could I proceed for damages? I expect the clergyman supplied the prints, as he had several copies of each."—In reply: Certainly not. You have no copyright in the photographs, as you were paid for taking them by your customer.

SUSPECTED MOUNTS.—"DOUBTFUL" writes: "During the last year or two, lots of my prints have gone yellow like those herewith, and I cannot make it out, unless it is the mounts. I send you three, and shall be glad if you will kindly test them to see if they are the cause; and, if so, have I any claim on the firm that supplied them. My printer is a very careful girl, and I know the fault does not lie with her."—In reply: We see nothing in the prints to lead us to suppose the mounts are at fault; but we do not undertake the testing of mounts. If you want them tested you must send them to an expert, unless you do the work yourself. See leader on this subject on another page.

STUDIO BUILDING.—H. A. P. writes: "I herewith enclose plan and section of a studio that I have recently built (two rooms at the top of the house knocked into one, and a 9 by 8 feet window at 45 deg., in portion E in plan). I have lined portion E with half-inch boards, and would like to lightly stain and varnish, but am afraid I should have trouble with reflections from G and H in plan. I should be glad if you will kindly give me your opinion on the matter. If you advse painting, kindly state the best colour for same."—In reply: We do not think you will be troubled with reflections from the varnished and stained wood. But if you have any fears on the subject, the wood might be painted. A darkish French grey would be a suitable colour for the purpose.

DISCOLOURED ENLARGEMENT.—"BROMIDE" writes: "I should feel obliged if you will kindly let me know why the enlargement enclosed has gone such a peculiar colour since it has been dried. When we took it from the washing-trough it was, as you will see, rather light, but otherwise of the usual colour. We might mention that when the acid solution was added to the fixing bath it caused it to turn quite thick and milky in colour. The formula for that solution was 2oz. sul. soda, ½oz. sulphuric acid, 10oz. water. Half an ounce of this solution was added to each pint of fixing bath."—In reply: the tint is no doubt due to the fixing bath being used in the turbid state. In future, allow it to stand until the precipitate has subsided and the solution is clear.

MAKING AN ENLARGER.—A. B. writes: "Will you kindly inform me how to make an enlarger (daylight)? I have a Watson's ½-plate Premier camera, and if possible to do it by this camera, what size can I enlarge to?"—In reply: The simplest way is to cover up the whole of the window of a room, except a space a little larger than the largest negative to be used. Against this arrange the back of the camera, with the negative in the slide and the shutter drawn. The image will then be projected into the room, where an easel, carrying the bromide paper, can be arranged to receive it. A piece of white card may be put outside the window, at an angle of 45 deg., to reflect the light from the sky through the negative. The camera will enlarge to any size, according to the length of the room.

STUDIO BUILDING.—E. L. writes: "Will you kindly give me a few hints respecting my studio and the arrangements of blind in order to get fairly good picture? 1. Studio is 20 by 12 in lnegth, 12 feet wide, eaves 8 feet, centre 11 feet, 11 feet of side and top light. Do you consider this studio suitable for good work? 2. I find the top light too strong. What are the best kinds of blind to use to make the light softer and give good effect? 3. What kind of blind do you think I should want to give a soft shadow, so there is not so much contrast? 4. Do you consider a Cook's series lens 111 suitable for studio and outdoor work in general?—In reply: 1. Yes; but it is a little short for portraiture. 2. You do not say the aspect of the studio, but a thin, white blind will soften the top light. 3. For the side, a white or dark blue, according to the aspect. 4. Yes; but it will be slower than the ordinary portrait lenses.

PHOTO ENGRAVING.—W. B. B. writes: "Can you inform me what process is used to photograph on to copper plates, so that they can be engraved through the film? Also, can the carbon transfer process be used, and what would be the medium to coat the plate with? There is evidently some way to put a positive photo on to the plate, and it does not chip while being engraved, and it is very thinly coated; the film under the photo is chocolate colour. I have a large order to execute for an engraver, but I do not yet know how to proceed."—In reply: We are not quite sure that we clearly understand your query. By the usual photogravure process the film is etched through by a solution of perchloride of iron, the plate having previously had a coating of bitumen applied to it in the usual way, in the "dust-box." In this case, the film under the carbon film is of a chocolate colour. If this is the process you are inquiring about, we should advise you to get Mr. Denison's work on that process.

OPALINES.—THOMAS LEIGH writes: "I have a difficulty in making opalines, and I should be very glad if you will kindly assist me. (1) I use Ilford P.O.P., toned as directed by the makers, and fixed. After fixing and washing, I treat prints with an alum bath, as I generally squeeze them on plate glass. To mount them on the opaline glass, I first immerse prints, which have been previously dried, in water. When limp, I place them in a hot solution of gelatine for a few minutes, and after heating the opaline glass to receive print, I float print on to it and squeeze the excess of gelatine off, and place to drv. When dry, I glue them to the plush support. Now, my difficulty is this. After being in stock a short time, I find that the print gradually leaves its glass support until in time it comes off altogether. I should be glad if you could suggest a remedy. (2) Could you recommend a good book which gives reliable information on the subject of the manufacture of opaline? I have several good books, including the "Dictionary of Photography," but none of them treat the subject very fully."—In reply: "(1) One cause of the trouble may be that the "opaline" glass is not thoroughly clean when the print is applied. We should advise you to omit the squeezing of the print on to glass to dry before mounting it on the opaline, as there is no necessity for it. If this glass were treated with anything to facilitate the stripping, it may have something to do with the non-adhesion in the final mounting. (2) There is no book devoted to the subject of "opalines."

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*** *The Editor can only be seen by appointment.*

*** *We do not undertake to answer letters by post.*

EX CATHEDRA.

Photographic Portraiture in One Generation.

The immense importance attained by photography as the entire result of discoveries during a single life is difficult to understand by the younger generation, but that it is so is well shown by an obituary notice recently published in America. We read that at Hastings, Hudson, U.S.A., the death occurred of the first person who ever sat for a photograph. "This Miss Draper, an old lady of 95 years of age, was a sister of Dr. John Draper, the discoverer of the process of making the daguerreotypes in a few minutes. A great sensation was caused in artistic sets in 1839 by the picture of 'Dolly Draper,' with the startling information that the subject only sat for about six minutes. This original picture is now in the possession of the descendants of Lord Herschell, who became its owner at the time." We give the paragraph literally, not for any historical account of the shortening of the daguerreotype exposures, but as showing the marvellous strides shown. The contrast between the marvellous six minutes of then and the photograph, for example, of a flying bullet of the present time, or, in portraiture, of a cinematograph picture, may be called stupendous.

* * *

Different Action of Light upon Chlorine Silver and Bromine Silver.

Modern scientific treatment of the action of light has shown how utterly impossible it is to predict results of light action upon one haloid salt of silver by reason of the results produced upon another. Time was when it was considered sufficient to indicate the actual action of light by one curve drawn upon a spectrum diagram. It has long been shown how misleading and false this would be if acted upon. Take so simple a matter apparently as sensitised albumenised paper. Sir W. de W. Abney long ago showed that silver chloride and silver albumenate were acted upon quite differently by the various portions of that part of the spectrum once called the actinic, and these differences could be multiplied *ad libitum*. We are led to these remarks by a singular case in point recently described by Herr V. von Cordier, who, by means of a specially-constructed apparatus, investigated the action of bromine upon metallic silver illuminated by an arc light, an incandescent gaslight, and diffused daylight. He found that while light assisted the combination of silver and chlorine, it had the opposite effect in the case of bromine; it actually hindered the combination. He further found that in the presence of carbon dioxide, light did not produce an evolution of bromine from bromide of silver.

* * *

Solubility of Some Silver Compounds.

The extent to which the less soluble salts of silver can be taken up by water cannot be said to be known with exactitude, and some recent pronouncements upon the subject may with advantage be here given. Herren Friedrich Kohlrausch and F. Dolezalik have ascertained these factors with regard to silver iodide and bromide by observing the increase in the conductivity of water shaken up with these compounds. They found that saturated solutions of silver bromide and iodide respectively contained 0.107 mg. and 0.0035 mg. of the salt per litre. These values are smaller than those previously obtained, but, owing to special precautions taken, are probably more trustworthy, especially as they are more in accord with electrical data obtained with a similar end in view. Silver sulphate *inter alia* has ben examined by Herr Karl Drucker, who, stating his results in grammolecules per litre, gives 2.57×10^{2} (or, in other figures, 0.0257). This proportion is very slight, and it is an open question whether a solution of nitrate of silver will take up more than plain water. This is not a purely academical question by any means, for an excessively minute quantity of this salt in a silver bath for collodion plates will work great mischief. Many years ago we showed that the presence of sulphate of silver in the bath was attributable to this defect. We are not aware of any other experiments than those made by ourselves on this subject having been recorded, but we conclusively showed that Mr. Henderson's cure by sulphate of baryta added in comparatively large quantities was owing to its getting rid of the sulphate in solution, and so preventing its crystallising in the film. At the same time we showed that a few grains of the baryta salt per pint was quite sufficient for the purpose.

* * *

Fogs.

"Nature" for January 30th, in speaking of an article in the current number of the "Nineteenth Century" by the Hon. Rollo Russell, gives an abstract which

will possess great interest not only to our metropolitan readers, but to all interested in photographic operations who reside in districts liable to be invaded by the fog-demon. It says:—"The author, who has for many years made a special study of the subject, divides fogs, so far as London is concerned, into four classes:—(1) Damp fog or mist, with much cloud, from the ground up to about 1,000 feet. Dust particles not numerous, and town clearer than country. (2) Damp fog or mist, dense in country. This type may be slight in London, especially if the fall of temperature has not been great. In mid-winter the fog tends to increase during the daytime in town, while in the country it rapidly dissolves. (3) Dense dry fog, with low temperature following a very cold night. It is anticyclonic in character, and the lowest strata of air are much colder than the strata at 500 to 1,000 feet. Fogs of this kind are the most serious and most frequent in London; their approach can usually be foretold. (4) Occasionally a fog occurs after a severe frost, when a warm southerly wind displaces the cold air near the surface. This fog is most dangerous to traffic, being the densest. It is least damaging to health, and may not reach more than 50 feet above the ground." The author considers that the need of the day is not so much scientific inquiry as administrative regulation, by which dark fogs might be reduced to almost harmless proportions. The preparation of forecasts is useful, as in the case of storms. Observations of the upper clouds are especially valuable in the prediction of fogs, but in London these clouds cannot always be seen; in such cases valuable data could be obtained by sending up a small balloon with recording thermometer and hygrometer.

* * *

Supplementary Images on Negatives. Letters in our last and previous issues detail experiences which, if not common, are not altogether exceptional—namely, a supplementary and mysterious image on the plate when the negative is developed. When such a thing appears there is usually a suspicion that the plate has been previously exposed and the image not developed. One of the letters suggests that, in the case the writer mentions, the plate may have been one used for wet collodion and recoated with the gelatino bromide emulsion. But this idea may be dismissed at once as being quite untenable, for the reason that no old collodion plates are ever used for dry plates; they would cost too much to clean, and, moreover, the glass for them is always, to save time and labour, coated in large sizes and cut into smaller ones afterwards. In the old collodion days, when the glass was often used several times, secondary images were not uncommon. The glass then used was often patent plate—that is, glass the natural hard surface of which has been removed by grinding and polishing. With this the silver image at times seemed to sink into the glass, and, although it did not show when the plate was cleaned, it sometimes made itself apparent unless the plate had been treated with nitric acid, which always proved a detergent by dissolving the silver. Many of these pictures were passed off as "spirit photographs" in the early days. The most probable cause—though we do not say it is the actual one—in the cases cited by our correspondents of the supplementary images is a minute hole somewhere in the camera which has acted the part of a "pinhole camera." We have frequently seen photographs—mostly interiors—in which windows, which could not possibly be seen by the lens, were clearly depicted in the picture. Modern bellows cameras that have long been in use, and in some cases new ones of the cheaper kind, are liable to have minute holes at the corners of the bellows, and where they exist they will always be prone to form supplementary images such as those referred to.

Fahrenheit. The thermometer is to the scientific worker what the two-foot rule is to the mechanic—he cannot get on without it. Just as the carpenter measures up a piece of timber with his pocket rule, the physician sizes up a patient with his clinical thermometer, and the photographer with a larger edition of the same instrument, tests the capacity for work of the various solutions which he employs. Although the Fahrenheit scale is that generally used in this country, it is not generally known how this particular tabulation of heat degrees came to be established, and Sir Samuel Wilks has done good service in contributing to the pages of *Knowledge* a short history of Fahrenheit's thermometer. The instrument was really due to Sir Isaac Newton, as a reference to the *Philosophical Transactions* for the year 1701 will show. It then consisted of a glass tube filled with linseed oil, and its starting point was the heat of the human body. As the duodecimal system was then in vogue, he fixed this blood-heat at 12, and divided the space between it and the freezing-point of water into twelve parts. The boiling point he called 30. Some years afterwards Fahrenheit took up the subject of heat measurement, and, in order to improve upon Newton's instrument, he divided each degree into two parts, so that 12 became 24. More than this, he found, by the use of freezing mixtures, that he could get far below the freezing point of water, and so he established a zero, and divided the space between it and blood-heat into 24 parts, placing the freezing-point of water at 8. The boiling point now became 53. So matters rested for a time, when Fahrenheit again went to work with the idea of securing greater delicacy of heat registration. He now divided each degree into four parts, by which arrangement, it will be noted, he arrived at the form of thermometer now in use. Zero remained where it was, freezing point became 32, blood-heat 96, and the boiling-point of water 212. Since this time more accurate readings have been called for, and the degrees have been divided into ten, but for the general purposes of the photographer the old Fahrenheit scale suffices. We may note that the centigrade scale is coming into extended use in this country. But at present old-fashioned workers, accustomed to speaking of so many "degrees of frost," prefer to stick to Fahrenheit's scale, just in the same way that they cling to pounds, in preference to kilogrammes. No doubt the change is bound to come sooner or later, but old-fashioned prejudices, like vested interests, have to be reckoned with, and they are not easy to overcome.

* * *

Spooky Photography. It is always a matter of satisfaction to get the direct opinion from an authority upon any subject round which there usually hovers an atmosphere of doubt. We all know that there is an association of good and clever people which, under the name of "The Society of Psychical Research," has taken the subject of ghosts, spooks, apparitions, and other uncomfortable things of a kindred nature, under its care. The president of this society may be supposed to know more about spooks and their ways than most persons; moreover, the gentleman who at present holds that office, in the person of Professor Oliver Lodge, is, as a distinguished man of science, already in possession of knowledge withheld from most of his fellows. He it was who materially helped forward the discovery of wireless telegraphy, the wonders of which far outshine anything that has yet been achieved by the most talented spiritualistic medium. We, therefore, read his annual address to the members of his society, delivered last Friday at the Westminster Town Hall, with greater interest than if it had come from the mouth of some titled nobody. The president of the ghost society does not believe in ghosts, that is certain. But what naturally interested us more was his opinion of "spirit photography." He confessed that he had never

yet seen a satisfying instance of this branch of photographic art. In a recent anonymous and weak book, said to be written by a member of the society, two such photographs had been reproduced, but the narrative which accompanied them at once suggested a trick on the part of the photographer with which our readers will be familiar—namely, backgrounds upon which had been painted in sulphate of quinine vague human forms. Professor Oliver Lodge, like most scientific men of the present day, is doubtless in the habit of employing photography as his handmaid, and is up to all the tricks possible with the camera. The Society for Psychical Research, whose aim is, no doubt, to seek the truth, may be congratulated upon having a president who is not likely to be carried away by mere appearances, and who requires good evidence before he is convinced of the truth of any statement. He regards genuine cases of apparent materialisation as being simple mental impressions; and with reference to those apparitions which are said sometimes to make themselves visible at séances, tangible and muscular somethings, "the simplest hypothesis was that the allegations were untrue." Now, it would puzzle the most gifted of camera workers to photograph a mental impression, even a so-called "impressionist" could not do it; and if the allegations concerning the spirits which appear at séances are untrue, those disembodied shadows are also outside the grasp of the photographer. Spirit photography is evidently not looking up just now.

* * *

Subterranean Photography. Visitors to the Ardennes and the Valley of the Meuse seldom fail to find their way to the famous Grotto of Han. Few realise that there is such a fairyland within ten hours' journey of Charing Cross, but the grotto is only two hours distant from Brussels, and the journey thither can, therefore, be covered in the time named. Should any scene-painter have exhausted his imagination in trying to depict the region "where fancy was bred" he would do well to undertake this short journey, for at this subterranean paradise he will be able to gather material for any number of fairy scenes. He could even gain inspiration from a little booklet which has recently reached our hands, entitled "The Wonders of the Grotto of Han," for the book is well illustrated with several capital photographs. Some of these have evidently been taken by magnesium, and others by means of the electric light, which now illuminates the principal galleries of the cavern. They are the best pictures of the kind which we have seen, and the question occurs to us, Why is not something of the same kind done in connection with our own British caves? Although we cannot boast of such a series of wonderful caves as those which are grouped together in the Grotto of Han, there are many in Yorkshire, and especially in Derbyshire, which are well worth visiting. One of the latter is of such a size that a rocket fired at the base of the chamber fails to touch the roof, but such illustrations of them as have come under our notice are in the shape of engravings or water-colour drawings, and it would seem that an artist is never more tempted to draw upon his imagination rather than upon respectable cardboard than when he attempts to pourtray one of these underground places. Although we know well enough that a photographic representation of a place cannot always be relied upon, such a picture carries conviction with it to the ordinary beholder, and more visitors would be attracted to these show-places if the camera were employed to advertise them. If it be possible to photograph the front of St. Paul's Cathedral at midnight, as was actually done on the last night of the year, by means of a powerful flashlight, these caverns should present no great difficulty to a painstaking photographer. And even if it were impossible to get sufficient light for such dark interiors by flash, there is no obstacle to a time exposure, using a pyrotechnic composition with magnesium or aluminium as its base. Last season, at the Crystal Palace firework displays, Messrs. Brock introduced a new feature in the form of a kind of aluminium torch, which gave a most wondrous light. And we have this firework in mind when suggesting that our British caves should be photographed in the same attractive manner as the Belgians have adopted at the Grotto of Han.

* * *

Gas versus Electric Light for Printing Purposes. At a recent meeting of the Photographic Club there was some discussion with reference to a statement in a circular relating to a paper that was before the meeting that ordinary gaslight was weaker than incandescent electric light. One of the members present stated that the incandescent electric bulb of 16 c.p. was less actinic than an ordinary gas burner of similar power. This may or may not be the case, as very much will depend upon the condition of the electric bulbs. We all know that they materially deteriorate with use. In time they get coated on the inside with a film that is very non-actinic; indeed, when they are broken the glass often resembles that of the "London smoke" spectacles worn by those who cannot bear a strong light on the eyes. Now that the "gaslight" papers are getting into such general use, the best light for their exposure becomes an interesting point for consideration, not so much, perhaps, with reference to its actual actinic quality—for a difference of a few seconds more or less in saving time is of minor importance as compared with the constancy of the light, whatever form it may be. This is more especially the case with papers of the Velox type, when colours other than the usual blacks are desired—say, sepias and reds, for example. The obtaining of these colours is entirely dependant upon the exposure, and it must be uniform with each print or the tints will vary. The electric incandescent light varies with the age of the bulb; the light is very actinic while it is new, but as it gets older the actinism decreases, and a much longer exposure becomes necessary to obtain the same colour in the print than is required while in its original condition. The incandescent gaslight is very actinic, but with this we meet with the same trouble as with the electric. The mantles deteriorate with use. The light emitted from a new mantle is very different from that yielded from it after it has been in use for a week or two, even with the same consumption of gas. Gaslight, when used without the mantle, is not constant, owing to the varying pressure on the mains at different periods of the day or night, unless some means are taken to equalise the pressure. What we have adopted, and we have found it answer for all practical purposes, is to have on the gas bracket a regulator burner, which costs at Sugg's about five shillings. On this we have a No. 5 Bray's fishtail burner, and on that we have placed a "gas economiser," which converts what would be a fishtail flame into a batswing one, which is very luminous and, at the same time, very actinic for a gaslight. With this arrangement, whatever may be the pressure on the main, the light is, to all intents and purposes, of uniform quality and intensity. From practical experience extending over some few years we can recommend this arrangement to those who work much with gaslight papers, or make lantern slides by artificial light. Magnesium ribbon we have left out of the question, but it may be mentioned that when that is used and has long been in stock the oxide on it should be removed with glass or emery paper before it is ignited.

TWO STUDIOS.

We recently had occasion to call on an "old hand" at his studio. The result of our visit afforded an object-lesson that we cannot do better than bring before our readers, especially at a time of the year when, in commercial parlance, "things are slack" usually. We found our friend in his shirt-sleeves surrounded with dark slides, apparently a new set. "Been buying a new outfit?" we queried. "No, sir; these slides are several years old, and have been used for some thousands of negatives," was the reply; and then commenced a tirade upon the young men of the present day. "They are none of them properly trained; clever they may be, and, indeed, must be, to get on nowadays; but for untidiness, uncleanliness in their dark rooms, and wherever they have a chance of making a mess, they can't be beaten. Come and have a look round here, and then we will go to our —— studio, where you may read, mark, learn, and inwardly digest. Keep your eyes open and your mouth shut, for the operator has not an angelic temper." In the first studio we passed into the dark room. It was a picture of order and cleanliness—bottles orderly placed on their shelves, not one without a sufficient label, brief or particularising; the graduated measures perfectly clean and bright; every dish in a rack, and each quite clean; sundry boxes with chemicals, each clearly labelled; dry plates at hand ready for immediate use; and, indeed, the whole room a picture of neatness, while the floor was of the proverbial kind off which, it is said, one could eat a meal. It was admirable, and we said so. "Now, as to those slides that you thought were new, if you will pick them up you will see they have had use, but just now I have been sponging off any stray marks and brushing out the shutter grooves, and generally giving such a 'doing-up' as elbow-grease and a sponge and duster will help in. Whenever we have a quiet day I go through this routine, and dust out the camera, re-blacking the inside every two or three years, and the result is they are always in perfect order and look nearly new. See this camera? It was new thirty years ago, though I had it done up by the maker when he was fitting some new slides a few years ago. This camera-stand" (which, by the by, looked very new) "was bought at the same time, but a little elbow-grease and Monkey brand have kept it all right, you see. But I can't get a man who will look after things as I do. When I learnt my business, nearly fifty years ago, I had to be clean and spry. I had to keep the dark room clean and wash dishes and measures ready for my employer to use at a moment's notice; but too often when I operate at my studio in —— Street I have to clean both dish and measure before I can do any dark-room work. However, come along to the other place." We entered a well-appointed reception-room with specimens evidently the product of an artistic mind, and we passed into the studio. It was well fitted with furniture and accessories, a close inspection showing that a little glue and a few tacks could be used with great advantage to appearances, and one or two of the blinds had small rents in them that half an hour's work with the help of a seamstress would have put all right and made them last twice as long as they would with the unrepaired rents.

But, entering the dark room, what a contrast met us! The floor very dirty and littered with wrapping paper and corrugated slips thrown down when filling-in the slides, the latter lying higgledy-piggledy on a table, and smeared and finger-marked, some out of repair, and all looking dingy and second-class. The capacious sink was littered with dishes which, though not caked with deposit, were unfit to use till well washed, and there seemed almost as many of them in the sink as in the racks. Measures all had the remains of pyro developer adhering to them inside and out. The bottles of solutions were mostly without a label; some were on the sink, some on a shelf, and heaped up in a corner was a large pile of what we learnt were partly emptied boxes of plates, remains of particular batches, or trial boxes of other batches, all good plates, but allowed to accumulate till eventually their kind, quality, and sensitiveness would be so much a matter of guesswork that the dustbin would be their probable ultimate fate. Coming fresh from the picture of neatness we have endeavoured to describe, the effect was absolutely disheartening, and our friend sighed audibly.

Some of our readers may say, "What does all this matter so long as there was good work done?" It matters everything—economy, pleasure in the work to be done, certainty as to the materials to be employed, and the soothing feeling when working at the camera that nothing will go wrong with results, so far as the dark room is concerned.

The present is a season when most operators find spare time on their hands, and what better method of filling up their leisure moments could they have than such overhauling, repairing, and cleansing of apparatus as we have described? And we can assure the younger generation of our readers—those who are, as it were, learning their business—that there is a pleasure and a comfort in working that is unattainable unless attention is paid to these little points we have indicated. We would inscribe over every dark-room door, not "All hope abandon ye who enter here" (as well might be done over the room we have just described), but

"Let order, system, and cleanliness prevail."

ON THINGS IN GENERAL.

Photographers in this country have many things to be thankful for, and not the least is their comparative immunity from such storms of hail as that described in a recent number of this journal as having occurred in Melbourne a fortnight before Christmas. We do have hailstorms here, but a hurricane of wind bearing along hailstones four-and-a-half inches in circumference, say two ounces each, is scarcely expected here, and, apparently, was somewhat of a surprise in the Melbourne studios. But that we do occasionally have violent hailstorms in our own country is a factor which should always have due consideration when designing a studio. The matter of £ s. d., unfortunately, cannot always be ignored in the matter, otherwise the simplest precaution would be to use plate-glass. I cannot remember any storm recorded which would have broken through thick plate-glass even in the most exposed studio. There is, however, an objection even to the use of polished plate glass, and that is the liability of some kinds to become discoloured in the light; in fact, we have seen shop windows in which the glass panes had taken on a completely purple tinge. The effect is owing to the use of manganese in the glass during the process of manufacture, to get rid of the yellow which the presence of iron brings about. But what would meet all cases would be the use of a stronger sheet-glass than is usually employed in skylights. It can be obtained of 32 oz. to the foot, which is strong enough to resist any hailstorm likely to occur here. Of course, the danger would be further diminished by making the roof with as steep a pitch as possible, which would have the added advantage of a more ready dislodgement of snow. The advantages of this form of roof will have been forcibly experienced during the late heavy falls of snow we have had, and this is by no means a trivial matter, as it may mean the difference between a day or two without sitters and a day or two without printing, when the latter is done under glass.

While discussing questions of studio arrangements, the dark-room naturally attracts attention, and the comfortable state of affairs described by a correspondent on page 77 sounds very

attractive; but a word of warning may be given. "A Fellow Feeling" describes a wonderful gas-stove, in which, according to his account of the makers' representation, the combustion is so perfect that it is free from all noxious fumes. Such representations are pure rubbish. We all know that coal-gas contains mainly carbon and hydrogen, and that these combine with atmospheric air when combustion takes place. One is ready to admit that the water largely produced may not be termed a "noxious fume," though unless the room were well ventilated the cold objects—glass bottles and negatives, &c.—would soon be coated with the condensed steam; but that the products of the combustion of the carbon, be they in the form of either carbonic oxide or carbonic acid (and one or other they must be) are not to be termed noxious is a most misleading and dangerous statement. No one ought to breathe the air of a small room into which the products of gas-stove consumption are turned unless there is perfect ventilation. It might be argued that an ordinary illuminating gas burner is open to the same objection. It is open to the same objection, but then the noxious products mainly linger in the upper-air strata of a room. Still the fumes are noxious; the only other ameliorating point is the greater probability of ventilation. A non-ventilating gas-stove in a small dark-room would be little better than slow poison, and might indeed produce death, as has happened with gas fires in a bath-room.

In the issue of this journal for the 31st ult. is a paragraph which deserves the serious consideration of, I am sorry to believe, many photographers. The paragraph is headed "Merchandise Marks Act Prosecutions," and after describing how two shopkeepers were each fined £10 and £3 3s costs for selling American hams and calling them English in the one case, and Irish in another, pointed out that a photographer supplying a bromide print and calling it a platinotype was just as liable under the Merchandise Marks Act to be prosecuted, and inflicted in penalties, as the provision dealer. And the offence would be greater, for the hams might be as good as they were described to be, but a bromide is far less costly, and, under certain conditions, liable to fade, which is not the case with a platinotype. I daresay this is a question which will ultimately be taken up by the Professional Photographers' Association, and very properly so, for such unscrupulousness is a disgrace to the profession, and tends to bring into disrepute a process of world-wide fame. From what I know of the members of that association, the majority, if not all of them, would throw up their membership if it were shown that any member was proved to have been guilty of such dishonesty and was not expelled from the organisation. Matters of this kind show the value that the work of the association may be to the whole of the profession.

There is one subject which I believe it is the ultimate intention of the association to tackle, and that is the question of cutting prices. It is difficult to see what can possibly be done. Still, equally difficult matters have been successfully treated by other bodies. A writer to the JOURNAL of the 24th ult. hopes that many readers have noticed the editor's curt reply to a correspondent, who charged half-a-crown a dozen, and complacently sent samples of his work for criticism. I, too, hope many readers have noticed the editor's reply. It is the most delightful bit of quiet sarcasm I have read for some time. How such a one can be dealt with will, I am afraid, be a little beyond the power of the association's combined talents. For it is not an uncommon instance. As another example, let me mention a metropolitan photographer, who does a roaring business on a Sunday only, and mainly at the hours when the public-houses are closed. As some explanation of his success, it may be mentioned that he usually has two barrels of beer sent up for a Sunday, and all his patrons have a free drink! I could tell of another whose charges are not 50 per cent. above that just quoted, but who is able to afford, and does afford, to buy the very best mounts he can obtain, and all for 3s. 6d. a dozen.

It is possible that some of these cutting prices may have been brought about by some so-called amateurs, such as "Sordello," who the other week wrote to the editor: "I am an amateur, but find that a certain amount of work can be put in my way. I shall, however, if the connection is to be developed, require an enlarger" (i.e., an enlarging apparatus). It is true "Sordello" does not propose to cut prices, for he asks where he can get a recognised list of prices. He wants a lot more information—in fact, teaching his business—does this "amateur." He does not say whether he proposes to inform the Income Tax Commissioner of the increase of income brought about by business being "put in his way," nor whether he will inform the Water Works Company that he will be using water for business purposes. Of course, he will want to buy his materials at trade prices. I may here repeat that every man has a perfect right to do what he likes with his camera, but, for heaven's sake, let him not call himself an amateur when he proposes to make money in this unblushing manner.

The brief abstracts given from time to time of papers read at various societies are most valuable features of this journal, but one cannot help feeling sometimes that they are either too short or too long. For example, take Sir William Abney's address at the Camera Club—brimful of valuable and suggestive matter. Yet at times the meaning is obscured in the abstract given. Thus it briefly states that flare-spots will appear unless the lenses are the right distance apart. It is known, of course, that in, say, an R.R. lens, if a flare-spot shows, it may sometimes be caused to disappear by even unscrewing one of the combinations to increase the distance between back and front; but when this is done the focus also is altered, and the essence of what Sir William was narrating was the need for exactitude of focus. But we really have the key to what, no doubt, he explained in the fact that the diaphragm was in a sliding tube, and the flare adjustment could be made by it. By-the-by, in speaking of the difficulty or increased expense of buying a meniscus, and recommending in lieu thereof a cemented plano-convex and plano-concave, I think that if a periscopic lens were inquired for, the increased cost (if any) would not equal the combined price of the two plano lenses named. I feel rather curious to know why Dr. Lindsay Johnson preferred a crossed lens, seeing that the spherical aberration with the deepest curve presented to the entering rays the spherical aberration exceeds that of a bi-convex, while with the flatter curve it is considerably greater. But, as I say, these abstracts are often too brief or too long, and if we had the *ipsissima verba* of the speakers, all difficulty would disappear. The paper promised by this gentleman on the suitability of various dyes for colour screens—coal-tar dyes, I presume, not necessarily aniline—ought to be of great value when published.

FREE LANCE.

DISFIGURING Advertisements.—Photographers are frequently annoyed to find that what would have been a fine landscape view is disfigured by an ugly advertisement of some soap, pills, ointment, or other nostrum. This is not so annoying to the painter artist as to the photographer, as he can omit it in his picture, while the latter, perforce, must include it or forego the picture altogether. A society has been formed here to attempt to prevent the disfigurement of the landscape by obnoxious advertisements, but, up to the present, as there is no law to meet the case, it has accomplished little or nothing. This advertisement disfigurement is not entirely confined to this country, although we think it had its origin here; if not, it had in America. It is with pleasure, therefore, that we see from a telegram from the Rhine Province, that the District Governor has issued orders to all the town and district councils in the Rhine Province and the Moselle Valley to prohibit all advertisements being exhibited that would spoil the views of the landscapes. Would that we had such an authority here, for the way that some of the best views in Great Britain, if they are popular resorts, are disfigured by hideous advertisements is lamentable. Perhaps a time will come when things will be different.

TECHNICAL EDUCATION AS APPLIED TO PAPER-MAKING.

[Abstract of a Paper read before the Society of Arts, and reprinted from its Journal.]

The Relation of the Chemist to Paper-making.

I venture to think that the national prosperity of paper-making in this country will largely depend upon the attitude of the paper-maker to the chemist, and the attitude of the chemist to the paper-maker. As this relationship must also affect the educational question, I think it deserves special consideration. The resident chemist, or, more correctly speaking, the person responsible for the routine chemical work of the paper-mill, should exercise more influence than he is able to exert at present. I am strongly of opinion that, in spite of the indifference of the paper-maker to science, the resident chemist has been largely to blame for his non-success. In many cases the chemist is not a properly qualified man, he is not at all practical, he is by no means a disciplinarian in his work, and he seldom carries his work to a satisfactory issue. The chemist is too often a dabbler who, when he is set to work out some problem, does it in a half-hearted way. He, perhaps, succeeds on a laboratory scale, and is not sufficiently in touch with the practical man to be able successfully to accomplish his work on a large scale. I venture to think that it is a mistake for the chemist to content himself with a knowledge of chemistry only; it is advisable that he should be a good draughtsman and have some knowledge of engineering. Further, it is important, if not essential, that he should have had a thorough drilling in the paper-mill. How often has a manufacturer taken a young fellow possessing a good elementary training as a chemist, and met with nothing but disappointment. It sometimes happens that a young man of this stamp will rise to the occasion, and instinctively acquire a technical grasp of the particular manufacture to which he is giving his services; but such men are few and far between, and it is consequently a dangerous experiment to employ a man under such conditions. On the other hand, the chemist is often left too much to his own devices by the practical paper-maker. He is not called upon to give sufficient account of himself and his work, and is left to study what problems he likes. It is only when something for which the chemist is supposed to be responsible goes radically wrong that he is brought to book. The appliances at the disposal of the resident chemist are, as a rule, altogether inadequate for useful work, and as the equipment that a chemist requires for paper-mill work is not expensive, there can be no excuse for his not having what he requires. I am inclined to think that the chemist is partly to blame for not adequately equipping his laboratory for the work he has to do.

Duties of Works Chemist.

The foundation of the work of a resident chemist should be routine work, undertaken at the instance of the principals of his firm. The work should be carefully chosen, care being taken, of course, that no unnecessary work is done. There are many tests that should be undertaken as routine work, either daily, weekly, or fortnightly, as circumstances warrant. The laboratory should be so equipped as to render this work as easy and rapid as possible. Records of the tests should be kept in books, to which members of the firm can refer, and there is no reason why they should not be entered with as much regularity and precision as entries are made in the day book or ledger in the counting-house. The rapidity and precision of routine chemical work is largely dependent upon the choice of suitable methods. When certain observations become matters of every-day routine, it is possible so to arrange the work as to reduce labour and minimise the possibility of error. An investigation should be conducted in such a way as to bring into due prominence the particular point requiring elucidation. A chemist will sometimes take too much pains over details that have no bearing whatever on the point at issue; this, of course, is a great waste of labour. There are many questions relating to paper-making that are extremely complex, and a chemist should form no judgment, except after repeated verification of his results. In bringing his results before a practical paper-maker, if need be, the chemist should present his figures in such a way as to be thoroughly intelligible to an unscientific mind. The choice of work should have very careful consideration. In this matter the chemist should be largely influenced by the practical paper-maker. The work might be conveniently divided under three headings:—

(1) Routine chemical work.
(2) Special investigations.
(3) Research work.

No 1 should be undertaken first, No. 2 as occasion requires, and No. 3 as time and circumstances permit. Under the heading of No. 1 there are, I should judge, twenty lines of work applicable to any paper-mill. Under No. 2 must be included all special work that the chemist is called upon to undertake from time to time, such as the testing of any new process. No. 2 will be a greater test of the chemist's capabilities than No. 1. The research work should be entirely spontaneous on the part of the chemist. If he has the time and opportunity, he might undertake investigations on his own initiative, and he should not be discouraged from so doing by his employers, so long as the work in question has some important bearing on paper-making. My reasons for stating that a chemist should be something more than a chemist are as follows:—He should certainly be able to do such things as indicate a steam engine, conduct boiler trials upon the evaporative efficiency of fuels, or determine the relative efficiencies of different types of furnaces, &c.; unless he is somewhat of a mechanic, he will not be able to make special appliances required for his investigations, or to instruct others to do so; unless he is a draughtsman, he will not be able to make his own designs or submit drawings to his principals. Unless he has actually been drilling in paper-making, he will most likely content himself by testing a process on a laboratory scale only. With practical experience of industrial processes a man, however scientific, if properly balanced, will not be contented with laboratory investigations alone; he will regard such work as stepping-stones only, and proceed to repeat his experiments on a more extended scale, and under conditions which obtain in practice. Then, and not till then, can he feel the least assurance of success on an industrial scale. I have said enough in reference to the duties and responsibilties of a paper-mill chemist, but the primary responsibility appears to rest with the practical man. How is it that most paper-makers have no resident chemist at all, whilst others have men who are mere dabblers, who, absolutely devoid of system, do just what they like and leave the rest? Whose fault is it that such is the case? I venture to think that the paper-makers are partly to blame for not employing thoroughly good men, and placing the necessary appliances at their disposal. Such men will be forthcoming if the paper-makers show more desire to enlist their services.

Technical Education from the Workman's Point of View.

Let us now regard the question of education from the working man's point of view. Mr. Davis says (see paper), "It is quite evident that the ordinary working man is not dependent in any way for the excellence of his work upon any scientific knowledge he may possess. It would not be fair to say that the possession of any scientific knowledge on his part would be a disqualification for his work, but in all ordinary cases he would be just as well without it." However true this may be in some chemical industries, I do not think it is true of paper-making. It is important that the working man should have an intellectual grasp of the general principles involved in the particular work he has to perform (which is only another way of saying that he should have scienific knowledge of his work), however limited in scope that work may be. In the case of paper making, which perhaps

is a peculiar one, he should have more than this, for the simple reason that each process is dependent upon its predecessor and influences that which is to follow. The working man, therefore, in order that he may do his work well and intelligently, should have some scientific knowledge of the other branches of the work which influence his own or are influenced by his own. I am sure many practical paper-makers are fully alive to this. It is said that paper is made in the rag house; this implies that the preliminary treatment of the raw material, before it receives its real chemical and mechanical treatment, affects the whole of the subsequent operations.* And yet how little the foreman of a rag house, to say nothing of those under him, knows of the after processes. Many of these workpeople, and undoubtedly with good reason, have not been permitted to walk through the other departments of the paper-mill. The same may be said of the "boiling," and perhaps with greater force of the "beating" departments. The beaterman, in my opinion, should possess a considerable knowledge of the processes to which the stuff is submitted, prior to the beating, and also (which is perhaps more important) a knowledge of the influence which some slight change in the beating will produce in the behaviour of the stuff on the machine, and its effect upon the qualities of the finished paper. I claim also, from another standpoint, that all workmen should be able to avail themselves of technical instruction. In order to appreciate their claims to technical education, let us endeavour to place ourselves in their positions. Undoubtedly workmen are ambitious of improving their positions. The boy comes to a paper-mill, and is put in some irresponsible position, where he has to do little else than manual labour. As time goes on, and as opportunities present themselves, he is given a "rise," and put in a better position. He is drafted, perhaps, from one department to another, and he gradually takes a more responsible position. He may in the course of his multifarious duties have occupied every position in a paper-mill. It is important that he should have the opportunity from the very commencement, not only in his own interest, but also in the interest of his employers, of obtaining a more intellectual grasp of the work he has to perform than he can gather from mere observation in the mill itself. Such knowledge must tend towards efficiency; it must give additional interest to work, and also it must assist a man to qualify himself for a better position.

Technical Equipment.

To overcome these difficulties, the Municipal School of Technology, Manchester, are setting a most excellent example by the erection, at a great outlay, of an installation of paper-making appliances on a small scale, by means of which the various processes of paper manufacture can be demonstrated to paper-mill workers. I am much indebted to Mr. J. H. Reynolds, Principal of the Municipal School of Technology, Manchester, for his courtesy in supplying me with details of the equipment. The plant is now in process of instalment, and when complete will comprise the following:—

Equipment of Paper-testing Laboratory.—Microscopes, microphotographic outfit, tearing machines, micrometers for measuring the thickness of papers, stoves for ascertaining the moisture in wood pulp, apparatus for ascertaining the resistance to folding and crushing, paper balances, ash balances, and numerous other appliances. *Paper-making Plant.*—Rotary spherical boiler, breaker, beater, stuff chest, sand-tables, strainers, Fourdrinier machine (to make paper 24 in. wide, wet end), two wet presses, two batteries of drying cylinders, smoothing calendar, slitter knives, reeling apparatus, re-reeling apparatus, sheet cutter, ordinary and friction calender, embossing calender. *"Hand-made" Plant.*—Vat, couching arrangement, special drying arrangement, spindle press, plate glazing calender. As far as I can gather from all sources, I shall be right in saying that the above equipment is quite unique, and it is to be hoped that the Committee's heavy expenditure will receive the support that it deserves from the paper trade in all parts of this country. I am informed that Mr. Julius Hübner, F.C.S., is the head of the paper department; he instituted the technical classes in connection with paper-making about nine years ago. I feel it only right to say that the trade is much indebted to Mr. Hübner for the enterprise and public spirit he has displayed. It was, I believe, due in a large measure to his support that the Municipal School of Technology decided to take the bold step, originally suggested by Mr. Robert Marx, of erecting model paper-making plant for educational purposes. In order that any real and substantial progress can be made in the technical education of paper-making, it is necessary that *practice* and *science* should go hand in hand. To read about a process, or even to be lectured to about a process by a practical paper-maker, could not give the same acquaintance as a combination of such teaching with the actual working of the process itself. On the other hand, seeing a process carried out, or even conducting a process for oneself, on a commercial scale, does not necessarily convey anything like a full knowledge, unless the scientific principles are, at the same time, fully enunciated. This is powerfully urged by Kropotkin, who condemns the arbitrary division of society into brain workers and manual workers, and advocates the system known as *Education intégrale*, in which both brain work and hand work are cultivated side by side. The importance of this mode of procedure as far as an industry will permit it, cannot be over estimated.*

It should be borne in mind that since the introduction of the Fourdrinier machine, the paper-maker is no longer the man who makes paper, in the literal sense of the word, but rather one who understands how to make it. The "hand" cannot be used in conjunction with the "head," to the extent to which it can be in many other industries, but, notwithstanding, the "hand" should be used to the extent of being able to operate any machine used in the process of paper manufacture, in addition to assist the understanding of diagrams and plans setting forth the full details of the machine, and education should extend to a full knowledge of the general principles of its working. It is to be hoped that the enterprise displayed by the Municipal School of Technology at Manchester will be productive of much good in this direction. It is quite feasible that a great deal of useful educational work could be done with a small paper-making machine. It is, perhaps, too much to expect that workmen would become practical machine men by merely familiarising themselves with the working of a small machine, but they could certainly rapidly acquaint themselves with the general principles of the machine and the influence of the different factors which control the properties of the web of paper far more quickly by such means than they could ever hope to do by acting as an assistant to a machine man on a big machine. With such a small machine the thickness, the shake, the suction, the drying, and the pressure of the rolls, the temperature of the stuff, and all such details could be controlled and rapidly changed at will, and the influence of all the changes could be studied in their effect upon the finished paper. A small machine might also be used for any class of material. An immense amount of useful information should be imparted by such means, which might prove of the greatest industrial, as well as educational, value. A small machine, such as that being erected at the Municipal School of Technology, can hardly be expected to do the work exactly in the same manner as a large machine would. I contend that this is not necessary for educational purposes. We all know that there is a difference between a chemical reaction on a few grains in the laboratory, and the same reaction, when carried on on a commercial scale, but there is, nevertheless, a direct relationship between large and small

* The same remark is often applied to the "beating."

* "Fields, Factories, and Workshops." By Prince Kropotkin, Swan Sonnenschein and Co., Ltd.

operations, which can be absolutely accounted for. It is conceivable, therefore, that a relationship can easily be established between operations of a small paper machine and those of a large paper machine, so that valuable and practical deductions can be arrived at even in the event of the small machine affecting the stuff somewhat differently. The Municipal School of Technology, Manchester, and also the engineers, Messrs. Hemmer Brothers, are to be congratulated on this very bold experiment, the results of which will undoubtedly be looked forward to with great interest by members of the paper trade. Should it succeed I think we should be compelled to modify our views as to the possible scope of technical instruction from a paper-maker's standpoint. It is encouraging to know that the technological examinations are becoming more and more practical every year; this must help to make the teaching more practical also. The responsibility of the examiners is very great, because the character of the questions which are set will, in a large measure, influence the character of the teaching, as a large bulk of those who go in for technical education do so with the object of passing the City and Guilds' examination. It is very gratifying to see so many more students entering for the examination, but it is to be hoped a far larger number will enter in the near future. The student has, perhaps, at present, four courses open to him, whereby he may acquire a knowledge of paper-making.

1st. By his actual work in the paper-mill.
2nd. By reading text-books.
3rd. By his attending classes.
4th. By correspondence teaching.

The limitations to the first of these have already been discussed.

Technical Articles, Lectures, and Examinations.

Text-book knowledge is valuable in its way, it is extremely useful in conjunction with practical work, but something more is wanting than text-book knowledge to supplement the ordinary practice in the mill. To supplement text-book literature, I would suggest that much good might be done by the publication from time to time of technical articles, dealing rather with general principles than with bare statements or descriptions of the processes, but whatever direction these articles take, it is important that we should keep them up to date. It is important that the mill worker should have the opportunity of close contact with those who are endeavouring to teach him, hence the necessity for lectures in all the most important centres. Technical education will be of little or no service unless it keeps abreast of the times. It is no good teaching what has been, but what is and is to be. It will be no good employing academic teachers. Practical men of good standing alive to all recent improvements and in close touch with the industry which they profess to teach, will be required—men who can acquire and assimilate all the most recent improvements, and not men who teach the same thing year after year, with little regard to changes that are taking place. What benefits shall we derive from men who go about the country lecturing on technical subjects, the whole of their knowledge of which is derived from text-books? In order to impart technical skill and knowledge a man must be what he wishes his pupils to become. An intelligent pupil, if he desires to, can assimilate knowledge from a text-book without the aid of a public exponent. Instructors are wanted for the purpose of imparting that intimate knowledge that cannot be derived from text-books. Fifteen years ago, on good authority, we are informed that the attitude of the workman towards education, was positively hostile. Five years ago we were told that this feeling had almost disappeared. To-day we find the National Union of Paper Mill Workers, or the Amalgamated Society of Paper Makers, meeting and discussing the subject of technical education, and even urging the necessity for it as a means of fighting foreign competition. The men themselves have not only lived down their prejudices, but are now crying out for technical instruction. At a meeting of the Trades Union held in 1894, a fear was expressed that the technical education would tend to overstock the trade with working men, and consequently bring down the wages and increasing the unemployed. It has been considered necessary by many to stipulate that only those engaged in the trade should receive instruction. I am very much in sympathy with those who consider it unfair on *bonâ-fide* paper-mill works to give instruction to outsiders, and that the instruction should be limited only to *bonâ-fide* paper-mill workers. This view has been expressed by members of different trades, and not without good reasons. If the examinations could be made an absolute test of practical experience and knowledge it might not be necessary, or, perhaps, desirable to make this stipulation. It has, however, under existing circumstances not proved possible to make the examinations a real practical test. As the result of the examinations, Mr. Slingo* informs us that "One city clerk was, in his year, the prize carpenter of the United Kingdom; another took the prize in the electric lighting; another the prize in the electrical instrument making; another in tools; and another, who had never been out of London for more than a week or two at a time, obtained a certificate qualifying him as a teacher for agriculture." Under such circumstances, and until examinations can be made an absolute measure of practical knowledge and experience, it would be only fair to prohibit all outsiders from competing. It is very encouraging, therefore, to know that the technological examinations are becoming more practical year by year, but it is impossible to urge upon the examiners too strongly the necessity of making them more so, and to be satisfied with nothing less than an examination which shall be an absolute measure of practical experience.

The Value of Research.

As a part of the educational scheme it is impossible to overrate the importance of chemical research. Research work may be divided under two headings: (1) Industrial Research, and (2) Pure Research. The very basis of our national advancement and prosperity must of necessity be largely dependent upon the careful and systematic prosecution of chemical research. There are a lot of questions pertaining to the paper trade, many of them apparently small but important details, only awaiting exhaustive and systematic study. In any adequate scheme for technical education, those who pose as instructors and demonstrators should have an intimate knowledge of what they desire to teach, but without research this cannot be done. I venture to think, therefore, that any institution or technical school that takes in hand instruction in paper-making should recognise the necessity of students applying themselves systematically to technical research.

There is a kind of research which is outside the ken of the majority of workers, but which is nevertheless of great importance if we are to safeguard our interests in the future. I speak of pure research. In the prosecution of pure research the chemist, more often than not, has no immediate industrial object in view, but if we read the history of modern progress correctly we cannot fail to recognise that many of the most important economic changes have been the direct outcome of pure research. And so it must be, but in a greater degree, in the near future. Although there are several workers on the Continent, Messrs. Cross and Bevan stand practically alone in this country in the prosecution of pure research in connection with the paper industry. Our war of the future must of necessity be an industrial war. There will be little good in waging this singly and individually. It calls for the most perfect and efficient equipment, and for united action. The trade as a whole should, I venture to think, recognise the necessity of furthering to the utmost technical education, and seriously consider the best means of effecting the desired end. To sum up, I venture to say that

* "The True Basis of Technical Education," by William Slingo, before the International Congress.

what is needed is a central Paper Makers' Institute to undertake the prosecution of industrial and pure research, as well as the technical education of all students. It will be necessary, of course, to have the use of a thorough equipment, such as the Municipal School of Technology are now installing. This institute should organise classes, lectures wherever possible, and a course of correspondence tuition. The intelligence department should jealously watch publications of all sorts bearing on paper-making in all parts of the world, and should issue publications to all paper-makers who support the Institute. They should make it their chief aim to render men more efficient in their daily duties, and to qualify them for better posts. They should make it their aim also to qualify those who desire it, for the City and Guilds of London Institute, and to urge upon the institute the necessity of modelling the examinations so as to make them in every way a thorough test of practical knowledge and experience. When this can be accomplished a certificate from the City and Guilds of London Institute will serve to qualify a man for a better position, and what is of more importance, perhaps, paper-makers might insist upon their workpeople, at any rate those in responsible positions, taking certificates.

Our paper industry, containing as it does many practical, progressive men, alive to their own interests, is still *lacking* in the department of technical education, and lacking possibly because private enterprise alone cannot promote it sufficiently. State aid may do some good, but the initiative must come from the members of the trade, and whatever shape the movement takes, it must be the outcome of united action on the part of those who are to reap the benefit that is bound to accrue.

CLAYTON BEADLE.

THE ANGLE OF VIEW.

[A Paper read at the November Stated Meeting of the Photographic Society o Philadelphia.]

WE will first show why narrow angle pictures are susceptible of being viewed from a great many more points of view than wide angle pictures. In this discussion it must be borne in mind that the *apparent* length of anything is proportional to the angle it subtends at the eye. Let *ae* be a picture plane, and F the eye, lens, or point of view. Let *cd* be a very short or differential line in the picture, subtended by the angle *a*. Let β be an equal angle impinging obliquely on the picture plane at an angle O. *ab* and *cd* are not equal, and we wish to show the relation between them.

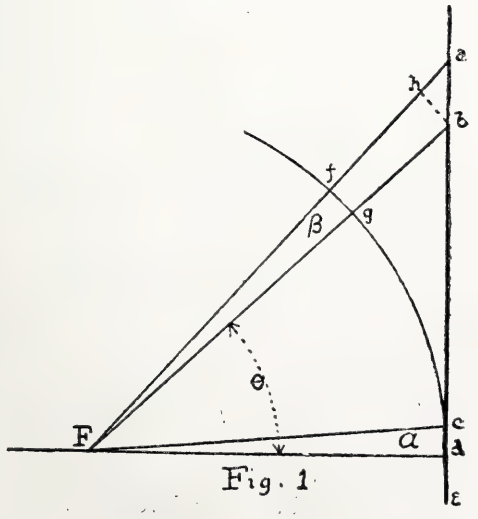


Fig. 1

Since $\angle$ a b h = θ

$$a\,b = h\,b \sec\theta$$

$$\text{Now, } \frac{h\,b}{f\,g} = \frac{F\,b}{F\,g} = \frac{F\,b}{F\,d} = \sec\theta$$

$$\text{and } h\,b = f\,g \sec\theta = c\,d \sec\theta$$

Substituting in (1),

$$a\,b = c\,d \sec^2\theta$$

Since the secant of small angles is nearly equal to 1, it follows that the inequality of *ab* and *cd* will be slight for small angles.

$\sec^2 20° = \frac{8}{7}$ nearly $\quad \sec^2 45° = 2$ exactly

$\sec^2 30° = \frac{4}{3}$ exactly $\quad \sec^2 60° = 4$ exactly

If *ab* represents a portion at the edge of the picture, θ will be the half angle of the picture. For pictures of less than 40 degrees objects of the same *apparent* size will be of nearly the same *actual* size in the picture, the greatest difference being between centre and border, and equal to an increase of only $\frac{1}{7}$. A 90-degree picture, however, will have the border object twice as long as the centre object, though it gives the same angular or *apparent* size. If now we remove this 90-degree picture to a distance of only 3 or 4 F*d*, then will the border rays impinge not nearly so obliquely, and β will equal nearly 2 x, and the border object will appear nearly twice too large for the centre object. We might say that the narrower angles are not sensitive to distance, as the secant is comparatively insensitive to angles even up to 20 degrees. Just so long as the mathematically correct point of view is far, and the border rays impinge not too obliquely, it makes little difference how much further the point of view is taken, for the relation of objects will stay the same and the appearance will remain approximately similar! But when the mathematically correct point is near and the border rays impinge obliquely, then will any variation (towards or away) in distance affect the relative size of objects greatly, and objectionable distortion results. We would say that pictures of 40 to 50 degrees can be viewed at any distance greater than the strict distance, and that still narrower pictures can be viewed not only at distances greater than the strict distance, but also at less distances until they begin to include an angle of 40 or 50 degrees. In Fig. 1, let β represent, instead of two single rays, a cone of rays. Inasmuch as β is a differential angle, we may consider this cone as a cylinder whose horizontal intercept in the picture plane is *ab*, and whose vertical intercept is the diameter of the cylinder or *hb*, and whose whole intercept is an eclipse with axes *ab* and *hb*.

$$h\,b = c\,d \sec\theta$$

$$a\,b = c\,d \sec^2\theta$$

$$c\,d = 1.0 \text{ (assume)}$$

When $\theta = 45°$

$$h\,b = \sec 45° = \sqrt{2} = 1.4 \text{ (nearly)}$$

$$a\,b = \sec^2 45° = 2.0$$

Thus at the centre of a 90 degree picture a sphere is represented by a circle—we will say of unit diameter. A sphere of same apparent size is represented at the border by an ellipse of 1.4 minor axis and 2.0 major axis. Thus not only the size, but the shape is distorted. And bear in mind that this is not distortion when viewed from the correct point; for we are speaking only of distortions due to a distant point of view, which is the usual case with these wide angle pictures. Let us call the point where the perpendicular from the point of view (to the picture plane) strikes the picture plane, the *centre* of the picture. In Fig. 1, *d* is the centre and *a e* may represent a horizontal, vertical, diagonal, or any other radial element of the picture plane through the centre. The maximum distortion is always radial with respect to the centre and equal to $\sec^2$ of the angular displacement. The *tangential* distortion (at right angles to the foregoing) is equal to the secant of the displacement. Rectangular pictures include the greatest angle on their diagonal, and the greatest distortion occurs in the corners, but there is no difficulty in dealing with it if we remember to consider it by its radial and tangential components.

Theoretically it is true that for every picture there is but one point of view, but as a matter of fact, we get perfectly satisfactory (and nearly true) impressions of most pictures from varying positions between quite wide limits, and the limits are wider for

narrow angle pictures than for wide. A wide angle picture will look worse when viewed a little too far away than a narrow angle picture when viewed either too near or too far. Narrow angle pictures give more distortion when viewed too near than when viewed too far, but the distortion is not altogether objectionable, and often gives compositions positively pleasing if they are not positively true. We would say that pictures including an angle of less than 40 degrees will give no apparent distortion when viewed at any distance greater than their focal length. The fact that artists rarely include more than 35 degrees (and usually much less) on their canvases and sketch blocks, is evidence to the fact that where the more artistic effects are desired in photographs a narrow angle is used. And, mind you, we do not say that a narrow angle will in itself make an artistic effect, or that a wide angle is not capable of it. As a rule, however, extreme wide angles are bad. They give "too much perspective," and their use should be limited to photographs that are desired principally as a record, and that cannot be obtained in any other way. Photographs of the interiors of buildings usually require the wider angles, but where such can be obtained at a somewhat longer range it is better. Interiors in wide angle usually give the apartment an appearance of greater length than it really has, and this because such pictures are not usually held near enough to the eye. There is a physiological objection to looking at anything nearer the eye than about ten inches, for the eye cannot focus with ease on objects much nearer than that. If we placed ten inches as the minimum limit, a 90 degree picture could not be less than twenty inches across. Small wide angle pictures when viewed at a point that will not give distortion, bring the eye too near for distinct vision. Three other objections to very wide angle pictures are also worthy of mention. If the head is placed in the angle formed by the two walls of a room, it will be seen that by turning the eyes and *not the head*, the two opposite walls cannot be scrutinised *with ease*. The two walls here include 90 degrees, and while pictures or objects upon them might be discerned *with difficulty* without moving the head, still 45 degrees is probably the largest field that ever has our attention without turning our head—that is unless we are very lazy. Hence wide angle pictures require a turning of the head to view their various parts satisfactorily, which must destroy the general unity of the picture to a certain extent. The second objection is the turning of the eyes. By looking at a word in the middle of a line of any ordinary book, one may easily see that it is almost impossible to read even the very next word without turning the eyes. The eyes are continually turning for every slightest change in the direction of the thing we are observing. While the rotation of the eyes and head is necessary to a less extent in narrow angle pictures, and while such rotation is perfectly healthy, easy, natural and unconscious, it is still too excessive and awkward in pictures of 80 or 90 degrees, not to detract from the pleasure in viewing it. The picture cannot be restful or have unity. The third objection is that both eyes cannot occupy the correct point of view. The eyes being only about three inches apart, this objection practically disappears for all pictures of any angle of over ten inches focal length. For the smaller wide angle pictures, however, the two eyes will get quite different appearances, and these will not mentally compose into the stereoscope effect of ordinary vision.

It is a great advantage to the landscape and general photographer to carry two, three or four lenses of different focal length. In general (other things being equal) the long focus lens will equalise the size of objects far and near, while the short focus will make the difference in their sizes great. Thus if we are taking a picture with a building as the principal feature, we might use a short or long focus lens and bring the building the same size with each by going far back with the long focus and near with the short focus lens. The long lens would, however, make things in the background, such as trees or mountains, very large, while the short lens would make them small. Thus where there is considerable choice as to the distance of the camera from the subject, a series of lenses will enable us to select that point which gives the desired relation of objects fore and aft and the most pleasing perspective. Again, where a subject is to be photographed, and there is but one available point of view, the advantage of a series of lenses is evident, for from a given point there is only one lens that will take in a given amount of view, and the thing to do is to select the lens that comes nearest to it. Here, of course, there is no choice as to perspective and relation of objects front and back. We are inclined to think that for artistic photography (outside of portrait work at least) the ideal way is to have a series of lenses ranging from one to four times the long side of plate for focal length, and probably the most useful are between two and three. We are also inclined to think that most photographers make the mistake of using too short a focal length, even though longer ones are at their command. Especially is this the case with amateurs and those beginning. It is most natural to think that the more taken in by a picture the better, and the term "wide angle lens" is with beginners synonymous with "a good thing." The tendency is not to be satisfied with the house, but to squeeze in the barn and pig-pen, and wherever the limit of the picture something just outside is always wanted. If the whole farm is wanted, go up to the nearest hilltop and take it with a very long focus lens, when a much more satisfactory grouping will result. All the buildings will be nearer of a size, and the front gate will not take up more than its share. But when you get up on the hilltop, don't think you want to add Smith's and Jones' farms to the picture also. From a given point of view the narrow angle lens has always more distinct bits or compositions to pick from than the wide angle. Since the visible horizon includes 360 degrees, more narrow angles are included in it than wide. This is a very real advantage in landscape work, and from any little eminence surrounded by picturesque country or objects many studies can be made without moving on.

CHARLES A. GILCHRIST.

EDINOL.

UNDER the above name, the Farbenfabriken vorm. Freidr. Bayer and Co., of Elberfeld, have introduced a new developing agent. It was first called paramol, but this name was dropped, as it infringed some patent rights.

According to the circular issued by the makers, edinol belongs to a new class of chemical compounds, and in its physical behaviour and in its photographic properties it forms a link between the two main classes of photographic developers, between the phenol developers, such as hydroquinone, pyrogallol, and pyrocatechine on the one hand, and the rapid developers, such as rodinal, metol, ortol, &c., on the other.

It is extremely soluble, so that concentrated stock solutions can be made without the aid of the caustic or carbonate alkalies. Like the rapid developers, edinol causes the latent image to appear immediately, but the duration of development is much longer, and it can therefore be easily restrained by the addition of water, bromide, or especially bicarbonate of soda. If development with edinol is pushed further than is usual with rapid developers the negatives show an equal density, but with great clearness and absolute freedom from fog, and considerably greater softness, an advantage in portrait work, whilst contrast may be obtained by the use of potassium carbonate. It is applicable to transparency and bromide work.

The following are the formulæ recommended by various authorities who have tested the new developer:—

EDER'S FORMULA.

I.—For contrasts.

A.—Sodium sulphite cryst.	10	parts
Edinol	1	,,
Water	100	,,
B.—Potassium carbonate	50	,,
Water	100	,,

For use mix 4 of A with 1 of B.

II.—For soft results.

A.—As above.

B.—Sodium carbonate cryst. ..... 10 parts
Water ..... 100 ,,

For use mix in equal parts.

MIETHE'S FORMULA.

I.

Potassium metabisulphite	2	parts
Edinol.....	1	,,
Potassium carbonate.....	6	,,
Water	100	,,

This solution will keep for a long time in a well-closed bottle, and is ready for use.

III.—Rapid Developer.

Sodium sulphite cryst.	6	parts
Edinol.....	1	,,
Triphosphate of soda	6	,,
Water	100	,,

This is ready for use.

If these two developers are mixed with an equal quantity of water, and a few drops of ten per cent. bromide solution be added, they are suitable for bromide paper.

PRECHT'S FORMULA.

Sodium sulphite cryst.	8	parts
Edinol.....	1	,,
Acetone	10	,,
Water.....	100	,,

This is ready for use, and keeps well, and gives a good grey-black image. With double the quantity of acetone, it is very suitable for transparency work.

THE MAKER'S FORMULÆ.

A.—4 per cent. edinol-soda developer.

Dissolve—
Sodium sulphite cryst. ..... 20 parts
In water ..... 30 ,,
Then add—
Edinol..... 4 ,,
Then add—
Sodium carbonate cryst. ..... 25 ,,
dissolved in—
Water..... 20 ,,
and make the total bulk up to 100 parts.

For use dilute with from 5 to 10 times the quantity of water. This developer is specially suitable for the hot season and the Tropics, and also for films. The soda may be replaced by potash when the developer works quicker and with more contrast.

B.—10 per cent. edinol developer.

Dissolve—
Potassium metabisulphite ..... 30 parts
In water ..... 50 ,,
Then dissolve by the aid of heat—
Edinol..... 10 ,,
Then add gradually when cool—
Caustic potash ..... 22 ,,
dissolved in—
Water..... 20 ,,

For use it is to be diluted with from 10 to 30 times the quantity of water.

C.—15 per cent. edinol developer.

Dissolve—
Potassium metabisulphite ..... 5 parts
In water..... 20 ,,
and add—
Edinol..... 5 ,,
and then add, cold—
Caustic soda ..... 5 ,,
dissolved in—
Water..... 10 ,,

For use it should be diluted with from 15 to 30 times the quantity of water.

Dr. Eder states that "the developer works rapidly, with softness, and brings out the half-tones well, and gives therefore with instantaneous exposure no chalky, hard pictures. From our results we can say that edinol is a developer belonging to the so-called rapid developers, very suitable for photographic purposes, and it is equal to the good rapid developers on the market, and possesses the advantage over some of them of a greater solubility in water." A. D. PRETZL.

ROYAL PHOTOGRAPHIC SOCIETY: RESULT OF THE ELECTIONS.

The annual general meeting of the Royal Photographic Society of Great Britain was held on Tuesday last, the 11th inst. The result of the ballot for Officers, Council, Exhibition Judges, and Selecting and Hanging Committees was announced as below.

NEW MEMBERS.

Certificates in favour of six candidates for membership were read a first time, and fourteen candidates were balloted for and elected members of the society.

AFFILIATION.

The President announced that the Thornton Heath Photographic Society, the Amateur Photographic Society of Victoria, and the Hawke's Bay Camera Club had been admitted to affiliation.

ANNUAL REPORT.

The annual report was then taken, and a motion for its adoption having been made, the President invited discussion upon it. After a good many comments and questions had been made the report was put to the meeting, and carried.

BALANCE-SHEET.

The Treasurer moved the adoption of the balance-sheet, adding a few words as to the growth of the society's receipts and expenditure since ten years ago, when he took up the office he was now relinquishing. Various items having been explained, the balance-sheet was adopted *nem. con.*

ELECTION OF OFFICERS, &c.

The scrutineers of the ballot reported that the result of the voting was the election of the following:—

President.

Thomas R. Dallmeyer, F.R.A.S.

Vice-Presidents.

Sir W. de W. Abney, K.C.B., F.R.S.
The Right Hon. the Earl of Crawford, K.T., F.R.S.
P. H. Emerson, B.A., M.B. Prof. Raphael Meldola, F.R.S.

Hon. Treasurer.

John Sterry.

Ordinary Members of Council.

H. Walter Barnett.
Frank Bishop.
C. H. Bothamley, F.I.C., F.C.S.
James Cadett.
St. Lawrence Carson, B.A., B.Sc.
Walter L. Colls.
Douglas English, B.A.
Ernest C. Fincham, M.R.C.S., L.R.C.P.
Thomas E. Freshwater, F.R.M.S.
A. Haddon.
Sir W. J. Herschel, Bart.
Frederick Hollyer.
Francis Ince.
G. Lindsay Johnson, M.A., M.D.
E. B. Knobel, F.R.A.S.
J. C. S. Mummery
Wilson Noble.
E. Sanger Shepherd.
Joseph W. Swan, M.A., F.R.S.
Prof. W. C. Unwin, B.Sc., F.R.S.

EXHIBITION JUDGES.

Pictorial Section.	*Technical Section.*
W. R. Bland.	Sir W. de W. Abney, K.C.B., F.R.S.
W. Crooke.	Chapman Jones, F.I.C., F.C.S.
P. H. Emerson, B.A., M.B.	E. Sanger Shepherd.
Lieut.-Col. Joseph Gale.	
J. C. S. Mummery.	

SELECTING AND HANGING COMMITTEES.

Pictorial Section.	*Technical Section.*
H. Walter Barnett.	Sir W. de W. Abney, K.C.B., F.R.S.
J. S. Bergheim.	Thomas Bolas, F.I.C., F.C.S.
W. R. Bland.	James Cadett.
J. Page Croft.	Douglas English, B.A.
W. Crooke.	G. Lindsay Johnson, M.A., M.D.
J. H. Gear.	Chapman Jones, F.I.C., F.C.S.
Rev. F. C. Lambert, M.A.	E. B. Knobel, F.R.A.S.
J. C. S. Mummery.	E. Sanger Shepherd.
Lyddell Sawyer.	J. Wilson Swan, M.A., F.R.S.
J. C. Warburg.	Prof. W. C. Unwin, B.Sc., F.R.S.

The total number of ballot papers received was 350, but 41 being invalid for various reasons, 309 represents the number of those complying with the regulations and participating in the election.

Votes of thanks to the officers and council, auditors and scrutineers for their labours closed the meeting.

EXTRAORDINARY GENERAL MEETING.

FEB. 11, 1902.—Mr. Thomas R. Dallmeyer in the chair.

The business before the meeting was the consideration of certain suggested alterations to the articles of association of a nature to confer upon the council the power to appoint either an hon. secretary or a paid secretary. The proposal also extended to the Editor of the Journal, who, under the suggested articles, would at the discretion of the council be either an honorary or paid official. After considerable discussion the proposed changes received the sanction of the meeting, as also did a resolution making it obligatory on the part of the council to engage the services of professional auditors or accountants.

Studio Gossip.

THE "Puff Preliminary."—The preliminary puff put out by the publisher is getting beyond a joke. We will give presently a specimen of the kind of puff we are now commonly expected to father, and not only "we," but all the editors of journals which deal in literature. Our readers will doubtless have noticed that when correspondents have to write to us—"more in sorrow than in anger"—they generally refer with delicate irony to the "Publishers' Circular" as being of a "professedly literary character." But the "P.C."— as it is familiarly called in the trade—makes no such claim; it is simply a trade organ, *the* trade organ, being a "Circular" for the publishers and a "Record" for the booksellers. It is true that it gives "Notices of Books," but the intention in doing so is not to trench on the domain of the higher criticism, but merely to give our thousands of readers, chiefly booksellers and librarians at home and abroad, such an idea of the nature of the work noticed as may be useful to them in their business. Now, it is good enough, and at times bad enough, to be held generally responsible for the views of our reviewers, but when in addition to this we are expected to insert free gratis and for nothing such an editorial opinion as the following, it is time to kick:—"The 'Beat-All English Grammar' by —— is in the press. The new features contained in it will, it is expected, render it more valuable than any other grammar on the market." Why should the publisher expect us "kindly to announce" such a statement as this? We never heard of the author, or, as far as we know, saw the publisher, and yet we are expected to say that a work we have not even seen is likely to be more valuable than any other on the market. Grammar is not ping-pong. But this is merely a specimen of the kind of statement we are constantly asked to put before our readers—not, of course, by publishers of high standing. But the fact is this "puff" business is getting a bit overdone: so much so that for some time past we have been thinking whether it would not pay best to put in advertisements gratis and make a charge for editorial puffs. Unfortunately, we cannot claim any originality for this suggestion, as our readers may remember it was projected by the editor of the "Journal of Applied Science." The invention of the typewriter has had a good deal to do with the rise and progress of the "puff preliminary," it makes it so easy to send out what are known as "complimentary notices" to the press. Many authors not only type their own manuscripts, but write their own puffs. We know cases where an author has claimed an "advance on account" on the plea that he could guarantee to get from fifty to a hundred free announcements of his new work inserted in the papers. It will be understood, we hope, that we are not referring to the sending to the press of important announcements, or even announcements which are not particularly important, by firms which do not imagine that a paper, any more than man, can live by bread alone, or any other kind of pastry—puffs, unfortunately, won't satisfy the printer or the paper-maker.—"The Publishers' Circular."

CRIPPLEGATE Photographic Exhibition.—The last day on which entries can be received for this exhibition has been extended to Monday next, February 17th, when pictures as well must be delivered. Intending exhibitors, please note. The hon. sec. is Mr. Alfred Ward, Cripplegate Institute, Golden Lane, E.C.

PHOTOGRAPHIC Exhibition at Congleton.—In connection with a grand bazaar to be held in the Town Hall, Congleton, on April 9th and 10th, 1902, there will be a photographic exhibition. A silver medal as first prize, and a bronze medal as second prize, will be given in each of the following classes:—(a) Landscape; (b) "Genre," or scenes or subjects in every-day life; (c) Portrait and Single Figure Studies; (d) Hand Camera Snapshots (open); (e) Hand Camera Snapshots (limited to residents within six miles of Congleton Town Hall); (f) Lantern Slides, in sets of four. Mr. E. Rimbault Dibden (the president), Mr. F. A. Schierwater (vice-president), and Mr. E. Simnett (hon. sec.), of the Liverpool Amateur Photographic Association, have consented to act as judges. They will have power to withhold any award should the exhibits in any class be of insufficient merit, and their decision will be final. Exhibits may consist of one or more photographs mounted together. They must be mounted, but not framed. They must be marked with a motto, and accompanied by the exhibitor's name in a sealed envelope bearing the same motto. They must be sent to the hon. sec., to arrive on or before March 26th. An entrance fee of sixpence will be charged on each exhibit, which must be paid at same time. All exhibits will be sold for the benefit of the bazaar. The hon. sec. is Mr. A. C. Conder, J.P., Woodland View, Congleton.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

February	Name of Society.	Subject.
17	Camera Club	*Old Silver and Hall Marks.* Mr. A. Butler.
17	Southampton Camera Club	*Enlarging.* A. Copeland.
17	Glasgow and West of Scotland	Demonstration of *Colour Photography* by Mr. E. Sanger Shepherd (London).
17	Oxford Camera Club	*Pictorial and Decorative Work* on Austin-Edwards' Films and Warwick Plates. Mr. Walter D. Welford.
17	Croydon Natural History	Mr. Rudler's Fifth Lecture.
18	Croydon Natural History	Ordinary Meeting.
18	Rotherham Photographic	*Lantern Slide Making.* Demonstration by Mr. T. G. Hibbert, of Sheffield.
18	Newcastle-on-Tyne	*Lantern Slide Making.* By Edgar G. Lee.
18	Clerkenwell Working Men's Col.	Discussion: *The Best Printing Process for Amateurs.*
19	Southport Photographic Society	*McDonough's Method of Colour Photography.* H. Ball.
19	Photographic Club	*Kinetic Photography.*—Part II. Mr. A. S. Newman.
19	Southsea Photographic Society	*Film Photography.*
20	Camera Club	*Cloisters and Chapter Houses.* Mr. E. W. H. Piper.
20	Sunderland Photographic	*Photography for Naturalists.* By Professor Brady, M.D., F.R.S.
20	Darwen Photographic	*Melrose and the Scottish Border.* Illustrated by Lantern Slides. By Frank Gray, Esq., Blackburn.
20	Brentford Photographic	*Practical Side of Pictorial Composition.* Mr. A. R. Read, Jun.
20	Maritzburg Camera Club	*Lantern Slides (Wet Plate).* A. Allerston.
20	London and Provincial	Lantern Night. *Japan.* Mr. R. P. Drage.
20	North-West London	Demonstration of the *Platinotype Process.*
20	Richmond Camera Club	*Synthol, the British Developing Agent.* Mr. Edgar S. Barralet, F.C.S.
20	Liverpool Amateur	Practical Demonstration. *Printing in of Skies.* Dr. Llewellyn Morgan.
21	Borough Polytechnic	*Home Portraiture.* Mr. F. W. Bannister.
21	Bognor Photographic Society	Lantern Evening: *Glimpses of Prairie Land.* Miss Simpson.
21	Sutton Scientific and Literary	The Session's Work (Lantern).
21	Croydon Natural History	Photographic. *Life and Work of George Tinworth.* Affiliation Lecture.

CAMERA CLUB.

THE Rev. Mr. Fitzpatrick undertook in August last a somewhat unusual holiday jaunt, for he found his way to parts of Russia which are so far out of the beaten track that the English and American globe-trotter is never seen there. The traveller, and the friend by whom he was accompanied, each had a camera, and each did good photographic work. Moreover, in telling the story of his tour, Mr. Fitzpatrick, bearing in mind that he was talking to photographers, gave a distinctly camera-and-tripod flavour to his discourse. The total journey undertaken by these two enthusiasts covered more than 6,000 miles, and the principal object of the expedition was to study peoples rather than places. You can neither get into nor out of Russia without a passport, and although this is easy to obtain, permission to photograph in the dominions of the Tzar is not so readily given. The travellers' application for such a permit was met by a blank refusal, but they were told at the same time that they might carry cameras, but that they must not complain if, in the course of their wanderings, the instruments were confiscated by the police. It was ascertained subsequently that the right course to pursue in such a case is to get elected a member of the Russian Photographic Society, which body, it seems, have *carte blanche* to photograph where they will. The language is, of course, a difficulty. Many of the cultured Russians speak English, but the population generally are so ignorant of their own language that it is necessary for the shopkeepers to exhibit pictures of the articles they sell, for written words would not be understood. It it advisable for travellers to learn the Russian alphabet at least, for that knowledge will help them over a few difficulties. The cameras were not confiscated after all. The police did not take them, but the cameras took the police instead, as many of the photographs obtained in the streets of St. Petersburg and Moscow showed. It was possibly an official joke, this bogey of confiscation, or possibly it was a warning against photographing fortifications and military works generally. A man who took a camera to Sevastopol, for example, would most likely have it taken from him. St. Petersburg does not offer many attractions to the artist, but Moscow is very different. From the splendid Kremlin to the humbler parts of the city it is full of interesting pictures, and of these the travellers did not fail to secure a few. The only time that they suffered any annoyance by being interfered with was when they inadvertently failed to remove their hats in the presence of the sacred ikon. One of these ikons they purchased and brought home. It is simply an elaborate picture in chased metals of the Virgin and Child, and enters largely into the religious life of the Russians of all classes. From Moscow the travellers went to Nijni Novgorod, visiting the great fair there and taking many

pictures of the busy buyers and sellers. They next found their way to the River Volga, and went by steamer to Astrakhan, on the Caspian Sea. An interesting picture showed how this steamer, built on American lines, was fed with fuel in the shape of refuse naphtha. Changing to a larger ocean-going steamer, the travellers journeyed south to Petrovsk, which was the most Eastern place they visited. Here were many Persians. The bathing customs on the shores of the Caspian and Black Seas are of the most primitive kind. Bathing dresses and bathing machines are unknown, and it is somewhat disconcerting to find a party of ladies disporting themselves in the waves under these conditions, just in front of one's hotel windows. We were next introduced to the wild mountain scenery of the Caucasus, for the travellers now made their way to Tiflis. Just on the boundary where Europe and Asia unite is placed a large stone cross. Tiflis was interesting, especially in the Persian and Armenian quarters, and very different to Batoum, on the Black Sea, where the tourists next arrived. This was a miserable place, but compensation was afterwards found in the delightful trip on the Black Sea to the Crimea. Here Sevastopol and Balaclava were visited, and here the travellers came upon the track of an Englishman with a camera who had fallen by the way. He had been using his opportunities somewhat freely, and the police had inquired what he was doing. His reply was that he was not photographing forts, but only peasants. But the police in these parts know how to develop photographs, so they possessed themselves of that man's plates, and the negatives came out forts. The photographer came home without his apparatus. The lecturer and his companion had some interesting experiences in the Crimea, and afterwards at Odessa. They saw the formidable Black Sea Fleet, they saw how Sevastopol was teeming with naval and military life, and how the arsenals contained enough material to blow up all Europe. Some day that fleet will swoop down on Constantinople, and Saint Sophia will once more become a Christian church. The travellers made their way home through Germany. The lecture was much appreciated, but disappointment was expressed that the photographs were coloured. The tints were no doubt correct—indeed, we had the lecturer's testimony to this—but the colourist, used possibly to water-colour work on paper, had not mastered the technique of transparency painting on glass, hence the many blots, specks, and other vagrant markings which disfigured the pictures.

PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

Report of the General Committee.

Your committee have to report that since the December meeting of the Association the membership has increased by eighteen, the total number of members now being 500.

With reference to the subject of dealers' terms for professional photographers, the Plate and Paper Makers' Association, as a result of the meeting on November 20th, when the matter was fully laid before that body by a deputation of this Association, refused to grant the concession to members of this Association. Your committee accordingly asked for a second interview, at which the matter could be further discussed. This, however, was refused. Subsequently the secretary of the Plate Makers' Association writes that "several members of the Association have been considering for some time past the question of proposing more advantageous terms to professional photographers generally, and there is every prospect of an early decision on the subject, and your Association will be informed of this when the times arrives." In reply to a query as to the probable date of the decision, the secretary of the Plate Makers' Association writes:—"I am desired to inform you that the members of this Association much regret that they are unable at present to give a definite reply."

The committee will at once consider what further action should be taken in the matter.

The following list of suggested subjects for discussion at branch meetings has been drawn up and circulated:—

(1) Benevolent Fund.—It has been suggested that in connection with the P.P.A. a benevolent fund should be established. The committee desire to ascertain the feelings of the members in the suggestion, with a view of enabling them to take any action that may be called for, and they therefore invite the opinions of local branches in the matter.

(2) Amendment of the Copyright Act.—It being obvious that the provisions of the present Copyright Act cannot prevent or provide remedies or penalties for the indiscriminate reproduction of the work of professional photographers, local branches are recommended to discuss the matter, with a view of ascertaining the best method of securing the necessary alteration of the law by the amendment of the Copyright Act, 1862. To this end it is suggested that the Photographic Copyright Union be approached by all branches, through the London Committee, and urged to promote a Copyright Bill which will contain a clause making it compulsory that before any photograph whatever, copyright or not, can be reproduced, the consent of the photographer must be had and obtained. Damages or penalties should be recoverable for contravensions of this clause.

(3) Photographers as Dealers.—It is suggested that local branches pass resolutions (to be transmitted through the London Committee) recommending manufacturers and wholesale houses to appoint, wherever practicable, professional photographers, as retail dealers in preference to chemists, stationers, Italian warehousemen, and other tradesmen and shopkeepers who have no direct interest in photography and are not concerned for its advancement.

(4) Local branches, many of whose members are dealers as well as photographers, should, it is suggested, form resolutions adverse to the attempt to introduce the "tied house" system of trading as largely practised in America.

(5) Fire Insurance.—The opinions of local branches are invited in the question of fire insurance as affecting professional photography.

The committee have deemed it advisable to start a benevolent fund for the purpose of befriending and affording temporary relief to members of P.P.A. or their dependent relatives. The funds will be administered separately from the ordinary funds of the Association. It is suggested that funds be raised by donations, proceeds of entertainments, and other means that committee may think advisable. The committee hope that members of local branches will take up the matter and see their way to assist the object as far as possible.

The committee, in accordance with the instruction at the last general meeting, communicated with the conductors of certain newspapers advertising cheap enlargements and misrepresenting their value. Your committee are pleased to say that, amongst others, the following letter was received from the managing editor of the "Liverpool Daily Post":—

"'Liverpool Daily Post' and 'Liverpool Echo,'
"Chief offices: Victoria Street, Liverpool.
"December 19th, 1901.

"Dear Sir,—I have to acknowledge receipt of your letter of December 17th. Of course, a communication coming from such an Association as yours is entitled to every consideration.

"In these days, when the 'Times' takes to selling Atlases and Encyclopædias, and the largest drapers take to selling every form of miscellaneous goods, it is very difficult to restrict business to one particular groove.

"I cannot, therefore, pledge myself to abandon a scheme of which you complain, but I think I may promise this, that the phrase 'if obtained through a professional photographer they would cost £2 2s. or £3 3s.' will be in future excluded from our advertisement.

"I may say that we are pledged to this scheme, and it would be impossible, even if we had the wish, to stop it just now.—Yours truly,

"A. G. Jeans.

"Alfred Ellis, Esq., hon. sec.,
"The Professional Photographers' Association,
51, Baker Street, London W."

Your committee consider the result of their intervention in this matter creditable to the particular newspaper whose example, it is hoped, will be generally imitated in the press.

Your committee regret to announce the death of one of their number—Mr. J. Caswall Smith.

[The report of last Friday's general meeting of the Professional Photographers' Association is unavoidably held over till next week.—Eds. B.J.P.]

LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

At the weekly meeting on Thursday, February 6th, Dr. J. W. Ellis, F.E.S., delivered an interesting lecture on "The Photography of Architecture." The lecturer contended that architectural photography afforded opportunities for the exercise of one's powers of pictorial composition just as much as in landscape photography, and was attended with just as great difficulties. Dealing with apparatus, the lecturer advocated the square bellows type of camera in preference to the taper bellows, and, where possible, the use of a lens of a focus equal to the diagonal of the plate used. As a guide to exposure for interior work, he suggested stopping down the lens until the shadow detail appears just visible, then giving five minutes' exposure with a moderately rapid plate. Backing of plates, development, etc., were fully entered into, and several valuable suggestions offered. In conclusion, Dr. Ellis pointed out what to avoid in the pursuit of this branch of the art, giving a practical application of his remarks by freely criticising a number of lantern slides which were thrown upon the screen.

PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION (EDINBURGH BRANCH).

A meeting of the above was held at 38, Castle Street, Edinburgh, on Friday evening, January 31st, 1902, Mr. W. Crooke in the chair. The secretary handed the chairman the suggested subjects for discussion received from the parent Association in London:—(1) Benevolent Fund.—After discussing the above, it was agreed unanimously that it was most desirable to have a benevolent fund, but that in the meantime it was a little premature to start one until the Association was more consolidated. (2) Amendment of Copyright Act.—A long discussion took place on the copyright of photographs. It was finally agreed that it was desirable that all photographs should be copyright in regard to the publication of them in the illustrated press, viz., that it should be necessary to procure the consent of the photographer before publishing any photograph; but in regard to the reproducing, in form of enlargement or otherwise, of a photograph by another photographer (although in some respects it might be thought desirable that each man should have the exclusive right to reproduce his own work), the meeting came to the conclusion that this state of matters would be quite unworkable, and it was considered that it would be detrimental to the business of the profession at large. (3) Photographers as Dealers.—The meeting recommended that professional photographers should not be made dealers. If they became dealers they would no longer be eligible as members for the P.P.A. (4) Fire Insurance.—The present rate of fire insurance was considered excessive, and it was thought advisable that the insurance companies should be approached by the Association and petitioned to reduce their rates. It should be represented to them that photographers do not now use the inflammable materials, in dangerous quantities, such as methylated

spirits, ether, collodion, etc., which formerly caused the insurance companies to charge a special rate. Photographers in Edinburgh were at present charged 4s. 4d. to 5s. per cent., and the meeting was of opinion that it should be reduced to 3s.

SOUTHAMPTON CAMERA CLUB.

THE above Club held its fortnightly meeting on Monday evening, the 3rd inst., at the Philharmonic Hall, under the presidency of Mr. G. T. Vivian. The hon. sec. made the announcement that the affiliation of the Club with the Royal Photographic Society had been completed, and the president (Mr. Burrough Hill) and hon. sec. (Mr. S. G. Kimber) were unanimously chosen as representatives of the Club on the council of that Society*. Another of the series of lantern slide competitions then took place, the subject being "Still Life." The contributions were of a very gratifying character. The winning pair, which well deserved first place, was produced by Mr. R. E. Jurd, who was awarded the usual certificate of merit. The slides were most realistic reproductions of fruit and vegetables. Then followed an interesting experiment with Fuerst Bros.' new flash-light candles, a photograph of a group of members being taken. On Monday next an extra night has been arranged, when Mr. R. W. Carden, A.R.I.B.A., will give a lecture entitled "Towns not on the beaten track in Northern Italy," which will be illustrated by lime-light views, to which ladies are invited.

[* A somewhat novel way of electing members of the R.P.S. council, unprovided for, we believe, in the articles of association.—EDS. B.J.P.]

PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION (HULL BRANCH).

AT the meeting held at the Grosvenor Hotel, Hull, on February 5th, 1902, Mr. W. Barry occupied the chair. The proposed "Photographers' Benevolent Association."—After considerable discussion the following resolution was proposed by the chairman (Mr. W. Barry), seconded by Mr. J. Osbourne, and carried unanimously:—"That, in the opinion of the Hull Branch, the time has not arrived when the P.P.A. can be considered financially and numerically strong enough to undertake the formation of a benevolent society worthy of British professionals, and that the committee in London be asked to defer, if possible, the establishment of any philanthropic scheme. That this meeting believes the energies of the new Association may, for a time, be more effectively employed in extending its membership and devising means for the better protection of professional interests in photography." Proposed by Mr. Delf, seconded by Mr. Fussey:—"That until the discount controversy with manufacturers is satisfactorily settled, members shall not allow the use of their names in advertising lists and handbooks now in course of preparation by a well-known firm of dry plate makers."
Carried unanimously. A letter having been received by a member from the Rotary Photographic Company, Limited, stating that it pays "the best London photographers, for the very best subjects, the price of one guinea for the right to reproduce on postcards," it was proposed by Mr. Pettingell and seconded by Mr. Wellsted, that the London Committee be asked if this extremely low fee had become an understood maximum for London photographers of position to charge for the use of valuable copyrights on postcards. A discussion on the possibility of extending Association work in Yorkshire resulted in a promise by all members present to assist at a meeting, should one be called at Leeds, with the view to the establishment of a West Riding centre.

FORTHCOMING EXHIBITIONS.

1902.	
January 31–Mar. 1 ...	Dundee and East of Scotland Photographic Association in the Victoria Art Galleries, Dundee. Hon. Secretaries, V. C. Baird and Archibald Campbell, 39, High-street, Dundee.
February 13–15	Nottingham Mechanics' Institute Camera Club, Mechanics' Lecture Hall, Nottingham. Joint Secretaries, W. Ward, 14, Stratford-terrace, Nottingham; E. H. Atkin, 68, Blue Bell-hill, Nottingham; A. Black, 9, Bowers-avenue, Nottingham.
„ 15–Mar. 8 ...	Edinburgh Photographic Society, Society's Rooms, 38, Castle-street, Edinburgh. Secretary, J. B. Johnston, 52, Hollybank-terrace, Edinburgh.
„ 19–26	Croydon Camera Club, The Art Galleries, Park-lane, Croydon. Hon. Secretary, W. H. Rogers, 46, Bensham Manor-road, Thornton Heath.
March 1–8	South London Photographic Society, Public Baths, Church-street, Camberwell. Hon. Secretary, Frank Goddard, Woodlands, Vanbrugh-hill, Blackheath, S.E.
Mar. 1902	Corporation of Glasgow Photographic Exhibition and Competition. Hon. Secretary, Peter Macnair, People's Palace, Glasgow.

THE South London Photographic Society had the honour, on Monday, in affording a welcome to the president of the Toronto Camera Club, who arrived in London last week. Mr. W. H. Moss has brought with him an interesting set of lantern slides and prints showing the homesteads and country of our colony, amongst them many beautiful scenes and artistic grouping of cattle, recalling many of Constable's portrayals of country life.

Commercial & Legal Intelligence

MESSRS. W. KING & Co., artists, enlargers, printers, etc., of the Kingston Enlarging Works, Southsea Road, Kingston-on-Thames, send us their latest trade list of bromide enlargements on paper, opal, and canvas, carbon enlargements on paper and opal; copying; developing plates and films; finishing enlargements, etc.; lantern slides; mounting; making negatives; platinotype enlarging and printing; printing; retouching special lines; toning and fixing prints; toned bromides.

THE Photorama.—Under the style of the "Photorama" there has appeared in Paris a novelty in photographic apparatus, the latest invention of the Brothers Lumière, which is capable of taking on a cylindrical film a photograph embracing the complete circuit of the horizon. From this a positive is printed, and by a slight adjustment of the working parts it is possible, using but one source of light, to project the result as a panoramic view, using the apparatus both for view-taking and projection. Sufficient film can be carried, whilst in the field, for some twenty exposures. When used as an apparatus for projection, the subjects may be readily changed, the time occupied being but a few seconds. From accounts received the following particulars are gleaned:—The negative is taken on a film, which revolves in an opposite direction to that of the single lens employed, and a mirror is used for the purpose of reversing the image. From the negative so obtained a positive is prepared, which, for projection, is held in position, above and below, by two circular metal collars. Illumination is derived from an electric arc placed over the central axis of the machine, the picture being equally illuminated by means of a series of mirrors and condensers. Projection is attained by the use of a series of lenses and mirrors revolving round the outer surface of the positive film.

A COMPENSATION Appeal.—Sheriff Henderson has allowed proof in an Edinburgh workman's compensation case, in which Messrs. Valentine & Sons, Limited, photographic publishers, 53, Montgomery Street, Edinburgh, who were defenders in an action raised some time ago, under the Workmen's Compensation Act, by Catherine Murray, 3, Ballantine Road, Leith, applied for the reduction of an award. The defenders lodged a minute wherein they sought to have the award granted in favour of the pursuer, dated May 7th, 1901, of a weekly payment of two shillings, reduced or reviewed, on the ground that the pursuer was at present earning more than her wages at the time of the accident. To that minute the pursuer lodged answers, in which she stated that her earning capacity was permanently depreciated by her injuries, and that her general condition was such that she could not earn as much as she did prior to the accident. Up till January 8th she did earn 7s. 2d. per week, her working hours being from 7 a.m. till 6 p.m., which was half-an-hour a day longer than when she was employed by the defenders. She had to leave two situations on account of ill-health, and since the date of the accident her average wage was only 4s. 2d. per week. The sheriff, in allowing proof, said he would have preferred to dispose of the case summarily, but in view of the fact that the parties were not at one on the question of the weekly wage of the pursuer, he had no choice but to allow parties a proof of their averments. The case has accordingly been placed on the roll, in order that a diet may be fixed.

ON Saturday, February 1st, an alarm of fire caused a panic at the Royal Albert Music Hall, Canning Town, but happily no serious consequences ensued. The last item on the programme, fixed for ten minutes past eleven, was a bioscope entertainment. The bioscope apparatus is contained in an iron box, inside which the operator is enclosed. The box was right at the back of the pit, and when the ordinary lights had been turned down the operator began his work. A portrait of ex-President Kruger had hardly appeared, when an unusual noise was heard at the instrument, and flames and smoke issued from the operator's box. The fitful light in the darkened house naturally alarmed the audience, and the word "fire" was mentioned. The people in the upper portion of the house, being unable to see the nature of the mishap, made a stampede from their seats. The policemen on duty, at the first sight of alarm, threw the doors open, and thus the people in the upper part of the house were enabled to pass out in a hurried manner, but one or two women fainted. As soon as it was seen what had happened, the electric light was turned on, and Mr. Walter Leaver, the chairman of the hall, called loudly for order, and assured the audience that there was no danger, while Mr. Charles Rel, the proprietor, to convince them that the danger was over, stood upon the bioscope box and addressed them. It appeared that the celluloid films of the bioscope had caught fire, but the flare did not last more than half-a-minute. The West Ham Fire Brigade and a number of policemen were speedily upon the scene, but there was no need for their services.

WE have received a thirty-page list of second-hand and shop-soiled photographic goods for sale by Mr. W. E. Dunmore (the Tella Camera Company, 110, Shaftesbury Avenue, London, W., including hand cameras: magazine, folding (hand or stand), Kodaks, twin lens; field cameras; lenses; camera stands; roll holders; changing boxes; lanterns; enlarging lanterns; shutters; sundries. Mr. Dunmore's conditions for the purchase of photographic apparatus on the easy payment system are as follows:—(1) Full particulars of goods required. State list prices, maker's name, size, etc. (2) Payments may extend over six months for amounts under £6; over nine months if over £6 and under £9; and over twelve months if the amount is over £12. (3) All apparatus is supplied at list prices, and guaranteed as described in maker's list. Interest at the rate of 2s. must

be added to each £. No interest is charged on the first or deposit payment. (4) A deposit of not less than a sixth part of the value of the goods ordered must accompany each other, which will be considered to be the first monthly payment. In event of references not being satisfactory, the deposit money will be returned in full. (5) References are only required as to the stability of customers; in making inquiries, the nature of business does not transpire, simply the amount as a ledger account. (6) Householders should fill in form A, and supply the names of two references; clergymen, bankers, or tradesmen preferred. (7) Non-householders should fill in form B, and supply full name and address, etc., of his (or her) guarantor, who should be a householder. (8) Instalments should be paid regularly, as soon as due. A printed receipt card is supplied free. (9) Goods may be selected from any maker's list approved of by the Company. A printed application form is sent post free.

A CLERGYMAN'S Company Speculations.—Upon a petition filed by Lord Foley, the only creditor, the Rev. A. A. Barratt, vicar of Holy Trinity, Claygate, attended at the Kingston Bankruptcy Court, yesterday, to undergo examination. The liabilities were returned at £3,893, and the assets at £4,230, but the latter include a claim of £4,162 against a company known as Photo, Limited, in which the debtor was interested, and which was in liquidation. The debtor attributed his insolvency to a judgment obtained against him by Lord Foley in respect of a guarantee given in connection with the formation of Photo, Limited. In answer to the Deputy Official Receiver, Mr. Barratt stated that he was vicar of Holy Trinity, Claygate, and had been in holy orders about twenty years. His income at one time from pew rents, endowment, and pupils was about £1,400. He first became connected with public companies in 1881, but it was more a hobby than anything else. He had been connected with the Artistic Letter Company, Limited, the Mechanical Bolt Syndicate, the Linoleum Tile Company, Limited, the Cresco-Fylma Company, Limited, the Cresco-Fylma Hannam Company, Limited, and Photo, Limited, all of which had gone into liquidation. In reply to Mr. Cooper Willis, who appeared for Lord Foley, Mr. Barratt said he was also connected with a company known as Stationery, Limited, and was to be managing director or working chairman of it at a salary of £1,000. He never, however, took a penny out of the company. He had one share for £100. He wrote to Lord Foley, in 1894, suggesting that he should give him a lease of some land round Telegraph Hill for the formation of a golf club, and Lord Foley gave him a lease for three years at £2 per annum. He afterwards sold this lease to a gentleman for £10. He did so without consulting the members of the golf club which he formed. He did not, however, obtain the lease by representing that it was on behalf of the parishioners, and he denied, therefore, that there was any fraud in selling it without their consent. For the debtor it was stated that he had lost everything except his pew rents. The examination was adjourned.

RE George Caldwell, photographer, residing at 66, Park Road, and trading at 9, St. Peter s Gate, lately trading at Wheeler Gate, and prior to then at Longrow, King Street, and Carrington Street, Nottingham. The first meeting of the creditors interested under this failure took place on Friday last, at the offices of the Official Receiver for Nottingham. The summary of accounts showed gross liabilities amounting to £2,380 3s. 6d., of which £2,226 0s. 2d. was expected to rank for dividend, and the assets, consisting of book debts, estimated to produce £4 2s. 9d., thus showing a deficiency of £2,226 0s. 2d. In reply to a question by one of the creditors, the Official Receiver said that debtor was insolvent a year ago to the extent of £2,000. He now stated that £1,000 of that arose from loss by a fire which he had in Carrington Street some years ago, that he lost about another £500 through litigation with his landlords, and that he had had some minor losses, but, substantially, the rest of the deficiency was made up of living expenses, which his profits have been insufficient to meet. There were a number of unsatisfactory features about the case, of which they could not take a favourable view, but it would be better to defer going into them until the public examination. The debtor appeared for his public examination at the Nottingham Bankruptcy Court on Friday last, before the Registrar. In reply to questions put by the Official Receiver, debtor stated that he commenced business as a photographer, twenty-four years ago, in Carrington Street, without capital. He carried on business there successfully for a number of years. Some eight years ago he endeavoured to effect an arrangement with his creditors. He offered 5s. in the £, which was accepted, but he could not find the money and the arrangement fell through. At that time his indebtednes was a few hundred pounds. Matters improved afterwards, and some of his creditors were paid in full, and others partially. Eventually he had a fire at his premises, and to that he attributed his insolvency. His property went when he was burnt out. He had been moving about from one place to another, and losing money constantly since. He executed a bill of sale in February, 1899, for £200, when he disposed of his stock, effects, household furniture, and everything he possessed. The rate of interest was 30 per cent., but he had never paid any interest nor anything off the bill of sale. The Official Receiver: You practically divested yourself of every scrap of property by the bill of sale? Debtor: Yes. The Official Receiver: And since then you have been carrying on business with absolutely nothing to lose? Debtor: That is so.—Continuing, debtor said he had had a great amount of pressure from his creditors, and there were about thirty-two judgment summonses out against him at the date of the receiving order. In addition to fire, he considered his insolvency had been contributed to by the fact that he had been moving from one place to another and was not established in a prominent position in the city. The only books he had kept were a ledger and a cash book. Practically the whole of his indebtedness was due to trade creditors; there were only one or two private debts. The £200 which he received on the bill of sale was placed in the Nottingham and Notts Bank, and paid away on business accounts. His deficiency account showed that he was insolvent a year ago to the extent of £2,070, and he had made other losses since then, in respect of having to live out of a business which was not making a profit, but he did not think he had drawn more than 30s. per week for household expenses. The Official Receiver pointed out that, according to his deficiency account, he had been drawing at the rate of £232, but the debtor said that he had not been living at that rate.—What was your object, then, in putting that amount in your deficiency account?—The account had been made out according to the books and papers.—I suggest that that figure is probably true; that you have had £232 out of your business for your household and personal expenses during the last year?—I don't think it was so much as that. We have not lived at that rate, I am positive.—Then why did you put the figure in your deficiency account?—It is made out from books and invoices, but I have not lived at that rate.—Where has the money gone then?—Paid away in debts somewhere.—But you have lived in a £40 house?—Friends have paid the rent of that house for more than a year. The 30s. was for living alone.—Asked as to the way in which his deficiency had arisen, the debtor said that he had lost a very valuable business in Carrington Street by fire in 1898. At that time he was solvent. The premises were the best in the midland counties, and he valued the whole place then at from £2,500 to £3,000, but the amount he recovered on the insurance was only £1,850.—How did that leave you insolvent?—I was not insolvent then, four years ago; three years ago I was.—The Official Receiver pointed out that in his signed statement the debtor had declared that after he had the £1,800 he was insolvent to the extent of £100. How did he come to be insolvent to that extent?—The debtor said that he could not explain.—In fact there is no explanation to that at all?—I can only go by that paper (the signed statement).—The Deputy Registrar: But you were doing such a good business before the fire, you said?—I did a big business. There was a large turnover, but the profit was not very great.—Answering a query as to why he continued to trade when he was insolvent, the debtor said that fourteen years ago he was in the same position as he was to-day, only not in the Bankruptcy Court, but he pulled himself round and made thousands out of the business, and that was the reason he continued to do as he had been doing, with the idea of business improving. He believed that the whole of the £2,000 he was owing now had been lost since the fire in Carrington Stret. The £1,800 carried him on for some time, while he was out of premises, and for living.—Where has the £2,000 been lost if it was not lost at the fire?—In business.—Which business?—The business I carried on since the fire.—Where were you in business?—First in Peck Lane, next in King Street, afterwards in Wheeler Gate, and now in St. Peter's Gate.—So you have been losing at the rate of over £500 a year?—I have been losing money all the time.—Continuing, he said he lost £500 in a lawsuit in respect of a dispute about the rent of the premises on Long Row. The rent there was £500, but there was a factory attached, and if that had been let it would have reduced the rent to £300.—Since when have you known beyond doubt that you were insolvent?—Three years ago.—What justification have you for continuing to trade?—My principal creditors did not press me.—But still there is the fact that you were insolvent?—The object I had was this: that fourteen years ago I was in the same position, and pulled myself round, and I lived in the hope of doing the same again.—In February, 1879, you divested yourself of every scrap of property you had, left yourself £2,000-worth of debts, and have contracted other debts since then. What possible hope had you of pulling yourself round?—The only hope I had was that I had done it before, and I thought I should do the same again.—But matters have been getting worse from day to day?—Yes, they have.—You have had absolutely nothing at stake since 1899: nothing to lose of your own at all?—No.—You have simply been carrying on a losing business and living out of that at your creditors' expense?—Yes.—The debtor added that he would have been all right if he could have remained at Carrington Street.—Did not all these things point to the fact that you must have known the hopelessness of your position—I did not know it so much as I do now that all my debts are down together. I had no idea I was in such a state. I thought my liabilities were £1,200 instead of £2,200.—In reply to Mr. W. B. Smith, who appeared for him, the debtor explained, in regard to the Carrington Street fire, that the loss of £1,000 was the difference between the amount of his valuation and the sum actually received from the insurance, but in addition to that he thought that the goodwill was worth £1,000. He had the advice of a solicitor in respect of the lawsuit, and only proceeded with it after counsel's opinion had been obtained. As a matter of fact, he entered a counter-claim and received a verdict for £50 upon it, while the judge who tried the case expressed sympathy with him in the position in which he was placed.—The examination was closed.

SOUTH London Photographic Society.—The following are the results of lantern slide competitions for work done on Continental excursions, 1901:—Silver medal for best slide taken on any excursion: C. Churchill. Rhine excursions, May and September: bronze medal, F. Smith; second, J. Bar. Rhine excursion, July: bronze medal, J. T. French. Zuyder Zee excursion, August: bronze medal, C. Churchill; second, T. Coysh. E. R. Bull and J. K. Ayling, judges.

THE Croydon Photographic Exhibition, which will be opened on the 19th inst., at 3 p.m., by Sir William Abney, K.C.B., will contain the largest assemblage of the green prints by Mr. Chas. Moss as yet shown at one time and place. A representative collection of the masterpieces of the late H. P. Robinson and a Daguerreotype display are amongst many other special features, including picture postcards. The exhibition remains open from 10 a.m. to 10 p.m. every day until the 26th. The usual lantern displays, supplemented by artificial-light portraiture and demonstrations will be arranged for the evenings.

Patent News.

The following abridged description is specially drawn for the BRITISH JOURNAL OF PHOTOGRAPHY by Messrs. Hughes & Young, patent agents, 55 and 56, Chancery Lane, London, who will give advice and assistance free to our readers on all patent matters.

PATENT APPLICATIONS.—No. 2,154.—John Toby, sen., and John Toby, jun., both of the firm of the Torbay Machinist Company, 173, Fleet Street. "Improved construction of washing baths for photographic prints and negatives."

No. 1,325.—Arthur Korn, Buckingham Street, Strand. "A new or improved method and apparatus for the production of telephotographs."

No. 1,332.—Arthur Lewis Adams, 26, Charing Cross Road, London. "Improvements in or relating to focal plane and other rolled blind shutters for photographic purposes."

No. 1,441.—Nathan Smedley Kay, Chancery Lane. "Improvements in or relating to the means for adjusting or regulating the shades, reflectors or screens employed in connection with adjustable or other electric-lights, gas-lights and others for the purpose of concentrating and diffusing the light therefrom in any desired or required direction for the purpose of facilitating photography, and apparatus therefor."

No. 1,470.—John Edward Thornton, Rokeby, Altrincham. "Improvements in the design, construction, and manufacture of photographic cameras, and parts thereof."

No. 1,477.—William Colvin, 98, Buchanan Street, Glasgow. "Improvements in and relating to photographic backgrounds."

No. 1,731.—Alfred Adam Marsh, 18, Fulham Place, Paddington. "Improvements in time and instantaneous shutters of the roller-blind type for photographic purposes.

No. 1,846.—Joseph Halden, Strand. "Improvements in apparatus for use in drying or removing the surplus moisture from photo-prints and the like."

No. 1,934.—Max Reichert, Chancery Lane. "New or improved means or apparatus for developing and fixing photographic plates, cut films, and the like."

No. 1,991.—Carl Paul Goerz, Strand. "Improvements in change boxes for photographic plates, films, and the like."

No. 2,061.—Edwin Drew Bartlett, High Holborn. "Improvements in or relating to photographic cameras."

No. 2,199.—Harry Billcliff, William Henry Billcliff, and Alfred Billcliff, 4, St. Ann's Square, Manchester. "An improvement in photographic cameras."

No. 2,216.—Walsu George Perks and Henry George Merrick Fletcher, Glanafon Hayle. "An improved method of separating flexible photographic films, cards, and other sheets."

No. 2,258.—Ernest Swan, 43, Cromwell Avenue, Highgate. "A cycle lamp adaptable for use as a photographic dark-room lamp."

No. 2,273.—Kuno Schloemilch and Alein Fichte, Chancery Lane. "Improvements in the production of screens for photographic reproduction purposes."

No. 2,314.—Paul Tracy, 5, Castle Street, City Road, E.C.—"Improvements in photographic printing machinery."

No. 2,347.—John Edward Thornton, Rokeby, Altrincham. "Improvements in packing cases, adaptors, and mechanism for the storage, exposing, and transferring of photographic plates or films."

No. 2,442.—George Houghton and Herbert Holmes, High Holborn. "Improvements in film cameras."

No. 2,443.—George Houghton and Herbert Holmes. "Improvements in photographic camera supports."

No. 2,468.—Austin Edwards, Chancery Lane. "Improvements in the manufacture of photographic papers and films, and in machinery employed therein."

No. 2,504.—Arthur James Anderson, Lloyds Bank Buildings, Bristol. "Improvements in or relating to photographic cameras."

No. 2,510.—The Birmingham Photographic Company, Limited, and Frank Alston, 24, Temple Row, Birmingham. "Improvements in shutters for photographic cameras."

No. 2,539.—Samuel Sykes, 185, Stanstead Road, Forest Hill. "The crescent camera front."

No. 2,556.—Charles Winthorpe Somerville, 88, High Holborn. "An improved photographic plate lifter."

PATENTS ILLUSTRATED.—No. 18,121. Colouring fashion-plates, maps, engravings, photographs, etc. Patentee: J. M. Lorimey, 19, Rue de Bourgogne, Paris.

Stencilling-apparatus for colouring or tinting fashion-plates, stamps, engravings, photographs, maps, etc., in several colours. The sheets or maps, etc., to be coloured are first placed in clips, by which they are registered in the stencilling apparatus proper. The clip is of split tubular form, with projecting spring gripping-blades between which one edge of the sheet is placed. Tubular ends project from the clip, and are the parts by which the clips and sheets are fed and carried through the stencilling machine.

No. 18,252.—Photography. Patentee: A. Pickard, 2, Lancaster Park, Harrogate, Yorks.

Printing.—The negative and printing-out paper are gripped at the base by a clip on a flexible backing, which has a tendency to curve back at the top to facilitate the inspection of the paper. The backing, which has a bend or roll at the top to exclude light, is secured to the negative and paper by a frame having clips which receive the parts, or other forms of clips may be used. The frame may have an aperture which, when the frame is on the negative side, serves for vignetting.

No. 18,297.—Photography. Patentees: J. Wilkinson and A. Wilkinson, both of St. Oswald Street, Manchester.

Printing.—Relates to certain devices applied to printing-frames to prevent the printing-paper from moving when the frame is opened for inspection. One arrangement is described, where one of the pressing-springs is partially turned back. In each spring are two holes, which fit over studs on the hinged back. There is also a hole in the free end of the spring, which fits on to a stud in the printing frame, where it is kept in position by the turn-button.

News and Notes.

PHOTOGRAPHIC Club.—On Wednesday, February 19th, at 8 p.m., at Anderton's Hotel, Fleet Street, Mr. A. S. Newman (of Newman and Guardia) gives the second part of his lecture on "Kinetic Photography." Any of our readers interested in the subject are invited to attend.

EXHIBITIONS.—Dundee and East of Scotland.—The results in the lantern slides and lecturette classes (judge, Mr. A. Horsley Hinton) were announced on Saturday as follows:—Lantern Slides: 1, G. S. Bryson, Glasgow; 2, James Walker, Birkenhead. Lecturette: 1, Graystone Bird, Bath; 2, John B. Maclachlan, Blairgowrie.

EDINBURGH Photographic Society.—The annual exhibition of this Society will be opened at 38, Castle Street, on Saturday, February 15th. We are informed that the show promises to be one of the finest yet held by the Society. There are 155 entries in the Open Section, and one or two less in the Members' Section.

EALING Photographic Society. At the meeting to be held at the Public Buildings, Ealing, on Monday, the 17th inst., Mr. E. Dockree, F.R.P.S., will give a lantern lecture entitled "Bits by the Way." The "Bits" will include a complete set of Newgate Prison, which is doomed. As it is probable that this set will not be shown elsewhere, the hon. sec., Mr. J. Watson, will be pleased to forward an invitation card to anyone interested and who would like to be present. His address is 2, Waldeck Road, Ealing, W.

THE New Light.—Last week an interesting exhibition of the new light (atmospheric gas) has been given by Mr. J. Wilkinson, of Burton-in-Lonsdale (the inventor and patentee), in the Lumbs refreshment room. Mr. Wilkinson has been indirectly connected with Ingleton for some thirteen years. He is a retired photographer, and during his career has invented and patented many useful things, the majority being connected with the photographic trade. His latest invention, however—atmospheric gas—places all his other efforts in the shade, and aims at revolutionising the lighting system of the present day. Mr. Wilkinson gave a full explanation as to the constituents of the gas, and practically demonstrated its powers, both in respect to light, power, and heat. The inventor claims that the gas can be supplied at 8d. per thousand cubic feet, and is particularly adapted for churches, chapels, mansions, and any large public buildings. It can also be used for street lighting, and could be worked through the ordinary gas mains up to a distance of 1,000 yards, but beyond that a circuit would have to be made, so that a complete circle would be made through the carboretter. Mr. Wilkinson has been working at the subject for twenty-five years.—"Lancaster Guardian."

HUNTING With the Camera.—After thirty years' experience as a sportsman, the well-known big-game hunter, Mr. George Shiras, of Pittsburgh, abandoned his destructive gun for a camera, having come to the conclusion that snap-shotting with a camera would afford all the fun of shooting proper with none of its attendant evils For ten years, now, he has hunted with his camera—with what success may be judged from an extremely interesting article upon this new sport in the February number of "Pearson's Magazine." Some flash-light photographs of deer illustrate this paper. "Having selected a dark, warm night, the flash-light hunter prepares his cameras, lights the lamp, loads his flash-light apparatus with magnesium powder, and, in his canoe, pushes out into the silent waters of lake or river. The paddle sends the slight boat ahead so easily that no sound is heard, except a gentle ripple scarcely noticeable a boat's length away. The wooded banks are wrapped in deepest shadow, only the sky-line along the crest showing their course. At the bow of the boat the bright eye of the jack-light is turning from side to side, cutting a tunnel of light through the mass of darkness, showing, as it sweeps the banks, the trunks of trees and tracery of foliage with wonderful distinctness. Soon the quick ears of the men in the boat detect the sound of a deer feeding among the liy beds that fringe the shore. Knee-deep in the water he is moving contentedly about, munching his supper of thick green leaves. The lantern spins about on its pivot, and the bore of light chases up and down the bank whence the noise came. A moment more and two bright balls shine back from under the fringe of trees; a hundred and fifty yards away, the deer has raised his head and is wondering what strange, luminous thing is lying out on the surfact of the lake. Straight towards the mark of the shining eyes the canoe is sent with firm, silent strokes. The distance is only a hundred yards; now it is only fifty, and the motion of the canoe is checked till it is gliding forward almost imperceptibly. At this point, if the hunting were in earnest, there would be a red spurt

fire from under the jack-light, and the deer would be struggling and nging towards the bush; but there is no sound or sign of life, only slowly-gaining light. Twenty-five yards now, and the question is, l he stand a moment longer? The flashlight apparatus has been sed well above any obstruction in the front of the boat, the powder the pan lies ready to ignite at the pull of the trigger; everything is readiness for immediate action. Closer comes the boat, and still the eyeballs watch it; what a strange phenomenon this pretty light is; hing like it has ever been seen in the lake during all the days of his rhood. Fifteen yards now, and the tension is becoming great. Sudly there is a click, and a white wave of light breaks out from the w of the boat—deer, hills, trees, everything stand out for a moment in the white glare of noonday. A dull report, and then a veil of y darkness descends. Just a tenth of a second has elapsed, but it s been enough to trace the picture of the deer on the plates of the neras, and long enough to blind, for the moment, the eyes of both r and men. From some place out in the darkness the deer makes a ghty leap; he has sprung towards the boat, and a wave of water ashes over its occupants; again he springs, this time towards the nk; he is beginning to see a little now, and is soon heard running, as dy a frightened deer can run, away from the light that looked so utiful, but was in reality so terrifying."

A New Light.—Mr. Peter C. Hewitt, an American, has recently brought t a new light, which is said to give out much stronger light and at a eaper cost than any other. The light was tested by the American ciety of Mechanical Engineers, New York, and it gave a very brilliant ht. The lamp consists simply of a glass tube with a bulb at one end, which is introduced gas generated from mercury. The tubes, when ed, are connected with the ordinary electric power in any building and e current turned on. The gas acts as the conductor, and as soon as the itch is turned the tube is flooded with light. Four of these tubes were ced at regular intervals around the gallery of the auditorium, and e was hung from the ceiling. The incandescent lights were also turned and the light from these looked like jets of uncertain yellow flame compared with the light in Mr. Hewitt's lamps. Mr. Hewitt read a per in which he described his new lamp. In the course of it he said:— he mercury gas lamps exhibited are operated on the standard Edison 3-volt direct-current circuit installed in this building, and lamps of this ss consume amounts varying from 1 to 6 amperes, and the efficiency approximately ½ watt per spherical candle-power. Under better conions as high an efficiency as ¼ watt per spherical candle-power has en obtained, determined by careful and accurate measurements. I ve made lamps with diameter of bore less than ⅛ in. and as large as 3 in. length up to over 10 ft., giving from less than 10 candles up to fully 00. Lamps of very small bores give more trouble in manufacture and eration than those of moderate size. Lamps of innumerable shapes d dimensions have been constructed, and great variation of candlewer for various diameters obtained. There appears no reason why mps may not be made of any size required and of any desired candlewer per inch within wide limits, the only limitation appearing being t imposed by softening of the glass when too many candle-power per h are produced. The general rules established regarding their operan hold good so far as examined, and it is possible to predetermine h almost absolute exactness the voltage, current consumption, and ndle-power of a lamp when the manufacture is perfect. The light oduced by pure mercury gas comprised orange yellow, lemon yellow, en, blue, blue violet, and violet; and although all shades of these ours may not be present, their absence would not be so seriously felt re it not for the absence of the red. For some purposes the lack of in the spectrum is objectionable, but for many uses it is a positive vantage. For shop work, draughting, reading and other work where e eye is called upon for continued strain, the absence of red is an vantage, for I have found light without red is much less tiring to the s than with it. It is possible to transform some waves of this light, ecially the yellow light, into red light, and thus in a measure to overne this defect where required for general indoor illumination. A derate amount of ordinary incandescent light interspersed with the rcury gas electric light serves to supply the deficiency, and the mixture y be made most satisfactory. For ordinary street-lighting purposes e mercury is available, even without the red, and it should be noticed at this light has very great penetrating power, and seems to be effece through greater distances than an equivalent amount of measured ndle power from the ordinary incandescent lamp. This may be due to e fact that the waves of the red light are less penetrating than those ves which are present in the mercury light, and hence the least luable portion of the spectrum having such illuminating effects is itted, and the energy is practically expended in the more useful porons of the spectrum. When it is considered that this light, when tained with mercury gas, has an efficiency at least eight times as great that obtained by the ordinary incandescent lamp, it will be appreciated at it has had its use in places where lack of the red is not important, the economy of operation will much more than compensate for the newhat unnatural colour given to illuminated objects."—Reprinted m "Invention."

*** Notice to the Trade, Wholesale Agents and Booksellers.—*A Contents Bill is issued with each number of the* Journal, *and copies may be had on application to the Publishers.*

*** Notice to Advertisers.—*A Revised Tariff for advertisements in the* Journal *is now in force. Blocks and copy are received subject to the approval of the Publishers, and advertisements are inserted absolutely without condition, expressed or implied, as to what appears in the text portion of the paper.*

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

TITAN SCARLET S.

To the Editors.

Gentlemen,—Some time ago you published very favourable reports of Titan Scarlet S., as a sensitiser for gelatine dry plates. I have obtained some from Messrs. Holliday and Sons, Huddersfield, and following "Valenta's" instructions most carefully, have failed to obtain any perceptible increase in red sensitiveness as tested in the spectroscope. Have any others of your readers tried this dye?—Yours truly,

Titan.

LANGFIER, LIMITED.

To the Editors.

Gentlemen,—As a matter of interest to your subscribers I beg to inform you that my company has declared an interim dividend at 10 per cent. per annum for the half-year ended 1st December last.—Yours faithfully,

Edward Jas. Patterson, Secretary.

9, Old Jewry Chambers, E.C.
February 5th, 1902.

SOLUBILITY OF MANDARIN ORANGE.

To the Editors.

Gentlemen,—In the Journal for January 31, in the "Answers to Correspondents" column, you refer to me for an explanation of the difficulty met with by "H. B. B." in dissolving this dye. This objection was raised by another correspondent, and in response to a similar invitation from you was answered in the number for October 11, 1901, to which "H. B. B." is referred.

It may be useful to add that the water used to dissolve mandarin G extra must be free from lime, and to repeat that for use with an ordinary lamp 2 parts in 500 are quite sufficient, even for orthochromatic plates. The saturated solution at ordinary temperatures contains 10 to 12 parts in 500.—I am, yours, etc.,

W. S. Davenport.

Uhlandrtrasse 39, Dresden.
February 8th, 1902.

OPALINES.

To the Editors.

Gentlemen,—Referring to Thos. Leigh's inquiry re opalines in issue of the 7th, if he abstains from the use of alum the prints may be mounted on glass direct from the washing water, without using any gelatine solution. For this method the glasses should not be heated. Of course, gelatine prints which have not been alumed should not be brought into contact with heat.

I saw a reference the other day to the difficulty in securing contact between a P.O.P. print and card mount. I had the same trouble, until I adopted the plan of passing a damp sponge over the face of the mount, and then placing the mounted print under pressure.—Hoping these hints may be of service, I am, yours, etc.,

T. Stokoe.

Clare, Suffolk.
February 10, 1902.

PHOTO-ENGRAVING: HOW IT IS DONE.

To the Editors.

Gentlemen,—I trust that you will find space in an early issue to reprint the enclosed cutting, containing accurate instructions, hitherto withheld by the photographic Press, for the making of true positives, so essential in half-tone work. Unfortunately, their author does not tell us how to produce a true negative. Must the camera in that case be fixed parallel to the angled mirror and are the "Directions for Use" to be put in the dark slide or the acid bath?—I enclose my card, and remain, sincerely yours,

Processor.

[The following is the extract referred to by our correspondent. It appeared in the photographic column of last Monday's "Daily Express":—

"Photo-Engraving: The Screen.

"In these days of photo-reproduction few people know or care to consider 'how it is done.' The camera is fixed at right angles to the picture to be reproduced. This is done to produce upon the plate a true picture instead of one reversed—a positive instead of a negative; the lens is fitted with an angled mirror inside or outside. Before the

picture falls on the sensitive plate the image passes through a 'screen.' This screen is a sheet of glass covered with minute dots or diagonal lines. A screen 12ins. by 15ins. costs from £20 to £40, or even more, according to the number of lines to the square inch. For first-class paper and slow printing a very fine screen is used, having, perhaps, 150 lines to the square inch, or some 90,000 dots. For rough paper and fast printing a screen with about sixty lines to the inch would be used. The whole process of photo-engraving is exceedingly interesting. [It is, indeed!] An acid bath is used to eat away the metal, which has been specially prepared, leaving the blacks and greys in sufficient relief to give the effects of light and shade when printed from."]

COSMICAL PHOTOGRAPHY AND JOURNALESE.

To the Editors.

Gentlemen,—Your leaderette on Astronomical Photography recalls to mind a debate on that modest thesis, the finiteness of the universe. Obviously, if the number of stars registered on the photographic plate does not increase after a certain length of exposure, the fact may be used in support of the thesis. I believe, indeed, that Lord Rayleigh has estimated the cosmos to consist of a thousand million stars, a third of which appear in the Photographic Star-Atlas. But the photographic evidence rests on a somewhat unstable basis, to wit, the molecule of silver haloid. To induce one to abandon a cherished idea of an infinite universe, it seems needful to prove that there is no minimum for the amplitude of the light-waves capable of breaking down the molecule, under conditions which do not admit of perfectly continuous action for more than a few hours. Also that the limit of star-registration is constant for all lenses. I do not know that any such proofs have been adduced.

Leaving this minutely gigantic subject, let me play the captious critic of the human "Cosmos" pursuing the "even tenor of his way" in crusted journalese. Why, O Cosmos, dost thou not decorticate that phrase obnoxious, and give the—ahem!—give Gray his due? For surely 'twas—

"Along the cool sequester'd vale of life
They kept the noiseless tenor of their way."

—I am, yours truly, J. Dormer.

February 7th, 1902.

ALSATIA.

To the Editors.

Gentlemen,—In his "Jottings" in the "B. J. P." for February 7, 1902, "Cosmos" asks where Alsatia is. It may interest him to know that this is the cant name for Whitefriars, and it lies to the west of the present New Bridge Street, and is bounded on the west by the Temple, on the north by Fleet Street, on the south by the Thames Embankment, and is crossed east and west by Tudor Street, and north and south by Bouverie Street and Whitefriars Street. Peter Cunningham, F.S.A., in his "Hand-Book of London," tells us that the name was given to the precinct of Whitefriars before 1623, and was "then, and long after, a notorious place of refuge and retirement for persons wishing to avoid bailiffs and creditors." Sir Walter Scott uses the name in his "Fortunes of Nigel," and Cunningham says he (Sir Walter Scott) gets his authority from Shadwell's celebrated "Squire of Alsatia" (4to, 1688). Shadwell, I may incidentally remark, gives quaint names to certain characters of Alsatia, such as "Cheatly," "Shamwell," Captain Hackum," and "Scapeall," but Cosmos need only trouble to consult the above-mentioned work to learn all about these interesting individuals.—Yours respectfully,

Arthur V. Kenah.

2, Eliot Hill, Lewisham Hill, Blackheath, S.E.

THE ROYAL PHOTOGRAPHIC SOCIETY.

To the Editors.

Gentlemen,—I see my name appearing amongst those whom you are good enough to propose for the Council of the Royal Photographic Society. I was quite unaware of the nomination, otherwise my name would have been withdrawn, for, much as I should appreciate the honour of being a member of that illustrious body, I am unfortunately unable to give the time and attention which I consider the proper fulfilment of the duties of the office require.—Yours obediently,

Fred. Hollyer.

9, Pembroke Square, Kensington, W.
February 5th, 1902.

[Mr. Hollyer's letter reached us too late for insertion in last week's Journal. We took no personal share in his nomination for the council, from which body we were aware he finally retired some years ago. It will be seen by the report published on another page that Mr. Hollyer has, nevertheless, been elected, so that by his refusal to serve a vacancy on the new council is already created. The only comment we feel called upon to make with regard to the election is that the results generally are in accordance with anticipations. And now, in dismissing the wearisome subject of the R.P.S. and its management from these pages, a very large proportion of which has been so occupied during the past four months, we heartily congratulate the president on his re-election, and cordially wish him and his new executive every success in the work of administering the affairs of the society.—Eds. B.J.P.]

KODAK, LIMITED, AND THE WHOLESALE TRADE.

To the Editors.

Gentlemen,—Apropos of the letter addressed to the trade by the "Photographic Trade Association," which refers to the position taken up by Messrs. Kodak, Ltd., and the restrictions they place upon dealers to prevent them stocking any other than Kodak makes of rollable films and rollable film apparatus, I should like to draw the attention of my fellow dealers to one or two facts which may be worth considering.

Personally I am opposed to the terms offered by Kodak, for I consider they restrict both the liberty of the dealer and also competition; still, my opposition must be passive for one great reason—there is nothing I know of which takes the place of the goods sold by Messrs. Kodak.

The dealer can only look at the matter from a traders' standpoint. It does not matter to him whether the goods he sells are Kodaks, or any other similar make, so long as he makes his profit, and he would be most foolish to refuse to accept the best terms he can get from one firm because someone tells him there will be something brought out by an unnamed firm that will be as good, or better, than that which he is selling. Let him remember that a bird in the hand, etc.

Messrs. Kodak spend several thousands a year in advertising. Will their competitors spend more? They must, or the dealer must spend a lot of time in pushing the goods, and would be entitled to a much larger profit. Would he get it? If so, would the retail price be fixed by the manufacturers?

Allow, for argument's sake, that we push other makes of goods against Kodak, and that we build up a trade for the other manufacturers. Where does the dealer come in? We have fought the manufacturer's battles for him, and he has got an excellent paying business. Our reward is freedom to purchase our goods from either Kodak or any other manufacturer; his reward is hard cash. I admit I am mercenary enough to be satisfied with the hard cash.

We don't like the restrictions Kodak have put upon our freedom of trade. At the same time, they have not (if their conditions are carried out) touched our pockets, but they have certainly touched the pockets of the manufacturers and wholesale dealers, and it is these gentlemen to whom we must look to fight Kodak.

To sum up the matter in a few words, the dealer stands between Kodak and the manufacturer and wholesaler. Neither can do without the dealer, and our position should be "on the fence," from which position we can watch the fight without getting hurt; and after the fight is over we can give our trade to the victor, for it is quite certain that it is as a prize we must consider ourselves, not as a cat's-paw.

My advice is: let those do the fighting who have most to gain, and see that you have more than empty promises if you give your trade to either, then good may come out of evil.—Yours faithfully,

W. E. Dunmore,
Proprietor of the Tella Camera Company.

110, Shaftesbury Avenue, W.

BURNHAM BEECHES.

To the Editors.

Gentlemen,—I enclose some correspondence, which I think may be found interesting to the readers of your Journal.—Yours truly,

E. T. Batten, Secretary,
Farnham Royal Photographic Society.

Farnham Royal, Slough.
February 9th, 1902.

[Copy of Resolution sent to "Town Clerk," Guildhall, January 13th, 1902.]

Resolution passed *unanimously* at a special meeting of the Farnham Royal Photographic Society, held in Burnham Beeches on 11th January, 1902:—

To the Committee of Management of Burnham Beeches.

The Farnham Royal Photographic Society, while feeling grateful to the City of London Corporation for preserving Burnham Beeches, nevertheless views with considerable alarm the cutting which has recently taken place in the woods.

Without expressing any opinion as to the necessity of the cutting, the society feels that it certainly should be performed with great care, so as not to damage either the present or future beauty of the forest.

The meeting is unanimously of opinion that these conditions have

not been kept in mind, some of the most beautiful trees having been felled for no justifiable reason.

The brushwood and undergrowth have also not been properly treated.

The society respectfully suggests the expediency of seeking the advice of some competent person of *artistic feeling*, who might supervise the cutting, and who would preserve the natural charm of the forest of Burnham, matchless in beauty and unique in character.

(Signed) F. C. Moscrop Young, President.
E. T. Batten, Hon. Secretary.

[Copy of letter received from the "Town Clerk," Guildhall, E.C., on the 30th January, 1902, in reply to the resolution passed by the Farnham Royal Photographic Society.]

Sir,—Your letter of the 11th inst., enclosing a resolution passed by the Farnham Royal Photographic Society relative to the thinning which is being carried out at Burnham Beeches, has been laid before the Corn and Coal and Finance Committee, by whom I am instructed to reply as follows:—

The committee, acting under expert advice, have authorised very necessary cutting down of the undergrowth and trees which may advantageously be dispensed with, in the interests of their neighbours, to the great future improvement of the woodland. This work is being proceeded with by a staff of experienced men under the supervision of Mr. Forbes, who has been in charge of the beeches for upwards of forty years.—I am, Sir, your obedient servant,

(Signed) John B. Monckton.

FLASHLIGHT PHOTOGRAPHY.

To the Editors.

Gentlemen,—In a recent number of the Journal you give an article entitled "Flashlight Work." A perusal of it gives to the uninitiated the impression that it is a simple matter to produce creditable and profitable work by means of the many methods published. You lament that so few professionals undertake the work. It is obvious that there is a wide field for improvement, and, considering the class of work usually turned out by means of flashlight, it is a matter for congratulation that the workers are few. As a serious worker with flashlight for many years, might I offer a few remarks in reference to some of the difficulties?

The factors which govern the length of exposure should receive more careful consideration, and in this you fail to reach the underlying principles. I have never met with a mixture that is consumed in the 1-90th part of a second. The facts relating to the speed of a falling body have little to do with the length of exposure, it is much more a question of the chemical composition of the mixture; this will determine the speed of combustion. The amount of mixture used is also an item of great importance. Dozens of formulæ for mixtures have been published, and often the time of combustion stated for the various kinds, but I have never seen the fact pointed out, that if ten grains would be consumed in, say, 1-40th of a second, an ounce of the same powder would take considerably longer.

Ignorance of this fact leads to much disappointment. A mixture is made up, five grains of which would probably be consumed in a second, but as, say, half an ounce is required for the work, this quantity would take perhaps a quarter of a second in consumption. The result is disastrous. The beginning of the flash has time to startle the sitter before the flash is completed, and horrible expressions are obtained, which do much to depreciate flashlight pictures. Another condition that prevails in most flashlight systems is the fact that the light can emanate from one point only, and many subjects cannot be satisfactorily illuminated from only one point. Thus difficulty in distributing and locating the light is great. Another serious drawback to the popularity of flashlight pictures is the awful nuisance of the smoke which is nearly always produced.

Looking at these facts, it appears to me that what is wanted for successful flashlight photography is an apparatus which fulfils the following conditions:—1st. Any number of small portions of the powder should be simultaneously ignited. 2nd. The apparatus should be capable of distributing and locating the portions of powder in any positions that are favourable to the best effect in lighting. 3rd. There should be no smoke allowed to escape.

With an apparatus fulfilling these specifications, flashlight work would more nearly approach daylight results. I may say that I am perfecting an apparatus that does this.—Yours truly,

E. Milner.

67, The Grove, Wandsworth.

P.S.—I send you a picture of a difficult subject, which was taken with my apparatus. In this case six different lots of magnesium powder were simultaneously ignited by electricity; you will observe the necessity for distribution of light; the subject could not have been lit from one point.

[Mr. Milner is an expert flashlight photographer of great experience. The specimen he submits is that of a 12 by 10 view of work in progress, in one of the modern tubular subterranean railways. It is a remarkably fine photograph of an exceedingly difficult subject.—Eds. B.J.P.]

THE OLDEST LIVING PROFESSIONAL DAGUERREOTYPIST.

To the Editors.

Gentlemen,—"Cosmos" thinks that Mr. Werge must be the oldest living daguerreotypist. I have an old friend of eighty-four who was a licensee of Beard for working that process. He was prosecuted by Fox Talbot for working his patented callotype process. He was as a youth with Mr. Cross, the eminent electrician, at Broomfield Hall, Somerset. He has been a chemist, dentist, photographer, and science lecturer. I have written asking his permission to name him to you. I wish you could interview him; you would get a lot of historical information from him in connection with the early days of the science. I hope to get a favourable reply from him.—I am, dear Sirs, yours faithfully, Fred. York.

75, Lancaster Road, Notting Hill, W.
February 7th, 1902.

In a further letter to us, Mr. York says:—

My friend Mr. Cogan, of Bath, has replied to mine, asking for information to corroborate my impression that he was the oldest living photographer, he has omitted dates, but has stated, "I may make use of anything I know." I cannot give dates; he has often talked the matter over with me. I was apprenticed to a chemist in Bristol in 1839, and became acquainted with Mr. Cogan in 1846.

The following is an extract from Mr. Cogan's letter:—

I suppose I am the oldest person living connected with photography, because my first interest in the subject was preparing photogenic paper for the shops. The difficulty then was to get paper without any iron specs. I remember hunting about for "Old Bank Post," then the difficulty was to coat it evenly with silver, there was no floating then. The paper was first salted and the silver brushed over. The advent of "Buckle's brush" was a great boon to those preparing their own paper. Beard, who was the licensee for daguerreotype, came to Bath and opened a studio in the Park. Freeman, a chemist, in Brock Street, rented this of him, but as soon as collodion portraits were known he gave that up, went to Sydney, and did a good business as a photographer. I never practised daguerreotype professionally, but I worked it for my own satisfaction very largely. The Ogibbiway Indians once spent a day at my house. I daguerreotyped them all, singly and in groups. I think some of them were the best pictures of the kind I ever saw. At Beard's head office in London they acknowledged they were as good as any they ever took, but I have not one left, they were all stolen by a French woman. My most successful work after the daguerreotype was with "wax paper negatives." I look back on that work with great satisfaction. I believe, for old abbeys, decayed buildings, ruins, wax paper will give the best results.

When the collodion process became known, at the suggestion of some friends, I opened a place in Milsom Street, 1845. No sooner was it got into working order than down comes a warning from Talbot's lawyer, that unless I took out a licence for printing on paper from Mr. Talbot I was to be prosecuted. I at once went to London and saw them. "How much do you want," I asked. "£300 a year." I said "It's absurd, and I shall not pay it." Nor did I; but what was I to do? Then it occurred to me I might print on plaster of Paris. So I took the negative in the usual way, put that in the copying frame, and took a positive, larger or smaller, as I wished. Then on the positive I poured a thin coating of plaster of Paris; when dry it left the glass, and gave really a very good picture. This could be cut round, put in a case; and for these I got a guinea apiece; but as soon as the action threw the collodion process open all this was stopped.

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Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY, 24, *Wellington-street, Strand, London, W.C." Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

PHOTOGRAPHS REGISTERED :—

A. W. Yallop, 198, High-street, Gorleston, near Gt. Yarmouth. *Photograph of stone breakwater.*

W. P. Little, 30, South-street, Exeter. *Photograph of oil painting of football match.*

W. P. Little, 30, South-street, Exeter. *Photograph of Devon and Durham football match.*

A. J. Ashbolt, 10, Exmoor-road, Southampton. *Photographs of H. Small, A. Brown, T. Bowman, and W. Henderson.*

J. HOUGHTON.—We are much obliged for the cutting.

JULIAN T. BEE.—The plates must, of course, be fixed in hypo as usual. We do not answer questions through the post.

C. C. LYON.—Direct examples are no longer to be seen. Mr. Jacolette, of 42, Harrington Road, South Kensington, S.W., would, no doubt, produce one for you as a matter of business.

CISTERCIAN.—It seems to us that if you register the copyright now you can claim damages for all prints sold after the date of registration, but not for those sold before.

CARAMEL.—E. T. M. writes: "Some time since a firm at Silvertown advertised in the JOURNAL preparations of caramel. Do you know their name and precise address?"—In reply: Messrs. Litchenstein & Co., Silvertown.

PALATINE.—(1) We should say that the lighting is faulty, but without seeing the studio we cannot say the best way of remedying it. (2) Such works as "Lighting in Photographic Studios," by Duchochois, "The Studio and What to Do With It," by Robinson, will give you the information you desire.

PORTRAITURE BY ARTIFICIAL LIGHT.—"ROSARY" writes: "Will you kindly give your opnion on the enclosed print, taken on a rapid plate, with one incandescent burner, 30 seconds' exposure; portrait lens, full aperture?"—Our opinion is that it is much under-exposed and not at all a pleasing portrait; but it is about as good as might be expected under the conditions it was taken

PREPARING CANVAS FOR OIL PAINTING.—"AN EARNEST APPEAL" writes: "Would you kindly tell me how to prepare canvas for oil painting?"—With the prepared canvas supplied by the artists' colourmen no further preparation is necessary. The manufacture of the prepared canvas in no way pertains to photography, and it is only queries that do which we undertake to answer.

FIXING BATHS.—"CRANION" asks: "(1) Is there a formula of acid hypo to prevent fixing going dark? (2) Can you recommend a fixing bath that will keep clear?"—In reply: (1) and (2) Hyposulphite of soda 5 ounces, water 20 ounces, sulphite of soda, 1 ounce. When dissolved, add slowly, with stirring, sulphuric acid 1 drachm. This bath will keep clear

PROCESS WANTED.—"PROCESS" asks: "Will you kindly tell me by what process the enclosed photograph is printed, and where paper and full particulars can be obtained?"—In reply: We do not know the identical brand of paper upon which the print sent was made; but several of the slow bromide papers of the "Velox" type will give similar prints.

WAGES QUESTION.—R. P. writes: "(1) Can I claim wages from a dead man, or must I sue his successor? (2) Is there a firm that would supply me with a ½-plate outfit on easy system?"—In reply: (1) How can a dead man pay you if you made the claim? You must sue his executors or administrators for whatever wages may be due to you. (2) Write to the Tella Camera Company, 110, Shaftesbury Avenue, W., and state your requirements.

GROUND GLASS SUBSTITUTE.—C. H. C. writes: "Kindly publish or give reference to a formula for ground glass substitute or matt varnish which may be coloured yellow or some suitable colour, to hold back printing of thin parts of negatives.—In reply: On page 1,085 of the Almanac a formula for ground glass varnish is given. It is:—Sandarac, 90 grains; mastic, 20 grains; ether, 2 ounces. When dissolved, add benzol, ½ to 1½ ounces, according to the grain desired. This may, of course, be coloured according to requirements.

COPYRIGHT.—"PLATO" writes: "I have an old engraving by Lockwood, published in 1803; that is ninety-nine years ago. Considering that all parties concerned in its production must be dead long ago, can I copyright a photographic reproduction of it? It is that of a public character, and, I think, would provide a ready sale just now."—In reply: If there is no copyright existing in the engraving, and we should not think there is, you can copy it and make your photograph of it copyright.

PHOTO MINIATURES.—P. C. CORNFORD asks: "I should be much obliged if you would inform me of any firms who supply or who would be likely to undertake the following:—From a series of single portraits, to be supplied, reproduce the same in miniature, for insertion in cheap forms of brooches, lockets, medallions, etc., supplying the whole thing complete?"—In reply: The Artistic Photographic Company, Kentish Town, will, no doubt, undertake your orders.

PATENT MATTERS.—H. L. YOUNG writes: "I am writing to ask if you will kindly inform me whether Houston's patent for panoramic cameras (as described on page 933 of the "British Journal Almanac for 1902) is going to be placed on the market? If you are unable to furnish this information, will you kindly give me the address of the patentee, that I may inquire from him?"—In reply: We do not undertake to answer questions through the post. Our correspondent had best address Messrs. Hughes & Young, patent agents, 55 and 56, Chancery Lane, W.C.

ADDRESS WANTED.—H. H. FRASER writes: "Will you kindly let me know where the automatic shutter release for photographic camera described on page 939 in the "British Journal Photographic Almanac for 1902," edited by Thomas Bedding, Esq., may be purchased? If you do not know where this article may be had, perhaps you will be good enough to forward this to Mr. Bedding, or give me his address."—In reply: We have no further information than that given in the article referred to. We do not undertake to answer letters by post.

TONING.—"ANXIOUS" writes: "I would like to know how to tone paper to the red or terra cotta tint such as Lafayettes tone, and also if the same is ordinary P.O.P.? I have searched high and low and cannot come across this toning bath; and as it is very important, I should be greatly indebted to you if you will advise me on this point.—In reply: It is some time since we saw any of this firm's work. So far as we can call to mind, the pictures were on albumen paper, and were possibly toned in the acetate gold bath; anyhow, the tone were such as could be obtained in that way.

AGREEMENT.—"PHOS" writes: "An agreement I made with a photographer was that I should not commence business, after a course of tuition from him, in a certain district. Can I go as an assistant, or manage a business for another, within this area? The indenture states business only, and stipuates no penalty in the event of commencing business."—In reply: Without seeing the agreement—as much may depend upon its wording—we can give no definite opinion. We should say, however, that managing a business for another might be construed as coming within the agreement. We should advise you to consult a solicitor on the point.

LENS QUERY.—T. P. writes: "I have a lens which acts all right for reproducing line drawing for process work when used direct, but when using it for reversed negatives with mirror box on I find the lines only focus sharp one way; therefore, if I focus sharp the parallel lines, the perpendicular lines are out, and then in focussing perpendicular lines sharp the parallel lines are out. If it is anything wrong with the mirror box, please can you give me an idea how it can be out? The lens is an R.R. of good make, and mirror and box were fixed by a firm which understands requirements of process, but I had the lens secondhand.—In reply: If the lens works satisfactorily when direct, it is clear that the mirror is at fault, and it should be returned to the makers for improvement. Perhaps, however, it is fixed too tightly in its setting and so its figure is altered. See that it is quite loose in its setting.

COLOURING PRINTS.—"STAIN" writes: "Can you inform me whether there are any stains suitable for colouring P.O.P. prints that can be considered fairly permanent? In all those I have used the colours fade very quickly when exposed to light, and the blues and violets have a tendency to bronze when used on shadows. I should be greatly obliged by any information as to whether there have been any improvements of late in their manufacture, and where the best can be obtained?"—In reply: By stains we presume that you refer to coal tar colours. Many of them are fugitive, while others are permanent. Messrs. Houghton & Son, we believe, supply these colours for photographic purposes, and they may be able to tell you which are permanent and which are not, when applied to photographs. With the coal tar colours one may be permanent on one material, while it is not on another.

ENAMELLING.—"WORRIED" writes: "Can you give me any advice on the following case? I am an enameller (the gelatine process), and since the new year have had very indifferent work in the shape of prints sticking to glasses. I cannot find the cause of it, although I have diligently sought for it. I have most carefully cleaned my glasses, and thoroughly inspected every one before chalking and coating. I filter my collodin (Mawson's) before coating, and also filter gelatine before using, and take every possible care, and yet some prints stick. Do you think that there is anything on the glasses that I cannot see; and, if so, can you tell me of anything that will perfectly clean the glasses?"—In reply: The only cause we can assign for the trouble is that the glasses are not made perfectly clean before they are French-chalked. Try cleaning them with tripoli and alcohol. If you do not succeed with that, try waxing them instead of French-chalking them.

*** *Many Answers to Correspondents are unavoidably held over.*

ANNUAL Dinner of the Professional Photographers' Association.—The first annual dinner of the Professional Photographers' Association will be held on Thursday evening, March 6th, in the Victoria Hall of the Criterion Restaurant, Piccadilly, London, W., at seven o'clock. The president of the Association, Mr. Thomas Bedding, F.R.P.S. (editor of the BRITISH JOURNAL OF PHOTOGRAPHY), will occupy the chair. Visitors will be welcome. Tickets (price 6s. each) may be obtained of the hon. sec. of the Association, Mr. Alfred Ellis, 51, Baker Street, London, W.

THE BRITISH

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*** *The Editor can only be seen by appointment.*

*** *We do not undertake to answer letters by post.*

EX CATHEDRA.

Photographic Surveying. In view of the unerring accuracy of photographic results when obtained with due precaution, it seems remarkable that the subject of surveying by photography has obtained so little acceptance in practice. The process is exact, and the actual survey capable of being made with a rapidity which, under many circumstances, would be invaluable; it is probable that the main cause of this indisposition to adopt photography for the purpose may lie in the indifference of the expert in ordinary methods to learn a new process. There must, for example, be thousands of cameras in the hands of our gallant officers at the front, but we doubt if any have been employed with the object of the negatives being collated and reduced to scale and the various recorded dimensions calculated out to make exact maps. The topic was taken up at a recent meeting of the Royal Astronomical Society, Professor Turner reading a paper on a simple method of accurate surveying by means of an ordinary camera, and showing that photography was capable of producing results of great accuracy. There is in this connection one consideration that may have a bearing on our remarks, and that is that ordinary surveying is often such a mere matter of measurement and neat drawing that very little training would be needed for its carrying out, while the reducing of perspective representations to a flat scale would need special study.

* * *

Photographic Competition. A photographic competition open to amateur and professional photographers has been organised by the "Figaro Illustré" for the best and most artistic original female portrait. The terms are somewhat novel, and framed in a manner that, whilst the competition offers a very liberal prize to some one fortunate individual, it doubtless will be of more than corresponding advantage to the paper. Each competitor may send in as many prints and negatives as he or she may please. The packages must bear a pseudonym, which is to be placed upon an envelope containing the name and address of the sender, but only one print will be selected by the jury from any competitor's work. The 24 prints which are adjudged to be the best by the jury will be published in the "Figaro Illustré," between March and November. In the December number a voting paper will be given, which each reader may fill up and return to the editor. The jury will count the votes and award the prize of 1,000 francs to the person who has the greatest number. The names of the winner and other competitors will be published in January, 1903, and the pictures will then be returned to their respective owners. £40 is a good price, but it is not a very liberal price to pay for the right to publish twenty-four selected pictures, which may also be the means of adding considerably to the circulation of the paper. Ful particulars appear in our correspondence columns this week.

* * *

Radio-activity of Air. Professor Geitel has been making researches upon atmospheric air in regard to its power of emitting actinic radiations, and he finds it shows, under certain circumstances, that it is capable of inducing radio-activity. When a quantity of atmospheric air remains shut up for a long time in a cave or cellar, for example, Professor Geitel finds that its electric conductivity increases to a maximum. He propounds three possible explanations, namely, (1) that the exposed substances were themselves radio-active; (2) that traces of radio-active substances were present in the neighbourhood; (3) that the air itself is the origin of the radio-activity. He is inclined to favour the latter hypothesis in view of certain experiments he had made with kites flown to a considerable height. Should this hypothesis be maintained, we have thus one

more danger to the integrity of dry-plates indicated in the possibility of radio-action through the wrappings of the stored plates from air itself, if plates are long stored in a close cellar, for example; it is not clear that there is any need for such air to be damp, as under such conditions few would be inclined to store plates. In view of the radio-activity shown to be possessed, and capable of being acquired by so many bodies and the not infrequent use of uranium salts by photographers, the question arises whether some of the inexplicable cases of fog or other abnormal effects shown upon development may not be traced to this power.

* * *

Backgrounds. Suggestions from other members of the photographic craft are usually of interest to those who make it a duty to satisfy their sitters by means of good and attractive work. The provision of new and attractive backgrounds is a constant source of perplexity to a large number of photographers. This is readily understood from the important part a background may play in a photograph, and how soon we revolt against its repeated use, when it has become fashionable. Herr Trant, of Munich, a photographer of considerable experience, writes in the "Atelier des Photographers" on the subject of modern backgrounds, and strongly advises the abandonment of conventional types and a return to nature for the choice of subjects. It appears to be his custom to carry a hand camera whenever he takes any recreation, and should he find a suitable subject, it is photographed. A print is sent to the "background" artist, who reproduces it in a style suited to the studio. Much will depend, of course, upon the artist who paints the scene. Many other subjects besides landscapes may be used, and if permission can be obtained from the owner, rooms furnished and decorated with faultless taste afford admirable studies for the purpose. But the selection and use of backgrounds of this description imply the cultivation of artistic perception and skill. Without such qualifications the photographer may offend the eye, in following Herr Trant's method, than in producing "the ordinary thing." The specimens given by Herr Trant himself are open to severe criticism, and there is only one we should be inclined to pass as satisfactory.

* * *

The Wintry Weather. Up to the time of writing, although the weather has been severe, dwellers in the London district have had but little opportunity of obtaining snow pictures. In most of the provinces, and in the north, photographers have, however, had them galore, and have doubtless profited by the chance. Snow pictures, when good, are very beautiful, but often they are not good—frequently just the reverse, both in technical quality and artistically. A year or two ago the question was raised as to whether, in a photograph of a snow scene, the sky or the snow should be the whiter of the two. It was agreed by some that, as the light came from the sky, the sky should be whiter than the snow. But if this were the case, would the picture convey the best idea of what is seen in Nature? We have before us as we write a copy of one of Rowbottom's drawings, entitled "Winter," and an admirable picture it is. The snow on an old windmill, a cottage, trees, and the ground, where it had drifted, are, in the lights, of a brilliant white, while the sky is of a grey, several shades darker than the snow generally. The picture at once conveys the idea of winter as seen in Nature. We have frequently been asked whether, in taking snow pictures, it is better to employ isochromatic or ordinary plates for the purpose. Opinions, we know, differ on the point. In winter, the sky and the atmosphere have in this country a more or less yellow or non-actinic tint, and, of course, isochromatic plates, sensitive to the yellow rays, would, to an extent, ignore that, and would represent them lighter than an ordinary plate would do; hence there would be less contrasts in the negative than it would have if taken on an ordinary plate. In these circumstances it is a question if an isochromatic plate possesses any advantages over an ordinary one for this class of work.

* * *

Care of Reversing Mirrors at this Season. During damp and foggy weather, particularly in large towns, the silvered surface of reversing mirrors quickly becomes tarnished if long exposed to the atmosphere, and thus entail a longer exposure in the negative. The tarnish is easily polished off, but in damp and cold weather it requires some precautions. When the mirror is damp the silver is but loosely adherent to the glass, and if the attempt is made while in this state to re-polish it, the whole of the silvered surface will probably be rubbed off. Now, if a mirror has been kept for a time, say all night, in a cold place, and then brought into a warm one, moisture will at once condense upon it in the form of dew, and in a short time the silver film will become very tender, and easily injured, until it has again been dried. A case in point came under our notice some little while back. The weather was cold and the light very bad, but a reversed negative had to be obtained. The camera and picture to be copied were placed out of doors in order to get the best light. When all was arranged the operator, who, by the way, was not very familiar with mirrors, noticed that it was considerably tarnished, and forthwith took it into the studio, which was warm, to re-polish it, with the result that the silver came away on the polishing pad almost as soon as it was touched. Moisture had condensed upon the plate, and thus loosened the silver. Had the mirror been warmed and the moisture driven off, no harm would have happened. In all cases mirrors silvered on the surface should be protected as much as possible from the atmosphere when not being actually in use, and when they require re-polishing they should be placed for some time in front of the stove until they become thoroughly warm before the operation is attempted; then it can be done without fear of injury.

* * *

The Woodbury-type Process. We must all agree that the old Woodbury-type represents one of the most beautiful methods by which a photograph can be printed and multiplied. The pictures are permanent, they can be printed independently of light, in any colour, and they have a transparency in the shadows which it would be difficult to excel by any other process. Unfortunately this method has two drawbacks which have militated against its more extensive use; the printing operation is somewhat slow, and the preliminary business of making a leaden mould from the gelatine relief, necessitates the employment of an hydraulic press. For certain purposes the first objection may be waived, but the provision of an expensive apparatus such as an hydraulic press is a consideration which only few workers would care to tackle. We have always thought that if some enterprising trader would place upon the market an efficient press of this character, at a moderate price, he would not only make a good thing of the venture, but would give a fresh lease of life to a very beautiful and effective method of photographic printing. Possibly an engineering firm of the old-fashioned type would decline to consider the construction of any press, or other tool, unless it were made according to long-established custom. Bright

steel must be relieved by burnished brass and other ornamental adjuncts which, without leading to extra efficiency, most certainly add to the expense of making. That such an hydraulic press can be cheaply made, we have for a long time been firmly convinced, and our views, we find, are corroborated in that useful book, "Experimental Science," by George M. Hopkins. On pages 77 and 78 of this volume may be found an illustrated description of "a very simple and easily-constructed hydraulic press, which has considerable utility. It is made of pipe fittings, valves, rods, and bolts that are all procurable, almost anywhere." We are further told that, with such a press, with pistons of respectively 2 inches and $\frac{1}{4}$ inch diameter, a pressure of 3,000lb. can be easily produced. And directions are given for certain modifications in the arrangement of parts which will secure a pressure much in excess of this. We are quite aware that comparatively few of our readers are metal workers, but we should imagine that, by the help of the drawings and description to which we have briefly referred, it would not be a difficult matter to get such a press built up at small expense. There are many engineers who advertise their willingness to carry out the ideas of amateur mechanics, and such men, knowing the cost of ready-made piping, rods, etc., together with the value of labour, would find no difficulty in giving an estimate for the construction of the machine. Those who are acquainted with the Woodbury type process will know that when once the press is at hand for furnishing the leaden mould, the further operation of printing positives in warm gelatinous ink presents no difficulty, and entails very little outlay.

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Anti-halation Backings. In the admirable paper by Mr. Holcroft in our issue for January 31st mention was made of various mixtures which have been suggested for preventing halation, and of these there is not the slightest doubt we think, that in England at least the caramel preprations are the most used. Caramel, as has been previously pointed out in our columns, is the name of a somewhat indefinite commercial mixture, and it may be obtained either as a syrupy liquid or as a dry powder, this latter being by far the most convenient for photographic purposes, though some samples have the disadvantage of becoming chippy and powdery when dry. This chippiness can be easily got over by the addition of glycerine, or golden syrup, as suggested by Mr. Holcroft, or by the addition of some of the fluid caramel, which retains its tackiness for a long time. Some of the formulæ recommended as backings contain dextrine as well as caramel, and the result, if no hygroscopic substance be used, is, when dry, an extremely powdery backing. A typical formula is composed of caramel, burnt sienna, dextrine, glycerine, alcohol and water, wherein we have dextrine added to make the backing dry and glycerine to keep it wet. Some formulæ for backings contain a colouring matter without dextrine and glycerine, which have the disadvantage of becoming chippy unless glycerine be added, but this has the disadvantage of retarding the drying of the backing. In order to avoid these troubles M. Hélain has suggested the use of ammonium chloride instead of the glycerine, as the crystals of this salt possess, as is probably well known, great flexibility. The formulæ suggested by M. Hélain are as follows:—

I.	Lamp black	10— 12 parts.
	Yellow dextrine.....	100 „
	Ammonium chloride ...	6 „
	Water	90—100 „

The lamp black should be moistened with spirit, the dextrine added, and then the water, in which the salt should be dissolved.

II.	Scarlet croceine	10 parts.
	Yellow dextrine	100 „
	Ammonium chloride ...	6 „
	Water	90—100 „
III.	Red ochre	200 parts.
	Yellow dextrine	100 „
	Ammonium chloride ...	6 „
	Water	100 „

IV. As No. III., but with only 25 parts of ochre.

No. I. proved to be the best backing, though closely approached by No. II. No. IV. was quite as efficacious as No. III., though containing only one-eighth of the colouring matter.

The use of ammonium chloride for this purpose is quite novel, and it may well be a useful addition to the caramel backings instead of glycerine or other hygroscopic substances.

Messrs. Cadbury, Bournville, Birmingham, have submitted to us a series of coloured lantern slides designed to popularise their well-known cocoa. The slides are supplied gratis to lanternists on application. They are well coloured.

Realism has invaded a department of science from which it should have been rigidly excluded. The surgical operation by which the Hindu Twins, Radica and Doodica, were separated was cinematographed. Quite a new series of sensation pictures will be presently delighting the music hall audiences of the world. One can see "in the mind's eye, Horatio" (Milles pardons, cher Jambon!), the programme of a cinematograph entertainment in the fat years of peace that are coming to us. No more travelling trains, bolster matches, or Royal children with a rocking-horse. We shall see instead:—Vivisecting a Dog at the Brown Institute. Lynching a Negro in the United States. The Execution of the Sloshbury Murderer—The Scene at the Scaffold, the Inquest—The Burying in Quicklime. A woman decapitated by a Train. The whole to conclude with a realistic series of pictures entitled "Our Hospital," in which scenes from the operating-room and the dissecting-room will be reproduced.—"Dagonet" in "The Referee."

Cripplegate Photographic Exhibition.—The third annual exhibition of the Cripplegate Photographic Society is to be held on Tuesday, Wednesday, and Thursday next, the 25th, 26th, and 27th inst., at the Cripplegate Institute, Golden Lane, E.C., and is to be opened by the Right Hon. the Lord Mayor, on the 25th inst., at one o'clock. We have it on good authority that this year's exhibition will be a distinct improvement on the two previous events of its kind. The catalogue is to have an original and special design for the cover, will be well printed on art paper, is to contain a finely-executed portrait of the Lord Mayor, and an illustration by Messrs. Wellington & Ward. A varied programme of entertainments is being provided, and will include lectures on colour photography by the Lumière process, by Mr. T. K. Grant, demonstrations of slide making and X rays, and exhibitions of lantern slides, added to which the London Viennese Band, under its musical director, Mr. Algernon Clarke, will perform a good selection of popular and high-class music. The judges, Messrs. J. H. Gear, A. Horsley Hinton, and J. B. B. Wellington, are to make their selection on Monday next, the 24th inst., so as to allow of the presentation of medals to the successful exhibitors by the Lord Mayor at one o'clock on the following day. The exhibition will be open each day from 1 to 10 p.m.

Physical Society.—The annual general meeting of the Physical Society of London was held last week at Burlington House, Professor Blakesley presiding. Professor Silvanus Thompson was re-elected president, and Mr. Lupton was elected vice-president to fill the place of Mr. Boys. Professor Langley, of Washington, and Professor Lorentz, of Leyden, were elected to fill the vacant honorary fellowships. The president of the German Physical Society was elected an *ex officio* fellow, a privilege which had already been accorded to the president of the sister society in Paris.—As Professor Thompson was unable to be present, his presidential address was read for him. In it reference was made to the honorary fellows who had died during the year—Dr. Roland, whose work in connection with electricity and the spectrum was well known, and Dr. Kœnig, the authority on acoustics. Of the new fellows, Professor Langley was the author of a word on "Researches in Solar Heat." Professor Lorentz had applied himself to mathematical theory, especially in its application to the aberration of light. Professor Thompson then referred to the anomaly in the patent law, which refused to grant a patent for anything set forth in a paper read before a learned society. Thus, Professor Oliver Lodge had described before learned societies the system of wireless telegraphy by means of a coheser and automatic tapper. He was, however, prohibited from taking out a patent in this country. Yet when Professor Lodge applied for a patent in the United States, he had to produce, as part of his claim, evidence of this very lecture. Through this law an inventor was discouraged from bringing his discoveries forward lest he should lose his rights. Among those present were Professor Glazebrook, Professor Callendar, Professor Watson, Professor Everett, Dr. Gladstone, Mr. Elder, and Mr. Boys.

THE CHOICE OF A PLATE.

It is wonderful how the old photographic proverb, "Get used to one make of plate and keep to it," lives on and flourishes! Formulated away back somewhere in the early seventies, soon after the introduction of the gelatine dry plate, it has been tenderly cared for and sheltered in the breast of nearly every orthodox photographer, whether amateur or professional. Even to-day, in spite of the almost bewildering array of various makes of gelatine plates, nine out of every ten average exponents of photography will solemnly—nay, almost indignantly—assure you that they never use any other plate than the "pet-particular"; while the tenth, alas! will cheerfully tell you he has tried nearly every kind of plate on the market, and is still seeking for his ideal. Now, in these two extremes, we have a striking example of what is happening in every branch of thought and work throughout the length and breadth of this England of ours—a vast, narrow-minded, wilfully ignorant, and orthodox majority, who will have none of your new-fangled methods or ways; and a small but growing minority, who dimly see the tragic importance to the mother country of those same, much-scorned, new-fangled methods, who are anxious to try them—aye, even adopt them, if necessary—so that they may keep the wolf from the door and render their country happy and prosperous. And what on earth has all this to do with the choice of a photographic plate? Well, we think a good deal. The noble army of British photographers, both professional and amateur, would make a very imposing array, could they be gathered together; and to their credit, be it said, a large proportion of them are earnest, intelligent folk, useful citizens every one of them. And if they would make up their minds to take a keen interest in experimenting with, proving, and adopting any methods, processes, or apparatus likely to advance and improve the science and practice of photography, they would, by the force of their example, greatly help towards the ultimate solving of one of the greatest problems we have to face. Let them decline any longer to listen to that slothful, orthodox bogie, which is for ever crying in our ears, "Stick to the one plate, the one paper, the one developer, and the one method, which you know so well, and scorn to try anything new." It may be a highly respectable, ancient British bogie, but the sooner we bottle it up in a museum jar as a curiosity of the past, the better for photography.

Choice of a plate means what? Certainly not the indiscriminate use of one make after another without rhyme or reason, but rather the careful, intelligent selection of a plate which, above all others, will be most suitable and likely to give the best and most truthful rendering of the particular subject to be photographed. But how few stop for a moment to give this all-important point a thought! No, they have got their one pet-particular plate, and with that they expect to get a perfectly satisfactory rendering of all the varied subjects that come under their notice, from a bunch of many-coloured flowers to a black-and-white sketch. And when the wished-for result is not forthcoming, it never strikes them for a moment that it is probably because they have employed a plate which was utterly unsuitable, and never intended for that particular class of subject. Generally speaking, the exposure, or the development, or even the subject itself, gets the blame, and, after two or three more unsuccessful tries, the attempt is given up. Now, this disregard of the selection of a suitable plate as an important factor in the ultimate success of the picture is in the case of most amateurs, at any rate, not due entirely to a too strong belief in the one plate theory, but to the fact that most of the so-called text-books on photography either ignore the subject altogether or only treat it in the most casual manner, as if it was of comparatively little or no importance. A few have something to tell about the advantages of an isochromatic plate for colour rendering, but the subject is generally broached in a sort of "better-left-alone" style. To gain some insight into the choice of a plate, the best plan is to, first of all, group them under their various titles. On examining a photographic dealer's list, we find that the various plates now on sale are called respectively lantern or transparency plates, half-tone plates, process plates, slow, medium, rapid, special rapid, and "lightning," or extremely rapid, plates; also isochromatic plates of slow, medium, and rapid grades. Now, each of these plates has its own peculiarity, and is, therefore, of course, specially adapted for certain subjects, and, if employed intelligently on those subjects, will yield the best possible results. The transparency or lantern plate, it is almost unnecessary to state, is intended solely for the production of glass positives, while the half-tone and process plates are employed in the making of what are technically termed "half-tone" blocks for the press. For copying black-and-white drawings, plans, and designs, the process pate will be found to be the most useful, but it is quite unsuitable for copying paintings or coloured prints, when a correct rendering of the colour values is required.

We next come to the series of plates chiefly employed by photographers—namely, the slow or ordinary, the medium, rapid, and special rapid plates. By carefully studying the idiosyncrasies of each of these plates, their full value and possibilities will soon be realised, and some insight into the colour-rendering abilities of each speed of plate must be gained. With such knowledge at command, it will be found possible to select a plate suitable for every class of subject and lighting. In photographing subjects containing much red or yellow, such as autumnal landscapes, or studies taken at, or about an hour before, sunset, under conditions permitting of a full exposure being given, the use of a slow ordinary plate will always be found to yield the best results. Should it be found impossible, however, to give the prolonged exposure necessary for a slow plate, then one of medium speed may be employed, care being taken to give as full an exposure as possible, and to carefully and slowly carry out the development. The result will be almost as good as if a slow plate had been used. From long experience, we are convinced that one of the primary reasons of failure by a large proportion of amateur photographers to obtain artistic and pictorial effects is the persistent use of very rapid plates, and of too urgent developers, the result being a preponderance of thin, flat, uninteresting negatives. If the "Snap-shot Brigade" could only be induced to carry some form of tripod (there are many excellent and serviceable walking-stick stands now on the market), much would be accomplished towards improving their standard of artistic and technical ability, for they would then find it possible to give the necessary exposure, and the weird creations which to-day loom out at you through a gloom of chemical fog would cease to exist. Generally speaking, the faster the speed of the plate, the coarser its grain and the greater its sensitiveness to the blue of the spectrum alone. Therefore, to use such a plate on an autumn landscape, a field of ruddy corn illuminated by the rays of the setting sun, or on an auburn or golden-haired model, is to court certain artistic failure and disappointment. On the other hand, the slow and medium rapid plates will yield a far truer colour rendering of the orange end of the spectrum. Though the isochromatic plate is slowly but surely working its way to the front, it is by no means an unmixed blessing in the hands of the inexperienced, for at present it is far from perfect, and has many vagaries. First, no plate varies more in its keeping qualities; sometimes it will keep in excellent condition for eighteen months or two years, and at other times not for two months. Again, to reap the best results and to obtain

really brilliant negatives, the isochromatic plate requires to be developed as soon after it has been exposed as possible. If kept for ten days or a fortnight after being exposed ere they are developed, a very great risk will be run of the resulting negatives turning out somewhat unsatisfactory. At present we consider the isochromatic plate more useful in the studio, for home-work such as flower studies, and the plate *par excellence* for photo-micrography; but not for touring in the field. When away on the annual holiday, plates have frequently to be removed from the dark slide under very awkward and disadvantageous conditions, and this is just what the average isochromatic plate cannot stand, the slightest trace of actinic light being sufficient to spoil it. Unless you are sure of being able to change your plates in a room absolutely free from any trace of light other than the dull ruby glow of the dark-room lamp, it is wiser to leave your isochromatic plates at home. If a good selection of plates of varying speed are taken, and care observed to use each speed of plate upon subjects chiefly composed of those colours of which, from experience at home, we know it will give the most correct and pleasing rendering, the holiday should prove a great photographic success.

THE GEOMETRIC INTERPRETATION OF PHOTOGRAPHS AS APPLIED TO SURVEYING AND OTHER PURPOSES.

[A paper read before the Civil and Mechanical Engineers' Society.]

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For the purpose of this paper we may define a photograph as a light-printed picture on a plane surface, obtained with the aid of a good modern photographic lens. Any rules and principles applicable for the interpretation of a true photograph will be equally applicable to any accurate process reproduction of pictures originally obtained by photography. Now, the one great generalisation upon which the whole science of metrophotography mainly depends is the truth that all good photographs are mathematically correct projections. The photographic projection is a true perspective with the focal distance as distance line. If the eye of an observer could examine any ordinary plane photographed through a small aperture at exactly the right distance in front of the picture along the correct axis of vision, then all points in the photographic picture would appear to occupy exactly the same relative positions as the corresponding objects would have appeared to occupy if observed by one eye placed at the station point where the lens was placed when the original picture was taken. For practical purposes we may consider that rays of light proceeding on perfectly straight lines from the object point have all passed on as straight lines through the station point until they meet the photographically sensitive surface inside the camera. This is not quite what actually happens, because the apex of the cone of entering rays is rarely or never coincident with the apex of the cone of emergent rays. They are always separated by a greater or less distance along the principal axis of the lens, but if they are very close together (as, in fact, they generally are with the best modern lenses), and if the objects to be depicted are far away, and the angle embraced by the picture of moderate amplitude, the maximum error which may result from treating the apex cone of emergent rays as the common station point for images and also for objects will be infinitesimal. Again, it is not of course literally true that all rays which reach the picture plane have actually travelled on straight lines from the object points. On the contrary, we know that the lens has collected rays over a fairly considerable area and refracted them, so that only a very small portion of the rays coming from the object points will succeed in travelling in approximately straight lines through the lens to the corresponding image points. But the resultant effect is as though the rays had all travelled in perfectly straight lines through a single point—in other words the refracted rays are brought to a focus at the same points on the picture plane where the unrefracted rays meet it.

It is quite an easy matter to prove experimentally that a good photograph taken with a good modern lens is a true projection. In a paper which the present author read before the Camera Club on December 7th, 1899, published in the Journal of the Camera Club for February and March, 1900, this subject was discussed at some length, and a simple experiment described for verifying the general proposition. Perhaps the best of all possible ways to prove that a photograph is a true mathematical projection is to observe that perfectly straight lines will always project on a photographic picture as straight lines or as points, never as curved lines if the lens is good. It can also be ascertained by measurement that the direction and length of the images will always be exactly what they should be with reference to the direction and length of the object lines, and to the known laws of geometry and perspective. It is quite necessary to get a clear mental grasp of the broad generalisation that all good photographs, large or small, are true perspectives. It is possible for photographs taken with a good lens to yield wrong impressions; to a casual observer they often do, especially what are called short focus, wide-angle pictures, but the mathematical projection is always right, and the pictures would look right if we could get our eyes to see them from the right points of view and to embrace so large angles. Now let us suppose it to be accepted and clearly understood that a photograph is an accurate perspective. It follows, of course, that all the laws of mathematical perspective apply to the interpretation of photographs. Suppose, therefore, that we have the necessary data, we should be able to interpret photographic perspectives just as we should well-made perspective drawings. We must, of course, have the necessary data, and the subject should be suitable, in order that the rules of perspective may be applied with advantage for the construction of ground plans and elevations direct from the pictures. In a general way it may be said that most large human constructions, in the shape of buildings, great engineering works, roads, canals, &c., could be fully measured and plotted in plan and elevation from photographic perspectives, as also could the outlines of lakes and bays, or other natural level surfaces. There can be no doubt, however, that perspective, except as applied to simple geometrical forms and figures, is essentially a difficult subject to study, and a more difficult one to apply to practical use. People get puzzled and confused with a multiplicity of vanishing and measuring points, and construction lines often at very acute or obtuse angles, and excessive care and much time are necessarily required to produce really realiable results, so it may be feared that if we had to depend too largely or entirely upon regular perspective methods, such as are generally employed by architects and others, metrophotography would at best make only slow progress in popular favour. Fortunately, we are not driven to depend on the inversion of the ordinary methods of perspective drawings for interpreting photographs. We can generally get along very well with a few simple rules of practice which are based upon sufficiently simple theory.

Suppose, for example, that we fall back on the conception of a photographic picture as a collection of tiny dots or points, each one of which is on the picture end of a straight line which originally started from a corresponding object point, and traversed the station point on its way to the picture, where it terminated in the dot under consideration. It is then evident that if we can set up the picture again in its proper position with regard to the station, any straight line from the station point to any point in the picture will be a true direction line from the station to the corresponding object point. It follows that the angle included between direction lines joining the station point to any two image points appearing on the face of the picture

will be the same as the angle between direction lines from the original lens station to corresponding points in the actual objects whose images appear in the picture. Similarly, projections of those rays or direction lines on any horizontal ground plan will correspond exactly with the direction of rays drawn on a plane table, when that most simple and popular instrument for surveying is used. It is, however, altogether necessary, when working with photographs, to possess certain auxiliary information concerning them. A number of reliable reference data are necessary to be known before it is possible to set up a photograph in correct position for sighting and drawing rays towards it if we decide to adopt this very simple method for obtaining directions and intersections on a plan, and it is equally necessary that these same data should be given or ascertained whenever we desire to interpret the photograph. For example, it is essential to be certain about (1) the plane of projection. This may be vertical or may be inclined at any angle to the horizon, provided we know the angle, but in a general way it is best to secure that the plane of projection shall be absolutely vertical. In this position of the plane of projection, all vertical lines will appear vertical, and the operation of plotting ground plans and elevations from photographs is most easily performed when the photographs are either truly vertical or truly horizontal projections. To secure a truly vertical position for the plane of projection, the camera used needs to be correctly constructed, and it must be fitted with accurate levelling arrangements. Then (2) we must know the traces of the principal horizontal planes where these planes intersect the picture plane. These traces will need to be recorded either by hand or automatically as hereafter described, and they must appear on the picture as straight lines intersecting at right angles. The principal vertical plane and principal horizontal plane intersect each other along the principal axis, which meets the picture plane at the point where the vertical and horizontal traces intersect. That point (3) is the principal point. It is a point common to three co-ordinate planes intersecting at right angles to each other. It is the true geometrical centre of the picture in the sense that if a circle of any radius be described on the face of the picture with that point as centre all points in the circumference of any such circle will be at the same angular distance from the principal axis. The principal point is also the nearest point in the picture plane to the station point, and the length of the straight line joining the principal point to the station point is the focal length, or distance line. If we imagine a sphere with the station point as centre, and focal distance as radius, then the picture plane will be tangent to that sphere at the principal point, and it is evident that angular distances can be measured in any direction along the picture surface from the principal point by aid of a tangent scale to a circle of radius equal to the focal distance. The importance of being able to find the principal point with unerring certainty can scarcely be over-estimated. That point alone is the only true origin of the three co-ordinates, which are necessary for an accurate determination of the three space dimensions and which need to be ascertained if we wish to fix with accuracy the true position in space of any point whose image appears as a projection on the picture plane.

Most commonly the principal point is to be found at or somewhere near the middle of the picture, but it need not necessarily be there, and it may even be far away from the apparent middle region; but wherever the principal point may be, it is always the true central point for reference, and the three rectangular co-ordinates already defined, which radiate from it, are the true co-ordinates axes, each one of which is common to two reference planes intersecting it at right angles. The photographic picture, which is obtained in the camera, is a projection on a vertical plane from (4) a definite station, which, as regards the picture, is a definite point on the principal axis at a distance from the principal point equal to the focal distance. The principal axis (5), as before explained, is an imaginary straight line coinciding with the intersection of the principal vertical and principal horizontal planes. It is perpendicular to the plane of the picture, and therefore the station which is a point on the imaginary line is a point standing out in front of the picture at a distance from the principal point equal to the focal distance. As regards the lens by whose aid the picture was taken, the station corresponds with the second nodal point, or the apex of the cone of emergent rays. The station, as regards the objects photographed, was a definite point at the apex of the cone of incoming rays which penetrated the lens. For reasons before explained, this point may be regarded in most cases as coincident with the apex of the cone of rays radiating towards the picture. Its position ought to be known or ascertained with care and accuracy by any of the ordinary well-known methods for determining the position of a station, and it is well to bestow a lot of careful attention upon the correct fixation of the station points; but, all other methods apart, it is well to know that the station points can be determined from photographs in the same way as other points. To determine the position of a station on a ground plan it is sufficient to be sure of a few direction lines from the station to points whose positions are already known, and favourably placed for the method of fixation, or station points can be fixed by the intersection of rays from photographs taken at other stations. Then it is evidently necessary to know or to find out by some means the (6) orientation of the view, which can be most conveniently ascertained if we know the orientation of the principal axis, which we already know is perpendicular to the picture plane at the principal point. For the rest, it is highly convenient, and for some purposes necessary, to have a scale (7) by which to measure on the picture angles subtended at the station. Lastly, it is convenient to have notes on a picture immediately available for the specific identification of every photograph directly it is taken in hand. Such notes may be made to indicate —(*a*) the station number; (*b*) serial number of picture; (*c*) index reference to point bisected by trace of principal vertical plane; (*d*) barometric pressure or attitude of station; (*e*) date; (*f*) hour; (*g*) magnetic variation; and so on. Before proceeding to consider how the photographs may be most easily interpreted with the aid of the reference data, let us turn attention to a specimen photograph which bears on its face most of the information necessary for its correct interpretation. (Slide shown.)

The picture plane here was truly vertical when the photograph was taken. It can be seen that all the lines which we know to be really vertical in the objects depicted are also vertical in the picture. If the picture plane had been inclined, either backwards or forwards, the lines which are here vertical would have been neither truly vertical nor parallel, but either convergent or divergent, as every experienced photographer will know. This picture was taken with an instrument similar to one which is here open to inspection by anybody interested. The verticality of the picture plane is secured by the construction of the instrument, and with the aid of the levelling screws and levels with which the instrument is furnished. The station for this picture, as it now appears upon the screen, is inside the lantern lens, and if it were possible to look at this picture with the eye placed where that lens now is, all directions and all dimensions would appear true and natural, as though the real things were being looked at from the spot where the lens stood when the picture was taken. The horizontal line right across the picture marks the trace of the principal horizontal plane, which contains the principal point and the station point, and all other points near or far which are on the same level as the station. Conversely, points which appear either above or below that line cannot be at the same level as the station, but must be higher or lower, as the case may be. (When speaking of the same level as this place, account is not taken of the rotundity of the earth). The vertical line marks the trace of the principal vertical plane.

This plane also contains the station and principal point, and every point in that plane has the same azimuth as the principal axis. The intersection of these two planes is the principal axis, and the point where the traces of those planes intersect is the principal point. The eye, being supposed to be at the station point, will be looking straight along the principal axis, which, if materialised, would appear to the eye only as a point, and at the same time the two principal planes, horizontal and vertical, will appear edgeways if materialised, so that the two straight lines only will be seen as projections on the picture plane of their own respective planes. The scale at the top of the picture gives an automatic record of the compass bearing. The vertical hair serves as index, and it marks on the compass scale the magnetic bearing of the principal axis. The scale which stretches right across the picture is a tangent scale, whose primary and chief use is to show horizontal angles at a glance. It serves also for the direct reading of the altitudes of all points in the principal vertical plane, or for reading unreduced angles in any direction from the principal point, the angle shown being the apical angle subtended at the station point. This tangent scale also affords very ready and certain means for quickly and easily finding the focal distance for any photograph on which it appears, whether the picture be natural size, or enlarged, or reduced. The equivalent focal length, or distance line, can be found geometrically by contructing a right-angle triangle, with a measured length of the tangent scale for perpendicular, to face an angle denoted by the measured lengths. The base of triangle will then be one focal distance. Or a measured length on the scale, multiplied by the numerical value for the cotanger of the angle corresponding to that length, will give the focal distance. The memoranda which are seen on the top corners of the pictures were made on slips of celluloid with ink, and inserted in the camera before exposure, so that they and all other records were impressed and developed at the same time exactly as the picture itself. Here, then, we have most of the necessary and useful reference data recorded automatically as latent images on the undeveloped plate, so that they spring into evidence at the same time as the picture to which they belong.

Most persons who have worked at the subject of metrophotography during the latter half of the last century have been driven to design special instruments for getting their pictures, because they found the ordinary cameras obtainable from the dealers of little or no practical use for accurate metrophotographic work, and all workers who have designed instruments have realised the necessity for having some definite guides to assist in finding the principal point and the traces of the principal horizontal and vertical planes; but even the best designed of those instruments had no better arrangements for finding those essentials than by inserting pointers or cutting notches in the margins of the frames against which the photographs were pressed at the time of exposure. The lines were afterwards ruled by hand between the images of the points or notches, and no other reference memoranda of any kind were impressed upon the picture at the time of exposure. One result has been that the operator has always had to attend to many observations, to make numerous notes when taking photographs, and the risks of going wrong in various ways then, and afterwards in office, were necessarily considerable. It has been the privilege of the author to originate the idea of impressing automatically on the picture at the time of exposure the most important and essential data for interpretation, and to design workable mechanical means for carrying the general idea into effect in detail. The earliest apparatus designed by the author for automatically registering the traces of the two principal intersecting planes and the compass bearing was made in 1894, and taken immediately to India. (Slide shown.)

The photograph now shown was one of many taken with that instrument. It is a view overlooking Fort Lahore. The tangent scale and other improvements have been added since. One of the most important obstacles in the way of the rapid progress of practical metrophotography has been the great difficulty always experienced of getting efficient working tools.

The theory of metrophotography, which is really the theory of descriptive geometry and perspective applied to light printed pictures, has been much studied and fairly-well understood by experts, but the application of the theory to practical use has been difficult and puzzling, because of the multiplicity and complexity of the matters to be attended to and noted when using this method, and particularly at the time of taking the photograph. One chief aim which the author has had in view has been to simplify procedure both in the field and at home, and to secure additional certainty in results by substituting to a very large extent automatically-working mechanical arrangements for personal observation and record. It is possible to make a machine record data with extreme accuracy, and if the machine is in any respect out of adjustment the error will often be constant, and can be detected and compensated, but human errors are more variable, and cannot be so easily detected or compensated. Time will not permit of any detailed discussion of instrumental appliances this evening, but before passing on to a brief review of some of the practical methods of working, it may be well to note that everyone who has devoted any serious attention to this subject has found that the ordinary photographic cameras of commerce are not adapted for accurate metrophotographic work, except under very limited conditions. The photographic camera has been fully developed as a toy by aid of which pictorial impressions are obtained with more or less apparent resemblance to the objects photographed, but for the purpose of record a vast majority of the pictures which are taken have very little real value, and they cannot be interpreted for mensuration purposes, not because they are not true projections, but because the key for the interpretation of those pictures cannot be found. On the other hand, given a suitable surveying camera, there is very little more trouble required to take good pictures which will be absolutely reliable records for all time so long as the pictures or reproductions from them continue to exist, and from which accurate surveys or exact detailed models can at any time be made of everything visible in the photograph. (Slide shown.)

The picture now on the screen is a survey photograph overlooking Trafalgar Square, which presents a nearly full-face view of the National Gallery, as seen from a point on the roof of Drummond's Bank. The horizontal line in this, as in all other pictures to be shown, marks the trace of a truly horizontal plane containing the station point. It is seen that it runs along the top horizontal ledge of the Gallery. The place where it cuts the monument is the same height as the top ledge of the National Gallery. If the view of the National Gallery were a perfectly full-face one, then all horizontal lines on the full view would be truly horizontal in the picture, and all vertical lines in this, as in the other pictures to be shown, are vertical, because the picture plane is always vertical. It follows, therefore, that all linear dimensions in a frontal view are exactly proportional to the linear dimensions of the object. The scale will vary with the distance of the object, or with the focal length of the lens used, but all linear measurements will always be exactly proportional on object and image, and the ratio will be $\frac{d}{D}$ where d = focal distance, and D = length of perpendicular from station point to object plane. The areas will, of course, be proportionate to d^2 and D^2. If we have a simple front view to deal with in any case, all dimensions in the view can be easily read by aid of a pair of compasses and a scale, or by other elementary means.

A full front view of a plane surface is the very simplest possible kind of view to deal with. If the front view includes parallel surfaces at different depths or distances from the station, then,

of course, the value of D varies, and the scales for different frontal planes will vary in inverse proportion to the value of D. In practice a very simple way to secure a good frontal view of a building is to set up the camera opposite the building, level it carefully, and then revolve the camera on its vertical axis until all horizontal lines in the building appear as truly horizontal lines on the ground glass back; slight movements in rotation will cause perceptible changes in the directions of the images of the horizontal lines if those lines are near the top or bottom of the picture, and far away from the principal horizon line, which is the only line to remain always truly horizontal, whatever may be the azimuth of the principal axis. It may be noted also that the area of the image is always largest with a frontal view. When dealing with the buildings for measuring purposes, it is best to use frontal views only as far as possible. It is not absolutely necessary that the lens should face the middle or any particular part of the building, but the plate should be parallel to the face of the building.

Next in point of simplicity to the image of a frontal plane surface is the image of a horizontal plane surface overlooked by the camera station. A lake, for example, on ground like the interior of Trafalgar Square. The ground plan of a level area can often be plotted from a single photograph by ruling the requisite lines to divide up the area to be plotted into a number of horizontal squares in perspective, and then noting the particular square in which particular points are to be found, and placing them in their appropriate regular squares in a plan drawn on section paper. For this method of plotting it is necessary to know the principal point with exactitude, and also the two co-ordinate axes in the picture plane, and the station should be at sufficient angular elevation above the area to be dealt with, otherwise the perspective squares cannot be rightly placed or distinctly identified, and the plotting by this method will then become inaccurate. A much more general method of procedure is to plot ground plans by the method of intersections, and then to ascertain altitudes by observing the angular elevation as seen from the station point. For plotting by intersection, views from two or more stations are necessary. (Slides shown.)

It will be seen that this method is really a kind of plane tabling, and there is no reason why actual plane tabling should not be performed on magic-lantern projections in a room, just as the same operations would ordinarily be performed on natural objects in situ. There are besides very many instrumental and simple geometrical devices which may be used with advantage to assist in the correct interpretation and measurement of photographs, and in time, as the science and art by metrophotography continue to make progress in popular favour, other improvements also will no doubt be brought to light; but this is certain, that whatever future developments may bring forth, it will always be necessary to depend on exact knowledge of the position of the principal point and of the three principal co-ordinate axes. Orientation will always be important, and it will always be necessary to have indubitably accurate information from which the exact position of the station point can be readily determined. Further, it will always be advantageous to have ready means immediately available for the measurement of angular distances from the principal point and azimuths and altitudes. All this information is invariably to be found on any photograph taken with any modern surveying camera fitted as the camera has been fitted with which most of these pictures have been taken, and which have been shown here to-night.

In conclusion, it may be observed that good survey pictures are very accurate detailed records of measurable facts, such as no mere verbal descriptions can rival. A library of good survey pictures would occupy an excessively small space by comparison with ordinary books, and yield much more detailed information than any descriptions and drawings. The operation of taking good survey photographs of large, and especially inaccessible objects, is incomparably the quickest and most economical way to gather full data for the mensuration of those objects. Survey photographs can be obtained by any moderately skilled photographer, provided he is equipped with automatically-registering cameras, so that the master minds of superintending architects, surveyors, engineers, and others can work effectively in office on materials collected from many places which they may not have been able personally to visit. For municipal, antiquarian, architectural, and surveying records survey photographs will in time be regarded as indispensable.

J. Bridges Lee, M.A.

THE CAMERA CLUB.

[From the Journal of the Camera Club.]

During the past month a considerable step has been taken in the direction of reorganising the club, by the appointment of three Sub-Committees, under the titles of the House Committee, Finance Committee, and Photographic Committee respectively. The House and Finance Committees are not new inventions, but have been to a large extent re-manned. The Photographic Committee represents a new departure. The following is a list of the members serving on these various committees:—

House Committee.—Percy E. Marshall, H. H. P. Powles, F. Seyton Scott, Hon. Secretary (*ex-officio*).

Finance Committee.—A. C. Beard, H. H. O'Farrell, A. R. Price, H. Wilmer, Hon. Secretary (*ex-officio*).

Photographic Committee.—A. C. Beard, J. W. Cadett, F. Seyton Scott, E. Sanger Shepherd, Hon. Secretary (*ex-officio*), Hon. Editor of the Journal (*ex-officio*).

The annual exhibition of members' photographs will open in the first week of May. Photographs intended for exhibition should consequently be delivered at the club on or before Wednesday, April 30th. The "ladies' evening" will be that of Tuesday, May 6th, and the annual dinner will be held on Thursday, May 8th.

Reconstruction of the Club Company.

The members of the Camera Club will have received, within the past day or two, a form of application for shares in the capital of the new Camera Club Company, Limited. It is well known that before taking decisive action in the matter of reorganising the company, the committee asked for promises of support from the members of the club, and received such promises to the full extent of what was considered the indispensable minimum to enable the reorganisation to be carried out successfully. The present issue of capital is made to that extent upon the footing of the promises so received, but it is not, we believe, understood that the subscriptions to the present issue will be limited by communications that have already passed. It was considered prudent, before embarking on the task of reconstruction, to ensure eventual success by such an understanding, but it is hoped that the members in general will manifest keener interest in the scheme of reconstruction, in the matured form in which it is now submitted for their consideration, than it was possible to awaken in the merely tentative proposals which were all that could be put before them when their promises were asked.

The reconstruction of the company gets rid at once of the burden of debentures, itself a sufficiently considerable improvement, seeing that the debenture interest at present figures at £50 per annum. It also affords the members an opportunity of making choice, in the light of experience, of the committee to whom the future conduct of the affairs of the club is to be entrusted. The statutory meeting will be held in the course of the month of March, when the present committee will go out of

office, and their places will have to be filled by means of a general election. The members will then have an opportunity of signifying, by the re-election of the retiring directors or the election of others in their places, what their wishes are as to the carrying on of the business of the club. From the announcement of the appointment of sub-committees it will be seen that the Board has already taken steps to secure increased efficiency in the organisation of the club, but it must be confessed that elaborated machinery will, by itself, accomplish nothing. Unless the motive power, which the lively interest of the members of the club can alone supply, is forthcoming, a promising beginning will fall short of its promise. But we have better confidence in our fellow members than to entertain doubts upon that point, and are well assured that what has been so well begun will be successfully completed.

THE PHOTOGRAPHIC SUB-COMMITTEE.

It will be seen from an announcement as above that a Photographic Sub-Committee has been formed, for the purpose of assisting members with scientific or practical information in reference to photography, and for the further purpose of providing a series of practical demonstrations in the various photographic processes.

A question box has been instituted in the hope that it will afford a ready means of communication between members and the committee.

Answers to questions placed in the box will either be posted or left with the hall-porter, as may be desired, and members may if they wish use a *nom de plume*. Country and foreign members may obtain information by writing direct to the committee.

The committee wish to help members in every possible way, and can do so the more readily if the wants of individuals are made known to them.

HISTORICAL NOTES.

THE note by "Cosmos" in the issue of a fortnight ago, as to who is the oldest living daguerreotypist, has created some little interest amongst some of our older readers. A correspondent calls attention to the fact that in the Victorian Exhibition at the Crystal Palace in 1897 Mr. H. N. King, the late Queen's architectural photographer, showed a daguerreotype taken by himself in 1847. Mr. King, we are happy to say, is still alive, and when we last saw him he was quite well, and is still carrying on photography professionally. In our last issue our friend Mr. Frederick York mentions a veteran photographic friend of his, Mr. Cogan, and encloses a letter from that gentleman which establishes him as a very old photographer. In historical matters it is very desirable to verify dates while there are those living who are able to do so of their own personal knowledge. In Mr. Cogan's letter there is an error in date that requires correction, or it may be quoted at some future period when it might prove misleading. Mr. Cogan says, "When the collodion process became known, at the suggestion of some friends, I opened a place in Milsom Street, 1845." Here is an obvious error in date, for the collodion process was not published by its inventor, Fred Scott-Archer, till 1851. The first publication of the process was in "The Chemist" for March of that year, and a few specimens by it were shown in the great exhibition of '51. It was only towards the close of that exhibition that they were shown, admission for them at that late period being then specially given on account of the novelty and excellence of the process.

TALBOT'S CLAIM.—There is one passage in Mr. Cogan's letter that will doubtless take many modern photographers by surprise, namely, that Mr. Henry Fox-Talbot claimed that the collodion process was an infringement of his calotype process. But it is a fact, nevertheless; Talbot did. Here is what Mr. Cogan writes with reference to the opening of his place of business: "No sooner was it in working order than down comes a warning from Talbot's lawyer, that unless I took out a licence for printing on paper from Mr. Talbot, I was to be prosecuted. I at once went to London and saw them. 'How much do you want?' I asked. '£300 a year,' was the reply." As a matter of fact, the working of the collodion process, for negatives, was retarded for a few years on account of Talbot's claims; hence the process was principally confined to the production of glass positives, and, in the hands of skilful workers, it developed into a process for producing very beautiful results, widely different from the wretched ones made now-a-days. Talbot's claim that the collodion process was an infringement of his patent was upset in an action that he instituted against Laroche, a photographer then in business in Oxford Street, which was heard in the Court of Common Pleas, at the end of December, 1854. The trial lasted three days, during which many expert witnesses were examined, and in the end the jury found a verdict for the defendant, and that the collodion process was not an infringement of Talbot's calotype patent. Had Archer patented his process, which was the everyday process from about 1857 to 1880, and Dr. Maddox patented the gelatino-bromide, which has been *the* process since 1880, what fortunes would have awaited them! A report of the trial of Talbot v. Laroche is given in the Journal of the Photographic Society—now the Royal—for December 21, 1854, and is very interesting reading, as showing the state of photography at that time. It was a pretty open secret at the time that Laroche, in his defence, was financially backed up by several other photographers whose interests were concerned.

Exhibitions.

THE NOTTINGHAM CAMERA CLUB.

[By Our Special Representative.]

THE society whose name and superscription heads the present article is not one of which we hear frequently in the journals devoted to photography, but it is a society which, nevertheless, in a quiet way is doing good work; particularly is this the case with regard to the survey of the City and County of Nottingham. This work was commenced, with Mr. J. T. Radford as secretary, some two or three years ago, and already a large number of valuable prints have been sent in as the result of the labours of the members.

The Camera Club is an off-shoot, so to speak, of the Mechanics' Institution, where its meetings are held, and boasts an imposing list of officers; the president, the Duke of Newcastle, is well known for his interest in photography. Amongst the vice-presidents are the city members of Parliament, and eight gentlemen, the best-known of whom (to exhibitors, at least) will be Mr. G. H. Wallis, the curator of the Museum, who has himself in the years not far distant organised exhibitions of photographs in Nottingham Castle; and Mr. H. Tolley, a name very familiar to secretaries and judges, and other interested persons in and subsequent to the year 1887. Mr. A. W. Flowerden presides over an efficient council, and, aided by hard-working secretaries, carries on the usual routine work of a society devoted to the art science.

The exhibition is the first held by the Camera Club, and has been engineered throughout by Messrs. Ward, Atkins, and Black, joint secretaries. The exhibition was arranged in the lecture hall of the institution, and opened on the 13th inst. by Lord Henry Bentinck, M.P., the Mayor presiding, supported by the Sheriff and an influential company. Lord Henry made a capital little speech, incidentally referring to himself as "a mere snap-shotter," and went on to say:—"Might he be allowed to put in a plea for the study of architecture in connection with photography? There were in the country specimens of most beautiful forms of architecture, yet the study of this subject was very much neglected in the present day. They saw nowadays a great many buildings run up which were not worthy of the great English people—he would not say this was the case in Nottingham any more than in other towns—but in Nottingham, which was a city of essentially old English traditions, the study of architecture should be especially inculcated." (Applause.) This is particularly apt in the case of Nottingham, where the state of architecture, for a large and important city, must be considered to be in a most deplorable condition.

However, our business is with the exhibits, of which there were upwards of 440. The judging was entrusted to S. Bourne, Esq., J.P.,

Nottingham; C. Barrow Keene, Esq., Derby; and Percy Lund, Esq., Bradford; and they had for distribution sixteen medals for prints and lantern slides, the awards being as under:—

Open Class.—Prints: Silver-gilt medal, 74, S. C. Stean; silver medal, 173, D. Deeley; bronze medal, 9, E. Strong; extra bronze medal, 14, C. J. Harrison, honourable mention, Nos. 43, 111, 126. Lantern slides: Silver-gilt medal, 9, R. Warden Harvey; silver medal, 20, P. Stock; bronze medal, 18, W. H. Pratt; honourable mention, No. 40a, G. Cleland, and 37, Jas. Smith.

Members' Classes.—Prints: Silver-gilt medal, 275, Thomas Wright; silver medal, 261, P. W. Crane; bronze medal, 206, E. H. Atkin; extra bronze medal, 234, Arthur Marshall; honourable mention, Nos. 213, 198, 246, 219. Lantern slides: Silver-gilt medal, 59, T. Wright; silver medal, 60, T. Wright (debarred); silver medal, 56, W. Mosley; bronze medal, 76, W. Mosley (debarred); bronze medal, 54, H. C. Hall; honourable mention, 80, T. Wright.

Commencing with the earlier numbers, the first frames to attract attention are those of E. Strong, whose No. 9, "Thoughts of Youth," takes a bronze medal—his No. 6, "At evening time there shall be light," struck us as the more artistic of the two; J. Ludlam hereabouts shows promise of fine work, his subjects might be improved upon, but his technique hardly. We liked the style, shape, and finish of No. 10, a little winter scene, by W. L. Harrison; there is in this little picture much beauty and depth of tone and colour. C. J. Harrison obtains recognition from the judges for a fine carbon enlargement (from quarter-plate), of the Priory Porch, Ely, No. 14. No. 20, by E. Strong, is a clever study, but shows the error of tacking on a title, and a long one, too, to a picture which, however good, is, to say the least, heavily weighted thereby; we look at the picture, then read the title, and back again, but how to combine the two is too much for us. W. J. Byrne has a goodly array of his well-known large direct studies, all in his best mood. Mr. Byrne's work and one fine study by W. W. Winter, suffer greatly here by the poor light in which they are placed. Everything is against No. 68, "Newark Market Place at Night," by S. G. Kirk. This gentleman would have been very well represented by No. 70, "A Rainy Day," which is indeed a watery, misty, drizzly sort of picture, which before now has taken the eye of judges. No. 86, "Norwich Cathedral, South Aisle," and 97, the same title, are fine architectural efforts by Spartan Camp. The want of a spirit level is clearly apparent in the former; we prefer Mr. Camp's No. 167, "A Deserted Shore," a fine bit of landscape which, we think, lies between Norwich and Yarmouth. Another "Deserted Shore," by Mr. Horsley Hinton, is in the loan section. Mr. Camp's work suffers nothing by comparison. Arthur Lewis, 104, "Bruges," 107 and 108, "The Quay Malines," gives us something which recalls the work of Mr. Sutcliffe, but far behind, the same subjects, not badly lighted, but utterly spoilt for want of suitable clouds. 111, by Charles E. Etches, "Miller's Dale," receives honourable mention. In Southwell Minster there are architectural bits galore. Mr. F. S. Partridge sends (118) "A Study in Perpendicular," which is a fair example of what may be achieved within a few miles of Nottingham. A. J. Loughton (128), "Spandrel" and "The Screen" (133), both in Southwell, shows technical powers and artistic selection of a high order in this line of work. Messrs. J. Chaffin and Sons show several examples of their work, one of which, "Meadow Sweet," receives honourable mention, but the light here is very poor indeed, and the whole series on this side of the room from 1 to 160 are badly served in this respect. Mr. Grayston Bird (171), "How Happy could I be with Either," is evidently a follower of Mr. Lyddell Sawyer, and very good at it, too! But 185, "Gloria,"—why Gloria? Now why not upon the crest of this mountain top or cloud, silhouetted against the brilliant sun-burst, print in "the youth who bore 'mid snow and ice the banner with the strange device," and call it "Excelsior"? 154, "Evening Worship," A. Paterson, is a beautiful unstrained effect of light and shade worthy of more than a passing notice. We now reach the members' class, and it is easy to see that Thomas Wright is one of the strong men of the club. 198, three pictures in one frame, interior of Southwell Minster, are very pleasing; the rays of sunlight are delicate and soft, no trace of halation, just the appearance fo an instantaneous effect, but attained by a suitable and long exposure. 205, "The Brook," by the same artist, but is not worthy of Mr. Wright's camera. J. W. Darcy, 209, "When the Tide is Out" and (210) "Doorway, Bishop's Palace, Lincoln," might be extremely good examples of pinhole photography. We hardly think this is pinhole work, however, and have not the least doubt both subjects would have looked better sharply focussed. 213, "Eventide," S. Vines, takes a deserved "honourable mention," but the framing is execrable. 217 is another "Eventide," this time by Mr. Arthur Black. 219, another "honourable mention," is a picture of two young ladies paddling on the sea shore; a "Scene on the Beach" is the kind of scene we are accustomed to in the summer at the seaside, and which appears to possess an irresistible attraction for some people: the worst of it is, other people immediately want to do the same, and fail to do it so well and so innocently as Mr. Darcy. 220, "Idle Moments," by the same, is more to our taste; had not the standing sailor been obviously "giving the show away" by watching the operator this would have been a picture worthy of Lyd. Sawyer himself. 226, "The Thaw," by Thomas Wright, is a fine study of snow and ice. This photograph is printed, if we mistake not (for it, with most others, is hung in a bad light) on rough paper; we think a fine surface would better represent the idea of liquidity, melting ice and snow. 236, "Cheedale, Derbyshire," by Alec Hartley, is Mr. Hartley's best, and shows him to be another strong man; the work is fine throughout. 245, "Idle Moments," by Arthur Marshall, is another study of a type similar to those of the "Whitby Sage"; we certainly prefer it as a picture to the same artist's medal photograph (234), "Sunset on Snowdon." 249, "Fishing Smacks," by A. E. Whitaker; two or three of these boats, clothed in the usual heavy dirty-brown shrouding, occupy nearly the whole length and breadth of the space at command; the strong light behind throws dense shadows over the fore ground, and leaves plenty of play to the imagination of the beholder as to the *raison d'être*, but the work is not without promise; with the aid of the domestic mustard pot and the office gum we have known great things done with a simple subject like this. Thomas Wright's medal picture (275), "A Winter Morning," represents a lovely bit of landscape with fine effects of snow and cloud; just such another picture as Mr. Sparham Camp's "Deserted Shore" (167) would make under similar conditions. Mr. Mosley, 297 and 299, large scale architectural studies are particularly worth notice. Mr. Mosley takes a medal in the lantern class. 293, "Tale-Wagging by Two Sea Dogs," by Henry Crewdson, is another good study. Mr. W. H. Seymour shows two pictures of much promise. The judges evidently exhausted their stock of medals before reaching the higher numbers.

There was a very good loan collection of photographs contributed by Mr. H. Tolley (whose style we recognised at once), Mr. A. Horsley Hinton, Mr. Percy Lund, Mr. W. R. Bland (whose collection included the well-known interior of Wirksworth Church, medalled at the R.P. Society Exhibition two years ago), Harold Baker, W. Edgar, and M. Manley. A large collection of frames sent by Mr. J. Page Crofts (Birmingham) attracted a great deal of notice. The subjects were chiefly "figure," printed in gum bichromate, and exhibited some remarkable effects of light and shade. Mr. C. Blandy, the X ray operator to the Nottingham Infirmary, contributed a set of interesting radiographs. Not the least valuable set of loan photographs were those of Mr. G. Harrison, whose work generally (a fine panoramic view of Port Louis, was especially noticeable), and wet-plate work in particular would have delighted the heart of the late Edgar Goold, a wet-plate man, as many will remember, of the highest class.

We must congratulate the Nottingham Club upon a very good first exhibition. Some of the members need not fear competitions in the open classes; but the Mechanics' Lecture Hall is emphatically not the place in which photographs can be hung—as they were—and seen to any possible advantage; indeed, with an arrangement of pictures upon the walls of a room top light is a sine-qua-non. The effect of the lighting in the present instance was to emphasise the obvious cockling of some of the mounts. There is every reason why a photograph of any merit should be finished off to the best advantage. Frames made of brown paper, frames which reek of the dust heap, and which would not be saleable in Broad Marsh or Petticoat Lane appear to be still the delight of some exhibitors. To frame a real photograph, i.e., one which possesses points of artistic interest, is to condemn it forthwith. It is only fair to say that the Camera Club have not reached this length yet, and may the time be far distant! Years ago the framing was considered to be correct when of oak. Exhibitions had a clean and healthy look in those days, not only on this account but of the careful technical work throughout, mounting and framing all looked to be thoroughly done. It would be well that all of our societies should pass through this "solid oak" stage.

EDINBURGH PHOTOGRAPHIC SOCIETY.

THERE has been a change—a decided change—in the conditions of the Edinburgh Photographic Society's Annual Exhibition, and probably that may acount for the slight decrease in the number of entries, although we doubt not the hanging committee could do with a very much larger reduction, and certainly the exhibition would be considerably improved by the elimination of many of the exhibits that have been hung; why their producers should have sent them is a puzzle, which we may attempt to solve, if we believe that they have never seen any other work than their own, and that would be a statement rather difficult of credence.

In previous years the E.P.S. has offered for competition gold, silver, and bronze medals in different classes; but this year the classes are restricted to two—open and members—and the only medals offered are bronze, with honourable mention for those pictures coming next to the medalled ones, in the opinion of the judges, Messrs. J. Craig Annan and A. Lindsay Miller, Glasgow; and Pittendrigh Macgillwray, R.S.A. In connection with this change the entry fee was lowered to a merely nominal sum. If, as was suggested to us by a member, the E.P.S.

in the distribution of awards were, as the Society of the metropolis of Scotland, following the lead of the R.P.S., then they might well have gone further and given the hanging committee the power to reject from amongst the pictures submitted to them, those that they considered not good enough to hang.

The exhibition, taken all over, is hardly up to its predecessor in quality, the quantity is a negligible factor in the case of such an exhibition. Many well-known workers are not represented on the walls, and others who are represented have hardly maintained their past reputation; at least three good medallists of the Society falling far short in their exhibits of the high quality that gained the award; while others who in past days exhibted splendid work, betoken in their present exhibits a rather lower standard than a mere "standing still."

The professional section has decidedly scored, in fact, we see it mentioned that only one of the five medals awarded in the open section has been gained by an amateur. Charles F. Grindrod, Malvern, gains a medal with "Woodcutters" (16), showing some men round a fire in a glade in a wood; the feature of the picture is the manner in which the light catches the clouds of smoke from the fire. R. S. Webster, Edinburgh, is medalled for his fine portrait of "Rev. Alex. Whyte, D.D." (22), a reposeful and dignified treatment of this prominent Scottish divine. "Devotion" (26), a subdued and successful rendering of a rather hackneyed subject—a nun—by James Auld, Edinburgh, is medalled, as also is "On a Moorland Road" (30), a satisfactory portrayal of sheep and moorland by J. B. Johnston, Edinburgh. Many are surprised that the picture hung immediately below this, viz., "The Quarry Team" (31), Archibald Cochrane's powerful picture, with which he gained the R.P.S. medal is unmentioned by the judges; we presume it is just another case of "doctors differ." "Fruit" (101), by J. M. Whitehead, Alva, is medalled; it shows good technique, perhaps a trifle hard, but the texture of the grapes is magnificently rendered. Hon. Mention is awarded to Charles F. Grindrod, "Cutting Oats" (5), landscape and figures, with a distracting highlight on some water in the middle distance; to Allan Carswell, Glasgow, for "The Bend of the River" (64), a well-composed picture in a glaring colour, and "The Mill, Evening" (120) (these are the only "gum-bi" work in the room); and Alex. Allan, Ratho, for "Figure Study" (85), an old cobbler at work, effectively lighted. Good work is also shown in this class by John Moffat, James Patrick, John Patrick, E. R. Dibdin, Miss C. H. Curle, Miss Agnes B. Warburg, Percy Lewis, Ernest G. Boon, W. J. Byrne, Graystone Bird, and others.

In the members' section, restricted to members who have not previously gained a medal at the Society's exhibitions, four medals and three hon. mentions are awarded, as follows:—Medals: Miss M. G. Johnston, West Cults, "Mother and Child" (253), woman with nude child, principal light on child's body, which lacks skin texture, evidently an "American" school study; Hugh Auld, Edinburgh, "Life in a Cairo Street" (264), splendid grouping of figures, good rendering of sunshine; T. N. Foulis, Edinburgh, "A Shepherd of the Harz" (288), good tone and grouping, too fuzzy on the right-hand side, and very slovenly mounted; Robert Forbes, Edinburgh, "The Village Well" (291), good technique, top of wall obtrusive, could be much improved by cutting down. Hon. Mention: Mrs. Herdman, Newton, Edinburgh, "Silver Beeches" (157), and "The Black Friar" (170), and R. Baird, Portobello, "The Fairy Glade" (207).

At the opening ceremony on Saturday evening a concert was arranged by Mr. F. P. Moffat, and the medals were presented. On 22nd a lecture, illustrated by lantern slides, on "Wanderings in Perugia, Assisi, and Sienna," by Mrs. Lander Thomson. On March 1st a conversazione will be held, arranged by Miss H. G. McLauchlan, and the closing ceremony on March 8th will include a smoking concert, arranged by Mr. John Anderson.

LEEDS PHOTOGRAPHIC SOCIETY'S JUBILEE EXHIBITION.

A display of photographic art which is worthy of a much larger share of public recognition than it appears to have secured is at present taking place in the Library of the Leeds Philosophical Hall, where the members of the Leeds Photographic Society are holding their jubilee exhibition. The society has the distinction of being the oldest organised body of photographers in the country, and during recent years the great improvement in the work done by members has fully entitled it to rank prominently amongst the best of its class to be found. Up to a few years ago the artistic side of the work was unduly sacrificed to the purely technical, but latterly this tendency has been corrected, and it may safely be said that the present exhibition is the best, both from the artistic and the technical point of view, in the society's history.

Mr. Godfrey Bingley, one of the oldest members of the society, as usual, has a good series, one of his best pictures being "Iffley Mill," a study in which choice of subject and perfection of finish combine to make a pleasing work of art. A view on the Isis is also a charming study, though it is somewhat spoilt by the woolly appearance given to the clouds. Among a number of pleasing views shown by Mr. R. Stockdale, "A Bit of Old Scarborough" and the "South Entrance to York Minster" are undoubtedly the best; while Mr. A. Nicholson shows, amongst other works, a very fine study of a staircase in Haddon Hall, the sunlight streaming through the diamond pane window being particularly well rendered. York has always been a happy hunting-ground for the photographer, and figures somewhat prominently in the present exhibition, one of the best York studies shown being "A Bit of Old York," which was also exhibited by Mr. Mackay at the recent Royal Photographic Society's show. Mr. James Taylor is another Royal exhibitor, though his "Emptying the Nets" is probably a better work than that shown at the premier exhibition. His "Waiting to Unload" is also a fine study of seaside life, though the hardness of the lines spoils its beauty as an artistic production. Mr. T. Carter has a number of interesting works, a street scene on "Washing Day" and a charming moorland view being amongst his best efforts, the latter being a Royal exhibit, as were also two effective pictures shown, amongst others, by Mr. Wm. Coultas, and entitled "Hospital Yard, Whitby," and "Haytime." A good study of a smithy, by Mr. A. B. Dixon, is spoilt by the fact that the figures of the working smiths are too obviously "posed."

Mr. J. H. Gash, who was the winner of the Royal medal two years ago, has a number of excellent exhibits, though some of the best of his work is not on show. His study of a "Jet Worker" at Whitby, and a charming view of a "Yorkshire Dale," taken at Hardcastle Craggs, were both Royal exhibits, while "A Lull in the Storm" constitutes an excellent study of an old fisherman, and a picture of an old hand-loom worker, with an "old bobbin wheel," is interesting both as a picture and as a reminiscence of an old industry. Amongst the other exhibitors may be mentioned Mr. F. Schofield, whose "Rievaulx Abbey" is the best of a good series; Mr. W. Denham, whose best work is in a frame of three small sunset scenes; Mr. B. A. Burrell, who shows a series of cottage homes and a cartoon designed to appeal peculiarly to the members of the Guild; and Mr. J. C. Coultas, whose best picture present is a study of the Aire near Leeds Bridge, but whose finest work is, unfortunately, not shown.

A curious feature of the exhibition is a collection of old paper negatives and documents dating back to 1850-3. The society, as the minute and account books show, had its beginnings in April, 1852, with Mr. Samuel Smith as president; and among the earliest members were Mr. C. Brady, who afterwards distinguished himself in the scientific world, Mr. Richard Reynolds, and Mr. J. W. Ramsden, who is said to have been the first to manufacture collodion on a commercial scale.

During the evening Mr. F. W. Branson, F.I.C., F.C.S., gave very successful demonstrations with high vacua Röntgen rays, Tesla's high-tension currents, and showed how to produce a light from electric lamps without wire connection. Mr. Philip Eliff's experiments in ceramic firing created much interest; and microscopic objects were also on view in the Library.—"Leeds and Yorkshire Mercury."

THE ANNUAL SUPPER OF THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

[From a Correspondent.]

On Thursday, February 6th, the "L. and P." set aside photographic discussion and gathered round the festive board to partake of their fourth annual supper. Mr. Thomas Bedding, F.R.P.S., occupied the chair, supported by present and past officials, and there were some 40 members and friends in evidence. The proceedings commenced soon after 7 o'clock, and continued until a late hour. Appetites for the more solid fare having been satisfied, the chairman's toast of "Their Majesties the King and Queen and the Royal Family" was honoured, after which an excellent entertainment was started by a pianoforte solo. The chairman then proposed the toast of the "L. and P.," giving expression to his feelings of well-known friendliness towards, and interest in it, that those present were evidently greatly pleased to hear repeated. A song by Mr. Lovett preceded Mr. T. E. Freshwater's reply, in which he performed his part again as the staunchest of believers in the Association's past, present, and future; its position as one of the powers in the photographic world, and the prospects it had of a bright and promising coming of age next year. Mr. Walter Hengler earned unanimous applause with his humorous song, "Girls I've Met," and a second appearance was inevitable. Mr. W. Thomas, toasting "Our Officers," in a complimentary speech congratulated them that they had not been troubled by requisitions for special meetings, an epidemic that was exceedingly prevalent in a neighbouring locality. He coupled the toast with the name of Mr. Walter D. Welford, the hon. sec., who responded, after an excellent rendering by Mr. Manger on his handbells. The following congratulatory telegrams from country societies were read:—"Luton Camera Club wish long life, continual success." "Hearty good wishes from members of Walsall Photographic Society to the boys of the L. and P., and black art and brother Day calls for three cheers for their old favourite, willing Walter, the champion demonstrator of the midland

counties." Mr. J. Walter Scott followed with a song, "The Devout Lover," being succeeded by Mr. T. K. Grant, with his toast of the "Absent Members." Reference to Mr. A. L. Henderson, the Association's benefactor in many directions, was appropriately made, and sympathetic words by the chairman concerning Mr. E. J. Wall, rendered *hors de combat* by his recent accident, were cordially echoed round the tables. Mr. Buckland was called upon, as the junior member, to acknowledge the toast, and his speech left nothing to be desired. Mr. R. P. Drage at this juncture introduced some appreciative remarks about the kindness of Mr. T. K. Grant and Mr. R. J. Kindon in providing such an excellent programme of musical and vocal talent, and led a demonstration of thankful applause. Mr. Kindon returned thanks, of course, denying, amongst other things, that he had done so very much to merit the members' thanks. Mr. Will Webster's song, "Changes," fully sustained the opinion as to the excellence of the programme, as also did Mr. Hengler with a further contribution after the toast of "The Visitors," dealt with by Mr. S. H. Fry, in his usual manner. Upon Mr. Martin Jacolette fell the pleasant duty of returning thanks, and he took the opportunity of adding yet a further prize for competition by the members of the Association, the subject being photographic silhouettes. Mr. Lovett gave "The Lost Chord," Mr. Manger another performance on his marvellous bells, and Mr. Webster a clever rendering of "The Fallen Star." The toast of "The Chairman," proposed by Mr. J. E. Hodd, though last, was received none the less enthusiastically, and the same may be said for the chairman's reply. The dispersal of the guests did not take place until "Auld Lang Syne" had been sung, and final healths had been drunk.

ANCIENT LIGHTS IN PHOTOGRAPHY

In the Chancery Division of the High Court of Justice, before Mr. Justice Farwell, on Saturday, February 8th, the case of Parker *v.* W. F. Stanley and Co. (Limited) was heard.

The plaintiffs carry on business as photographers, under the title of W. G. Parker and Co., at 288, High Holborn, their studio, gallery, and darkroom being situated in a one-storey building at the rear of the premises. When the plaintiffs first entered into possession, in 1890, this building was lighted by a number of skylights which were ancient lights. The plaintiffs subsequently slightly altered the pitch of the roof of the building and enlarged the skylights over the studio, but they darkened or obscured the skylight over the portion of the building used as a dark-room. To the west of the plaintiffs' premises is a long strip of land behind 287, High Holborn, about 15 feet wide, which was formerly partly bounded on the western side by an old building about 33 feet high, which was pulled down in 1885. In February, 1901, the defendants, who carry on business as mathematical instrument makers, at 4 and 5, Great Turnstile, High Holborn, commenced building operations on the site of the old building demolished in 1885, and since the issue of the writ in this action have raised their building to a considerable height above the line of the said old building, whereby the plaintiffs complained that the access of light to their premises was seriously diminished. They accordingly claimed a mandatory injunction for the removal of such portion of the defendants' new buildings as obstructed or injured any of the ancient lights as the same were previously enjoyed. The defendants denied that there was any material diminution of light, and contended that as regards the darkroom the plaintiffs had abandoned their right to ancient lights. They further contended that, as the premises now occupied by the plaintiffs had prior to 1890 been used as an eating-house, the plaintiffs were only entitled to so much light as was necessary for those purposes.

Mr. Jenkins, K.C., Mr. F. H. Colt, and Mr. F. J. Coltman appeared for the plaintiffs; Mr. Bramwell Davis, K.C., and Mr. Percy Wheeler for the defendants.

The hearing of the evidence occupied two days.

Mr. Justice Farwell, in delivering judgment in the case, said that there could be no doubt that, when the plaintiffs took the premises in 1890, the skylights were ancient lights. The action was concerned with the skylights over the studio and the darkroom. As regards the darkroom, abandonment had been pleaded, but he could find no evidence to support the plea. The fact that the plaintiffs had darkened or obscured the skylight was not sufficient, the room might be required at any time for other purposes. Then, with regard to the studio, the old skylight had been replaced by what was practically a glass roof. But that new glass roof covered the place occupied by the old window, and their right of ancient lights had thus been preserved, although, of course, it only applied to that portion of the glass roof formerly occupied by the old window or skylight. The defendants had raised their building several feet above the line of the old building which formerly stood on the site, and after hearing the evidence his lordship was clearly of the opinion that the access of light to the plaintiffs' premises was thereby materially diminished. The fact that before 1890 the premises were used not for photographic purposes, but as a restaurant, was immaterial to the present issues. Photographers required, and reasonably required, special light, and since the judgment in "Warren v. Brown" (1902, 1 K.B., 15) the plaintiffs were entitled to complain that they were injured by the defendants' buildings in the conduct of their photographic business, even if that business had not been carried on in the premises for 20 years. The parties had not been able to come to any terms, and consequently he was constrained to grant a mandatory injunction, but it would apply only to the additional obstruction caused by the defendants' new buildings as compared with the old buildings that formerly stood on the site. He thought the parties ought to be able to arrange between themselves what form the necessary alterations should take.—"The Times."

A NEW NEGATIVE PAPER.

In introducing their new negative paper to the notice of photographers, the Rotary Photographic Company point out that for years past a material has been sought which should be less fragile, lighter, and cheaper than glass as a support for gelatine films. "In these attempts the extremely simple method of coating transparent paper with gelatine emulsion has been tried—in fact, the use of such paper dates back to the very early days of photography—and paper as a support for the sensitive film, when taking negatives in the camera, has been used over and over again. Hitherto, however, the coarse grain of the best paper obtainable for the purpose has proved an insuperable obstacle to the adoption of the paper film, notwithstanding its many positive advantages. Within the last few years improvements in paper manufacture have taken place, which, though they did not at first completely solve the problem of making a grainless negative paper for use in the camera, yet have made it possible to produce papers of much finer structure."

The company announce that they have perfected a negative paper, almost entirely without grain, which in many cases can replace plates with the most satisfactory results.

The following are the instructions for use:—

Exposure: The paper should be filled into the dark slide by red light. It should be placed in the usual card or metal film holder, or simply backed up with a piece of card. The time of exposure is the same as for rapid plates.

Suitable developers are:—

Ortol:—A.—Ortol, 1 ounce; potass metabisulphite, ½ ounce; water, 60 ounces. B.—Soda carbonate (cryst.), 12 ounces; soda sulphite (cryst.), 8 ounces; water, 60 ounces. For use take A, 1 part; B 1 part; water, 10 parts.

Rodinal:—Stock sol. rodinal, 2 parts; water, 100 parts; to every few ounces of which 5 or 10 drops of 10 per cent. solution of potass bromide are added.

For snap-shots the ordinary terrous oxalate developer for dry plates can be used; it is best, however, to add a few drops of potass bromide solution thereto, in order to slow development.

To compound a suitable developer:—Make solution of ferrous sulphate (proto-sulphate of iron), 1 part in 3 parts of water; also, oxalate of potash solution of the same strength. Add 1 part iron solution to 3 parts oxalate, and to each 4 ounces of the mixture add 3 to 6 drops of 10 per cent. solution of potass bromide.

Clearing.—After rinsing the paper, after development, it is placed in a clearing bath. For ferrous oxalate developer, use 5 to 10 parts of acetic acid in 1,000 parts of water. For otol, and other "organic" developers, use a 10 per cent. solution of alum. After a few minutes the paper is rinsed for 5 minutes in water and fixed.

Fixing.—A 10 per cent. solution of hyposulphite can be used; but an acid bath made as follows is better:—Sodium sulphite (cryst.), 15 parts; water, 300 parts; citric acid, 3 parts; hypo, 60 parts. Mix the chemicals in the order given, adding the hypo after the sulphite and citric acid have completely dissolved.

Washing.—Wash for one hour in frequent changes. Be careful in washing and rinsing the paper that the stream of water does not run directly on the film. This is liable to lead to blisters of the film.

Hardening.—In order to harden the film of the negative paper, place for a few minutes in 10 per cent. alum solution, and wash afterwards for a quarter of an hour.

Drying.—The negatives are hung up or laid on blotting paper.

Intensifying and Rendering Translucent.—The paper is sufficiently transparent to print quickly without further treatment. If, however, great transparency is required, the following mixture should be rubbed into the back of the paper with cotton wool:—Canada balsam, 1 part; turpentine, 5 parts. Another method is to coat the back of the paper with a solution of castor oil (1 part) in absolute alcohol (2 parts).

We have had some of the new negative paper under trial, and report upon it elsewhere in this issue of the JOURNAL.

The Earl of Crawford has devised a means of manipulating a vessel's rudder by means of electricity from any part of the ship. A practical demonstration of the invention was recently given upon the inventor's steam yacht "Valhalla" in the Solent before several representatives of the British and Japanese navies, who were considerably impressed with the device The most prominent feature of the device is that it is not so liable to accident as the steam gear, and it is much easier to manipulate.—"Invention."

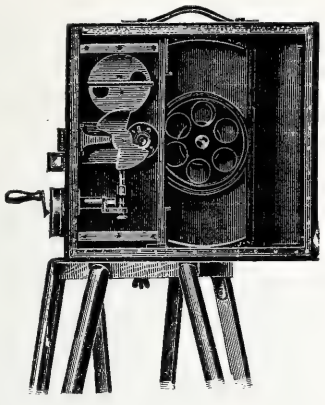
New Apparatus, &c.

The "Agfa" Negative Varnish. Charles Zimmermann & Co., 9 and 10, St. Mary-at-Hill, E.C.

Messrs. Zimmermann & Co. have sent us a sample of "Agfa" negative varnish, which is manufactured by the Actien Gesellschaft für Anilin Fabrikation, and for which they are sole agents in London. We have tried the varnish, which, by the way, may be applied cold or with the plate slightly warmed. The varnish flows evenly over the negative in either condition, and, when dry, yields a hard, though not brittle, film. When applied to the negative cold, it naturally takes a slightly longer time to dry, but the result seems the same in the end—a hard film which should be an efficient protection to gelatine negatives.

The Kammatograph.—Manufactured and sold by L. Kamm & Co., 27, Powell Street, Goswell Road, E.C.

The Kammatograph is an instrument the purpose of which is to bring the making and the projection of "animated photographs" within the grasp of the amateur, without the necessity of employing a celluloid ribbon. The pictures, several hundred in number, are taken upon a circular gelatine plate, which plate can be developed in a dish with the ordinary re-agents. A negative plate thus developed will yield a positive



by contact, as in the case of an ordinary lantern slide. The camera used for taking the negative serves afterwards as a lantern attachment for projecting the positive. In each case the turning of a handle causes the plate, which is 12 inches in diameter and circular in form, to travel eccentrically, so that the part immediately behind the lens never arrives there a second time. The little pictures are thus made to form a spiral pattern on the plate. The risk of using inflammable celluloid is altogether obviated, and the arrangement is quite as safe in use as the ordinary optical lantern.

Axe Brand Novelties.—Fuerst Bros., 17, Philpot Lane, E.C.

We have received from Messrs. Fuerst Bros. samples of three preparations which they have recently placed upon the market. In each case they are put up in glass tubes or "cartridges," a form which will commend itself for its convenience to all photographers whose work only necessitates the employment of small quantities of solutions and at intermittent intervals.

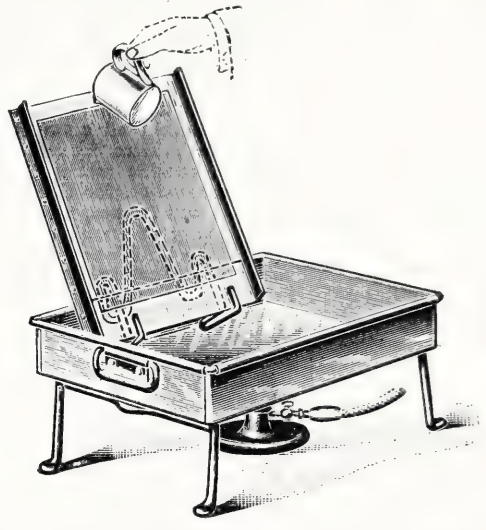
Intensifaxe.—This preparation, when used according to the directions, forms a useful and effective one-solution intensifier. The solution is made by dissolving the contents of a cartridge in 4 ounces of water, and the negative to be intensified, having been fixed, and the hypo thoroughly removed from it by washing, is to be immersed in it. The intensifying action proceeds with fair rapidity, and its progress may be easily judged. When it is deemed to have progressed far encugh, the negative is to be well washed, and, to ensure the permanency of the result, placed in an ordinary developing solution such as hydrokinone or metol and carbonate of soda until the image is blackened. The subsequent developing operation does not prevent the amount of intensification being easily judged, as the further intensifying action of the developer is slight only and may easily be allowed for. It is stated that the solution keeps well, provided it be protected from the action of light.

Stand Developer Cartridges.—The method of developing known as stand development is frequently a very advantageous one, and in the case of plates which have received the minimum of exposure there is, perhaps, no more certain way of developing detail to the fullest extent without running the risks incidental to forcing the plate with a powerful developer. Most developing agents may be employed this way, but they are not all equally suitable. The developer now under notice seems to us to answer its purpose admirably. It is exceedingly stable, that is to say, it maintains its developing activity for a long period. It does not stain, and has no tendency to reduce the silver compound of the plate except to the extent it has been acted upon by light. The careful worker, who is more anxious to obtain the best results from his hand-camera exposure than to obtain his negatives in a hurry, will find in this a useful preparation and in a convenient form. It is particularly recommended by the makers for X-ray work, and we should say it is admirable for the purpose. For use the contents of a cartridge require simply to be dissolved in 40 ounces of water.

Anti-Hypo and Hardening Cartridges.—The contents of a cartridge dissolved in 16 ounces of water form a bath for the removal of hypo from negatives and films, which has also the effect of hardening the gelatine. There is no better method of removing hypo from a plate or print than careful washing in plain water, but undoubtedly there are occasions when it would be a great convenience to be able to shorten the time required to carry out this process effectually. On such occasions this preparation will be found useful. In hot weather the hardening effect claimed adds to the advantage of its employment. At the moment of writing we are regretting that we have not the opportunity of testing its efficacy under such circumstances.

A Developing Tin for Gum Bichromate Prints.—Sold by J. R. Gotz, 215, Shaftesbury Avenue, W.C.

In the instructions for "chromatype," a gum bichromate paper obtainable of Mr. Gotz, that gentleman thus briefly outlines the process of "development":—"The developing operation is carried on over a deep galvanised iron pan or tank, about twice as large as the size of the prints. A gas burner or spirit lamp serves to keep the water at the desired temperature. This should be, at the beginning of the operation, for black and red 95 deg. to 105 deg. F., and for sepia 110 deg. to 115 deg. It may



be increased, according to exposure and result desired, for black to 120 deg. and for sepia to 140 deg. F. A proportionate quantity of fine sawdust is put into the hot water and stirred up for operating on the print. This is to assist the hot water in attacking the soluble parts of the pigment. The developing bath must not be sensibly thickened through the addition of the sawdust. The print is placed on a slab—metal, wood, or glass. This is fixed on the edge of the tank, and the hot water poured over it by means of a jar, teacup or jug. The development should last until the high lights are well out." A specimen tin and print-holding board have been submitted for our inspection. They appear to be capable of admirably answering their special purposes.

"Vega" Collodio-Chloride Paper.—George Mason & Co., Glasgow.

There is undoubtedly an increasing demand for collodio-chloride paper, and to many its delicate, smooth surface is more acceptable than the high gloss which is characteristic of gelatino-chloride. There is ample evidence that with reasonable care in its manipulation the results are permanent, and this is not the least of its recommendations. The Vega paper is made in two varieties—glossy and mat surface. The directions for the use of the former are as follows:—Wash in three changes of water, and in washing do not handle the prints more than is necessary, but simply rock the tray until the prints separate and the water becomes milky; then pour off the water and gently press prints against bottom of the dish to remove as much of it as possible, and refill the dish. After the third change, transfer the prints separately to a tray of clean water to await toning. Any of the toning baths for printing out papers may be employed, but the following is recommended:—

Potash sulpho-cyanide	30 grains.
Gold chloride	2 grains.
Water	30 ounces.

The toning bath should be made up some hours before use. The bath may be used for five or six times, and merely requires to be strengthened by the addition of a little gold before use. Slow toning gives a rich deposit of gold and vigorous prints. The tone should be judged by the surface, and not by looking through them. It should not be carried as far as the finished print is desired to be, as they dry colder in tone. When sufficiently toned, the prints should be removed from the toning bath to a dish of water acidulated with a few drops of acetic acid or in which a little salt has been dissolved. This will stop the toning action. The fixing bath consists of 1 ounce of hypo dissolved in 20 ounces of water, and the fixing action is complete in five minutes. Washing and the subsequent operations are conducted in the usual way. The mat surface paper may be treated in precisely the same way as the glossy when warm tones are required, but for black prints resembling platinotype the following treatment is to be adopted:—The prints must be printed very deeply—in fact, until the shadows appear bronzy. After washing for

about 10 minutes in about three or four changes of water they are to be placed in the first toning bath:—

Stock Solution A:

Distilled water	4 ounces.
Borax	3 drachms.
Acetate of soda	3 drachms.

Stock Solution B:

Chloride of gold	15 grains.
Water	3½ ounces.

To make the toning bath, add 1 part of B to 40 parts of A. The prints should remain in this bath until they acquire a blue violet tone. The prints are then to be rinsed, and placed in the second toning bath, consisting of:—

Potassium chloro-platinate	15 grains.
Fluid phosphoric acid	4 drachms.
Water	21 ounces.

Here they are to remain from 5 to 15 minutes, according to the strength of the bath, which may be used over and over again. The prints require washing in three changes of water before fixing.

We have tried the samples of both varieties of the paper, and, following the instructions, have had no difficulty in obtaining very beautiful results.

Welford's Specialities. Walter D. Welford, Warwick Lodge, 166, Romford Road, London, E.

We have received samples of Mr. Welford's new series of carbon cloud negatives. These being on thin celluloid, in all sizes up to 15 by 12, are very convenient to use, and can be printed from either side. The bottom portion of the negative being opaque makes the use of these clouds extremely simple. Another introduction for this season is a new series of masked borders, floral designs and frames, also in carbon. The mask obviates the necessity of vignetting, and makes the use of these designs very easy. The series includes frames and edges round prints, upon which the title can be written on the back in some opaque medium, so as to print in white on the finished print. In addition to these there are a number of floral studies of certain flowers, such as roses, forget-me-nots, ivy, sweet peas, Virginia creeper, etc.

The Automan Hand Cameras. Manufactured by the Thornton-Pickard Manufacturing Company, Altrincham.

Those who, like ourselves, have watched the growth and progress of the esteemed shutter and stand camera works at Altrincham, have long been prepared for an extension of the business into the inevitable field of hand-camera production. During the past year the Company's inventive and mechanical resources have been steadily employed towards that end, and the outcome of those efforts is the introduction of a series of hand cameras of the folding or collapsible type, which are probably destined to secure great popularity amongst amateur photographers. The instruments, it may be mentioned, are made throughout at Altrincham, and they have that neatness, high finish, and ease of movement which we naturally associate with photographic apparatus that comes from the Cheshire workshops.

One vital characteristic of the Automan series of hand cameras makes for the sympathetic notice of that large class of workers whom it is the foolish fashion to style "snapshotters." The pressure of the finger on the top of the camera opens and sets it firmly in position at a definite focal length. Thus the Automan cameras may justly be

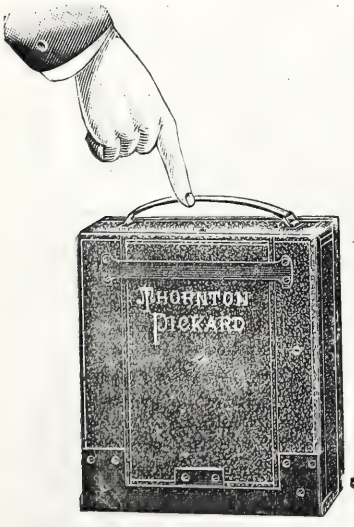


Fig. 1.—The Oxford Automan Closed.

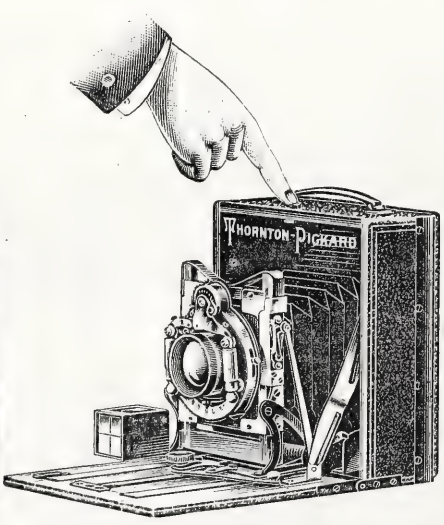


Fig. 2.—The Oxford Automan Open.

described as of the ever-ready type. They open, as it is said, like a "Jack-in-the-box," and they are closed in just as simple a fashion, namely, by slight pressure on a side stay. The Oxford Automan takes holders for plates or cut films, has a spring ground-glass focussing screen, and is fitted with an "iris" shutter between the lens combinations, giving exposures from time down to the 50th of a second. The camera also has a rising front, double extension, and a lever focussing arrangement.



Fig. 3.—The Roll Film Automan Open.

Yet a second camera takes rollable film, the method of inserting, unwinding, and rewinding the spool being very simple in action. It is made in ¼-plate size only, and can also be fitted with adaptors to take glass

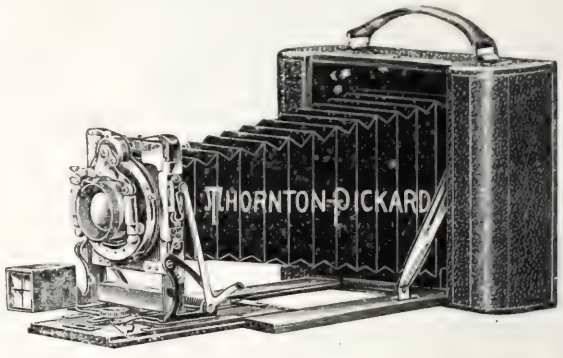


Fig. 4.—The Long Extension Automan.

plates or cut films in holders. It possesses the features, already enumerated, of the Oxford Automan, with the added advantage, as shown in the fourth illustration, of long extension.



Fig. 5.—The Focal Plane Automan closed.



Fig. 6.—The Focal Plane Automan open.

The Focal Plane Automan is made in ¼-plate size only. As the illustrations show, it presents the appearance and features of its congeners, but is distinctive as regards the shutter, which has an adjustable slit opened and closed from the outside. A speed calculator affixed to the side of the instrument enables the photographer by the simplest possible arithmetical sum to know precisely what exposure he is giving. There is an available range of speed from 1-30th to 1-1,000th of a second.

We have only touched in the briefest possible way upon the salient characteristics of the beautiful series of Automan cameras that have been

placed before us for examination; but enough has been said, we think, to show that the Thornton-Pickard Company have well prepared themselves to meet a practically inexhaustible demand in photography, viz., for

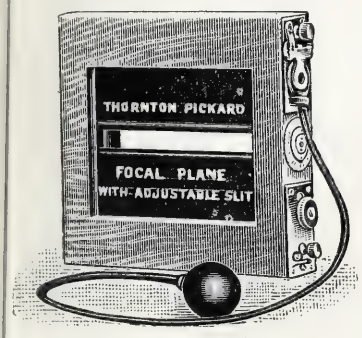


Fig. 7.—The Focal Plane Shutter with Adjustable Slit.

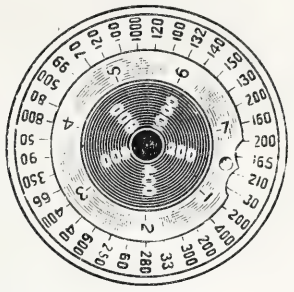


Fig. 8.—The Speed Calculator.

scientifically-conceived, well-made, easily-manipulated hand cameras of a high-class. The Automan cameras appeal to a vast public, with which, we have no doubt, they will be exceedingly popular during the coming season.

The "Rotograph" Papers.

The Rotary Photographic Company, Limited, 14, New Union Street, Moorfields, London, E.C., have sent us various samples of the different kinds of bromide paper they have placed upon the market. Photographers have already become familiar with the "Rotograph" bromide paper, for ordinary printing, in its six different grades—thin glossy, thick glossy, thin matt smooth, thick matt smooth, thin matt rough, and cream-tinted thick rough. We find this description of paper renders the negative with great delicacy of gradation, the shadows being deep and velvety, the high light pure and bright, and the half-tones well differentiated.

The "Rotograph" negative paper is introduced as a substitute for plates and films, and can be obtained in two speeds—normal and rapid. If we disregard the disadvantages of fragility and weight, there is no support to compare with glass for a sensitive film, but in photography there are many fields in which these two factors demand first consideration. In such cases we think "Rotograph" negative paper will be very valuable. Although films combine lightness and flexibility with the transparency of glass, their keeping quality is doubtful, and we think a good negative paper may be a strong competitor, especially in large sizes, where the slight grain of the material is unimportant and perhaps in some instances advantageous. Amateurs especially should find negative paper of great service for large, direct work and for production of enlarged negatives. We have found "Rotograph" negative paper very easy to use, free from faults, and of excellent quality. The sample was of "normal speed," and the exposure was approximately the same as for an ordinary dry plate.

"Rotokon" paper is the latest candidate for the favour of the photographer. It is a slow-printing contact paper of the gas-light type, and may be had in five grades:—Thin glossy rose, thin glossy mauve, thin matt smooth, thick matt smooth, and thick matt rough. We tested the samples by gas-light in an ordinary room, thus avoiding all the discomforts of the dark-room. The prints were clean and bright, in good gradation, with very intense shadows. The developer used was Rodinal, and with thin negatives, exposures of 20 to 30 seconds, at 4 inches from a gas-flame, were sufficient.

Commercial & Legal Intelligence.

The Austin-Edwards Monthly Film Negative Competition.—The prize camera for the current month has been awarded to Miss Gladys Strick, Llanfair, West Cross R.S.O., Glamorganshire, for her negative "Shire Horse."

The Barnet Carbon Tissue.—Messrs. Elliott & Son, of Barnet, have issued the following notice to dealers:—"We have for some time past felt that the inducements offered to dealers to stock Barnet carbon materials have not been sufficient for them to push these goods. In order to give dealers a better opportunity of diverting the numerous orders which now flow direct to the manufacturer, we have decided to increase the discount to 33⅓ per cent. The growing popularity of the carbon process is undeniable. The process is really a very simple one, and it is already being very generally taken up by both professional and amateur. We propose to help dealers by issuing specimen showcards and literature, which will be ready at an early date. Foreseeing that the most prosperous days for the carbon process were ahead, we laid ourselves out to improve the material and at the same time cheapen the production. Both these objects we have now successfully accomplished. In the erection of the enormous plate and paper factory which has been in course of construction during the past year, we have effectually provided for the manufacture of Barnet carbon tissue, whilst reminding our customers that the most up-to-date methods and machinery have been requisitioned in every stage of the manufacture of Barnet plates and papers."

Taking the Donkey to be Photographed.—At the Marlborough Street Police Court, on Saturday last, George James Armsworth, 37, a master carman, living in New Street, Covent Garden, was charged before Mr. Kennedy with having obstructed the footway in Bear Street, Leicester Square, on Friday afternoon. Constable Hulbert, 315 C, said the defendant was in charge of a donkey decorated with a dark blue rug bearing the words "Ping-Pong," round which was gathered a considerable crowd. As he refused to take it away and thus prevent obstruction, he was arrested. In defence, Armsworth said he was taking the animal—which was the performing donkey in "The New Clown" at Terry's Theatre—to be photographed, and was on his way back to the theatre when a constable came up to him. He did not think he was responsible for the obstruction, as he was not on the footway. A Mr. Skinner who was with him stopped to speak to someone on the pavement. When the constable asked him to move on he (defendant) said to him, "There are only you, I, and the donkey." Mr. Kennedy: Why don't you bring the photographer to the donkey, instead of taking the donkey to the photographer? If you take strange things of this kind about with you you are sure to cause obstruction in the street. You will be discharged now, though it was through your own fault that the obstruction was caused.

Breach of Contract.—At the Leeds County Court, on Thursday last, before his Honour Judge Greenhow, Messrs. Brooks & Borland, magic lantern experts, of Sheepscar Grove, Leeds, sued Mr. J. B. Elliston, proprietor of the Theatre Royal, Bolton, for the sum of £40, for alleged breach of contract. Mr. A. Willey appeared for the plaintiffs, and Mr. E. O. Simpson for the defendant. It was stated that the defendant produced the pantomime "Puss in Boots" at the Alexandra Theatre, Stoke Newington, and that the plaintiffs were engaged to give a biograph exhibition at the end of each performance. The pantomime stayed at Stoke Newington six weeks, and was afterwards performed for a fortnight each at Leeds and Sheffield, but in the two latter cities the biograph entertainment was dispensed with. The plaintiffs contended that they were engaged for the six weeks at Stoke Newington, and for the "run" of the pantomime wherever it appeared, and claimed £40 remuneration for four weeks. Mr. Brooks, one of the plaintiffs, stated that he did not know that some of the artists came to Leeds and Sheffield under new contracts, although he would not be surprised to hear that they did. For the defence Mr. Simpson submitted that the words in the contract, "six weeks and run," meant that the plaintiffs were only engaged for the time that the pantomime was running at Stoke Newington. Miss Ethel Sydney, at present principal girl in "Bold Robin Hood" at the Leeds Grand Theatre, said that she was principal girl in "Puss in Boots." She understood that the contract was to bind her services only for the time that the pantomime was running at Stoke Newington. His Honour held that the defendant was bound to engage the plaintiffs if the company went on tour. He also held that the company did go on tour, and found for the plaintiffs for the amount claimed.

Patents for Combinations of Parts.—Here is a brief report of a case that came before the Court of Appeal on Friday last. We give it simply to show that a patent may be taken for a combination of parts, all of which may be old, for obtaining an old result in a better or cheaper way. This fact may not be known to every reader:—"Before Lords Justices Vaughan Williams, Stirling, and Cozens-Hardy.—Alleged Infringement of a Patent.—Bunge v. Higinbotham & Co., Ltd.—This was an appeal by the plaintiff from an order of Mr. Justice Kekewich, dismissing an action brought to restrain an alleged infringement of a patent taken out in 1894. The patent was for a horizontal sifting machine with circular-shaped sieves for sifting flour. The patentee claimed a combination of parts, all of which were old, for obtaining an old result in a better, cheaper, and more expeditious manner. The alleged infringing machine was a sifting machine for the same purpose, and both consisted of a number of connected sieves easily taken apart, and both were put in a rotary motion on a horizontal plane, so that the material to be sifted fell on the surface, and each sieve passed over the edge on to the sieve below, alternately spreading over the sifting bottom, the coarser particles falling out at the centre. Both machines were fitted with rotating arms, upon which were brushes for the purpose of keeping the sieves clean, but in the plaintiff's machine the material passed to the circumference of the sieves by falling on a cone-shaped surface, and in the defendants' the sieve was fitted with a horizontal plate, with guiding slots. There was also a difference in the method of driving the brushes. Mr. Walter and Mr. Gray appeared for the plaintiff; and Mr. Moulton, K.C., and Mr. Clarke for the defendants in the action. The Lords Justices held that there was no infringement, but did so with regret, as they thought the invention most ingenious and commercially useful. They accordingly dismissed the appeal with costs."—"Standard," February 15th, 1902.

The Royal Astronomical Society.—At its annual general meeting the Royal Astronomical Society presented the gold medal, its highest honour, to Professor J. C. Kapteyn, of the University of Groningen, Holland, which award was in some part a recognition of an arduous piece of work done by him voluntarily to help British science. In the year 1882 Sir David Gill saw the possibilities offered by photography for charting the stars, and immediately began to put his ideas into execution; but though the resources of the Cape Observatory were sufficient to take the photographs, he was not able to undertake the more important and difficult work of measuring the plates and tabulating the stars. Dr. Kapteyn, then a young professor at Groningen, offered his services without hope of reward other than the consciousness of having made a valuable contribution to astronomy, and, his offer being accepted, the result has been the production of the Cape Photographic Durchmusterung, which contains, in three quarto volumes, the positions of half-a-million stars as seen from the Southern hemisphere. Dr. Glaisher, the president of the Society, in making the presentation, pointed out that the problem

of cosmical astronomy, or the determination of the size and form of the universe, is only to be solved by enumeration of stars such as this, the determination of their distances, and the classification of their velocities. In researches such as these Professor Kapteyn has exercised his ingenuity, and this work was another reason for the council's selection of him as the new medallist. The bronze medal of the Society was given to Dr. T. D. Anderson, the Edinburgh clergyman, who was the first person to recognise the bright new star which appeared in the sky last February, and has also made other discoveries of variable stars no less difficult, if not so sensational. The list of fellows of this Society who have died during the year included the names of several persons well known in other spheres of life—Mr. Bowen, the Harrow Master; General Drayson, an energetic Artillery officer; and John Brett, the artist, who was also an enthusiastic astronomer.—"Standard," February 15th, 1902.

New Books.

New Season's Show Cards. Published by Elliott & Sons, Limited, Barnet, N.

Messrs. Elliott & Sons, Limited, have submitted for our inspection a large number of show cards, varied in size, shape, and style, and bearing boldly printed references to the well-known plates and papers manufactured at Barnet. The show cards are remarkably striking and effective, and have been produced with great taste. Mounted upon them are capital prints made with "Barnet" papers, and the total result in each case is such that the cards cannot fail to catch the eye and arrest the attention of anybody interested in photography—and who nowadays is not? We congratulate Messrs. Elliott on their alertness and enterprise. They inform us that they are prepared to send to every photographic dealer in the country a duplicate set of these beautiful show cards. Every photographic dealer should take advantage of Messrs. Elliott's offer, and we hope he will.

"Selection of Subject in Pictorial Photography." By W. E. Tindall, R.B.A. 83 pp.; illustrated. Price 3s. 6d. nett. London: Published by Iliffe & Sons, Limited.

Says Mr. Tindall in his preface: "If any apology be required for putting forward the hints contained in his book, that apology is to be found on the walls of the photographic exhibitions." He "freely admits that the majority of the works to be seen are of a high technical quality; yet in many cases they are such that they could be considerably improved were more attention given to the subjects of point of view, the value of lines, and the meaning of tone values and their reproduction by photography." It is with a view to the improvement of photographic work in these directions that Mr. Tindall's book is written. The author's style, if neither inspiring nor inspiriting, is at any rate chatty and intelligible, and as we turn over his pages our feeling is that of journeying through the domain of pictorial photography in easy and pleasant stages. The illustrations are instructive, and we cannot imagine a photographer of average intelligence failing to profit by Mr. Tindall's advice on imparting pictorial qualities to photographs. He wisely omits all reference to manipulative details from his readable volume, which consequently has the additional merit of standing outside the great Fake *versus* Anti-Fake controversy. The book is well printed.

Picture Postcards.—London: Published by Messrs. Alfred Ellis & Walery, 51, Baker Street, W.

Taking advantage of the facility which the bromide process affords for this class of photographic printing, Messrs. Alfred Ellis & Walery are issuing an interesting series of picture postcards which are sure to be popular with admirers of stage favourites. The illustrations on the cards are, in fact, portraits of prominent actors and actresses, amongst whom may be named Mr. Wyndham, Miss Julia Neilson, Miss Fay Davis, Miss Isabel Jay, Miss Lily Hanbury, Mr. Hayden Coffin, Mr. Tree, Miss Edna May, Miss Marie Studholme, etc. Each portrait is surrounded by a delicately worked-in background, and all the results are effective. Why do not photographers generally work out such ideas as these for themselves?

Received.—"Chemistry for Photographers." By C. F. Townsend, F.C.S. Third edition (revised). 1s. nett. London: Published by Dawbarn & Ward, Limited, Farringdon Road, E.C.

Last week Sir George Kekewich, secretary to the Board of Education, distributed the prizes awarded to students of the Birmingham School of Art, at the Town Hall, Birmingham. In an address he said that the art ladder was more complete in Birmingham than in any city in the kingdom. It seemed to him that the present age was remarkable, not so much for the lifting of high art to a higher lever as for the more popular diffusion of art among the people, and for the practical and utilitarian application of art to our trades and industries, and for the recognition of the part that education played in humanising—he might almost say in civilising—the population. The taste and refinement which a boy acquired in the school he would carry to his home, and the poorer the home the more necessary was it that he should carry into it those qualities. Things were beginning to improve a little, but up to recently hideousness had reigned supreme in china, glass, and cheap furniture. From improved taste and greater refinement our people would profit, not only intellectually, but also materially. Taste and refinement were the sworn enemies of disorder, of uncleanliness, of vice, and of intemperance. He believed there was a coming demand for art productions in the markets of the world. He hoped that Birmingham would take a leading part in bringing a more artistic atmosphere into our jewelry and furniture trades.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

February	Name of Society.	Subject.
22	Birmingham Photographic	The Annual Exhibition.
24	Camera Club	*Designing a Comfortable House.* Mr. Barry Parker
24	Croydon Natural History	Mr. Rudler's Sixth Lecture.
25	Croydon Natural History	Zoological.
25	Newcastle-on-Tyne	*Demonstration of Wet Plate Photography.* By the President, J. S. B. Bell, C.E.
25	Leeds Photographic Society	*Finding and Focussing; some Practical Hints in Pictorial Work.* Illustrated with Lantern Slides. Mr. A. Horsley Hinton (Editor of the *Amateur Photographer*).
25	Thornton Heath Polytechnic	Lecture. *The Optical Lantern.* By A. E. Isaac, Esq.
25	Stonehouse Camera Club	Paper by Mr. Ford.
26	Southsea Photographic Society	Prize Slides.
26	Photographic Club	*Birds of the Forest, Field, and Shore.* Mr. Oliver G. Pike.
26	Ashton-under-Lyne	*The Carbon Process in Practice.* The Autotype Company. Reader, Mr. Samuel A. Platt.
27	Camera Club	*The Austrian Tyrol.* Mr. T. C. Porter, M.A., F.C.S., F.R.A.S.
27	Richmond Camera Club	*Photographic Heresies.* Mr. R. Child Bayley.
27	Woolwich Photographic	*Lantern Slide Making.* Charles Churchill, F.R.P.S.
27	London and Provincial	*Photographic Facts.* Mr. F. O. Bynoe (Messrs. R. and J. Beck).
27	North-West London	Annual General Meeting.
27	Rodley, Farsley, and District	*Platinotype.*
27	Oldham Photographic Society	Demonstration. *How a Lens is Made* (Goerz). By a Member.
27	Liverpool Amateur	Lantern Lecture: *A Tyrolese Valley.* Mr. Jas. Shaw.
28	West London Photographic	*Enlarging with Home-made Apparatus.* F. C. Hart.
28	Croydon Natural History	Photographic. Exhibition of "Photographic News" Prize Slides.
28	Borough Polytechnic	*Optical Lantern: its Management and Uses.* Mr. H. C. Philcox.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

February 13.—Mr. P. R. Salmon in the chair.

A few weeks ago Mr. Featherstone showed a celluloid film that had become quite yellow. The film was of the rollable order, and it was seen, by stripping the emulsion, that it was the celluloid itself that was so yellow. Most of those present said that they had never seen celluloid films of that colour before, and one member doubted whether there had been any change, but rather that it had always been that colour. Mr. Drage said that in looking through some spoiled films he had found many discoloured in the same way. These were cut films, and were not made in the same way as rollable films. The celluloid did not seem so deeply stained as the earlier examples, but they were going in the same direction.

Mr. T. E. Freshwater drew attention to a method of drawing in black and white for reproduction, as practised by Mr. Benham. The lines were very fine and clean, and much better for process work than those the usual pen would give. It was a more or less photographic process. The drawings were done by the harmonograph and pendulum methods, and instead of using ink and pen he treated the paper with solution of sulphate of iron and traced the lines with a pen charged with a weak pyro solution. The lines in the drawings shown were remarkably fine in character, and the method was one that seemed to work very well.

Mr. Mayall brought up some developed P.O.P. prints, which he asked the members to compare with some ordinary printed-out photographs from the same negatives. He had much to say for the method, and especially for the particular way in which he worked, which, however, was not vouchsafed to the meeting. He pointed out that the method had the advantage of saving in time, which in this time of year was a great consideration. The results were, further, infinitely superior to the ordinary prints. As regards the tone, he replied that he used the old acetate bath. He was very economical of gold, and said he could tone eighteen prints measuring 12 by 10—representing very nearly five sheets of paper—with 4 grains of gold. Much of the success with the method seemed to depend upon the amount of printing-out first given to the paper, and Mr. Mayall also laid emphasis upon the point that weaker hypo baths than usual should be employed in all work.

Mr. J. W. Hodges showed the Thornton-Pickard "Automan" focal plane camera. The mechanism of the shutter was interesting. It worked up to 1-1,000th part of a second. As regards the utility of such exposures the chairman remarked that Mr. Walter Kilbey had done a lot of work in the neighbourhood of that speed, and his diving pictures were generally about 1-800th of a second.

Mr. Drage asked for some assistance regarding cutting the neck off a bottle which he thought would make a useful dark-room lamp. He was recommended to try the following methods that have been said to answer:—To file the neck around and apply a hot poker. To tie a piece of wool saturated with spirit round the neck, burn the spirit, and plunge the part into water. It was also stated that scissors used under water could be made to trim glass roughly to the shape desired failing other help.

PHOTOGRAPHIC CLUB.

February 12.—Mr. J. R. Gotz in the chair.

Mr. A. S. Newman gave Part I. of a very interesting paper on "Kinetic Photography."

Mr. Newman dealt rather fully with the general principles of Kinetic Photography and the scientific reasons for the effects produced, reserving the practically photographic and mechanical part of his subject for his second paper, to be given on the 19th inst. The various stages of apparatus for showing "persistence of vision" effects, from the wheel of life to the present day bioscope, were duly noted. Mention was made of Mr. E. Muybridge, who, at the London meeting of the Photographic Convention of 1889, exhibited by means of the "zoopraxiscope" the results of a number of exposures made on moving objects by a series of electro-magnetic shutters; and of Mr. Friese Green, who, in the following year, at the Chester meeting, read a paper wherein he described a camera which had been constructed for taking photographs by merely turning a handle, which made a series of negatives on a band of sensitized material at the rate of 600 a minute," and exhibited a film about 30 feet long taken with his apparatus. This was undoubtedly the precursor of all the various forms of cinematograph at present in use.

An interesting discussion took place, in which Messrs. Gotz, Bridge, Parfitt, Stretton, and others took part, and the second portion of Mr. Newman's paper is looked forward to with great interest.

CAMERA CLUB.

"The Grumblings of an Amateur Photographer" was the title of a paper read on the 13th inst. by Mr. James Swinburne, and judging by the full attendance, it was a subject which was attractive to many. Mr. Swinburne soon let his hearers know that he was not going to grumble with them, but that the bones he had to pick were with the dealers, platemakers, lens-makers, and others who were in the habit of doing what they "didn't ought." First there was the camera to grumble about, and he took as the typical form of camera used by amateurs, the half-plate variety. His grumblings were, perhaps, about small things, but it was the small things of this life which made up its joys and sorrows. First there was that wretched lens cap, a survival of wet plate days, when exposures were long. Why not replace it by a sensible form of shutter? It was always getting lost, and probably there were enough lens caps lying about the country to pave Regent Street. A hinged cap would be far better, and the lens should have some form of sky shade atached to it. Mr. Swinburne's next grumble was with regard to lenses. He complained that the purchaser, under present conditions, did not know what he was buying. That dealers should not content themselves with pointing out that a lens was of such and such a focus, and would cover a plate of a certain size, but that they should always show specimen pictures of the lens's work. Surely Mr. Swinburne cannot be serious in this grumble, for specimen pictures salute buyers at every turn, not only in shops, but in the advertisement pages of many journals. "Of course," said the lecturer, "you can send a lens to Kew to be tested." But he evidently had a very poor opinion of Kew's handling of a lens, for he said that it was given over to a soldier, "who does everything with it except take a photograph with it." This is hardly fair to Kew, whose system of lens testing is thorough, and what has a soldier to do with the business carried on at the observatory? The next grumble was, perhaps, more reasonable, for it referred to the difficulty of reading the very small figures engraved on lens mounts, relating to aperture of the iris diaphragm. And the complaint that flanges and screws are not yet standardized is also reasonable; indeed, it is a very ancient grumble. One firm only has attempted to deal with the matter, and apparently, said the lecturer, "their action has had the effect of warning the others off." Other grumbles about lenses followed. They had no provision for the interposition of a yellow screen. The telephoto lens was clumsy and heavy, and had other drawbacks in manipulation. He regarded it as a generally unfortunate thing that one man should make lenses, another cameras, and another shutters, etc. They did not work hand in hand. Shutters were notoriously inaccurate. Blind shutters which were regulated by their own friction must necessarily vary in their performance with their age. Shutters, the release of which depended upon pressing a knob, were to be condemned, for they shook the camera; a pneumatic bulb was much better, where it could be employed. With regard to the camera, why was it always of mahogany or walnut? Why cannot it be made so that it will fold up within the lens and shutter in situ? Then the camera is generally far too big, the square shape now adopted in order to accommodate the plate vertically or horizontally being a mistake. Would it not be better to make the section of the camera oblong, and turn it on its side? Surely Mr. Swinburne must be aware that this was the original practice, and that the square form is an improvement. It is obviously far less trouble to reverse the back than to reverse the entire camera, as he suggests. The lecturer was quite alive to the improvements brought about in camera design by certain American makers, but he complained that the front of these was often ricketty, and not vertical. The focussing cloth ought to be abolished entirely, for it is easy to focus without it if the ground glass screen be furnished with discs of microscopic glass attached with cement. But he rather contradicted himself when he suggested that the half-plate camera should fold into a size small enough to go into a pocket—for this could hardly be possible if it comprised both lens and shutter. The book form of dark slide he regarded as a relic of collodion days, and thought it should be abandoned in favour of the American pattern, with slides which draw out entirely. The tripod head and the tripod screw—which always gets lost—next came under review, and both were condemned. Mr. Swinburne had plans for their improvement or effacement, but, strange to say, he made no mention whatever of the well-known turntable attached to the camera base. The plate makers next came under castigation. The ¼-plate size was peculiar to England and Germany, and it would be far better if it were replaced by a size which was actually one-half of the whole plate, viz., 6½ by 4¼. He considered that plate makers ought either to date their plates or to guarantee them only up to a certain date. A midsummer madness seemed to attack plate makers in the dog days, and they turned out goods which gave the most erratic results. Then he had a word to say about stereoscopic cameras, which should be more portable, and of the snapshot variety. Stereoscopes themselves should have an adjustment for diminishing or increasing the space between the eyeholes, for the width between the eyes varies so much with different individuals. It was not uncommon, on this account, to hear people say that they could see the pictures in a stereoscope better when they closed one eye. With a few words on the depravity of the common printing frame, and the vices of certain lenses issued with enlarging apparatus, the paper was brought to a conclusion.

The discussion which ensued was amusing, because of its conversational character, and the proceedings closed with the usual compliments.

PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

February 7.—Mr. Thomas Bedding, F.R.P.S., president, in the chair.

The printed minutes of the last meeting were taken as read, and confirmed.

Letters from absent members having been read, the chairman announced with regret the death of Mr. J. Caswall Smith, who died very suddenly a few days before. A vote of condolence had been recorded by the committee, and a wreath had been sent in the name of the Association

The report of the committee on the business transacted since the previous general meeting was read by the assistant secretary, in the absence of Mr. Alfred Ellis through indisposition.

A motion for the adoption of the report was proposed by Mr. J. Done, seconded by Mr. S. H. Fry, and carried.

Mr. Simmons spoke in favour of a full consideration by the branches of the suggestion made by him some time ago, whereby photographers should co-operate and start a factory of their own for the supply of the material which at present they had to get on disadvantageous terms from existing and unsympathetic makers.

Mr. Elliott pointed out that the committee were pledged to act on a matter conflicting with Mr. Simmons' suggestion, and until that was disposed of nothing should be done to interfere with the negotiations. He therefore put it to Mr. Simmons that he should limit his motion to one requesting the committee alone to look into his suggestion, and not make it obligatory to send the matter as a suggestion to the branches.

Mr. Simmons agreed to make a motion in these terms, and the same, seconded by Mr. Bridge, was carried.

The assistant secretary read the reports from the Edinburgh and Hull branches.

The Proposed Benevolent Fund.

Mr. Lang Sims, speaking on the proposed Benevolent Fund, said that he took it that one of the objects of the Association was benevolence—not in a large way, but in a small way; at least, to begin with. The subject had been fully discussed in committee, and before he entered further into discussion he should like to hear some observations by the general body of members.

Mr. S. H. Fry asked whether the project of the benevolent fund was to apply generally to photographers? Were they to subscribe money for their mutual benefit or for philanthropic motives?

The chairman replied that the scope suggested was the membership of the P.P.A., and their dependent relatives.

Mr. Elliott asked Mr. Turner to give the views of the Hull branch, as they appeared to have adopted a definite line.

Mr. T. C. Turner said that if photographers were in need of temporary assistance on a small scale, it seemed to him that they must have already ceased to be in a position to pay their annual subscription to the Association. Unless the benevolent fund was on an extensive scale it seemed to them that it would be better not to play with the scheme at all. There was a good deal of private generosity exercised amongst professionals already. The sense of the Hull report was that the Association had plenty to do in persuading photographers to keep from such a state in which a benevolent fund was wanted. The Association was one of business men, and the help that would be necessary to put such business men on their legs again, if they were unfortunate, was hardly such as could be expected from the benevolent fund. The Association was hardly strong enough yet for a complete benevolent scheme.

Mr. W. Coles, speaking of the old Benevolent Association, said it was supported mainly by amateurs, the support from the professional element having at the last fallen quite away.

Mr. H. E. Hull said that the old Benevolent Association was on lines that were totally different from those now suggested, and a comparison would be of no assistance.

The chairman said that there was undoubted room for a benevolent fund, and although Mr. Turner's arguments were very cogent, they did not destroy the fact that there were hundreds of cases for urgent attention. The rapid distribution of the late Benevolent Association's funds had destroyed the one and only centre towards which an unfortunate man or woman might direct his or her gaze. He thought Mr. Lang Sims' proposal was a practical one so far as it went, and that it would help to fill a want at present felt in a very keen way by many who came under his notice.

Mr. F. A. Bridge said that, however desirable it might be, it was rather too soon, in his opinion, to embark upon schemes of the sort

until the Association was at least a couple of years or more old. The Association had already much on its hands, and it would be better, he thought, to keep the idea of a benevolent fund in the background.

Mr. W. Downey spoke in favour of the benevolent scheme and its commencement at once. He signified his willingness to start the thing with a donation of £5.

Mr. R. Lang Sims thought the Association should commence at once, even in a small way. The Association could annually or at its general meetings vote small sums of money in aid. They had a balance of £80, and he hoped they always would. If the money were not used for some time to come they might at least start the benevolent fund, and the money set aside would be adding to itself. In order to get the definite opinion of the meeting, he moved that the sum of £5 5s. be appropriated from the general funds for the purpose of forming a benevolent fund.

Mr. England seconded the motion.

Mr. H. J. Dalby spoke against such a use of the official funds, and would substitute a subscription box.

Mr. Hull was against any scheme whereby the ordinary funds would be utilised for benevolent purposes, and said that, on the other hand, there were many who would be prepared to subscribe to a little separate fund to commence the work with.

Mr. Done held that if the Association's funds were to be used as proposed, the benefits should be limited to those who subscribed to the Association.

Mr. A. Mackie thought it inadvisable to use any of the P.P.A. funds for a benevolent scheme. The amount that could be spared, too, would be so little. He thought that no member of the P.P.A. was likely to require assistance immediately. In the days of the old Benevolent Fund it was ten or twelve years before the funds were called upon, and so they were able to accumulate some £250. It was in after years that the calls came. He approved of the benevolent fund scheme in a modest way, but held that it should be supported by voluntary subscriptions.

The motion was put to the meeting and lost.

The chairman thereupon stated that the committee would have now to consider in what other way the scheme could be set afoot.

Reproduction Fees

Mr. T. C. Turner spoke about the recent action on the part of a certain firm with regard to terms for the reproductions of photographs upon some postcards they were issuing. The Hull branch had concerned itself a good deal in the matter, as they were anxious to know whether their copyrights were only to produce a maximum fee of a guinea for such purposes. In one particular case he asked £3 3s.—the subject being a unique one of Penley in "Charley's Aunt"—and of this 20 per cent. had to go to Penley under agreement. A reply was received, in which he was asked not to forget that the best subjects of the best London photographers were all to be had at a guinea, and that the expense of reproducing, etc., did not permit of a higher figure being given. Mr. Turner ventured to say that, such being the case, it was to the advantage of the profession not to allow the use of the work, for it must be admitted that anything that tended to the vulgarising or cheapening, unreasonably, of photographic work, was not to the advantage of the Association or of its members. If this postcard work had to be done, photographers could do it themselves. There were plenty of publishers who would take up the work. Then as regards the relations of the professional and the manufacturer; they in the country felt the tension far more acutely than London people. They were face to face with a form of competition that was very unfair—that in which the dealer embarked upon professional work, with the advantage that he got better discounts than the pure professional. Upon the top of that state of things came the manufacturer asking professionals and others to allow their names to be printed on their circulars as users of particular wares. In Hull they had made up their minds to disallow the appearance of a single name in this way. It was strange that dry plate makers, who found it an advantage to use the names of professionals were so averse to extending to that body the consideration which they in turn asked for. Hull was looking with interest to see what action would be the outcome of the steps of the London committee in the discount question. It was thought that in the end they would get better terms. The Association was strong, and it was growing stronger, and what it could not get in one way it would in another. He thought the time was not at hand when a manufacturing business could be started by the Asssociation, and, moreover, it was unnecessary to do so while there were young firms who were prepared to meet professionals' just demands. Conservative bodies like professional photographers were, however, liable to stick too long supporting old firms who had done well by them in the past. They in Hull held that they must not carry this fancy too far, and if a request for better treatment be received uncompromisingly, then to look to another source for supplies. Mr. Turner finally moved that until the discount controversy with manufacturers was satisfactorily settled members are advised not to allow the use of their names in advertising books issued by well-known firms of dry plate makers. Mr. F. A. Bridge seconded the motion.

It was agreed that those who, without thought had sanctioned the use of their names should be asked to write that they had reconsidered the matter and withdrew their names. The motion was agreed to *nem. con.*

Mr. Downey assured Mr. Turner that his firm could not endorse the statement that the best work could be had for a guinea. He proceeded to name the prices that he was in the habit of demanding, and they were much in excess of the figure stated.

Mr. Elliot also asserted that the particular company's statement was quite inaccurate as far as his firm was concerned.

Mr. H. S. Mendelssohn also identified himself with this demand. He said that he got as much as he could, and certainly always more than the amount stated.

Mr. Turner said he was much gratified to hear these denials.

Insurance Rates.

Mr. W. Coles raised the question of fire insurance rates, and said that through the Tradesmen's Association the Birmingham Mutual office were issuing policies at a reduction of some 25 per cent. on ordinary rates.

A discussion took place, and while it appeared that some were paying as much as 7s. 6d. per cent., others were paying as little as 2s. 6d.

Mr. Turner suggested that the local secretaries should approach local offices with a view to the reduction of excessive premiums. If this work fell upon the Central Committee there would be an enormous amount of work to see to.

The chairman promised that the committee would consider the matter, and that the local branches should also have the matter placed before them. Speaking on the general question of the Association's future, he said that the feeling in the country and London continued as strong as ever. Ten months ago the Association was only being formed; now it had a membership of over 500. The committee were still piling on those bricks that would eventually complete an edifice of which all must be proud. There were many years of labour before them, but if the same spirit continued to animate the members as now, there could be no uncertain voice about the future.

A vote of thanks to the Royal Photographic Society for the loan of the rooms brought the meeting to a close.

Recently-elected members of the Association:—William Gill, Head Street Studio, Colchester; James Patrick (J. Patrick & Son), 52, Comiston Road, Edinburgh; William Strickland, 297, Mill Street, Liverpool.

There will be a meeting of the General Committee at 51, Baker Street, W., on Friday evening, February 21st, at six o'clock. Business: Election of members, and to confirm arrangements for the annual dinner.

The following notice with reference to the annual dinner has been issued to members:—

Professional Photographers' Association, 51, Baker Street, London, W., February 17th, 1902.—Dear Sir,—The first annual dinner will be held in the Victoria Hall of the Criterion Restaurant, Piccadilly, on Thursday, March 6th, 1902, at 7 p.m., Thomas Bedding, Esq. (president), in the chair. Tickets 6s. each. If you wish to be present on this occasion, please fill up attached form and return to me with Postal Order for 6s. for each ticket required. An early reply will be appreciated. No application for tickets can be received later than the first post on Thursday, March 4th.—I am, dear Sir, yours faithfully, Alfred Ellis, hon. sec.

Professional Photographers' Association.—To Mr. Alfred Ellis, hon. sec.—Please send me ..... tickets for annual dinner on March 6th, 1902. I enclose ..... being 6s. per ticket.

Name .....

Address .....

Name of Visitor (if any) .....

Memo.—This must be posted in time to reach the secretary by first post on March 4th.

NORTH MIDDLESEX PHOTOGRAPHIC SOCIETY.

February 12.—Mr. J. P. W. Goodwin lectured on "Fred. Walker, A.R.A., and His Pictures."

The lecture was illustrated by slides from the paintings and black and white work of the artist, and they were ably commented on by the lecturer as they appeared on the screen.

His faculty of investing simple themes with undying interest showed the power of the artist. They were always striking and full of feeling. His short career was described by the lecturer, with many incidents.

SOUTHAMPTON CAMERA CLUB.

On Monday evening, the 10th inst., the above Club had a very successful gathering at the Philharmonic Hall, the president (Mr. Burrough Hill) occupying the chair. After the election of several new members, the president introduced Mr. R. W. Carden, A.R.I.B.A., to deliver his lecture entitled, "Towns not on the Tourist's Track in Northern Italy." The lecturer treated the subject in a masterly manner, conducting his audience from Milan due East to Venice; thence Southwards to Bologna: then back again in a North-Westerly direction to Milan, the Lake of Como, and Göschenen in the St. Gothard Pass. Mr. Carden paid a tribute to the generosity of the Italians to foreign visitors. The numerous slides projected by the lime-light lantern, under the able management of Mr. G. T. Vivian, were very excellent and well chosen, representations of the various beautiful specimens of architecture which abound in the country. The gradual decay of such masterpieces seems most regrettable, Mr. Carden describing some of the remains of most beautiful buildings being actually occupied as marine-dealers' stores, and as workshops for artisans, etc., whilst lovely statues and images might be seen in a great many ordinary back gardens, etc. Attention was drawn to the erroneous impression prevailing that all the grand architecture of Italy was centred at Venice. In many other places most lovely edifices exist, quite equal to any Venice could boast of.

Liverpool Amateur Photographic Association.—The weekly meeting of this Association was held last week, at the rooms in Eberle Street. Dr. Ellis, in the absence of the president (Mr. E. R. Dibdin), presided over a very large attendance of members. The lecturer was Mr. W. A. Taylor, whose subject, "Evesham and Warwick," was the scene of an excursion of the Society, and was illustrated by numerous views taken by the members, including many fine animal studies. Taking Evesham as a centre, Warwick, Chipping Norton, Tewkesbury, etc., were visited, Mr. Taylor's racy, historical account of the various places being closely followed by his audience. At the conclusion a hearty vote of thanks was passed to Mr. Taylor, on the motion of Mr. Lange, seconded by Mr. Marples.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

ON VARIOUS SUBJECTS.

To the Editors.

Gentlemen,—I find in the "British Journal of Photography" of February 7 last what is probably an error. You say that the weight of a metre of magnesium ribbon was 63 gramms, which is over two ounces. In a former number a very interesting article was written on slow development and development on given time. In it there is a note about a certain developer which is excluded from the benefit, and that is pyro ammonia. Allow me to protest against this. I am using this developer since over twenty years, and using it now for slow development, and find it to answer splendidly, having left plates in it for over seven hours, and have good negatives after that, all the difference being that they were rather hard to print, but not exaggerately so. This developer I use keeps for months, and, however, somewhat stained by age, does not affect the plate any, and works very well. It is no secret developer, and I have given the formula at least twice in this Journal already. Now, as to development in a given time, I do not know if any photographer would be likely to just time his bath as advised, and then take out all the plates indiscriminately at once, and transfer them to the hypo-bath without a glance at them, especially so as the exposures in a day's work are so different, as has so justly noticed a correspondent lately. Therefore, when looking at the negatives every half-hour, these which have correct intensity may be taken out, while those not up to the print can be left for half an hour or more in the developer yet. If at the end one is in a hurry a more concentrated bath may be used to give them rapidly the required intensity. For general use I dilute my bath about five times the original strength, when a correctly-exposed picture will be finished in about one hour or one hour and a half at most, while an instantaneous picture (which, of course, has received enough exposure to come up in time) will require from three to four hours at most. One must not expect from any developer, I suppose, to have a picture come up from an under-exposed picture, be it time or instantaneous. I do not pretend to say that my developer or slow development will bring out details which are not there, but when exposing pictures with strong contrasts, slow development, with me at least, has brought out details. I did not expect to see more harmonious results and less hard contrasts.

Competition is the soul of trade (this is an English saying, I think; if not correct, please put it right for me). Some time ago you advised strongly English manufacturers to compete with foreign goods, and make them at home. This was quite right, and, however, I am not English, I admit your right to do so as well as I would say the same for every country. Later on, when a large firm wanted by a reduction in their trade discounts to dispense with larger dealers, you did not know how these large dealers could now fight the large firm with other goods similar, but imported or not. This was a step backward on your part, and I think not quite right, as it was inducing monopolists to persevere in their course. Allow me here to say that I am now nearly out of business, and therefore think I can speak of it impartially, having no interest in it one way or the other. Now, to go on, let us admit a big firm, allowing a trade discount of 25 per cent. to retailers, and an extra discount of 10 per cent. to wholesalers. Wholesalers are few, of course, but they are sufficiently numerous, anyhow, in London and in other cities, to have at first satisfied the big firm in supplying the retailers, which they could not have reached so easily nor so rapidly as through these wholesalers. Now, these wholesalers were satisfied with 10 per cent. discount only. As, after having brought about the desired effect, they can now be thrown aside, it has been done, and the retailer is now asked to order direct, and he loses nothing for the present, at least, and here I would cry "Casse-cou," or "Look out," and benefit, if you can, with the past. The big firm now pats you on the shoulder and says: "Order direct from us, and you get same terms as heretofore, and even better if you throw all other goods overboard." Beware! by so doing you anihilate all competition; you ruin existing factories, prevent others from coming up, and, in fact, all improvements which would require piles of money to come within notice, etc., etc. When this result is obtained, 25 per cent. discount will come down to 20 per cent. What can you do then? Nothing whatever; you are owned by the big firm, a few whose trade is rather small will be pushed to the wall and fail. Those having been able to stand it will see their business somewhat increased, but profits will remain same as 20 per cent. will leave less and troubles increase. Another shrinking will happen, when 15 per cent. is thought sufficient, with same results as above. Then we will come back to the original 10 per cent., with only a few scattered firms having a larger trade, of course, to whom one will have to go, until the natural consequence arises again and the cry "not profit enough," and then the big firm sets in again as a benefactor (for itself), larger discounts will be given, but with higher prices for goods. And then the retailer, that now gives in, will be the Dindon de la farce, as later on the amateur will have his share as well as the photographer himself. The remedy is very simple, I think. First, refuse to bind yourself by any contract; this will not be liked much by monopolists. Second, do not refuse the sale of any goods that are in your opinion as good, or may be superior, to those of monopolists. Third, do not allow yourself to be always controlled by a few pence, or may be a few shillings, of discount, which in the end, as above shown, may cost you pounds. The big firms depend altogether on retailers. Let retailers have their word, and if they want that word to their benefit, do not bind yourself to one firm only.—Yours very truly,

A. Levy.

Asnières, February 13, 1902.

P.S.—Since I wrote above I read in the "British Journal of Photography" a letter from Mr. W. E. Dunmore, signing himself "Proprietor of the Tella Camera Company," and I wonder what he would have written had he simply been proprietor of Kodak, Limited, and more in their favour. Wholesale dealers preferred also hard cash. Where are they now? W. E. D. advises dealers to remain on the fence unconcerned and watch. Watch what? Wholesale dealers are now practically out of it, and it remains only for retail dealers to see my letter above, and consider carefully what is your course to follow, and profit by the past.—A. L.

THE NOTTINGHAM EXHIBITION.

To the Editors.

Gentlemen,—I am pleased to say that our exhibition has been a great success, both from the photographic and financial point of view. Over thirty exhibits found purchasers. At our next venture we mean to go one better; but we have yet to decide whether to make it annual or biennial. Thanking you for the notices you have given us in your valuable paper,—I am, yours faithfully,

Arthur Black, Exhibition Secretary.

9, Bowers Avenue, Nottingham.
February 16th, 1902.

THE "FIGARO" COMPETITION.

To the Editors.

Gentlemen,—We write to draw your attention to a photographic competition, which is to be held in connection with out publication, "Le Figaro Illustré," for the most artistic photograph of a lady. The prize to the successful competitor will be one thousand francs (£40). We enclose herewith a prospectus, giving full details of the competition, and shall be glad to know that the scheme will receive your approval.—Yours faithfully,

Goupil and Co.,
Fine Art Publishers.
Manzi, Joyant and Co.,
Fine Art Publishers, Successors.

25, Bedford Street, Strand, London.
February 17th, 1902.

Le Figaro Illustre.

24, Boulevard des Capucines.

Direction et Rédaction.

CONCOURS PHOTOGRAPHIQUE D'ART ET DE BEAUTE.

CONDITIONS DU CONCOURS.

A. — Le Concours est ouvert à tous les Photographes, amateurs ou professionnels.

B. — Les concurrents sont priés de remettre ou adresser leur envoi à la Direction du "Figaro Illustré," 24, boulevard des Capucines, Paris.

Cet envoi peut consister en une ou plusieurs épreuves, en un ou plusieurs clichés photographiques.

Chaque envoi devra porter un signe de reconnaissance, répété sur une enveloppe dans laquelle le concurrent indiquera son nom et son adresse.

La dernière limite pour la réception des envois est fixée au 31 mars 1902.

Les documents communiqués seront restitués à la fin du Concours.

C. — Le Jury, après avoir constaté les envois choisira une épreuve par concurrent.

A l'expiration des délais d'envoi, le Jury classifiera les épreuves choisies et leur attribuera un numéro d'ordre.

Les vingt-quatre épreuves ayant obtenu les cotes les plus fortes paraîtront successivement dans le "Figaro Illustré," de mars à novembre.

Dans le numéro de décembre, sera encarté un bulletin de vote que nos lecteurs seront priés de remplir et de retourner à l'administration du "Figaro Illustré."

Le scrutin sera dépouillé par le Jury, et, avant la fin de décembre, l'auteur du portrait qui aura obtenu le plus de suffrages sera avisé

pour toucher la prime de mille francs promise dans notre numéro de janvier.

Le résultat du Concours et les noms des vingt-quatre concurrents primés seront publiés dans le numéro de janvier 1903.

FLASHLIGHT PHOTOGRAPHY.

To the Editors.

Gentlemen,—I notice in your last issue a letter by Mr. Milner, who, speaking of the difficulties of flashlight photography, rightly lays down several conditions which are necessary to achieve daylight effects when using artificial light. I am glad to say I can save him further research in this direction, inasmuch as it has been my good fortune to conceive an apparatus fulfilling the above, several years ago, which, having been protected at the Patent Office just about a year ago, is now on the market, and, recognising the most efficacious means of bringing it before the photographic world, has been advertised in large type in your esteemed paper for some weeks, bringing me many inquiries.

I am sorry that Mr. Milner does not avail himself more largely of the educational means your Journal undoubtedly affords (having been a reader and occasional contributor to these pages for over twenty years, I might almost call its yearly volumes "Enquire Within for Everything" appertaining to photography), or else he would have seen my advertisement or the eulogising remarks in the body of the paper re my demonstration of the method he advocates at the Hackney Photographic Society. I have used these electrically, simultaneous, and instantaneously fired, smoke and dust trapping lamps for a couple of years in my studios, and they can be absolutely relied upon to secure good daylight effects with the necessary chiaroscuro under perfect control, with so brief an exposure that when the sitter starts (as may happen when the ordinary room illumination is not of the brightest), or closes the eyes, the photo has already been taken. I have 15 by 12 groups of up to 30 figures, full length and three-quarter pictures, that are always (even by professional photographers) believed to be daylight work.—Yours faithfully,

J. HUBERT.

138, High Road, Chiswick, London, W.
February, 1902.

THE FIRST PERSON TO BE PHOTOGRAPHED.

To the Editors.

Gentlemen,—A few days ago I wrote to thank you for forwarding a letter to me, and promised to call and see you soon, but the weather is so cold that I am pretty closely confined to the house. Since then a friend has forwarded to me a newspaper cutting relative to the first Daguerreotype taken in the United States, which is anything but correct. I do not know the source of the cutting, but I give verbatim: — "The death is reported from Hastings-on-Hudson, United States—of the first person who ever sat for a photograph. This Miss Draper, an old lady, of 95 years of age, was a sister of Dr. John Draper, the discoverer of the process of making the Daguerreotypes in a few minutes. A great sensation was caused in artistic sets in 1839 by the picture of 'Dolly Draper,' with the startling information that the subject only sat for about six minutes. This original picture is now in the possession of the descendants of Lord Hershell, who became its owner at the time."

Now, *imprimus*, admitting the statement to be true, that Dr. John Draper did make the first Daguerreotype portrait in the United States, it is equally true that he employed the iodine process, simply as published by Daguerre in 1839, and never employed a chemical accelerator at all in 1839. What he did do was to whiten the faces of his sitters, which would undoubtedly shorten the time of exposure; but the process, if that term can be employed, was neither artistic nor scientific. There was no chemical accelerator employed in any part of the world until Mr. Goddard employed the vapour of bromine along with that of iodine in 1840, and this converted the surface of the silver plate into a bromo-iodide of silver, which at once reduced the time of exposure from minutes to seconds, and when Mr. Bingham introduced his bromide of lime accelerator the time of exposure was still more reduced, so that instantaneous Daguerreotypes were produced long before the process became extinct. Having disposed of the chemical and scientific errors of the paragraph, I next go into the possession of the picture referred to. It never was, nor is, in the possession of the family of Lord Hershell. It was sent to Sir John Herschel by Dr. Draper, and, to prove my statement, I will make a few extracts from his son's letter to me, dated March 27, 1893, and he says: "Professor Draper sent my father, Sir John, a Daguerreotype, taken by himself, before the 28th of July, 1840, and that is still in my possession, and is to go to Chicago for exhibition there. The interest of it, scientifically, is that it is certainly the first of his that was sent to England, and was found then to be, in Sir John's opinion, by far the most satisfactory he had seen. This, I think, shows that there were others already in England. I shall be glad to show you this one when it returns from America some day.—Yours very faithfully, W. J. Henschel."—I remain, yours truly,

JOHN WERGE.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY, 24, *Wellington-street, Strand, London, W.C.*" *Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

PHOTOGRAPHS REGISTERED:—

G. Stringer, 7, Chapel-street, Colchester. *Photograph of Rev. C. Pierrepont Edwards.*
H. Sparrow, George-street, Brandon, Suffolk. *Photograph of Grace Stones.*

PHOTO PRINTER.—The spots, or rather batches of them, appear to be due to the prints having been insufficiently fixed. The remedy is obvious.

ARTIST.—(1) No good C.C. paper cracks or blisters if it is properly used. (2) The usual sulpho-cyanide bath will yield the tones of the print sent. (3) The print looks as if it was burnished with a bar burnisher, used with a moderate pressure.

INSURANCE.—J. M. A. writes: "Will you let me have a reply in your next as to which of the insurance companies give photographers policies at a fair rate?"—In reply: We have heard the Westminster Fire Office, King Street, Covent Garden, W.C., well spoken of by photographers.

EARNEST WORKER.—The photographs were overlooked, and have now been returned. We should describe them as fair commercial portraits, worth the prices charged for them; but conventional in style and treatment. If our correspondent made a point of studying the portraits at the best exhibitions he could not fail to derive many hints and suggestions that would stimulate him in his work.

COPYRIGHT QUERY.—"LENS" writes: "A client gave us a sitting. He has had some copies. The sitter being a celebrity, we took the earliest opportunity to copyright [register] his photo. Now, as he has not paid—although he offered to do so after registration, and we refused to accept—can we now sell his photographs without his permission? We have had numerous applications for same?"—In reply: Yes.

BROMIDE PRINTING.—"ARTIST" writes: "When at your office a few months since, I saw a strip of bromide paper with a number of beautifully uniform prints from one negative upon it. I should be obliged if you would let me know through your correspondence page the name of the machine they were printed on?"—In reply: The bromide photographs referred to are printed by Messrs. Wellington & Ward, Elstree, Herts. We do not know the name of the machine.

LESSONS IN LANTERN SLIDE PAINTING.—G. E. M. asks: "Could you kindly tell me the address of a first-rate painter of lantern slides, in or near Manchester; or, if not, London or Liverpool. I wish to take a lesson in painting slides, as I find in all books on the subject it is particularly recommended that the student should have, at least, one practical lesson?"—In reply: Perhaps some reader will oblige our correspondent with the required addresses.

PERPLEXED.—Without having more particulars than are contained in your letter we cannot give a more precise cause of the trouble than saying that it is due to faulty manipulation. If you think that the streaks arise from the mounts why not test them and satisfy yourself on the point. The matter is very simple, and has frequently been described in these columns—even so recently as two or three weeks ago (see page 103 *ante*).

DEFAULTING CANVASSER.—"PROVINCE" writes: "I find that a canvasser I employed some months ago has been receiving money and not paying it in. I thought of giving him in custody for embezzlement, but a friend tells me I cannot as I did not pay him a salary, but only commission on the orders he got and the money he collected. Is that so?"—In reply: If you did not pay the man a salary he cannot be charged with embezzlement as a servant, and your only remedy is in the County Court, to recover the money due to you.

TAX ON TRAP.—W. H. H. writes as follows: "Can you tell me the law on this point? I keep a pony and trap for business purposes, as much of my business is with taking groups and views away from the studio. Occasionally, however, I take my wife and children out for a drive, but not often. The Income Tax people want to tax me for a pleasure trap. Can they do so?"—In reply: If the horse and trap are used exclusively for business purposes it is exempt from taxation; but as you say it is sometimes used for pleasure purposes we expect you will have to pay the tax upon it.

ENLARGING BY ARTIFICIAL LIGHT.—"ENLARGER" writes: "I think of doing my own enlargements on bromide paper, but am somewhat at a loss as to which light to use—the lime-light or the electric arc light. I shall have a difficulty in getting oxygen, as it will have to come from London, but we have electricity in the town; indeed, at the door. Will you please say which you think will best answer my purpose?"—In reply: Either will answer admirably, and it is simply a matter of convenience which is employed. If you employ the arc light the lamp should be a "focus-keeping" one, so that the arc is always retained in the axis of the condenser.

Several Letters and Answers are unavoidably held over.

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*** *The Editor can only be seen by appointment.*

*** *We do not undertake to answer letters by post.*

EX CATHEDRA.

Glass Bottle Dangers. If it were considered foolish to put new wines into old bottles, at a time when bottles were represented by sheep or goat skins, surely it is most reprehensible to store highly volatile and inflammable liquids in bottles of brittle glass. And yet the custom is common enough. For some occult reason the Winchester quart, which is an unwieldy glass bottle, holding half a gallon has for a long time been the chosen receptacle for holding liquids of a dangerous character. In oilshops we have seen often enough mineral acids and strong ammonia so stored, and have wondered, with a shudder, what dire results might happen should one of those bottles get a sufficiently hard knock to shatter it. And it is not only by a knock that mischief might occur. These bottles are of such an awkward size that they are hardly big enough for two hands, and certainly too big for one to pour from comfortably, consequently there is a risk whenever they are manipulated. But the greater danger arises in the case of volatile liquids, the vapour from which is inflammable, and these, too often, are supplied and stored in glass bottles. A terrible example occurred only last week at Balham, at an incandescent mantle factory, where more than 100 workpeople were employed. It is generally known that these earthy mantles are stiffened by means of collodion, the plentiful use of which at the factory in question was always evident to passers-by through its strong smell. This factory has been completely burnt out, and many of the unfortunate hands injured by the accidental breakage of a bottle of collodion. The local reporter puts the matter thus :—" One of the workmen in the spirit room broke a large bottle of collodion, and this liquid flowed to a gas stove, which immediately exploded." Of course, all photographers used to the ways of collodion know exactly what happened, although they will not endorse the accuracy of the newspaper man's statement. It is easy to be wise after the event, and to point out the criminal carelessness of keeping collodion within reach of a gas stove; but we venture to think that the disaster would not have occurred if the liquid had been stored in a metal drum, or if the glass had been protected with wicker work. No doubt precautions of this kind will be adopted when this factory is reinstated, and they will be rigorously enforced until familiarity breeds contempt and someone again blunders. Even when employed in much smaller quantities, glass is not the right material for vessels which are destined to contain corrosive, volatile, or inflammable liquids.

* * *

Trees. Although it is the fashion among a certain number of artists to taboo photography as if it were some unmentionable thing, and to talk of the camera as a mechanical device over which the user has no kind of control, we all know very well that painters have a secret respect for the gelatine plate. A glance round any modern collection of pictures will show, in the landscape department especially, what an influence photography has had in guiding the brush. We see this more particularly in ripples on water, in wave motion and in clouds. We may also note by comparing old pictures with new ones, to what a wonderful extent the method of painting foliage has changed within the last few decades, a change which, we think, may be traced to the influence of photography. The schools of art, dotted all over the country, have, of course, done wonderful work in educating the popular taste through the medium of

the many students whom they have instructed. And these schools of art have, too, ousted the old-fashioned drawing master, whose works were generally as faulty as they could be. It was the fashion then to draw foliage with an outline like pinked paper. The pinkings were pretty uniform in the case of such a tree as an elm, the edges were a little more pronounced when it was desired to represent a chestnut, and they were somewhat elongated to make the tree into an ash. As to the trunk, or the structural arrangement of the branches, these were left to take care of themselves. Photography has helped to change all this, and the true artist studies his foliage in mass rather than in detail. But we think that much more could be done in this direction if photographs of trees were produced in a more systematic manner. What we mean is, that a separate photographic study should be made of the details of each tree, just as some enthusiastic photographers have reproduced the details of the architecture of a particular building. A photograph in the early spring would show the branches bare, or the leaves just sprouting. A picture taken a week later would exhibit the lovely tracery of the leaves against the sky. Later on, we might depict the foliage in full dress, before the heat of summer has begun to dry it and reduce it to one dull tone. Separate photographs might show detail or trunk markings and leaves, but the most valuable pictures to the artist would be those which showed the massing of the foliage. There is no reason why, in a good painting, the trees should not be as readily recognisable as the other items represented, and photography ought to prove useful as a reliable guide towards that goal.

* * *

Photographs as Fixtures. It is not uncommon to see, in houses of modern design, photographs employed as decorative panels. Everyone will remember the beautiful frieze exhibited some years ago by Mr. Van der Weyde, in which ladies and gentlemen, apparently stepping forward in some such stately dance as the cotillion, and arrayed in the Court costume of a century back, figured as a most elegant and attractive procession. Such a frieze would be a most suitable form of decoration for a ballroom, or for the vestibule leading thereto, and very possibly this clever bit of pictorial composition has found a resting place in more than one mansion. Such pictures, printed in carbon, and properly protected, are as able to defy the ravages of time as are pictures painted in oil colour. Now, the question arises, are such pictures, attached to the panelling or the walls of a house, to be regarded as fixtures? In other words, do they remain the property of the man who paid for them and placed them in position, or must they be regarded as part and parcel of the fabric of the house, thus becoming the property of the freeholder? This problem has required solution more than once in connection with tapestries, and a recent decision of the House of Lords will haply set the matter at rest. The appeal case in question related to the ownership of seven pieces of tapestry, valued at £7000, which were hung in the drawing-room of Luton Hoo Mansion, Bedfordshire, and the legal point raised was, whether they were chattels belonging to the executors of the person who bought them or whether they had been so affixed to the premises as to be irremovable therefrom, therefore becoming part of the freehold? Of course, much depended upon the manner in which the tapestries were fastened to the walls. It seems that strips of wood had, in the first place, been attached to the brickwork, and upon these the hangings had been stretched and pinned with very small tacks. The Court below had decided that the tapestries so fixed had become fixtures, the Court of Appeal had reversed that decision, and now it was the turn of the House of Lords to say which was right. The Lord Chancellor took a common-sense view of the matter. Was it conceivable, he asked, that the purchaser of these tapestries, who had been an ordinary tenant, and had put them up for ornamentation, should have regarded them as fixtures which would go as a present to the landlord? It was clear, in his opinion, that they were never intended to be permanent fixtures, nor were they meant to be dedicated to the house. We fear that the landlord, who wanted to secure art treasures on the cheap, will have to pay rather dearly for his whistle. But he has done good service in bringing to a final settlement a question which affects all kinds of pictorial decoration, photographic and otherwise.

* * *

A New Light. For some time past the public, at least the scientific public, has been alternately interested and amused by sundry paragraphs in the papers about some mysterious new light, usually represented as being the result of some bottled mercury compound, and often as being self-luminous when once started. The true inwardness of the invention is now properly put forward, and we have before us details of a new form of electric light, which appears to have great promise for purposes photographic, though for general public or private use its colour would seem to be a drawback. The inventor, an American, Mr. Peter C. Hewett, has had an opportunity of bringing the new light in actual operation before a body of scientific men, the American Society of Mechanical Engineers, and there is no question that his lamps gave a brilliant light, and at, it is alleged, a considerable economy of electric power, accompanied by increased efficiency. The lamp appears to be quite simple in construction, consisting, as it does, according to the account in *Invention*, of a glass tube, with a bulb at one end, in which is introduced "gas generated from mercury," which, failing any better description, may be assumed to be simply mercurial vapour in a vacuum. The gas acts as a conductor, and, as soon as the switch is turned on from the electric main the tube is flooded with light. Four of these bulbs were placed round the auditorum, and one hung from the ceiling. At the same time the ordinary incandescent lamps were illuminated, and appeared by comparison like jets of uncertain yellow flame. Mr. Hewett in his paper said the mercury gas lamps exhibited are operated on the standard Edison 118 volt direct-current circuit, and vary in consumption from one to six amperes. though there was, he said, no reason why they should not be indefinitely increased in size, save for the heating effect and consequent softening of the glass, when too many candle power per inch are produced. He had made lamps with a $\frac{1}{8}$-in. bore and 3in. long, up to 10ft., giving from less than 10 candles up to fully 3,000. The light produced contained rays of orange yellow, lemon yellow, green, blue, blue violet and violet; and though all the colours were not represented, it was only the absence of red that made the light less pleasant in colour than might be wished. It was stated that he could transform some of the waves of this light, especially the yellow rays, into red (but Sir William Crookes pointed out some years ago, that such change was an impossibility). The light was said to have great penetrating power, and to be effective through greater measured distances than the equivalent incandescent light lamps. From all these data it should prove to be of great value for photographic purposes, and the spreading of the light area ought to render it specially serviceable for studio portraiture, or for the process-block makers. We shall hope to hear more of the new light before long.

The Most Powerful Gas Light Known. At the same time that we are hearing of Mr. Hewett's new electric light we have accounts of a paper by Mr. Clayton H. Sharp read before the Institute of Electrical Engineers, New York and Chicago, in which he describes a new gas light, about which he claims that it is the most brilliant gas flame known, though it was the result of investigations of which such a light was not his primary aim. Mr. Sharp has been engaged off and on ever since 1896, his aim being to produce by the combustion of a fixed, pure, definite chemical compound, a light which should be isolated from fortuitous external circumstances, such as atmospheric purity and moisture content. He had not hitherto succeeded in his quest, but meanwhile has published notes of what he had obtained in the direction of a brilliant light, far superior to anything yet obtained from a gas. He chose acetylene mixed with hydrogen for his first experiments, the latter gas being added to prevent the acetylene rapidly depositing carbon at the burner, and so destroying any fixity of illuminating power. He obtained a flame that was long, slender, and of great brilliancy, but which, on account of the different solubilities of the two gasses and of their different temperature coefficients of solubility, could not be relied on for constancy. He then set to work to discover a method of burning acetylene alone, and was highly successful in making a jet in which the consumption was perfect and carbon deposition entirely absent. It may be described as a species of blow-through jet, with acetylene issuing, like ordinary coal gas, in the oxy-hydrogen burner, with a partial surrounding of oxygen of greater or less volume. The special peculiarity though of the new burner is the provision of a water jacket to keep the acetylene cool. This jacket is extended beyond the jet whence the acetylene issues, hence combustion only takes place at a point much beyond the jet orifice. The oxygen tube surrounds this arrangement, and by varying the amount and pressure at which it is passed, it is capable of inducing enormous variations in the intensity of the light. There is no deposit of carbon, and the consumption can go on indefinitely. When the oxygen supply is not turned on at all the flame is tall, unstable, murky, and smoky. Increasing the supply of oxygen up to a certain point the flame shortens and increases in whiteness, brilliancy, and luminous intensity. It is very staple, and little affected by draughts. Further increase of oxygen beyond a certain point starts a degradation of the light until, at last, by continuing the increase, we get a flame whose beauty has departed, and which is simply entirely blue. The flow of gas was regulated by a micrometer screw and a suitable manometer. A diagram is published, showing its spectrographic value, and from this we see that it is a very white light, richer in rays of short wave length than the oxy-hydrogen light, for instance, and so, eminently adapted for photographic requirements.

* * *

Chronophotography. A very interesting series of papers upon this subject has been sent to us by Drs. L. Morokhowetz, A. Samojloff, and A. Judin, of the Physiological Institute of the Imperial University, Moscow. The instrument used by them for making exposures is of simple construction and worth the attention of those interested in this branch of photography. A pendulum swings upon a steel prism, supported by a stand of triangular shape. The end of the pendulum runs in a prismatic groove, containing a rod furnished at both ends with wedge-shaped projections. The rod is pivoted at the centre, and when the pendulum is held in position by one of the wedges ready to swing the depression of that end of the rod raises the other end ready to catch the pendulum at the end of its swing. The pendulum bob is bean shaped, with the ends turned upwards, and weighs 3,700 grammes. Another rod is fixed on the stand above the steel prism, and is provided with a plate holder. The screen in front of the plate is provided with a slit 10 cm. long and 1 cm. wide. The plate forming the shutter is fan shaped and fastened to a continuation of the pendulum rod above the prism upon which it swings. The shutter is provided with an aperture that swings immediately in front of the slit in the plate screen. The aperture in the shutter is formed by taking the point upon which the pendulum swings, and from it, as centre, describing a series of concentric arcs upon the fan-shaped plate. These arcs are 11 in number, and at 1 cm. from each other. From the middle of the top $10\frac{1}{2}$ cm. spaces are set off on each side, and lines are drawn from them to the point upon which the pendulum swings. Ten concentric spaces are thus formed between the arcs, and each is cut into 20 sections. The two central sections are cut out from the lowest arc, two more in succession from each one next above, and, finally, the 20 from the top arc. The 10 open spaces forming the aperture thus represent from one to 10 cm. The length of the pendulum may be regulated by a screw supporting the bob. Supposing the pendulum to be so adjusted that it takes one-tenth of a second for the top of the aperture in the shutter to pass over the slit in the plate screen, then the lowest part of the aperture in the shutter will give a one-hundredth second exposure. Instead of the plate, a smoked card may be used, and the curve of a vibrating tuning fork attached to the pendulum may be recorded. Dr. Morokhowetz has tested the speed of various plates with this instrument. Ten different kinds were used. Only three were British, and these were of Ilford manufacture. The "Special Rapid" Ilford heads the list, and it is curious to note that the "Empress" were found to be exactly half the speed of the "Special Rapid," and the "Ordinary" half the speed of the "Empress," which agrees completely with the company's description. The apparatus may be adapted for testing shutters and various other purposes. Some scientific applications of it are given by Drs. Samojloff and Judin.

The Uses of Photography.—On Monday next, March 3rd, Mr. J. D. Geddes commences a course of three Cantor lectures at the Society of Arts, on "Photography as applied to Illustration and Printing." The lectures deal generally with the whole subject of the preparation of printing surfaces by photographic methods, including typographic blocks, photogravure, Collotype, and Woodburytype; also the application of the three-colour process to the production of pictures in colour by photographic means.

Presentation to M. Marey.—A year ago the Scientia Club of Paris gave a dinner in honour of Prof. E. J. Marey, the eminent French physiologist, whose work has disentangled the intricacies of many animal motions. At the close of the banquet, Prof. Marey's numerous colleagues, friends, and pupils expressed the desire to give tangible testimony of their admiration of his scientific achievements, and eventually it was decided to present him with a commemorative medal. This souvenir was engraved by Dr. Paul Richer. [It is reproduced in our contemporary, "Nature," of the 13th inst.] The presentation was made to Prof. Marey at a meeting held at the Collège de France on January 19th. M. Leygues, Minister of Public Instruction and Fine Arts, occupied the chair, and a large number of eminent men of science and other representatives were present. M. Gaston Paris, administrator of the college, gave expression to the feelings of those who had combined to show their admiration of Prof. Marey's contributions to the study of physiological actions; and he was followed by M. Franck, one of Prof. Marey's old pupils, who described the work of his master. M. Chaveau spoke as an old and close friend, and M. Leygues, after referring to the chief characteristics of Prof. Marey's researches, remarked in conclusion:—"Je prie Monsieur Marey, au nom du gouvernement de la République, dont je suis ici le représentant, d'agréer l'hommage de sa reconnaissance et de sa respectueuse admiration." Letters and telegrams of congratulation were received from many physiologists unable to be present at the meeting; and Prof. Marey replied in appropriate terms of thanks to the numerous expressions of regard of which the medal which has been presented to him is a token.—"Nature."

PORTRAITS WITH BACKGROUNDS FROM NATURE.

In a note last week we referred to an article by Herr Trant, of Munich, that recently appeared in the "Atelier des Photographers," in which the author treats of scenic backgrounds painted from photographs taken from nature by himself. He also mentions that backgrounds of rooms furnished and decorated with faultless taste afford admirable studies for the purpose. It will be remembered that several years ago, and on more than one occasion since, we suggested that photographers at seaside and other pleasure resorts would do well to have backgrounds, made after the manner of Herr Trant, of local scenery or spots of interest to use with sitters who may be on a visit to the place. We have also given a method by which any photographer with a little artistic knowledge can produce such backgrounds from photographs taken by himself.

A large collection of painted scenic backgrounds requires considerable room for their storage when not being used; it also means a considerable outlay for their production when they are done by scenic artists, if they are well done. Even then they require to be frequently changed for fresh subjects, otherwise their continuous appearance in the portraits palls on one from a general sameness in the pictures. As a case in point of the way that backgrounds and accessories may become hackneyed and common, we may quote the famous Haddon Hall property steps, which were to be seen almost everywhere in portraits. They were often used for portraits of persons who had never been to Haddon Hall, or were even ignorant of where the place is. The same remark might also apply to backgrounds, as suggested by Herr Trant, of beautifully furnished and decorated rooms which would, perhaps, be quite out of keeping when employed for portraits of persons in a more humble sphere of life than their owners.

There are many persons who would doubtless prefer to have their portrait taken with their own surroundings—say, as sitting in their own drawing room, or, may be, their boudoir for example; or, possibly, standing at a favourite spot in their garden. Now, portraits taken at home, whether outdoors or in, are rarely so satisfactory as regards lighting as those taken in the studio. There is, however, no reason why sitters taken in the studio should not have a background of one of their own rooms, with its furniture, appointments, and decorations. Of course, if it were necessary to have a background specially painted for the occasion the cost would be prohibitive, except in the case of very wealthy persons. But that is not necessary, as it may be done without if we adopt double printing. Double printing sounds a formidable operation to the majority of modern photographers; but, after all, it is a very simple thing by the method here to be suggested. If the pictures are to be produced by double printing the thing will not commend itself to those who do portraits at a low price, say fifteen shillings or a guinea a dozen for cabinets. But there are persons who are willing to pay a good figure for something really novel or original, and good portraits representing them as being in their own house or grounds, would fulfil these conditions.

Here is a very simple method of producing such pictures. The first thing to do is to secure a photograph of a suitable portion of the interior of the apartment, or, may be, grounds, in which the sitters desire to appear. One background will, as a matter of course, suffice for a whole family. The negative, it may be mentioned, is best taken with a lens of, approximately, the same focus as the one with which the portrait is to be taken; and, usually, the rooms of those who would go to the expense of this class of work are sufficiently large to permit of that being done, as only enough of the subject is required to form a background to the portrait. The portrait of the sitter is then taken in the studio with a plain light background, the light being so arranged that it will accord with that in the background negative. The portrait negative is then printed, when, of course, it will have a plain light grey background. The printed figure is then painted over with a non-actinic colour—gamboge is a convenient one to use. This need take but little time, as there is no necessity for the colour to be very evenly applied; so long as there is enough on to protect the printed picture during the second exposure it will suffice. The background negative is then taken and the print placed upon it, in position, and the second printing made to the proper depth. The print is then washed, toned, and fixed, in the ordinary way. In washing out the free silver from the prints the colour is washed away at the same time, and leaves the picture intact. The slight grey tint of the portrait background serves to give atmosphere and distance in the finished picture, which it would not possess were it taken with a white background. Moreover, if it were taken with one the room background would appear too pronounced to be artistic.

The above simple method of double printing was introduced by the late Mr. Thos. Edge, of Llandudno, for introducing natural backgrounds of local scenery in his portraits, and very artistic they were. It may as well be mentioned that this system of double printing is not suitable for gelatine papers, inasmuch as the colour would, to an extent, be absorbed by the gelatine and could not be washed away without leaving a stain behind. Either albumen or collodio-chloride papers, however, are well suited for the purpose.

In the above we have indicated how "at home" portraits may be successfully produced in the studio with comparatively little trouble, but it goes without saying that some artistic feeling and judgment must be brought to bear on the work. Natural backgrounds of local or other scenery can, of course, be utilised in the same way. It is far easier to obtain a few dozen background negatives of as many different subjects than it is to get even half a dozen painted ones of them made, to say nothing of the cost, and, what is more, constant changes may be made. Double printing is, as a matter of course, more trouble than single printing is, but when it is done systematically it is not so much extra as many would think at first sight.

Acetylene Lighting at a London Board School.—Mr. John C. Christie, of Aldgate, gas contractor to the London School Board, is at present fitting up the new Board School at Fulham Palace Road with acetylene. A portion of the school has been handed over for use, and the installation has proved most successful. The generators and purifiers used are of the Thorn and Hoddle Acetylene Company, Limited, of Westminster, manufacture.

At the last meeting of the Midland Pharmaceutical Association Dr. Hall-Edwards delivered a lecture on his experiences in South Africa. The lecturer was attached to the Central Hospital of the Imperial Yeomanry at Dielfontein. He illustrated his remarks with a series of lantern slides, showing incidents of life and work at the hospital. Dr. Hall-Edwards described at length the dispensary attached to the hospital, which was situated, he said, at one end of the main building and fronting the operating theatre. It was stocked with a magnificent collection of drugs. Every known drug in the B.P. was kept at hand, as well as most of the additional things not mentioned there. In addition there were large quantities of anti-toxin—anti-diphtheria toxin, anti-typhoid toxin, and anti-enteric toxin—and immense quantities of bitter waters, such as lime juices, presented to the hospital by various chemists up and down the country. These were found to be exceedingly useful, and they came to hand in such large quantities that those connected with the hospital were able to spare some for the "niggers," who looked upon them as wines. In conclusion, Dr. Hall-Edwards gave the result of some of his experiments with the X-ray apparatus, and said that during fourteen months between three and four hundred cases came under his official notice. He emphasised the great value the apparatus had been in locating in the hand, chest, legs, abdomen, and other parts of the body.—*Pharmaceutical Journal.*

JOTTINGS.

While we are all patiently waiting for "the flowers that come in the spring, tra la!" and longing to say good-bye to that disagreeable General Février who has been making our lives so unpleasant during the last 28 days, the signs of commercial activity in the photographic world during the coming season are rapidly increasing. One hears almost daily of new hand cameras, new plates, new roll films, new printing papers, new lenses, and so forth. It has been the case every February that I can remember since my connection with photography. Last year's incidents in the trade made it inevitable that competition in the four items first mentioned above would assuredly be provoked. But new lenses! Surely the photographic man in the street might be pardoned for hinting that he was already well catered for in this respect? The scope for novelty of introduction in this branch of industry is not easy to indicate; yet I hear of great activity in three important directions which is to be made publicly manifest before long. The fittest will survive, of course; but the arm-chair student of the industrial war that is going on around him can hardly avoid a shiver as he surveys the ferocious melée of competition that seems a necessary part of modern existence. It must somewhat shake his faith in the truth of the old copybook maxim: "Competition is the soul of trade," especially in some of its particular applications. In photography there seems so little left to invent, improve, or cheapen that the only form competition can conceivably take in the future will be that of the delightful process of starving out—a war of prices all round. But I do not think this is the kind of competition which was meant by the proverb of our schooldays.

The use of paper for negatives is again receiving attention. The history of the subject is, of course, practically contemporaneous with that of photography itself, as the correspondence columns of the JOURNAL constantly show. My own personal experience of paper negative work only dates back to the early days of the Eastman epoch in 1886, when for a time it seemed that glass plates were to be superseded. Some of the architectural paper negatives made at that time, which I possess, render the finer details so well on surface paper that without direct comparison it is hard to say whether the support was glass or paper. For small work, however, celluloid, cut and rollable, has in recent times been found so convenient to handle and so practically efficient that paper has stood very little chance of adoption, especially in cases where enlarging or lantern-transparency making followed as after operations. Such work demands an original crispness of definition which paper as a rule cannot yield. Occasionally the use of paper is advocated in the making of large direct portraits, and its advantages for that purpose are so considerable that the wonder is so little is attempted with it in this respect. With the latest make of negative paper that has come into my hands a friend has been kind enough to make me a 12 by 10 studio portrait negative, concerning which he writes, "I send you an untoned print from the negative you saw on Saturday. The little grain there is I rather like for large work. The negative is quite untouched, and there is no dodging in printing." There is no halation in the print, which is taken from a negative having strong contrast of light and shade. Personally I could not wish to see a better print from a glass negative. It is true that the specimen before me lacks the razor-edge sharpness of a diaphragmed image on glass; viewed, however, at a distance approximately equal to the equivalent focus of the lens, the effect is that of softness and truth of rendering. It is late in the day to discuss the economic advantages of flexible supports for gelatine images, but perhaps some of my readers will thank me for the hint that for large direct studio portrait work paper is worth consideration.

Will the gentlemen who have written asking for particulars of the Colour Club kindly note that none are at present available? In all probability none will be published. The intention is to confine membership to a limited number of those interested in the subject from purely scientific motives, and the founders or original members will be chosen by invitation. Beyond this it is impossible to say anything further of a definite nature, as the Club is not quite in working order. I am not sure that I have not incurred the displeasure of the founders of the club by making public reference to it. My object, however, was not to advertise it with the view of attracting members, but rather to let it be known that a circle had been formed consisting of men whose sole object was the study of colour photography and the advancement of knowledge relating thereto. Of its future proceedings I can give no hint, and from now I shall make no further public reference to it, unless I am officially authorised to do so. When one looks round in photography nowadays it is so difficult to discover an association of men in which self-aggrandisement and self-puffery are not the dominating instincts of those most concerned that I welcome with great relief the opportunity of participating in a movement whose supporters are pledged to suppress self, and to keep only in view the success of fundamental aims. Somewhat monastic, eh? Maybe! It is curious that in photography small and publicity-avoiding associations have been not the least successful. The Solar Club, which, I believe, numbered Wharton Simpson, Pritchard, Hughes, Robinson, Taylor, England, Mayland, and many other lights of the past amongst its members, flourished for years. To this day, too, the Field Club exists, after a career of nearly half a century. It is composed of amateurs, and, if I am not mistaken, is the oldest photographic *club* (not society) in the world. It has periodical outings, does much good work in a quiet way, and is happily untroubled by reform agitations, special requisitions, etc. Long may it flourish.

I have to thank the correspondent who sent me a cutting from the New York correspondence of a recent issue of *The Times*. There is no necessity to reprint the extract, which points anew the old moral that a self-respecting journalist, with a just cause behind him and a fluent pen in his hand, can always safely be backed to win against odds. I need say no more—at present. It was the late James Payn, the novelist, who, at the not very youthful age of 56, published a book of literary recollections. One of his reviewers—a *Times* man, if I recollect aright—chided Payn with being too young for indulgence in the stately pastime of autobiography! I have fortunately a long, long way to travel before reaching Payn's reminiscinatory stage, so I'll e'en lock up my note-books and keep some very piquant "Jottings" indeed for 1920 or thereabouts. It is so galling to be called young when you feel old—although you may not look so—and have a memory stocked with a well-varied assortment of experiences! But even years and experience, though sometimes failing to keep a man from making a fool of himself when he takes the pen in hand, ought at least to assure him against disgracing himself. The cowardly creature who in a contemporary the other day, over the signature of "A Dealer," gratuitously attacked this JOURNAL is not, I am told, the person I took him for, but "a photographic dealer of nearly lifelong experience, and is the head of an important firm." Even so, and I assert that an anonymous "dealer of nearly lifelong experience" (or anybody else) who so writes of the Professional Photographers' Association that "in the flock of those who were attracted by [it] was an exceedingly large proportion of mediocrity; towards the latter time any names of successful men who were won to it were kidnapped by invitation!" ought to be heartily ashamed of himself for criticising, in such a spirit, an Association in no sense antagonistic to him or his class. A dealer's "lifelong experience" has, it appears, put him at the "head of an important firm," but has left him seriously deficient in truthfulness, good manners, fairplay, frankness, and the other things that make a man.

The most absorbed audience I have ever faced listened to me the other night, when, in my riverside village, I took photography for my theme at a lantern lecture. To those gentlemen who were good enough to lend me slides for the purpose I send my best thanks and the assurance that their work was thoroughly well appreciated. To me, who am no novice at addressing audiences in photography, the chief charm of the evening was the substantial interest evinced in the subject. And yet one hears in many quarters that lantern lectures on the one hand and photography as a subject for them on the other are not so popular as hitherto. On this occasion the slides were no doubt the main cause of success. My lanternist, who has been engaged in such work for over ten years, assured me that he had never seen such results. The one gentleman I pitied in a crowded gathering was an industrious representative of the fourth estate whose phonographic powers were hardly equal to the formidable phraseology of photography. And yet, thanks to the lay "Press"—"A Dealer" who seems to have taken more kindly to the "lay" than to the photographic Press will be interested in what follows—one would have thought that everybody "knew all about" photography nowadays. But as to this same "lay press," one's excellent confrères of Fleet Street and elsewhere not only "crib" from these and other pages, and get advertisements on the strength of it, but even expect you, at times, to supply them with original ideas. Only the other day I received a letter from the compiler of a photographic column asking a number of questions in order to assist in the preparation of a special article. With such splendid sources of reference available as the British Museum, the Patent Office, the free and other libraries, I wonder why these people do not take advantage of them! Formerly, writing folk "worked out their own salvation." Now-a-days your lay journalists, especially of the female kind, seem to be nothing but marauding suckers of other people's brains. Ouf!

It has already been announced that the First Annual Dinner of the Professional Photographers' Association will be held on Thursday, March 6th, in the Victoria Hall of the Criterion Restaurant, Piccadilly, London, at 7 o'clock. Applications for tickets (6s. each) should reach the honorary secretary, Mr. Alfred Ellis, 51, Baker Street, London, W., by Tuesday morning, March 4th. The function promises to be of some historical importance, as I believe it will be the first occasion on which members of a numerous profession will be given the chance of meeting together at a properly organised celebratory festival. I may therefore, I hope, be allowed, on behalf of the Executive, who are taking great pains to make the dinner something to be pleasantly remembered, to say that all professional photographers, whether members of the Association or not, will be cordially welcomed. The dinner should furnish a most pleasant opportunity for learning something of the work and the objects of an Association which has been formed to advance the professional status and well-being of its members. A pictorially illustrated souvenir menu is in preparation, and the entertainment portion of the programme will be in charge of accomplished professional artists; so that those who attend are guaranteed their moneysworth in material respects. But the dinner should have even higher claims to support, for besides furthering the interests of the Association, it affords members from a distance the opportunity of making one anothers' acquaintance, and thus establishing the important factor of direct personal community of interest which is so essential to the cohesive working of a representative body. A plan of the dinner-tables, with the names of those present printed on it, will be supplied to everybody there. My experience of dinners is extensive and peculiar, and I have no hesitation in saying that that of the P.P.A. on Thursday, March 6th, will have the advantage of such highly-skilled organisation that it is bound to "go." The larger the number that attend, the better for the immediate success of the function and the ultimate ends of the Association. Hence, I repeat, all professional photographers will be very heartily welcomed.

COSMOS.

NOTES ON EARLY TELE-DIOPTRIC LENS-SYSTEMS, AND THE GENESIS OF TELEPHOTOGRAPHY.*

[Abstract of a paper read before the Royal Photographic Society.]

I.

In my paper on the early history of the camera obscura (vol. XXV., p. 270) I incidentally noted that the foundation of our modern system of telephotography was laid by Kepler, in Prob. CV. of his *Dioptrice*, published in 1611, shortly after the Dutch, or so-called "Galilean" telescope came into use. I also noticed Father Scheiner's application of the same principle of using a convex with a concave lens for solar observations with his "heliscope." I have gone again into the question with the object of tracing the further development of the method of producing enlarged images on a screen at a comparatively short focal distance, by the use of such combinations of positive and negative lenses. Initiated by Kepler, utilised and developed by many of the most eminent astronomers and mathematicians of the seventeenth and early part of the eighteenth century, it seems to have been lost sight of by later writers on optics, and was not taken up again till Porro revived it some fifty-five years ago, and adapted it to photographic work. It is, however, only within the last ten years that compound positive and negative lens-systems, or teleobjectives suitable for photography, have been perfected and brought into practical use. It may be asked what has this very early work of Kepler and his successors to do with photography? Processes of evolution are always interesting, often instructive, and although the records are scanty and imperfect, the gradual development from early times of photographic methods and processes in their optical, physical and chemical aspects, offers an attractive field for study, which has hitherto been neglected by most writers on the history of photography. In the narrow acceptation of the term photography is, of course, an essentially modern invention, but it must not be forgotten that the optical and physico-chemical actions of light upon which it is based, have existed from all time, and for some thousands of years have formed the subject of speculation to philosophers groping in the darkness of limited knowledge, as even we are at the present moment, but each contributing his mite of enlightenment for the use of after ages. We do not know how much of this ancient lore has been lost, or what its value may have been, but sufficient remained to form a foundation for the work of later philosophers, of whom Alhazen, Roger Bacon, Peckham, and Vitellio were among the first to investigate the optical phenomena of light, while to Geber and the early alchemists we owe our first knowledge of the darkening action of light upon compounds of silver. Their work was carried on by the brilliant band of philosophers, mathematicians, and chemists who flourished in England and abroad during the sixteenth, seventeenth and eighteenth centuries; but what we now know as photography with the camera cannot be said to have come into existence until the very beginning of the nineteenth century, when Wedgwood and Davy tried to produce images in the camera on leather and paper treated with the nitrate or chloride of silver. Imperfect as these experiments were they brought about the union of two photographic systems, or principles, the optical and the chemical, which till then had remained quite distinct, and each undergoing a slow process of evolution and development. It yet required the discovery of iodine in 1811, of bromine in 1826, and of hyposulphite of soda in 1839, to complete the union of the two principles and

* In the full paper published in the Journal of the Royal Photographic Society for January General Waterhouse gives several illustrations and appendices.

produce its first-fruits in the marvellous light-pictures obtained by Nièpce, Daguerre, Talbot, and other early workers of their time by methods from which nearly all our modern processes of photography have been evolved.

In my former paper I sketched the early history of the camera obscura and its connection with astronomical observation. I now propose to show how our modern teleobjective was anticipated, the main principles of its action fully demonstrated, and a combination of single uncorrected positive and negative lenses applied to produce graphic records of solar observations nearly three centuries ago. Although the light-pictures thus obtained were not fixed chemically, but had to be drawn by hand, they were, I think, none the less photographic. The use of such a combination is particularly interesting because it seems to be the first really practical application of a compound lens-system to graphic delineation of which we have any clear record.

I need not discuss the invention of the Galilean telescope. Who first discovered the combination of lenses is still quite uncertain, but there can be little doubt that if Roger Bacon was not himself the inventor of the telescope and the camera obscura, many passages in his works are very suggestive of them. In the second preface to the second part of his *Pathwaie to Knowledge* (1574), Robert Recorde mentions Roger Bacon as having made such an instrument. He says: "Great talke there is of a glasse that he made in Oxforde, in which might se thinges that wer doen in other places, and that was judged to be doen by power of euill spirites. But I know the reason of it to be good and naturall, and to be wrought by *Geometrie* (sith perspective is a part of it) and to stand as well with reason as to see your face in common glasse." Further, Thomas Digges, at page 189 of his curious arithmetical military treatise, *Stratioticos*, published in 1579, has a passage showing that his father, Leonard Digges, was able, by the aid of a copy of *Bakon's Experiments*, which came into his hands by chance, to make perspective glasses with which he was able to see things at great distances and scan the surrounding country. In Leonard Digges' own treatise, *Fantometria*, which was finished and published by his son in 1571, there is a very interesting passage (Book I., Cap. 21), which may almost be taken to show that the combination of concave and convex lenses was not only known and applied by the elder Digges for visual observation, but also for graphic delineation. In the quaint old black letter text it runs:—"But maruellouse are the conclusions that may be perfourmed by glasses concave and convex of circulare and parabolicall fourmes, using for multiplication of beames sometime the ayde of glasses transparent, which by fraction should unite or dissipate the images of figures presented by the reflection of other. By these kinds of glasses, or rather frames of them, placed in due angles, ye may not onely set out the proportion of an whole region, yea represent before your eye the lively ymage of euery towne, village, etc., and that in as little or great space or place as ye will prescribe, but also augment and dilate any parcell thereof, so that whereas at the firste apparence an whole towne shall present it selfe so small and compacte together than ye shall not discerne any difference of streates, ye may by applycation of glasses in due proportion cause any peculiare house or roume thereof dilate and show it selfe in as ample fourme as the whole towne firste appeared, so that ye shall discerne any trifle or reade any letter lying there open, especially if the sonnebeames may come into it, as playnly as if you were corporally present, although it be distante from you as farre as eye can discrye: But of these conclusions I minde not here more to intreate, having at large in a volume by it selfe opened the miraculous effectes of perspective glasses." Whether he, and Bacon before him, used glass lenses alone, or, as seems more probable, a combination of a concave speculum with lenses to magnify the image, is not clear, and it is greatly to be regretted that the work referred to was never published, and seems to have been lost. John Dee, another early English writer, also refers to *perspective glasses*, as in common use some time before the assumed date of the invention of the telescope in 1609. Maurolycus seems to have been the first to investigate the optical properties of concave and convex lenses and the formation of reversed images of objects at the focus of the latter (*Diaphaneon*, Lib. I., Proposition XXIII. See Appendix I.). He has not, however, suggested any practical use of the principle, as Barbaro did, nor mentioned the combination of a convex with a concave to obtain a larger image with practically a shorter focal length. Hevelius says he discussed the theory of the telescope, but I have not found the passage. It is very unfortunate that so many of his works have been lost, and that those which remain were not published earlier, so that he could have had the full credit of his investigations. In an interesting letter to the Viceroy of Sicily, dated 1556, published with other of his hitherto unpublished writings by Professor Federico in 1876, he has given a very full account of his various researches and literary works. His observations of the images formed by lenses are noticed (see Appendix I.). He seems to have been a man of great learning and research, who, as he declares in this letter, worked without any desire for fame, honour, or gain, but solely for the pleasure of observation and the love of truth. In his *Magia Naturalis*, 1589 (Lib. XVII., Cap. 10), J. B. Porta mentions a combination of a concave and convex lens, with which, if properly adjusted, both near and distant objects could be seen larger, but clearly. Upon this passage claims have been made for Porta as the inventor of the telescope, but if it was so he does not seem to have in any way realised the importance of his discovery, and certainly did not suggest its application as a graphic instrument. I have gone through much of the early literature of the telescope without finding any theory of its graphic application until Kepler propounded his problem within a year or two after the instrument had come into use. He had already constructed and used an apparatus for projecting the image of the sun through a small aperture on to a screen, and it might very naturally occur to him to apply his telescope in the same way. In section CIV. of his *Dioptrice*, he shows that if the rays from a point which after undergoing refraction through a convex lens, would converge, are intercepted by a concave lens before they reach their point of convergence, either the distance of this point will be extended, or the rays will be carried on parallel, or, lastly, they will diverge again. The demonstration given is very imperfect, but shows that he recognises the three cases, and in the next section, CV., he propounds the problem of depicting visible objects with a concave and convex lens upon paper larger than by a single convex lens, but reversed. He does not go into the question of the adjustment of the relative distances of the convex and concave lenses and the effect on the size of the projected images, but says that in instruments showing visible objects larger and distinctly, the concave lens cannot effectively be far from the point of convergence formed behind the convex lens. His further remarks about the distances of the lenses refer to the viewing telescope more than to an instrument for projection.

The extracts given will suffice to show that Kepler understood the general principle of the combination as applied to enlarged graphic delineation, and is entitled to the credit of its discovery, though Leonard Digges may have anticipated him. Before leaving Kepler, I may mention that Dr. von Rohr has drawn my attention to an extract from a letter of Sir H. Wotton to Lord Bacon, which was quoted by a correspondent, "W. M. L.," in Vol. IV. of this JOURNAL (1857, p. 129), and is descriptive of a visit paid by Wotton to "Keplar," as he calls him, at Linz, where he saw a landscape drawing executed by Kepler with the aid of a camera obscura in the form of a portable dark tent. The extract from *Graphice* given in my paper, was taken from the same source, though neither Wotton's nor Kepler's name appears in it. I have verified the quotation at p. 412 of the *Reliquiæ*

Wottonianæ, published in 1651. No date is given to the letter, but it was probably about 1620, and tends to show that Kepler was one of the first to make and use a portable camera obscura for drawing purposes. As lens he used the object glass of his telescope, or *perspective truncke*, having removed the concave. In my former paper I noticed the work of Father Christopher Scheiner in utilising the telescope for the projection of images of the sun when observing sunspots, etc. This had already been done by Fabricius in 1611, and by Simon Marius about the same time, but whereas they say little about their optical arrangements, Scheiner has discussed the question very fully and practically in the second book of the *Rosa Ursina* (1630), though he confesses his inability to calculate the optical relations between the convex and concave lenses and screen, owing to the science of refraction not being sufficiently developed. For his own purposes he found it more convenient to arrange his lenses and screen as he found gave the desired results. He seems to have first used the method at Ingolstadt, in 1612, and afterwards principally in Rome. In Chapter IV. he mentions a special telescope or helioscope for viewing the sun, of which the lenses were made of coloured glasses, especially one he made of blue glass which he gave to the Archduke Maximilian for viewing sunspots and faculæ. In Chapter VII. he shows the advantages of the graphic method of observing the sun, and in the following one gives a brief description of the helioscope he constructed for the purpose. After noting the difficulties connected with the sun's motion and discussing the nature and movements of the spots, he enters, in Chapter XIX., into the optical requirements. He says he has explained the difficulties connected with glass lenses for visual observations of the sun in his letters of Apelles to Welserus (1612), but now he will treat of those connected with projection on paper, and not only for the learned, but also for beginners. In the glasses for telescopes three points have to be considered, *material*, *form*, and *position*. He then discusses the quality and colour of the glass, its uniformity and homogeneity, or freedom from striæ, air bubbles, etc., and perfect transparency. He remarks also that rock crystal, however clear and free from defects it may appear, is unsuitable on account of veins, imperfect transparency and double images. He notes the different forms of spherical lenses, and the effect of greater or less curvature both for convex and concave lenses, and in Chapter XX. gives practical rules for distinguishing good lenses and the principal defects in them. In Chapter XXII. he gives a more complete description of his apparatus than he did in Chapter VIII., and briefly notes the arrangement of his lenses as shown in his diagram and how they are fitted in the tubes, the convex being in the larger one, into which a smaller one containing the concave is fitted, care being taken to keep the lenses centred on the axis and perpendicular to it, and to have the tubes fitting well, to avoid twisting and distortion of the image. In the following chapters he compares the eye with the telescope and his illustration, showing a comparison of the effect of the combination of a concave with a convex lens on vision and in the camera obscura fitted with a lens, is interesting because it shows the method of attaching the lens to the camera in a tube fitted with several diaphragms.

In Chapter XXVIII., after discussing the difference in the refractive action of concave and convex lenses, and the effect of placing a concave in front of a convex, at or beyond its focus, or immediately behind the convex, he considers the case in which the concave is placed a little in front of the focus of the convex, so that a real image is formed on the screen, larger, more distinct and at a greater distance than if the convex were used alone, and he explains it by means of a figure which is a great improvement on Kepler's, and might well serve as an illustration to a modern treatise on telephotography. He goes on to show that the position of the concave lens is not fixed, but has a considerable range between the convex lens and its focus. The nearer it is to the focus, the smaller is the image thrown on the screen, but clearer, and the screen can be at its shortest distance from the concave. Conversely, as it approaches the convex, a larger image is formed, but not so clearly, and the distance between the concave and the screen will be increased. The picture formed by a certain adjustment of the lenses and screen will be confused if the screen is moved in either direction to or from the concave. He notes, however, that this confusion is not immediate and that there is a certain latitude, especially if long focus lenses are used in a proper way. In the same way, if the screen on which the image is correctly depicted remains fixed, and the concave lens alone is moved forwards or backwards beyond the limits of sharp definition, both the lens and the screen will be put into the position of confusion. He notes the changes of colour and brilliancy of the images accompanying the movements of the lens. The same occurs if the convex lens alone is moved, or if the object approaches or recedes from the convex. A deep concave lens requires a longer distance from the convex and less from the paper, and will form a larger image than a lens of less concavity (or longer focus), which would require a shorter distance from the convex and longer from the paper, but give a smaller and more intense image. With the same concave, a convex lens of short focus requires less, and one of longer focus greater distance. He next considers the effect of a concave lens between two convex lenses as used in the telescope for vision, though it is also applicable to the helioscope. In this case the concave is near the back convex, and the two together act much in the same way as the single concave. When brought closer to the object glass a larger image is formed on the screen, which has to be moved a little back and *vice versâ*.

In Chapter XXXIII. he deals with the selection and arrangement of the lenses and the construction of the observing telescope, the use of diaphragms for cutting off the oblique pencils. He then gives some practical problems for finding the focus of the convex object glass, from which the proper position of the concave lens slightly in front of it can be ascertained. It does not depend on the power of the concave lens, but on the focus of the convex, and if found for one others can be used, the screen being adjusted to suit the image. The focus of the two lenses being known, the length of the tube required can be ascertained exactly, a little excess being allowed, and if it is intended to use concaves of different powers, the length of the tubes must be arranged accordingly. As regards the fixing of the distance of the screen for any combination of a concave with a convex lens, he says "It is better and more safely found practically and mechanically than theoretically and by reasoning, because it is impossible to treat the question scientifically until the science and doctrine of refraction are perfected. I have not yet seen the full and exact science of it, and to go fully into the doctrine would only confuse. After all, how can it be ascertained whether the lenses are properly formed, how they are figured, their sphericity and power except by trial and laborious experiment? How will you find the position of the common base for the picture required except from the image shown on the screen? How, in fact, will you observe whether the image is well-shaped or deformed, sharp or coarse, except by projection on the screen? When everything is ready for use, this can be done mechanically, with less trouble, quicker and more certainly than if a lot of theoretical precepts were carried out. The full science cannot be attained without innumerable previous experiments which open out the way, and, as it were, lead the intelligence by the hand to discover many abstruse and wonderful things. Thus you will have the best distance for the screen from the concave, when you judge by the eye that you have obtained the best picture, which you determine by approaching or withdrawing the screen to or from the concave. The distance once found can be used with certainty for the same arrangement. With the

same lenses the size of the image can be increased by moving the concave towards the convex, and drawing away the screen from the concave as much as may be necessary. To lessen the image, move the concave from the convex (without going beyond its focus) and bring the screen nearer the concave." His next problem is keeping the image always the same size, and he shows that if the distance of the object is invariable it is easy to obtain an image of uniform size by keeping the adjustments of the lenses and screen unaltered. If the object recedes sensibly a smaller and confused image will be formed, and it will be necessary to move the concave towards the convex until a sharp and equal image is obtained. On the other hand, if the object is sensibly closer, a larger image will be produced, and the concave must be removed further from the convex till the desired image is obtained. By this means he kept the image of the sun in winter and in summer, in perigee and in apogee, always of the same diameter. In the third book, at p. 347, he describes an equatorially mounted or heliotropic apparatus made by F. Christopher Gruenberger, which he found much more convenient, and a figure is given of it. The telescope and plan board are mounted on a polar axis, and there is also an arrangement for altering the declination. For Scheiner's work of solar observation he required a fairly large and distinct image of the sun, on which the spots, faculæ, and other details could be clearly seen, and he has given full and somewhat prolix details of his method. From the above short abstract it will be seen that although optical science was very imperfect he had a thorough practical knowledge of the main principles involved in this method of projecting enlarged images. He did as many of us still do, and having found by practice the best system of working, was content to follow it without going into the scientific theory. His teaching still holds good so far as it goes, and is applicable to the modern telobjectives, and no great advance was made on it for nearly a century. Although Kepler first propounded the problem, Scheiner seems to have been the first to work it out practically and apparently independently, because he does not mention Kepler in this connection.

MAJOR-GENERAL J. WATERHOUSE, I.S.C.

PRACTICAL VALUE OF NERNST LAMPS.

[Reprinted from "The Scientific American."]

AFTER three years of labour, Nernst lamps have been reduced to commercial form. The object here is to inquire to what extent the qualities of the Nernst lamp fit it to displace the arc and incandescent types. The main points to be considered, in a comparison of this latest lamp with the older types, are adaptation for distribution, size, and qualities of the service units and efficiency. In distribution of electric lamps the prevailing methods are the series and the multiple. Series distribution is generally applied to street lighting, and requires lamps for each of which the ratio of volts to amperes is as small as possible. Multiple distribution is the rule in commercial lighting, and here a lamp is wanted with a large ratio between its required volts and amperes. The smallest Nernst lamp now offered consumes not less than 88 watts, and the sizes that seem best adapted for general use range from this to 517 watts. A lamp for 88 watts may be had at either the 110 or 220 volt pressure, but the larger sizes are only available for 220 volts. The 88 watt lamp at 110 volts, taking 0.8 ampere, has a ratio of required volts to amperes of 137. On a series circuit of 3,000 volts maximum pressure only 27 of these lamps may be operated, giving a total capacity of 2,376 watts. Incandescent lamps for such a circuit may be readily had, each of which requires 6 amperes at 15 volts, or 90 watts, so that the ratio of volts to amperes for each lamp is only 2.5 instead of 137, as in the Nernst lamp. Of these incandescent lamps, 200 may be operated on a circuit of 3,000 volts maximum pressure, and the capacity of this circuit will then be 18,000 watts, or almost seven times that of a series circuit of like pressure with Nernst lamps of equal watt consumption. If larger units of illumination are wanted, a Nernst lamp taking 517 watts in the form of 2.35 amperes at 220 volts may be compared with an inclosed arc lamp taking 6 amperes at 85 volts, or 510 watts. For this Nernst lamp the ratio of volts to amperes is 93, and for the arc lamp the like ratio is only 14. On a series circuit of maximum 3,000 volts' pressure 13 of these Nernst lamps may be operated, giving the circuit a capacity of 6,721 watts. The inclosed arc lamps on a similar circuit may number 35 with an aggregate capacity of 17,850 watts. From the foregoing it appears that if 88-watt Nernst lamps are used the number of circuits must be seven times as great as if incandescent lamps using an equal amount of energy each are employed. If resort is had to Nernst lamps of 517 watts each the number of series circuits to distribute a given amount of energy must be 2.6 times as great as where inclosed arc lamps of equal watts are employed. It seems improbable that in street lighting either the advantage of series distribution will be given up or the large increase in the number of circuits just indicated be made for the sake of using Nernst lamps. For multiple distribution it is desirable to have a high ratio of required volts to amperes at each lamp. In this particular Nernst lamps are superior to arcs, but are on a par with the incandescent, since the latter are regularly made for the pressure of 220 volts. Taking the pressure for multiple inclosed arc lamps to be 110 volts, because of the necessary resistance to insure steady operation, it seems that when the Nernst and arc lamps require equal watts the weight of copper necessary to distribute the former at 220 volts is only one-fourth of the like weight for the latter. The great bulk of commercial incandescent lighting is done with 16-candle power lamps, because a lamp of this capacity gives better distribution of illumination for general purposes than larger sizes, and has been found ample for individual use at the work bench or desk. The smallest Nernst lamp offered consumes 88 watts, or 1.76 times as much energy as the 16-candle incandescent lamp using 50 watts. It has generally been found in practice that each workman in the counting room or shop must be supplied with a lamp for his individual use, so that the adoption of Nernst lamps for these purposes must increase the required capacities of dynamos and circuits by 77 per cent. This Nernst lamp using 88 watts yields more than 16-candle power, but incandescent lamps of any candle power up to several hundred have long been available. A large part of electrical distribution at the present time is carried out with direct current, and the important functions of storage batteries furnish strong reasons for continued practice in this direction, as do also the great investments in direct-current systems. The application of Nernst lamps in direct-current circuits encounters the serious objection that a black deposit gradually spreads from the negative toward the positive end of the glower and cuts down the candle power. In the matter of first cost the Nernst seems to be at a decided disadvantage compared with the incandescent lamp. Six dollars is reported to be the price of an 88-watt Nernst lamp, and this sum is about twenty times that of an incandescent lamp of equal wattage. The Nernst glowers must be renewed like incandescent lamps, and while the price of glowers is not at hand it seems fair to presume that the cost of their renewal will be as much as that of incandescent lamps that consume equal energy. Considering the remainder of the Nernst lamp, aside from the glowers, it seems that the rate of depreciation can hardly amount to less than 10 per cent. of the first cost per annum. Interest at 6 per cent. plus this depreciation brings the fixed yearly charge per lamp to 96 cents. If lamps operate 1,000 hours yearly and renewals are every 500 hours at equal cost of 30 cents for the incandescent and Nernst, then the renewals, interest, and depreciation on the latter amount to 2.6 times the renewals of the former. The Nernst

lamp taking 517 watts is said to cost 15 dols., or about eight times as much as a group of six incandescent lamps of equal energy capacity. An inclosed arc lamp with a capacity of 500 watts costs approximately the sum just named for the Nernst lamp of that rating, and it is fair to assume that renewals, interest, and depreciation on these two will not be far apart. In required cleaning and care in operation the Nernst appears fully up to the inclosed arc lamp.

The Nernst glower operates at a temperature between that of the incandescent filament and of the electric arc, and, as might be expected, the quality of light obtained is mediate between the other two sources. It thus seems that for some purposes the Nernst is superior to incandescent lamps, though not necessarily so much superior as are arcs. The claim urged as most important for Nernst lamps is that of high efficiency, and this deserves to be examined with some care. Complete data as to efficiency is available for only that size of Nernst lamp that consumes energy at the rate of 517 watts, and it is admitted that the 88-watt lamp has a somewhat lower efficiency. According to the figures published by its makers, the best result obtainable with the 517-watt Nernst lamp is 149 mean spherical candle power in Hefner units. This corresponds to an efficiency of 3.47 watts per candle power. Measured in this same unit, either direct or alternating arcs of the inclosed type with clear outer globes yield a candle power for every 2.6 watts drawn from 110-volt constant-pressure mains. When these arcs are used on series circuits, so as to avoid the losses in steadying resistance, the rate of energy consumption falls to 2 watts per mean spherical candle. Incandescent lamps may commonly be had at either 3 or 3.5 watts per mean spherical candle power, the higher efficiency going with a shorter life.

In view of the foregoing the following conclusions may be reached as to the practical value of Nernst lamps: For street lighting the Nernst is not generally suited, because it is impracticable to operate it on series circuits, and because its efficiency is materially below that of series arcs. For divided indoor lighting Nernst lamps are less suitable than incandescent, because of the larger first cost, fixed charges and energy consumption of the former in the smallest units. Where large interior spaces are to have general illumination, the Nernst lamp has some advantage over the incandescent in the quality of its light, and over the arc in the weight of conductors necessary. This advantage over arcs seems to be fully offset by the lower Nernst efficiency.

A.D. Adams.

Exhibitions.

BIRMINGHAM PHOTOGRAPHIC SOCIETY.

The seventeenth annual exhibition of the above society was opened at the rooms of the Royal Society of Artists, New Street, on February 22nd, by Mr. A. J. Leeson, one of the vice-presidents, in the absence of the president, Mr. Whitworth Wallis, F.S.A. The judges were Messrs. E. R. Taylor (Headmaster of the Birmingham Municipal School of Art), J. H. Gear, F.R.P.S., and F. M. Sutcliffe, of Whitby. Their awards were as follows:—

Silver Medals:—426. A Sketch in Bi-gum, J. Cruwys-Richards. 432. The Coming of Spring, Bernard Moore. 599. An Old Time Street, H. M. Painter. 615. Major Seaver, W. S. Aston.

Bronze Medals:—451. Through the Woods, G. Wilkes. 462. Among the Fields Wild Flowers are Fair, Geo. Whitehouse. 501. Evening—Southwell, William A. Clarke. 573. Crossing the Ford, Bernard Moore. 586. Old Entrance, Kenilworth, H. C. Leat 659. Quayside, Chioggia, Percy Lewis.

Hon. Mention:—443. A. Reedy Pool, Lewis Lloyd. 477. Lengthening Shadows, Geo. Whitehouse. 725. Studies of Snails, G. E. Carter. 733. Studies of Flowers, Poppies, D. T. C. Crump.

MEMBERS THREE-PRINT SECTION.

Silver Medal:—748. Branksome Chine, 749. Near Swanage, 750. Early Morning—Scarborough, Harry Goode.

Bronze Medal:—751. Country Lane, 752. Girl Sewing, 753. Portrait Study, Ivo F. Lewis.

Hon. Mention:—736. Meraak Harbour, 737. The Jordal Harbour, 738. German Emperor's Yacht at Molde, Ernest F. Russell.

LANTERN SLIDES.

Silver Medal:—Glasgow Exhibition by Night, Search-light on Grand Dome, Glasgow Exhibition, Electrical Illuminations, Palmer's Blast Furnaces by Night, Jarrow, by W. E. Cowan.

Bronze Medal:—An Essex Marsh, Autumn, Day's Decline, A South-East Quay, F. C. Wickison.

Hon. Mention:—Bolton Abbey, Going to See Grandmother, Soldier's Return, The Old, Old Story, The Outcast, W. McLean.

The present exhibition well sustains the reputation of the society, as the work of the members is quite up to the standard, and it is pleasant to see new members coming to the front. There is no loan collection this year, and in that respect the show is not so interesting as in some former exhibitions, but this is fully compensated for by a magnificent collection of four hundred and twenty-four of Sir Benjamin Stone's record work, lent by the Board of Education, South Kensington. It is only when such a collection is brought together in this way that we realise the magnitude and value of the work which Sir Benjamin Stone is doing. His untiring energy and unflagging enthusiasm have had innumerable obstacles to overcome; but at length the importance of his work is acknowledged, and the fact that the authorities of the British Museum have offered to take charge of his negatives shows that his efforts are appreciated now. The work of the Warwickshire Photographic Survey has not been neglected, as there are two hundred and ninety-one prints sent in by various contributors. The exhibition remains open till the 29th, and there are concerts, lantern shows, and cinematograph displays every evening.

CROYDON CAMERA CLUB.

The Croydon Camera Club held its fifth annual exhibition on the 19th to the 26th inst.

Perhaps the most interesting feature of the exhibition was a collection of Daguerrotypes and early glass positives, lent by Mr. Henry Bennett. The Daguerrotypes dated from 1843, and included work done up to the middle of the next decade. Apart from the archæological interest of such early specimens of photography, many of them were extremely beautiful, especially those by Claudet of the later period, and the delicate colouring strikes no jarring note, as the colouring of a modern photograph usually does. Though it is in portraiture that the marvellous delicacy of the Daguerrotype is displayed to the fullest advantage, a large number of views of Calcutta, which were included in the collection, have an interest of another kind. Necessarily, they must be records of the place of a period when photography was young, and they, or copies from them, should find a place in some public institution where they may be accessible to those who can make use of what these views record. Another feature of the exhibition was a number of specimens of the work of the late H. P. Robinson, lent by Mr. R. W. Robinson, and including "Dawn to Sunset," "When the Day's Work is Done," "Wayside Gossip," "Carolling," and other almost equally well known works. Thus the early and the middle periods of photography were represented by examples of two of the most distinguished photographers of their time and the modern photography, in addition to the work shown in the competitive classes was represented by a collection of eighteen pictures in gum bichromate, by Charles Moss.

The competitive work of the members seemed to be a slight improvement over that of last year, but in a large proportion of it there was very little evidence of any attempt at pictorial treatment. The members appear to roam far afield for their subjects, and the temptation to include that which is only of topographical interest is often succumbed to. Unfortunately, there was no compensating excellence in the work technically, and much of it, indeed, displayed something like carelessness in its production. It was almost typical of the want of attention to details shown in some of the members' work that the finishing touch to the exhibition, which evidently entailed an enormous amount of labour in its organisation, the affixing of labels to the pictures, should have been performed with so little regard to effect. The small picture in one of the open classes which the judges had distinguished by awarding two medals, had two labels of generous size announcing the fact pasted upon it so as to cover an appreciable amount of its area, and generally the members' tickets were treated as though they were rather ornamental than otherwise. Croydon must wake up if its camera club means to maintain its position in the photographic world. The go-as-you-please style which sufficed a few years ago for a society exhibition is no longer tolerable. The society seems to spread its energies over many branches of photography and to specialise in none. This is a mistake, in a society's career, no less than it is in one's career in life, and the result is the same—uninteresting mediocrity.

A novel competition was introduced at the exhibition—pictorial post-cards. We are not sure in what way a photographic pictorial post-card should differ from an ordinary photograph; the size of a

post-card, with the usual amount of margin, and the little pictures displayed, did not help us, but many of them were very pleasing little prints, and the two classes were, on the whole, we thought, quite equal to the average of the exhibition. The judges, however, withheld the two medals offered. We can only imagine the reason to be that the awarding of twenty-two medals was too much for their strength. The Croydon exhibition is evidently a happy hunting ground for the medal hunter.

The exhibition gallery has been enlarged since last year's exhibition. The pictures are well arranged, and the catalogue well got up. The trade exhibitors were Messrs. R. and J. Beck, td., R. W. Thomas, Ltd., Seabrooke Bros., and D. P. Roberts, of Croydon. The judges were Messrs. Ralph W. Robinson, J. B. B. Wellington, and B. Gay Wilkinson.

THE AWARDS—

MEMBERS' CLASSES.

Class A.—Landscape, etc., silver medal, S. E. Taylor; bronze, J. W. Hicks.

Class B.—Portraiture, Figure Studies, etc., silver, withheld; bronze, P. F. Smith.

Class C.—Architecture, bronze, G. W. Jenkins; bronze, W. H. Rogers.

Class D.—Lantern slides, silver, G. W. Watson; bronze. J. Noaks.

OPEN CLASSES.

Class F.—Landscape, etc., silver, Percy Lewis; bronze, S. C. Stean.

Class G.—Portraiture, etc., silver and gold medal for best picture in exhibition, E. Norton Collins; bronze, J. P. Padwick.

Class H.—Architecture, medals withheld.

Class I.—Any subject, open only to residents in Croydon, silver, F. W. Hicks; bronze, G. W. Jenkins.

Class J.—Lantern slides, silver, Harry Wild; bronze, Aubrey Le Blond.

Class K and L.—Pictorial Post-cards, medals withheld.

The exhibition was opened on Wednesday afternoon, February 20th, the formal ceremony of opening being attended by a considerable number of members and friends of the club. The exhibition was declared open by Sir William Abney, President of the London Camera Club. The chair was taken by the president of the Camera Club.

The president (Mr. Hector Maclean) said it gave him much pleasure to welcome his hearers, particularly as they were able to bring to their notice a collection of photographs which was very much in advance of what they had been able hitherto to show. He might say, without divulging any secrets, that it was the opinion of the judges that at all events, as far as the members' classes were concerned, the average of excellence was a very satisfactory one. It had been suggested to him that if they were to confine the exhibition to the works of members the exhibition would rather gain. If that club could do so much, how much might the Corporation do for photography! He wished to draw attention to the fact that they had some representative exhibits. In the corridor they would see some of the works of the late H. P. Robinson, perhaps the greatest master of photography England ever had. They also had a unique—he believed the only—portrait of Orsini; and they had a collection of gum prints by their neighbour, Mr. Charles Moss, which was particularly interesting to Croydon, because the gum process owed its present efficiency very largely to a dweller in Croydon and a member of the club, Mr. James Packham. Mr. Moss was now known as the chief exponent of the process in England, if not in the world. The president then called on Sir William Abney, on whose admirable standard text-books, he said, most of them based their theoretical knowledge of this beautiful art. (Applause.)

Sir William Abney said he was surprised that Croydon had been able to get together such an admirable collection of photograms as he saw on the walls. He did not know if it had ever struck them that the artist in black and white ought to be the most highly developed artist—much more developed than the artist in colour, because if they took the eye they would find that in the primitive eye there was no sense of colour; there was only a sense of light and shade. According to the theory of evolution, the first impressions involved were those which dealt with black and white, and the black and white artist ought to be ahead of the artist in colour. There was no doubt that the sense of form was more highly developed in artists than the sense of colour. They had on the walls examples of that sense of form, and very beautiful forms they were. The pictures of Mr. Moss were certainly beautiful pictures in every sense of the word. He was not going to say that there were not other equally good pictures on the walls, but Mr. Moss's gave him the greatest pleasure. Such clubs as that were very valuable institutions. He was president of the London Camera Club, which started fifteen years ago—they seemed to make him a sort of perennial president so far. They also had exhibitions, and he might say that Croydon was holding its own. (Applause.) These clubs were very valuable, because they brought in amateurs especially, and it was the amateurs who had done most for the development of photography, for the amateur had more time to devote to the pursuit, and had one great advantage—he was able to please himself, and had not got to please the public. Photography had two sides—its utilitarian side and its artistic side, and in that exhibition they had both sides fully exemplified. The glance he had had at the exhibition had given him great pleasure, and he had great pleasure in declaring the exhibition open. (Applause.)

The Mayor, in proposing a vote of thanks to Sir William Abney, said it was a very great encouragement to have, not only the support, but the countenance of Sir William Abney. (Applause.) Sir William had referred to the utilitarian part of photography, which seemed to him (the speaker) to be one of the most important, and likely to take an important part in the future. Undoubtedly, when it had been applied in connection with the Röntgen rays it had been a great aid to science. He had no doubt that as time went on still further developments would take place. Mr. Maclean had referred to the Corporation, but he thought that when this matter was in such good hands they could not do more than offer the club what tacit encouragement they could, and they did so most fully. (Laughter and applause.)

THE RECEPTION ROOM.

An attractive and pleasing reception-room is certainly one of the first requirements of the professional photographer who wishes to make his business a commercial success. It ranks, perhaps, only second in importance to the show-case, as a bait and lure to possible customers. It is where the sitter obtains his first impressions, those initial suggestions of coming possibilities which have such an effect on his order, immediate or ultimate. Here he, or she, is either charmed into a gracious temper, which he carries into his studio, to the immense advantage of the operator, or rendered nervous and irritable, conditions so often fatal to the securing of a satisfactory portrait. How our ideas have changed, or are changing, of late years, as to the treatment and decoration of the reception-room! We can all remember the old variety, where, in whatever direction the eye might look, it fell on nothing but photographs, large and small, in highly ornate frames, with gilt or plush mounts. A bewilderment of pictures and frames, all clashing with and disturbing each other, and insensibly producing in the prospective sitter a sense of worry and distraction. Then that almost universal bell at the entrance, which H. P. Robinson spoke of so feelingly, which "went off over your head, upsetting your nerves and making you feel like an intruder that had broken something"! We don't often hear that bell nowadays, and we do generally find someone in the reception-room ready to attend to visitors without a hasty and hurried rush from upstairs, or some other distant quarter. In probably the majority of studios the reception-rooms are now really artistic and restful in effect, the specimens, while in quite sufficient number and well displayed, are yet not allowed to predominate sufficiently to destroy the idea of comfort and fitness. The photographs are beginning, too, to be used more decoratively—that is to say, as items in the general scheme of furnishing, rather than on the shop-window principle of display. And this is, of course, a great step in the right direction, and a really politic one, for it teaches the public in how many ways the products of the camera may be effectively employed in the making of "the House Beautiful." Photographs are capable of being wonderfully decorative, as some of our leading art furnishers and designers appear to understand. This is not so well comprehended by the general public, as many an otherwise tastefully furnished drawing-room bears witness. We see a multitude of photographs in more or less gaudy frames scattered confusedly over the walls, without any very clearly defined attempt to secure an harmonious effect. The room is probably prettily arranged as to the rest, but the unfortunate photographs are simply thrown in to fill up the bare spaces. Now, here is the photographer's grand opportunity to demonstrate the decorative possibilities of his productions. Let him make his reception-room a silent but eloquent witness to the added beauty that any room may possess when photographs, correctly and tastefully framed and displayed, are used in an intelligent and appreciative manner to assist the general scheme.

Many of our modern reception-rooms are models of elegance and comfort, where one might, indeed, feel inclined to while away a morning or afternoon. The proprietors appreciate the undoubted wisdom of pleasing and soothing the sitter to the utmost of their power, and adapt all their internal arrangements with that end in view. We remember a certain photographer who argued against making his reception-room too comfortable, on the ground that it was difficult enough, as it was, to get rid of the sitters, without offering additional inducements to them to waste his time. This was a very original and unusual view of the question. No doubt its propounder had gleaned wisdom by experience, but one cannot help thinking his experience must have been peculiar and out of the ordinary run. Cheerfulness should be the keynote of the reception-room. The receptionists should be chatty and agreeable to all they have to deal with;

not too much so, however; all good things may be carried to excess, and the slightest familiarity and lack of respect must be guarded against. But the majority of people who go to have their photographs taken undoubtedly enjoy a little talking, and often thereby give valuable hints as to the best way of pleasing them in the execution of their order. We know some studios where the sitters are received in a businesslike, unemotional way, calculated to produce anything but gratification, and hastily dismissed as if their presence were a grievance. It is surely needless to point out the foolishness and undesirability of such behaviour. Certainly there are people who will, if allowed, waste unlimited time in irrelevant talk, and give the smallest of orders; these belong to the genus of those terrors of the linendraper, who demand to examine half the contents of the shop and finally purchase a packet of pins. But the generality of the photographer's clients are of a more liberal mould, and, on the whole, he will gain rather than lose by admitting a generous amount of conversation and gossip. There should be no appearance of hurry and rush in the doings of the reception-room. A little time wasted here will be amply made up elsewhere. Let the customers or inquirers be as leisurely as they like, let them stare lazily round at the pictures, or repose themselves in the most comfortable and luxurious of chairs or settees—it all helps to fill them with that contented and amiable feeling which causes the purse to open and the cheque-book to come out!

It is customary in some establishments to fill up the receptionist's spare moments with retouching, mounting, spotting, and like employment, which are often done in the reception-room. It is a moot point whether, if it can possibly be avoided, this is a wise thing to do. There are many who have an apparently well-founded opinion that it is bad policy to allow the public to see any of the work in course of completion. It tends, they say, to make people over-critical and increases the difficulty of pleasing them. There are certain peculiarities about photography which differentiate it from most other avocations, and one of them is the decided undesirability of allowing any lay person, not cognisant of its methods and mysteries, to view any but the finished product of our studios. The work seems to be done too easily and lightly, as seen by the inexpert onlooker, with the result that he unconsciously values it less, and gives more rein to that spirit of independent inquiry which paves the way for re-sittings, or vexatious alterations to proofs. At least, that is the carefully considered pronouncement of some who have no reason to be ashamed of their place in the photographic world, and cannot certainly be charged with any lack of practical business experience. It is only fair, however, to state that their judgment is contradicted by other equally weighty authorities, who consider that work of the kind mentioned is not out of place in the reception-room. It used to be an unwritten law with many photographers that their receptionists should be attired in sober black. H. P. Robinson, indeed, gives his benediction to the idea on the ground that brighter colours tended to clash with the more subdued hues of the specimens. A certain well known artist, however, who was lately appealed to on this point by a photographic comrade, expressed his emphatic dissent. You might as well, he said, compel all the visitors to the Royal Academy to be garbed in sable raiment. If it were desired to render the reception-room pleasant and acceptable to the average mortal, he was strongly of opinion that the assistants therein should wear something more human and less funereal. So spoke the painter; perhaps he forgot that a collection of monochromatic photographs is hardly to be compared to, or treated in the same way as, the rich blaze of colour in a picture gallery; still, no doubt, his were words of wisdom, and worth pondering by his brethren of the camera. Brightness, comfort, courteous, and tactful treatment of visitors—these should be the foundation principles of the reception-room, and of the whole establishment. With these inestimable qualities borne well in mind, and the simultaneous production of good work, it is probable that even in these days of fierce competition no photographer need complain of dearth of business, unless, indeed, his case presents exceptional and unusual features.

A. Lockett.

PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

The following gentlemen were elected members of the association at the committee meeting on February 21st.:—

Mendelssohn, H. S., 14, Pembridge Crescent, W. Squibbs, Arthur, Napleton House Studio, Tenby, S. Wales. Wheeler, Henry D. H., 9, Church Street, Folkestone. Charlton, John Chas., 14, Mercery Lane, Canterbury. Penfold, Hugh William, 100, High Street, Ashford, Kent. Deaken, Frederick, 121, Snargate Street, Dover. Swaine, Thomas Page (Swaine and Co.), 41, High Street, Broadstairs. Sellwood, Sidney Jas., Photographer, 6, Cecil Street, Margate. Burgess, Arthur, 34, Guildhall Street, Folkestone. Bonnaud, Germeliel, 50, High Street, Dover. Jacob, William H., High Street, Sandgate.

New Books.

"Liesegang's Photographischer Almanach, 1902." Leipzig: Ed. Liesegang's Verlag (Rud. Helm).

Dr. L. Herm. Liesegang, the editor of this annual, has collected a very interesting selection of papers upon various photographic subjects. The contributors' names include Dr. Lüppo-Cramer, Dr. Neuhauss, Messrs. Lumière and Seyerwetz, Dr. R. E. Liesegang, and J. Gaedicke, which of itself should speak for the value of the volume.

"Gut Licht." Dresden: Verlag des "Apollo," Franz Hoffmann.

This annual for German amateur photographers, has now reached its seventh period of publication, and the editor is to be congratulated upon the excellent collection of items of interest he has brought together in the volume. Some very good collotypes and process prints are included among the illustrations. We notice that a copious extract from Messrs. R. & J. Beck's useful pamphlet, "Practical Notes on Telephotography" is included with the original contributions. Other English publications are also extensively quoted.

The "Herrmann" Mounts. Manufactured and sold by W. Hermann & Co., 9, Gracechurch Street, London, E.C.

Professional photographers of a past generation, we are assured, highly appreciated the Herrmann mounts, the manufacture of which has recently been resumed. Two sample books containing specimens for cabinet and larger sizes have been placed before us for examination. The mounts are shown in great variety of tint and lettering, and a speciality is made of the fact that individual photographers may have their own specially selected designs executed and printed. The specimens in Messrs. Herrmann's sample books are conceived in good taste, and they should meet the requirements of those photographers who desire to keep abreast of the times in such matters. An inspection of the firm's sample books will be well repaid.

Class List and Index of the Periodical Publications in the Patent Office Library. London: Published at the Patent Office, 25, Southampton Buildings, Chancery Lane, W.C.

Of No. 5 of the Patent Office Bibliographical Series, the Controller, Mr. Dalton, in his prefatory note, remarks:—"The heading 'Periodical Publications' includes journals, transactions of societies, year books, reports of permanent congresses, and of State and municipal departments issued at stated or irregular intervals, together with a few collected works which are kept with these publications for convenience of reference. The heading does not, however, include the official literature of patents, designs, and trade marks. This handbook is divided into three sections—*(a)* an abstract of the classification adopted; *(b)* a classified catalogue; *(c)* a brief alphabetical title index. The system of class-marks is as follows:—The collection is divided into ten primary classes, lettered A-K (omitting I), each of which is divided into sub-classes, numbered consecutively, *e.g.*, D.—Physics, Societies; D 50.—Electricity, Societies. In some cases the sub-classes are further sub-divided according to locality, thus:—J 50 signifies Agricultural Experiment Stations of the United States; J 50 Min. signifies Agricultural Experiment Station of Minnesota. The above combination of letters and numerals constitutes the class-mark.

Following the class-mark is the size-mark, which is indicated by the : (colon) for works under 13 inches; / (slant rule) for works between 13 and 17 inches; || (parallel mark) for works over 17 inches.

After the size-mark comes the work-mark, *i.e.*, the mark which is used to distinguish a given work from its fellows in a class. As the arrangement of works within a class is by order of date, the work-mark is, in fact, a date-mark, and consists of the last three numerals of the year of the first volume of a given serial contained in the library, *e.g.*, E 20/856.—"The Engineer" (London).

When two or more periodicals occur of the same class, size, and date of issue, the second and following periodicals are distinguished by the addition of letters, *e.g.*, A 11.—Photography: Periodicals.—1886-90.—"Camera."—A 11:886. 1886-1900.—"American Journal of Photography."—A 11:886a.

The present list comprises 2,563 works, distributed under 356 classes, and representing some 39,682 volumes. Those interested in the wealth of technical literature to be found in the Patent Office will no doubt appreciate the class lists and index now in course of publication.

At a recent meeting of the Photographic Society of Philadelphia Mr. Morris Earle exhibited an improved form of the Kitson light adapted for use in the optical lantern. The apparatus was quite compact, and consisted of a metal tank some 18in. high, fitted with an air pump and gauge and connected to the burner by a small, flexible, seamless, copper tube. The burner was of ingenious construction, in which the petroleum vapour coming from the tank was heated and converted into gas; this, when mixed with air, was burned under an ordinary Welsbach mantle, giving an intensely bright white light, estimated at 300 candle-power. The regulation and adjustment were easily effected by valves. To operate the apparatus, two or three quarts of kerosene oil were placed in the tank, and air pumped in until the pressure showed 60lb.; then a small quantity of alcohol was placed in a pan just under the burner and ignited. This was to start the vaporisation of the oil, which, as soon as the burner became warm, was carried on automatically. The illumination on the screen was of considerable brilliancy and remarkably even. The apparatus was claimed to be absolutely safe from explosion. The consumption of oil was about one pint per hour.

New Apparatus, &c.

Sensaxe."

Messrs. Fuerst Bros., 17, Philpot Lane, London, E.C., have introduced a novelty for sensitising postcards and other suitable objects, upon which photographs may be printed. This sensitising fluid is sold in small bottles, under the name of "Sensaxe," and gives very attractive prints. For the amateur who wishes to make his own picture postcards the solution is a very practical novelty. The card is brushed over with "Sensaxe," dried in the dark-room, and printed in the ordinary way. The print is of a chocolate brown colour, and should be made rather deeper than required after fixing. The speed of the sensitised material is rather slower than that of ordinary gelatine P.O.P. The solution seems to be adapted for negatives of very different character, and the tone of the print is a warm brown when fixed in hyposulphite of soda.

The "F.O.P." Camera. Manufactured and sold by R. & J. Beck, 68, Cornhill, E.C.

"F.O.P." stands for "films or plates." Forty of the former, notched, but packed flat "like a pack of cards," or ten of the latter in notched sheaths, are placed in the magazine, and on exposure are removed, one by one, into the receiving chamber by the Frena changing system of alternate notches and teeth. The camera retails at a guinea, has two finders, an achromatic single lens, and an adjustable shutter. The size of film used is $3\frac{1}{4}$in. by $2\frac{5}{8}$in., the actual dimensions of the image obtained being $3\frac{1}{2}$ by $2\frac{3}{8}$. There is no focussing adjustment to the camera, but Frena magnifiers can be supplied to bring objects as near as 3 feet into

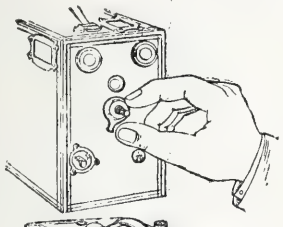


Fig. 1.

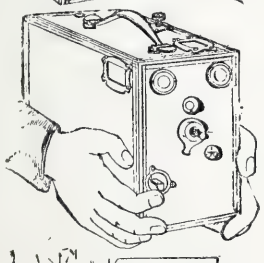


Fig. 2.

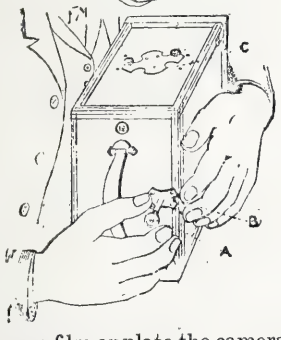


Fig. 3.

focus. To change a film or plate the camera is held with its lens end pointing downwards; a knob on the top of the camera is pulled out, which draws

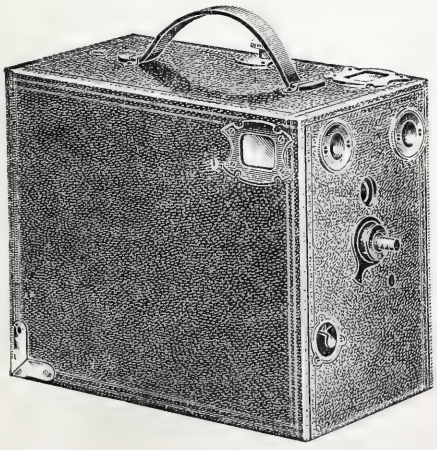


Fig. 4.

a tray into position underneath the pack of films or plates, and, turning a lever at the back of the camera, drops the foremost film into the tray, leaving another ready for exposure. Upon returning the knob to its original position, the storing tray is slid back, and the camera is ready for the next exposure. The general manipulation of the camera is shown in the accompanying block. Fig. 1 represents the shutter being wound, Fig. 2 the exposure being made, and Fig. 3 the process of film-changing. Fig. 4 shows a general view of the instrument.

Some excellent photographs taken with the new camera have been shown to us; and an exhaustive book of instructions is issued with each instrument. At the low price of a guinea, and constructed with great mechanical ingenuity, the "F.O.P." appeals to a very large class of amateurs, and will not do so, it may be expected, in vain.

The Watkins Daylight Enlarging Test Box. Manufactured and sold by the Watkins Meter Company, Imperial Mills, Hereford.

Some of the uses of this little instrument are described in the explanatory pamphlet of instructions which is issued with it. That pamphlet points out that, when enlarging from different negatives at different times with the same paper, lens stop, and degree of enlargement (distance of lens from paper) there will be only two varying factors, namely, the activity of the light and the density or thinness of the negative. The test box here illustrated accurately allows for these by a single test, which only occupies a short time. The test is made by the indoor meter held in the box at a fixed distance from the negative, which is placed over the square opening. The box is held in the same position and pointed in the same direction as the enlarging camera will be.



The instructions for usmg the test box are:—Prepare all the enlarging appliances, and the bromide paper ready placed in position. Place the negative (face down) over the aperture of test box, so that an average amount of sky (about one-third of the aperture), or high light appears. Take the box to the position where enlarging exposure is to be made, and point in direction of sky. Turn the lower flap up to yellow window, and with right finger and thumb turn the lower part of indoor meter to expose a fresh surface of sensitive paper. Allow flap to fall back to its place by means of the spring and at once begin to count seconds. The time to note for the test is when the paper *begins* to darken to a very faint visible tint. The little half-circle of pale buff tint (the same colour as the undarkened paper) is a guide to observe the first darkening beyond this fixed tint. The meter can be turned up to the yellow window for observation at intervals, but counting must cease when this is done, to be resumed at the same number as it is turned down again.

The test box is also applicable to lantern slide reduction. The instructions give various methods of calculating out the exposures that have been ascertained in the test box, which is a piece of apparatus obviously capable of simplifying, by making less empirical, the work of enlarging from negatives of varying qualities.

PHOTOGRAPHIC Club, Anderton's Hotel, Fleet Street, on Wednesday, March 5th, at 8 p.m. Mr. Ernest Human will demonstrate Messrs. Wellington & Ward's S.C.P. for fireside printing. Visitors will be welcome.

THE annual dinner of the Hackney Photographic Society was held on Tuesday evening, February 18th, at the London Tavern, Fenchurch Street, E.C. About eighty members and friends were present, and a very enjoyable evening was spent.

RÖNTGEN Society.—At the ordinary general meeting, on Thursday, March 6th, 1902, at 20, Hanover Square, the chair will be taken at 8.30 p.m. A short paper will be read by Dr. Barry Blacker, on "Localisation; with demonstration of a Simple Direct Reading Apparatus."

COLOURS Photographed.—The New York "Herald" announces the discovery of a wonderful new process of colour photography by Hyatt Verrill, son of Professor Verrill, of Yale University. It is an orthochromatic process, but its exact nature has not been revealed yet. Professor Verrill, in an interview on the 16th inst., showed the "Herald" correspondent five photographs taken by the new process. One was a landscape in Bermuda, in which palm trees and other tropical foliage appeared. The blue-green tints of the sea were wonderfully reproduced. Two other photographs were copies of water-colour paintings of brightly-coloured tropical fishes, whose varied tints were equally well done. Verrill says that the chief difficulty at present is to reproduce bright red, but he expects eventually to perfect this.—"Daily Mail."

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

March	Name of Society.	Subject.
3	Camera Club	*Some Uses for Hand Cameras.* Dr. W. J. S Lockyer.
3	Southampton Camera Club	*Photography* Prize Slides.
3	Glasgow and West of Scotland	Technical Meeting *Hand Camera Work.* Demonstrator, Mr. Cameron Todd.
3	Oxford Camera Club	*Through the West of Ireland with a Hand Camera.* Mr. F. W. Hindley.
4	Croydon Natural History	Anthropological.
4	Rotherham Photographic	*Carbon and Ozotype.* Demonstration by Mr. T. A Scotton, of Derby.
4	Mellourne Working Men's Col.	Lecturette: *The Otway Forest and District.* Mr. A. J. Relph.
4	Birmingham Photographic	Members' Lantern Evening
5	Edinburgh Photographic	*Photo-Micrographic Illustrations of Gelatino-Bromide Films.* Illustrated. W. Forgan.
5	Maritzburg Camera Club	*Glazing, Mounting, and Backing of Prints.* A. E. Smith.
5	Southport Photographic Society	*High-power Photo-Micrography.* Alfred Quayle.
5	Southsea Photographic Society	*Bird Nesting with a Camera on a 400-acre Farm.* Dr. J. E. Kelso.
5	Photographic Club	*S.C.P., or Fireside Printing.* Mr. Ernest Human.
6	Darwen Photographic	*Platinotype Printing by Grapho.*
6	Brentford Photographic	Lantern Evening. Members' Slides.
6	Röntgen Society	Exhibition Evening, probably.
6	Liverpool Amateur	Practical Demonstration: *Lantern Slide Making.* Mr. William Harvey.
6	Richmond Camera Club	Lantern Evening.
6	Woolwich Photographic	*Modifying Development.* Henry W. Bennett, F.R.P.S.
6	London and Provincial	Open Night.
6	Sunderland Photographic	Lantern Night.
7	Leicester Literary	Proposed Exhibition Evening.
7	Bognor Photographic Society	Monthly Competition: Winter Scene. *Apparatus.* E. L. Wood.
7	Borough Polytechnic	*Intensification and Reduction.* Mr. F W Bannister.

ROYAL PHOTOGRAPHIC SOCIETY.

FEBRUARY 18TH.—Mr. J. J. Vezey in the chair.

There was, as usual, a large attendance at the monthly lantern meeting that was held on the above date, when Mrs. Catherine Weed Ward gave a lecture on an always fascinating subject—the life and work of Charles Dickens, under the title of "The Real Dickens Land." The lecturer has spared no trouble in getting photographs of places that have the slightest bearing upon the life of the never-to-be-forgotten inimitable Dickens or upon that of the characters in his novels whom we know so well. It was pleasing to hear an American lady speak so appreciably of Charles Dickens and his writings, and to be told again that "Martin Chuzzlewit," and other writings from Dickens' pen. that at first gave some offence to Americans, had been overlooked, and that he had been entirely forgiven his offences. Pickwick and his friends came in for frequent mention by the lecturer, who brought with her photographic counterfeits of many of the inns and places rendered famous by their travels. It is impossible, in the space of this brief notice, to follow the lecturer over the whole of the ground she covered. The address was wonderfully comprehensive, and the photographs included views of many a place that is now no more as Dickens saw it, and others that have been since improved off the face of the earth. A hearty vote of thanks was passed to Mrs. Ward for her lecture.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

FEBRUARY 20TH.—Mr. W. Thomas in the chair.

STEINHEIL'S COPYING ORTHOSTIGMATS.

Mr. Philip Everitt showed a new lens brought out by Steinheil. When the lens was being calculated he had mentioned to Steinheil that as soon as it was ready the L. and P. would be very glad to see it. The lens was finished towards the latter end of last year, and one of the first that were made was sent to him; but as he was unable, through illness, to bring it down, it was sent on to Beck, who quickly disposed of it. He had now received another of the lenses, which were described as orthostigmats of the copying type. In order to obtain still finer definition than was given by the first series of lenses, such as was required for first-class line work, Steinheil undertook the recalculation of the lens, and the second series, of which he now showed a specimen, was the result. The angle covered by the second series was rather smaller than that of the first series of the copying orthostigmat, but the aperture was the same, and the definition and flatness of field were much finer. To show what the lens would do, he had asked Mr. A. E. Smith, a member of the Association, to be good enough to make some trials for him, and to give his opinion of the capabilities of the lens. Mr. Smith had made two negatives, each measuring 18 by 16, and although Mr. Everitt wished that the lines of the original had been finer, yet it would be seen that the defining power of the lens and flatness of field were of a high order. The test subject was a large map of London, with an ordinary business card in the centre and another at the margin. The very fine lettering of these cards was rendered in an excellent way in both negatives, one of which was taken at full aperture (F/10) and the other at F/20. The lens was one of 23½in. focus. In reply to a question by Mr. Rapson, he said that the outer lenses were of hard glass, and it was an advantage that with this series of lens the soft glasses which had to be used were enclosed by lenses of a harder and more durable glass. The price of the lens was £40. In asking those present not to take the lens to pieces, he said it was a point that should be borne in mind that the setting of lenses of this character was very easily disturbed, as they were not hot-cemented but cold-cemented. If one unfastened the ring which secured the cells, the adjustment of the lens might possibly be disturbed, and the defining power of the lens would be seriously interfered with. As a matter of fact, it was very unwise to tamper with the fittings of any copying lens of modern style. The first series of the lens, which covered an angle, as stated above, somewhat smaller than the second series, at the focus of 23½in. covered, with a small stop, a plate of about 36 by 28; with a medium stop, 28 by 24; and at full exposure, about 18 by 14. These figures would be slightly reduced, of course, in the second series. Mr. Smith spoke very highly of the lens, and had said that it compared most favourably with other lenses in his possession.

Mr. R. P. Drage then gave a lecture on

JAPAN,

as visited by him some five or six years ago. The photographs and the lecturer's remarks had, perhaps, additional interest in view of the recent treaty concluded between that country and our own. Photography in Japan, according to Mr. Drage, dates its seriously active career from the time when Professor W. K. Burton arrived in that country to take up his duties in the engineering college at Tokio. Professor Burton, whose death was deeply deplored by his many English and Japanese friends, was still living at the time of Mr. Drage's visit, and the latter spoke with considerable feeling of the kindness with which Professor Burton had set himself to make Mr. Drage's visit instructive and pleasant and comprehensive. The lecturer threw a map upon the screen, and traced the steamer's course from the first port of call, through the inland sea, to Tokio—a city which covers, he said, more space than London, although, of course, the population is considerably less. There are a good many canals, and the lower classes of people live very largely on them. He showed that the Japanese consist, generally speaking, of two classes—the lower and less attractive, and the wealthier and more intellectual, who come nearer the European conception of beauty. The lecturer had a good word to say for the Japanese soldiery and their smart appearance, and showed several photographs in support of this opinion. The men of the Japanese navy were also shown to cut a very similar figure to those of our own, even to the extent of carrying the orthodox bundle when ashore. There is a curious custom, he said, amongst the Japanese working classes, whose clothes bear wonderful symbols denoting the wearer's trade or profession. Those coast towns of Japan which have necessarily come into close contact with Europeans and Americans, have largely adopted the customs of those peoples; for instance, horse-cars and 'buses have almost entirely superseded their former modes of travelling, and the telegraph has been introduced to such an extent that the poles and wires have ruined, from a pictorial point of view, the otherwise beautiful scenery. In Mr. Drage's travels he came across many fine specimens of Buddhist and Shinto temples, photographs of a large number of which he projected upon the screen. There was also a number of photographs depicting several of the essentially Japanese trade, among them being the making of Japanese lanterns. Many figure studies were also shown, with a view to exemplifying the national costume and the modes of dressing the hair. Away from the busy centres of life and industry, the ricksha maintains its position as the only method of getting from place to place, and it says a lot for the endurance of the men who draw them when it is remembered that thirty miles in a day is a common performance, and at times forty miles or more have been accomplished without apparent distres to these sturdy natives. A chat about Japan would not be complete without reference to the famous wrestlers. Their methods are not in these days entirely unknown to us, seeing that on several occasions exhibitions have been given by exponents of their art. It seems, to judge by the photographs that were shown, that Japanese wrestlers deem it essential that they should carry as much flesh as possible, and the best of them were really of tremendous bulk. Professor Burton took a large amount of interest in Japanese wrestling, and until his death he maintained a very close friendship with some of the most distinguished professors of it.

A hearty vote of thanks was passed, by acclamation, to Mr. Drage for his very interesting lecture and photographs.

LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

AT the last weekly meeting Dr. Llewellyn Morgan gave a chatty demonstration on the treatment of skies in photographs.

At the outset he cautioned his hearers against the tendency to over-emphasise the cloud effects when painting, stating that in most cases the clouds or sky required to be subordinate to the landscape.

Dr. Morgan gave a practical illustration of the effect of sunning up and down for subjects in which cloud forms would have been unsuitable.

He also exhibited and explained his method of printing with the drawing-board, which, he contended, gave the operator more control over the print.

An open discussion followed, in which several members took part.

A vote of thanks to Dr. Morgan terminated the proceedings.

BLAIRGOWRIE AND DISTRICT PHOTOGRAPHIC ASSOCIATION.

The annual general meeting of this Association was held in the Photographic Rooms, Blairgowrie, on Tuesday, February 18th, Mr. John B. Maclachlan, vice-president, presiding. The secretary (Mr. H. B. Jamieson) gave in his annual report, in which he congratulated the members on the progress they had made in their work during the past year, and counselling them to be regular in their attendance at the monthly meetings, and also to be regular competitors in the monthly competitions. The treasurer (Mr. John Cameron) gave in his annual financial statement, which showed a credit balance in favour of the Association. Both reports were adopted, and the officers thanked for their careful attention to the good of the Association. Office-bearers for the year were elected:—President: Alexander Geekie; vice-presidents: John B. Maclachlan and James Richardson; secretary: Lake Falconer, jun.; treasurer: John Cameron; lanternist: H. S. Fyffe; auditors: James Donaldson and James Richardson; executive: W. D. M. Falconer, James Donaldson, Alex. Mitchell, J. D. Petrie, and D. G. Monair, Messrs. G. and W. G. Murray were heartily thanked for their services as judges last year, and it was agreed to ask them to again judge the monthly competitions this year. It was remitted to the executive to prepare the syllabus. The lecturette competition resulted:—1, J. D. Petrie, "Through Fife in a Motor-car; 2, D. G. Monair, "The Muirton." The Macgregor medal for most points in the year's competitions was won by D. G. Monair, and the B Class points prize (presented by Mr. J. D. Petrie) was tied for by James Donaldson and W. D. M. Falconer.

SOUTHAMPTON CAMERA CLUB.

A meeting of the above Club was held at the Philharmonic Hall on Monday evening, the 17th inst., under the presidency of Mr. G. T. Vivian. There was a good attendance, and after the election of new members the hearty thanks of the Club were given to Mr. Marsack for a gift of four nicely-bound volumes of the "Amateur Photographer" as an addition to the recently-formed library. Mr. Copeland was then called upon to contribute his evening in the winter programme, which consisted of a discourse and demonstration on enlarging. Quoting from "Practical Enlarging" by John A. Hodges, F.R.P.S., the lecturer said that there were some who took exception to an enlargement because they assume that it will be less sharp than a photograph printed direct from the negative; but the fact remains that a 12 by 10 enlargement from a ¼-plate negative taken with an aperture of F/8 will possess greater sharpness and depth of definition than will be found in a direct print from a 12 by 10 negative. The explanation of this apparent paradox is due to the fact that the depth of focus and defining power of lenses are much greater in small, short, focus instruments than in those of large, long focus. Mr. Copeland then gave demonstrations, with a simply-constructed apparatus, for enlarging by artificial light, the provision of which was within the reach of every member (with the aid of his camera) at a comparatively trivial cost. All being well pleased with what Mr. Copeland had shown them, a hearty vote of thanks was accorded him. It was announced that the next meeting of the Club would take place on March 3rd next, when the "Photographic News" prize slides would be exhibited by limelight. Visitors are invited, including ladies.

NEWCASTLE-ON-TYNE AND NORTHERN COUNTIES' PHOTOGRAPHIC ASSOCIATION.

Mr. Edgar C. Lee gave a valuable demonstration of his favourite process (lantern-slide making) before the above Society, at their rooms, the Y.M.C.A., Blackett Street, on Tuesday, February 18th. Mr. Lee's apparatus consisted of a printing-frame enabling him to take a slide by contact from any part of a negative up to a 10 by 8; a stage to hold the negative, and a ¼-plate camera to copy it, for those where contacts are not desirable; a lamp consisting of canary fabric in the form of the folding one on the market, but much larger, and the top was simply a large piece of cardboard with electric wires running through, lighting the incandescent globe within, and could be lifted off for exposing and ordinary illumination. A rocker and dishes completed the equipment, the latter being very useful, as it enables the operator to attend to other details whilst developing, especially when warm tones are required, and another advantage is that the dishes are easier kept covered. The lecturer prefers the Pyre-ammonia formula for development given with the Mawson plate, but where speed is a consideration, and black tones are not objected to, other developers answer better; but for best results, where warm tones are required, he much prefers the pyro, and recommends that the plates be backed, as this gives greater latitude of exposure as well as reducing halation. Where specially warm tones are wanted, carbonate of ammonia is, of course, used, but the time of developing is considerably prolonged. The ones aimed for should be those best suiting the subject in hand, and not used indiscriminately. Should the slides be too dense, he reduces with Farmer's ferricyanide solution. It is advisable to well alum or treat with formalin all valuable slides, so as to render the gelatine insoluble. For the clearest results—and this is a very important item in all lantern slides—those got by reduction in the camera are better than those got by contact; and another advantage of the camera-made ones is that any distortion due to tilting the camera in taking the original view can be remedied in the slide. At the conclusion of his lecture Mr. Lee showed the members a large number of his best-known views as well as four which he had exposed and developed in the room and dried off with spirit, and he incidentally remarked that, where procurable, spirit should always be used.

DEVONPORT CAMERA CLUB.

Mr. H. J. Hissett presided at a well-attended meeting of Devonport Camera Club last week, when Mr. Thomas K. Grant lectured on the Lumiere process of colour photography. He explained the spectrum, and pointed out that with the three colours red, blue, and yellow the most effective colour photography could generally be produced by simple means. Except the three dyes, nothing was required but what was ready to the hand of any photographer. The three colours were really pink, blue-green, and yellow, and the process was to use these on three plates of a picture after the ordinary development. Some non-stretching paper should be procured, and a layer of ordinary glue placed on the red plate. This should be stuck to the paper, and the picture would come off with it. The blue and yellow plates would then be coated with gelatine, and as all the articles were transparent they could be fixed to the paper exactly on top of one another. The glue being very soluble in an ordinary temperature, the whole could be placed in water, when the paper would come away, and the three colours, which would be found to have intermixed to form all the colours in the picture would be fixed to a lantern slide and displayed. Mr. Grant explained that sometimes the three colours did not combine to form all the colours in a picture, but that usually they were sufficient. Colour photography he considered of much more interest than ordinary photography. There were many things to learn in colour photography, for the science in that branch was nothing like so advanced as in ordinary photography. Mr. Grant showed a splendid series of coloured pictures on the screen, and they were very much appreciated by the audience, which included members of Stonehouse Camera Club, who had been invited. Mr. Grant was very heartily thanked.

Patent News.

The following abridged description is specially drawn for the British Journal of Photography by Messrs. Hughes & Young, patent agents, 55 and 56, Chancery Lane, London, W.C., who will give advice and assistance free to our readers on all patent matters.

Patent Applications.—No. 2,685.—John Edward Thornton, Rokeby, Altrincham.—"Improvements in packing cases, adaptors, and mechanism for the storage, exposing, and transferring of photographic plates or films."

No. 2,808.—Henry Frank Purser, Chancery Lane. "Improvements in or relating to photographic cameras."

No. 2,834.—Albert Edward Bowers, 73, Cheapside, E.C. "Improvements in mounting and finishing photographic or other transparencies, and in mounts therefor."

No. 2,838.—Arthur Lewis Adams, 26, Charing Cross Road, W.C. "Improvements in photographic cameras."

No. 3,023.—Johann Nikolaus Ludwig, 34, Belvoir Street, Leicester. "An improved process for developing photographic plates and the like in open daylight."

No. 3,121.—David Allan, 157, Whitfield Street, London. "A washing tank and rack for photographic films and papers."

No. 3,249.—Friedrich Bruck, 165, Queen Victoria Street, E.C. "Improvements in and relating to automatic shutter operating devices for photographic cameras."

Patents Illustrated.—No. 18,535.—Photography. Patentee: C. P. Goerz, 45, Rheinstrasse, Friedenau, near Berlin.

Change-boxes; plate and like boxes.—Relates to a box for storing a packet of plates, which may be inserted into a plate-changing device and removed after all the plates have been exposed. The box can be inserted in a plate-changing device of the kind in which a plate is changed from the top to the bottom of the pile by pulling out and pushing in a drawer. The box is inserted by removing the cover, this cover being provided with two slots for withdrawing or inserting the top and bottom shutters of the plate box.

No. 18,585.—Photography. Patentee: J. Wilkinson and A. Wilkinson, both of St. Oswald Street, Manchester.

Printing.—Relates to a device applicable to printing-frames, to prevent the paper from moving during inspection. The two halves of the back are hinged to a transverse bar, which is connected to the frame, at its ends, by studs and holes. The studs may be either on the frame or on the bar.

No. 18,662.—Photography. Patentee: A. van Hoorn, 72, Union Street, West Oldham.

Washing.—Relates to a print or plate washing tank with intermittent syphon discharge. For washing prints the water is admitted by a tangential opening, passes through the perforated bottom, rises through the annular space between the tubes, and is discharged by syphonic action as soon as it overflows into the pipe. To empty the tank the tube is withdrawn from its socket in the plate. For washing plates the perforated bottom is reversed, and the plates are set on edge in notches in the ridges. The water is, in this case, admitted by a spraying-head.

Commercial & Legal Intelligence.

Messrs. J. H. Dallmeyer, Limited, of 25, Newman Street, Oxford Street, W., have declared and paid a dividend of 15 per cent. for the year 1901.

Alleged Camera Frauds.—Albert Davies, 27, of no fixed abode, was charged at the Southwark Police Court, on remand, before Mr. Cecil Chapman, with the unlawful possession of cheques and money orders of the total value of £15 19s. 6d. Detective Beard, L Division, stated that the prisoner was believed to be a person who had been carrying on an extensive system of fraud by advertising for sale motor-cars, bicycles, cameras, Christmas gifts, physical developers, and other articles, which he did not possess. He induced people in all parts of the country to send him money, which he appropriated, and made excuses for not sending the articles. His correspondence was addressed for a time to a small shop in a certain district, in the name of Davis, Mason, Walker, Johnson, or some other alias, and then when that district got too hot for him he would try another. Complaints had been received from Leeds, Harrogate, Barnsley, Stockton, Altrincham, Petersfield, Bradford, Wigan, Manchester, Ilminster, and various other places since December last. The witness and Detective-sergeant Milton arrested the prisoner in Blackfriars Road while he was opening letters. He was very violent, and bit the witness on the hand. Two shopkeepers from Waterloo Road and Kennington Road having given evidence, a further remand was ordered.

The Kodak Postcards.—Messrs. Kodak, Ltd., of 43, Clerkenwell Road, E.C., are now issuing packets of sensitised postcards, in connection with which they announce a special competition, with prizes to the value of £50. The following are the conditions:—There will be three classes. (1) Class A: Portraiture and figure studies. Class B: Landscape and seascape. Class C: Architecture (exterior and interior), street scenes and incidents, and any other subjects not included in A and B. (2) All postcards sent in must be printed on Kodak sensitised postcards. (3) All prints to be the work of the competitor. (4) Any competitor may enter any number of postcards, but no competitor will be awarded more than one prize in one class. (5) Postcards must have the name and address of the competitor, together with the class, written on the address side, and each set of postcards for each class must be enclosed in a separate envelope, with the name and address of the competitor and class written outside. (6) No restriction as to camera or negative is imposed; negatives made in any camera and on either glass plates or films are eligible. (7) Kodak, Limited, reserve the right to purchase, at 10s. each, any negative from which prize-winning pictures are made. (8) An exhibition of the competing postcards will be arranged in London, the date and full particulars of which will be announced in due course. Exhibits to be sent in on or before April 14th, 1902.

"Illustrated London News" and "Sketch," Limited.—The third ordinary general meeting was held last week, at Winchester House, Sir William Ingram presiding. In moving the adoption of the report, the chairman said that the board were of opinion that the result of the past year's trading was satisfactory. The profit, amounting to £62,072, was larger than in the preceding twelve months. This was not due to any material economies in the cost of producing the papers. The size of the "Illustrated London News" had been increased so far as the number of pages was concerned during the period under review, but in spite of the additional expense thereby incurred the outcome of the year's working showed an improvement. With regard to the profit of the current year, there was reason to expect that it would exhibit a further advance. The company's two papers were making good progress. The circulation was to-day greater than ever before, and the advertisement revenue was well maintained. He thought that the Coronation festivities would help to increase their earnings. From the profit of the year there had to be deducted the interim preference and ordinary dividends and interest on debentures. The board had also written off the final one-third of the preliminary expenses, leaving a balance of £28,088, to which had to be added the sum of £1,962 brought forward. After paying the preference dividend for the half-year ended December 31st last, and a dividend for the same period at the rate of 8 per cent. per annum on the ordinary shares, making the total distribution on the latter 7 per cent. for the year, there remained to be carried forward, subject to provision for the remuneration of the board and the managing directors, a sum of £4,738. Mr. G. J. Maddick seconded the motion, which was adopted. A resolution was afterwards passed, fixing the remuneration of the board, including the managing directors, at £2,500 per annum.—"The Times."

Thornton-Pickard Manufacturing Company, Limited, v. Thornton Film Company, Limited.—This matter came on on motion for judgment in default of defence in the Chancery Division of the High Court of Justice, before Mr. Justice Kekewich. The plaintiff company, whose registered offices and works are at Altrincham, in the county of Chester, claimed an injunction to restrain the defendant company, whose registered offices and works are at 60, Oakfield Road, Altrincham, from using the name, style, or title of "The Thornton Film Company, Ltd., or any other style or name which included the name "Thornton" or so nearly resembled the same as to be calculated to induce the belief that the business carried on by the defendant company was the same as the business carried on by the plaintiff company, or in any way connected therewith, and from carrying on business in any name or manner, or in any place, so as to induce the belief as aforesaid. Mr. Scott Thompson, in supporting the motion, said that the defendants had formerly appeared, but they did not now put in an appearance. The plaintiffs were manufacturers of photographic appliances, and the defendants had set up a rival business adjacent to the plaintiffs. The statement of claim set out the objects for which the company was acquired, and said that the Thornton-Pickard Manufacturing Company had acquired a worldwide reputation for the excellence and quality of its goods, so that the name of Thornton-Pickard, either alone or coupled with the name of a place of business or manufacture, was indicative of and generally well known to mean the goods supplied by the plaintiff company. The defendant company was incorporated on January 11th, 1900. The plaintiffs' business was originally founded by one Jno. E. Thornton, in connection with Edgar Pickard, and by an agreement dated January 23rd, 1897, and made between J. E. Thornton and Edgar Pickard, of the one part, and the plaintiff company of the other part, it was agreed that neither Thornton nor Pickard should at any time after the sale to the plaintiff company of their present business, either solely or jointly, act as manager or agent for any other person or persons, directly or indirectly carry on or be engaged or concerned or interested in the business of a manufacturer of or dealer in cameras, shutters, or other photographic appliances, either in England, Wales, Scotland, or Ireland, or permit or suffer his name to be used in connection with such business. In July, 1898, Mr. J. E. Thornton promoted and formed the defendant company, and became the chairman of the directors. The word "Thornton" was used as indicating the connection between J. E. Thornton and the defendant company, and as the means of attracting business to the defendant company. At the time when the defendant company was promoted or formed, it was known to the directors that the defendant J. E. Thornton had entered into the agreement of January 23rd, 1897.—Mr. Justice Kekewich: What do you ask for?—Mr. Scott Thompson: I ask for an injunction and costs, and for an inquiry as to damages.—Mr. Justice Kekewich: Yes. I think you are entitled to it. There will be judgment accordingly.

The New Patent Bill.—In the House of Commons last week Mr. Gerald Balfour, in asking leave to introduce a Bill to amend the patent laws, reminded the House that in 1900 a committee was appointed by the Board of Trade to inquire into the working of the Patent Acts, with respect to three specific questions on which the committee made recommendations. One of them related to a comparatively simple matter, and the recommendations of the committee regarding that were carried out by a Bill passed in the course of last session. The other recommendations of the committee had reference to two matters of somewhat greater difficulty and complexity. One was the question of examining the specifications of Letters Patent previously granted in the United Kingdom with a view of ascertaining whether such specifications contained any anticipations of the invention claimed in the specification that had been deposited, and the other question was that of granting compulsory licences. He did not think it was necessary at this stage of the proceedings to explain or justify the provisions of the measure further than to say that they followed very closely the recommendations of the committee. He was aware that the opinion of the commercial community with respect to these recommendations was not absolutely unanimous, and he thought it would be as well for a considerable interval to be allowed between the first and second reading, in order to give an opportunity to those interested in the question to study the provisions of the Bill. He would undertake on his part to consider most carefully, and with an open mind, any representations that might be made to him in the interval. The Bill was read a first time.—The Bill is in accordance with the recommendations of a committee which reported in January of last year. It relates almost exclusively to the point whether the Patent Office should possess larger powers of controlling the issue of Letters Patent, and, in particular, to the examination of applications directed by the Act of 1883. That examination is at present almost formal. The examiner to whom the Comptroller refers the matter must report whether the nature of the invention is fairly described, whether the application, specifications, and drawings are prepared in the prescribed manner, and whether the title sufficiently reveals the subject-matter of the invention. The examiner may also have to report whether the same invention is comprised in two different applications. But, speaking generally, the preliminary examination stops at formal points. Whether it should be searching and complete, and result in a report which, if favourable, would amount in practice, if not in theory, to a guarantee of validity, is an open question on which experts differ. Some inventors prefer the German or American system, with its careful examination of the literature of the subject. Some hold that, defective though our system is, it is preferable to systems which promise a vigorous examination, but really give not much more security than our own. But there is general agreement—though some patent agents hold strongly the contrary view—that the present preliminary examination might well extend to anticipations easily ascertained. It appeared that of a hundred complete specifications which were filed, about forty-two could be shown from information in the office to have been anticipated. And so the examiner is to be directed to make a further inquiry to ascertain whether the invention claimed has been wholly or partly described in any specification published before the date of the application and deposited in the Patent Office in furtherance of any application for a patent during the last fifty years. It is believed that this will weed out many claims which now obstruct the path of the genuine inventor and of manufacturers. The report, if in favour of the application, will not amount to a guarantee of the validity of a patent; but its practical or market value ought to be somewhat increased. As the "Times" points out, the present enactment as to the issue of compulsory licenses to persons interested works unsatis-

factorily. The section which governs the matter reads as if it might be all that is wanted; in fact, it has proved nothing of the kind. Bitter complaints have been expressed by those who sought to make use of Section 22 of the Act of 1883, and who found its procedure costly and cumbrous. We are not sanguine that the new clause, if adopted, will greatly abridge the length of proceedings; and there is force in the criticisms of the committee's recommendation by Sir Edward Fry and others. But it may at least mitigate some of the evils to which attention has been drawn. Most of the changes will meet with the approval of all interested, including patent agents. It is true that some view the Bill with distrust. They see in it the thin end of the wedge an inroad on their private domain by officialism. But others will be glad to see a clean sweep of a great deal of bogus business. The new measure will leave most of the grievances in regard to the Patent Laws just as they were. The law will not be consolidated. The prodigious costs of patent inquiries will not be diminished. They threaten, indeed, to increase.—"The English Mechanic."

News and Notes.

Mr. A. W. Rich, a member of the New English Art Club, will hold in the beginning of March an exhibition of his watercolour drawings at the Egyptian Hall, Piccadilly. These drawings are chiefly of English landscape, and represent especially subjects in Sussex, Suffolk, Surrey, Gloucestershire, and other Southern counties. The exhibition opens on March 5th, and will continue for twelve days.

At the last council meeting of the National Photographic Record Association 359 prints were presented, including 100 by Sir J. Benjamin Stone, of "Sandringham Hall," "Frogmore," "Hatfield House," etc.; a series from Iona, by A. Victor Haslam; sixty by B. Diveri, of "Scotch Antiquities"; forty-two from H. W. Fincham, of "St. John's Gate and remains of St. John's Priory, London" and the prize sets sent in for competition to the "Amateur Photographer" by Mrs. Gandy, Mrs. Muriel, Miss Beedham, F. Parkinson, F. R. Armytage, E. J. Felce, O. Gethin, F. Littledale, and A. J. Loughton; and fifty-six by Geo. Scamell, of "Historical Houses of London," and "Sussex Churches."

The Photographic Society of Ireland's annual exhibition of photographs will be held in the large hall of the Society, 35, Dawson Street, Dublin, from Monday, March 24th, to Saturday, March 29th. The judges will be Sir Walter Armstrong, Mr. A. Horsley Hinton, Prof. J. Joly, D.Sc., F.R.S., and Mr. Alfred Werner, Esq., F.R.P.S. The following are the classes for members only. Silver and bronze medals in each class. Each entry to consist of one picture:—1. Landscape or Marine. 2. Instantaneous work. 3. Figure and animal studies, and portraits (if not taken in a professional studio). 4. Historical, architectural, and archæological. 5. Still life, including fruit and flowers. 6. Lantern slides—(a) landscape or marine (b) other subjects—sets of four. 7. Enlargements (see Rule 2). For members who have never won a medal in any society. Bronze medals:—8. Prints, any subject. 9. Lantern slides, sets of four, any subject. The "Werner" special medal will be awarded to the member of the P.S.I. whose picture will be judged the best in artistic merit. There will also be an open class for all comers, gold, silver, and bronze medals being offered for best picture, any subject or size, produced by any process. The gold medal will not be awarded unless there are at least 100 entries. Entry forms and further particulars may be obtained of Mr. W. F. Cooper, hon. sec., at the above address.

The Lord Mayor of London on Photography.—The Lord Mayor, accompanied by the Lady Mayoress, Mr. Alderman and Sheriff Bell, and Mr. Sheriff Horace B. Marshall and Mrs. Marshall, opened at the Cripplegate Institute, on Tuesday, the third annual photographic exhibition held in connection with the institute. Mr. R. Dyas, the president, stated that since the Cripplegate Institute was opened five years ago nearly 1,000,000 persons had enjoyed the advantages it offered. The Lord Mayor, having declared the exhibition open, said he had special pleasure in doing so, as he was one of the Sheriffs on the occasion of the laying of the foundation stone of the Cripplegate Institute. He congratulated the governors upon the rapid development of the institute and its usefulness among all classes of the community, and pointed to the fact that it had proved to be absolutely necessary in the City of London. Its library consisted of 35,000 volumes, and since the opening of the institute it had been visited by over 850,000 persons. Few arts had made greater strides of recent years than the art of photography, and he contrasted with the beautiful specimens with which they were surrounded the horrible photographs and atrocities described as "likenesses," which were very prevalent not many years ago. The Lord Mayor then distributed the medals among the successful exhibitors. A report of the exhibition will appear in our next.

FORTHCOMING EXHIBITIONS.

1902.	
February 15–Mar. 8 ...	Edinburgh Photographic Society, Society's Rooms, 38, Castle-street, Edinburgh. Secretary, J. B. Johnston, 52, Hollybank-terrace, Edinburgh.
March 1-8	South London Photographic Society, Public Baths, Church-street, Camberwell. Hon. Secretary, Frank Goddard, Woodlands, Vanbrugh-hill, Blackheath, S.E.
Mar. 1902	Corporation of Glasgow Photographic Exhibition and Competition. Hon. Secretary, Peter Macnair, People's Palace, Glasgow.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

KODAK, LTD., AND THE TRADE.

To the Editors.

Gentlemen,—Your corespondent, Mr. A. Levy, gives us a very gloomy idea of the future of the photographic trade in England, but the only advice he gives is, that we refuse to be bound by conditions of sale, that we do not refuse to sell what, in our opinion, may be as good or superior to the goods supplied by the "monopolists," and that we do not allow ourselves to be controlled by a few shillings profit.

This is good advice, and well worth considering, therefore let us consider it, taking the second piece of advice first, for it is the most important. Can we replace Kodaks by as good or superior cameras, and can we replace the films by others equally good? Not yet, at any rate, then I say that to refuse to accept a fair profit under the circumstances is childish.

We are promised better cameras at half the money. Well, there will be plenty of time to refuse Kodak's conditions when we have examined these wonderful cameras. We shall then be in a position to judge, and if they are such bargains as we are told they are, we shall be compelled to purchase or lose our trade; but we have not seen them yet, and, having heard similar tales before, "I have my doubt." Any way, we cannot do wrong if "we make hay while the sun shines."

We must not forget, however, that the profit on a guinea camera will only be half that on a two guinea, and, although we might sell more, the cost of distribution would be greater and our profit less after the rate.

Mr. Levy, as I take it, has made enough money to be able to be "nearly out of business," and as advice comes well from a man who has made his pile, we usually are only too pleased to be favoured with it; but we want the advice that has helped to make the pile, not the sort that the old lady gave to the workman who was slipping down the roof of a high building, "Don't fall, or you will be killed." Does Mr. Levy understand that a very large number of photographic dealers all over the country look to Kodak for a large amount of their profits? What are they to do if they refuse to accept Kodak's terms? Having nothing to take the place of Kodak's goods, Mr. Levy seems to think that they are in duty bound to lose their profit. No, Mr. Levy, you can't expect them to place themselves in such a position without you show them how they will make good their loss.

I think you are on the fence, Mr. Levy, and your advice seems to be independence, not profit, but if you had followed your own advice you would not be "nearly out of business," but quite. I think there is little doubt that you banked your profit and passed on the independence as advice. This is, I think, what your letter teaches, and I have no doubt my fellow dealers will be pleased to follow that part of your unwritten advice and bank their profit and pass on the advice when they are in a position to retire.

Now, Mr. Levy, read my letter again, and you will see that I do not agree with Messrs. Kodak, but as you say "the big firms depend altogether on retailers," and if they want our trade let them get it by honest competition; but I fail to see what right they have to expect the dealer to fight their battles for them.

We hear rumours as to what we are to expect and of what the English manufacturers are doing. The latest is, that a certain well-known exporter is away in America arranging for a competitive set of cameras, so that we are expected to make the fortune of one American firm because we are hurt by the treatment of another, or, in other words, we have our choice of being either scalded or burnt. Is there no British firm that can give us a British camera of equal value to Kodak, using British capital and British workmen. Give us a good all-British camera and then there will be no need to ask the dealer to push it against any foreign make camera; but as it is, I fear there is no help in that quarter, and for my part I think we might as well sell a known camera like the Kodak as any other foreign make.

Another rumour—and I sincerely trust that it is only a rumour—is that our discounts on plates are to be reduced by 5 per cent. Let us hope that we may have the assurance of the Plate Makers' Association that the rumour this time is wrong.

Mr. Levy wonders what I should have written had I been "simply proprietor of Kodak, Ltd." Really, I don't know, but I have not the slightest objection to the position, and if Messrs. Kodak, Ltd., are troubled with the same wonder an offer by wire will be accepted, and the cost of the wire duly refunded. (Clerkenwell Road papers please copy.)—In the meantime, I must simply sign myself, yours faithfully,

W. E. Dunmore,
(still) proprietor of the Tella Camera Company.
110, Shaftesbury Avenue, W. February 22, 1902.

FORMULA WANTED.

To the Editors.

Gentlemen,—Would the author of the valuable article on "Halation" in your issue of January 31 kindly give a formula for converting the silver in the gelatine negative into chloride (p. 87, col. II., line 20)?—Faithfully yours, MAX FERRARS.

Freiburg I, Baden, Hilda-Str. 56.
February 12, 1902.

THE OLDEST LIVING PROFESSIONAL DAGUERREOTYPIST.

To the Editors.

Gentlemen,—I am much inertested in the question, believing that I can claim the distinction. I signed articles of apprenticeship with J. E. Mayall, of 433, Strand, in the year 1848. At the time there were only four professional daguerreotypists, viz., Beard, the patentee, Mayall, Claudet, Henderson. I daguerreotyped at the Exhibition of 1851, where I had the honour of speaking to her late Majesty, the Prince Consort, Duke of Wellington. After some seven years' service I engaged with the late Jabez Hughes, of Glasgow, still daguerreotyping. Mr. Hughes and self left Glasgow for London, and abandoned daguerreotype for collodion. Practically I have been daily engaged in the various processes of photography for the last fifty-four years, and am still in harness.—I am, yours, etc.,

GEORGE CASSINELLO.

Forest Hill, S.E.
February 14th, 1902.

TITAN SCARLET S.

To the Editors.

Gentlemen,—I note in a recent Journal a correspondent inquires if any other readers have found this dye of value as a sensitiser for dry plates. I otbained a sample of the dye through Messrs. Burgoyne, Burbidge and Co., and have carefully tried it with a formulæ given, and also in other ways, and in no case have I obtained any action in the red. Its action is just what might be anticipated, from a spectroscopic examination of the dye in solution; it gives an ill-defined band in the blue green, which, however, is very weak, and only brought out by prolonged exposure. I fear that for the purpose named the dye is of no value whatever.—Yours truly,

E. R. TURNER.

8, Queen's Road, Hounslow.
February 17th, 1902.

PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION'S FIRST ANNUAL DINNER: SPECIAL RAILWAY ARRANGEMENTS.

To the Editors.

Gentlemen,—On March 6th, 1902, excursions will run for half, one, or more, days from the large provincial towns, especially from Liverpool, Manchester, Huddersfield, Halifax, Bradford, Leeds, Sheffield, Derby, Birmingham, Nottingham, Loughborough, Leicester, etc., etc., to convey, at special rates, members of the P.P.A. to their first annual dinner.

For times of departure and return and prices see bills at the nearest railway agents or booking office.

I have only just ascertained the above fact through Dean and Dawson, and Cook's office, so excuse hasty scribble, but thought worth note.—Yours truly, R. LEONHARDT.

Nottingham, February 25, 1902.

WELLCOME'S PHOTOGRAPHIC EXPOSURE RECORD, 1902.

To the Editors.

Gentlemen,—We have pleasure in informing you that we can now supply this book in the Italian language, and with exposure and other tables suitable for use in Italy and other countries on the Mediterranean seaboard.

The sale of the English edition has already far exceeded that of all last year's issues. We are now reprinting, so that we may be able to meet further demands without delay. All who require copies should not fail, however, to place their orders at once so as to avoid disappointment.—Yours very respectfully,

BURROUGHS WELLCOME AND CO.,

Snow Hill Buildings, London, E.C.
February 19, 1902.

DEVELOPING.

To the Editors.

Gentlemen,—A recent writer has described developing as a secondary consideration to exposure. Doubtless he has taken this extreme position with a view to emphasise the necessity for correct exposure. At any rate, we credit him with that object; otherwise the remark savours of absurdity. Practice proves that both subjects are wedded, the one in large measure dependent on the other. While exposure may be the taking of the picture, developing is certainly the making of the picture. In the former there is a certain element of chance and risk; we have to question precedent, or we may have acquired some certainty through long experience and instinct, yet the question remains an open one, which even the much-talked-of photo-meters has not answered: one reason being that we cannot see what we are doing at the time of making an exposure. It is when we get into the dark-room that this becomes apparent. There we work with absolute certainty, because we can watch the process from the beginning to the end, and, what is more, keep it entirely under control.

Strictly speaking, exposure admits of no latitude; it is either correct, or else it is over or under exposed. Were it not for the wide latitude offered in development, photography would be much more difficult to practice than it now is. A mistake in exposure—even a gross mistake—can, as a rule, be rectified, while the plate is being changed to a negative, provided always that the mistake is not absurd. It is for this reason that photographers remain partial to the older developing formulas, because of the latitude they allow and the consequent certainty of results. But, on the other hand, this may often encourage a feeling of negligence, which must be condemned, for after all it is just in this, as in other things, it is best to be correct, if possible.

And that is just the point this writer has raised. How often is it possible for one to give what he deems to be the correct exposure? Not, as a rule, very often. If to give the absolute exposure were an absolute necessity, photographers would often have to face the impossible. In illustration of what is meant, take, for example, everyday occurrences in the studio, where exposure is known to a nicety. Restless children will not sit out an exposure of even two or three seconds; nervous sitters cannot; the result is that the operator's exposures are entirely at the mercy of his sitters, and he has just to give the plate all he can—usually a flash, which may only represent a small fraction of the necessary exposure. Take also the case of the landscapist, moving objects, trees blown in wind, and the like often cause him to cut the exposure shorter than was necessary to get a perfect negative. And as for the snap-shot worker, he never looks for anything else but under-exposure; no sane man would use normal developer to plates that had been exposed on street scenes even under the best conditions of our climate. In such instances, the photographer's only escape is in a judicious modification of the developer. He knows the plates are not sufficiently exposed, and treats them accordingly, producing a result that—save in extreme cases when it may even be passable—could not be challenged.

Perhaps the writer did not intend to be taken too literally. He will discover that developing is a subject on which few photographers are agreed. They each have their own ideas about quality and tone of a negative, but they will readily admit that "faking" is quite legitimate when it produces the desired effect. In fact, as already hinted, they look on "faking" as so much of their art, and would scorn the intruder who dared question them why they flooded an under-exposed plate with tepid water to force up the shadows, or restrained an over-exposed plate in order to keep the shadows from clogging.—I am, yours, etc.,

RICHARD THIRSK.

100, Bothwell Street, Glasgow, N.B.

STEREOSCOPIC CAMERAS.

To the Editors.

Gentlemen,—I have lately been looking for a second-hand half-plate camera, suitable for stereoscopic work, and, thanks to a small advertisement in your columns, have had a good many to choose from. Amongst the lot I came across one which was such a remarkable example of first-class machinery misapplied, for the want of a little practical knowledge on the part of the designer, that I think, possibly, a description of it may prove of interest and use to those of your readers who may contemplate taking up stereoscopic work. I hope they are many, for of all the branches of photography on a small scale it is, in my opinion, the most satisfying and most fascinating. A gentleman offered me a square bellows half-plate camera, made by a prominent firm. It was fitted with reversing and central swing back, side swing, double extension leather bellows, rising and falling front, stereo division, Thornton-Pickard Time and Inst. behind lens stereo shutter, with adjustable centres and exposure valve, rapid rectilinear lenses, good travelling cases and tripod, three splendid dark slides, with hinged divisions, and overlapping joints; in fact, every latest movement and improvement, a real up-to-date ring to it. What more could a man ask for? Never been used; which is true enough, for, strange to say, it never could be, except under such circumstances as to be practically impossible.

It sounds strange, does it not? that such a combination of first-class apparatus should be useless for stereoscopic work; but, as I shall explain, it was, and that simply for want of a little practical knowledge on the part of whoever put it together. The camera was a good

one, well made, and designed for half-plate work, and, like most half-plate cameras, was designed for use with lenses of eight and a half-inch focus, and over. The back of the camera had to be pulled back a certain distance before it could be clamped to the rack and pinion focussing gear, and when fixed at the nearest possible point to the front, the distance between the front and the ground glass was about seven inches. To the initiated I need say no more, that upsets the apple cart so far as stereo work is concerned, lenses of over six inches focus being very seldom used in that branch of photography. As a matter of fact, long-distance stereoscopic photography being out of the question, long focus lenses are not applicable.

However, to continue my story, to the front of the camera was attached the most "up-to-date" Thornton-Pickard behind lens stereo shutter, thus further increasing the distance from the ground glass to the lens by about an inch and a half, and to complete the wreck a pair of nameless rapid rectilinear lenses of about five and three-quarter inch focus was added, one of which was about a quarter of an inch longer focus than the other.

I well remember the old stereo camera of my youth, sliding box pattern, fitted with a pair of lenses, each having a ratchet and pinion focussing jacket. You first slid out your box and clamped it at about the right place, and then focussed each lens separately, but the box slid true, and the rest was easy. Now, in modern "up-to-date" cameras, as everybody knows, the back does not slide true, but provides a side swing, and in the particular camera under consideration the only possible method of getting the stereo lenses in focus was to push and pull the back about until one of them was focussed, then clamp that side, and focus the other in a similar manner, and when that had been accomplished, it was revealed that one lens was about a quarter of an inch longer focus than the other, the side swing having enabled both to be focussed. That, I submit, is not a practicable process, though it may be possible to one possessed of skill, patience, good sight, and good temper. Yet every component part of this apparatus was of the best except the lenses, and they were not bad examples of the nameless variety, except for the error in pairing.

Is it not strange that such good machinery should be so misapplied, or, should I say, badly mixed? It was not so when we worked with simpler tools, but those who bought them knew how to use them, and it seems to me that the want of practical knowledge is not now confined to those who buy, but it is also shared by those who supply the tools; but what a pity it is that such a misfit instrument is liable to fall into the hands of a beginner, who pays an immense price for it and gets nothing but disappointment, and an incongruous collection of valuable items, which are not what he expected, and ensure failure, through no fault of his own.—I am, yours, etc.,

P. O. P.

LANTERN LECTURES AT THE R.P.S.

To the Editors.

Gentlemen,—Much of the success of a lantern lecture depends on the company being able, not only to see the pictures, but also to hear the lecturer—comfortably. On more than one occasion my own enjoyment of the beautiful pictures and interesting lectures has been very greatly marred, first by the quite unconscionable head gear of the ladies just in front of me, and secondly by the frequent bursts of applause as a fresh picture is thrown on the screen. What is more annoying than to hear "The next picture is . . . . . (Applause.) As to the obstructed view, who has not known the miseries of having to dodge the matinée hat? I venture to suggest that the chairman, just before the commencement of each lecture, should ask the audience to reserve their applause until the end of the show, and also ask the ladies to kindly remove their hats and bonnets, out of piteous consideration of the weaker brethren. I feel sure that the ladies, whose presence we all so heartily welcome, only need the hint, and this concession, together with that of reserving the applause, would greatly add to the enjoyment and appreciation of these excellent lectures. And I feel equally sure that these small matters of mild reform have only to be whispered to the new council and Utopia will be within measurable distance.—Yours,

F. C. Lambert.

FLASHLIGHT PHOTOGRAPHY.

To the Editors.

Gentlemen,—In your last issue a letter appears, written by Mr. Hubert, re flashlight work. Having been shown Mr. Hubert's apparatus by that gentleman personally, I found that it did not meet with my requirements, and I consider it somewhat bad taste on his part, knowing that I paid him three visits in order to examine same to question my education on the subject. I trust shortly to give a practical demonstration, showing that I have an apparatus fulfilling all my requirements, and shall have pleasure in showing Mr. Hubert its many advantages.—Thanking you in anticipation for the insertion of this letter, I am, gentlemen, yours very faithfully,

E. Milner.

67, The Grove, Wandsworth.
February 24th, 1902.

SUPPLEMENTARY IMAGES ON NEGATIVES.

To the Editors.

Gentlemen,—Most probably your suggestion that a pinhole in the camera is the cause of these images in many cases is correct, but it could not be so in my case; for, as I stated in my former letter, there is no building having the same outline visible from the window from which the plates were exposed; and, moreover, in some instances, the building is inverted in the negative. The pinhole theory was my first idea, but I had to dismiss it after ascertaining these facts.—I am, yours, etc.,

J. Tilfor.

231, Elgin Avenue, Maida Vale, W.
February 17th, 1902.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "The Editors, The British Journal of Photography, 24, *Wellington-street, Strand, London, W.C.*" *Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* Messrs. Henry Greenwood & Co., 24, *Wellington-street, Strand, London, W.C.*

Photographs Registered:—

E. P. Roberts, 23, Vicarage-road, Watford. *Photograph of Steel Engraving of E. Jenner.*

J. A. Ashbolt, 10, Exmoor-road, Southampton. *Photograph of C. B. Fry. Photograph of Southampton Football Club.*

J. A. Horsburgh, 4, West Maitland-street, Edinburgh. *Photograph of late Prof. A. B. Davidson.*

Copyright.—"Cabinet" writes: "Some time ago I photographed an athlete, a prominent one, for an advertisement for myself, and got no payment from him. Now he appears, as I have taken him, in the catalogue of the manufacturers of the bicycle he rides, and also in two weekly papers, as an advertisement for their goods. Can I claim anything from those people?"—In reply: If you registered the picture, you can; if not, you cannot. If you register the photograph now, you can only claim for copies made after registration.

Copyright.—"Old Photographer" writes: "About twelve years ago, more or less, there was an action by the London Stereoscopic Company against a copier of a cricket group of theirs—if I remember, Jackson. I think the Court held the Stereoscopic Company had no copyright, as the operator who was sent to take the group was the maker of the picture, and should have registered it and afterwards made an assignment of it to his employers. Is that opinion still held to be the law?"—In reply: Yes; under the existing Copyright Act.

Relief Photography.—"Subscriber" writes: "Could you kindly inform me whether there is any practical method of producing photographs in high relief, or if a matrix could be made in gelatine, or any other substance, by photography, whereby plaster casts could be moulded? Thanking you in anticipation."—In reply: Yes, by the well-known "swelled-gelatine" process. From the relief so obtained moulds in plaster of Paris may be obtained. Space in this column is far too limited to give full working details, but they may be found in all the works devoted to photo-mechanical processes.

The Lippmann Process.—"Interference" asks: "(1) What is the best book on the Lippmann process of colour photography giving practical instruction, preferably in English? (2) Is it possible to obtain an example of the process for inspection? (3) What is the best house to apply to for the "quicksilver cassette" or other special appliances?"—In reply: (1) "Colour Photography," published by Messrs. Marion, Soho Square, contains an excellent description of the process. (2) Mr. E. Senior, of the Battersea Polytechnic, Battersea, London, S.W., might let you see a specimen. (3) Penrose & Co., Farringdon Road, London, E.C.

Copyright.—J. T. M. & Sons write: "If a photographer takes a photograph of a celebrity, such as a minister, is it legal for an editor of a paper to publish in his paper or books reproductions of same without the permission of the photographer, or could the editor be made to pay for so doing? The photo was purchased from us for 1s., and no mention as to reproducing was made at the time. Also, if views and photos of buildings are purchased, have they a right to reproduce without consent or payment?"—In reply: Yes, certainly, unless the photographs are copyright. Anyone who purchases an uncopyrighted photograph can do what he likes with it.

Marine Glue.—F. Weitzele says: "I want some marine glue, to fill up the joints of some wooden trays I am making for photographic purposes. Will you please tell me how to make a pound or so, as I shall not want more; proportions of ingredients for that quantity; and the method of mixing?"—In reply: Marine glue is a little difficult to make in small quantities of good quality, and, moreover, it is a somewhat dangerous operation without proper

appliances. As the quantity required is so small, we should advise our correspondent to purchase it ready-made. It may be had from houses such as Townsen & Mercer's, Bishopsgate Street, at a very moderate price.

THE ROYAL ARMS.—A. R. asks: "Would you be kind enough to advise us whether we are entitled to use the Royal arms under the following circumstances:—Our predecessor was ordered to Sandringham to photograph some of the King's cattle, which were supplied to the King's agent, and since we have taken over the business we have also supplied copies from the negatives. Could you kindly give us some idea to whom to apply for permission and the probable cost to use the Royal arms, if you think we can claim to do so?"—In reply: You will have to apply to the Chamberlain's Office for the Royal warrant to use the Royal arms; but we may tell you that you are very unlikely to get it, unless you can put forward a better claim than you mention in your letter.

AGREEMENT.—"UNSIGNED AGREEMENT" writes: "I took my house on a three years' agreement, and signed it myself. A friend of mine came to live with me, taking part of the house and agreeing to pay half the rent and half the rates. He has done so for this last eighteen months, but now refuses to pay half the rates, saying that he is not responsible for them. What can I do? I must say that I had no written agreement with him, also that I have never given him a receipt for rent or rates he has paid to me. Can I add the half-rates to the rent? I am told I can—is that so?—as they have no proof to say what rent they pay."—In reply: A solicitor had better be consulted. We cannot undertake to answer legal queries when they are in no way connected with photography or photographic matter.

SHADED VIGNETTES, ETC.—"INQUISITIVE" writes: "Will you kindly inform me (1) how the shaded vignette effect of the enclosed pictorial card is obtained? Is it done inside the camera? I should be glad if you would kindly give me any details. (2) Are there any dark-rooms, in or very near the West End, where one may change plates or develop, especially provided for the use of amateurs, etc.?"—In reply: (1) The portrait (which has been returned by post) appears to have been shaded in the camera. Full working details of the method were given on page 163 of the volume for 1900, and we cannot spare space here to repeat them. (2) Yes; several of the dealers at the West End, who cater for amateurs, have a dark-room for their use. We cannot, however, for the moment, call any particular one to mind at the West End.

THE CARBON PROCESS.—W. E. R. writes: "In reading through Mr. J. W. Swan's description of the carbon process, as devised by him, in your issue of January 24th, there is one point which I cannot quite understand. Would you be kind enough to enlighten me? The inventor states that in the permanent, as in the temporary, mode of mounting, the tissue is cemented with its photographically-impressed surface downwards to the surface to which it is to be permanently attached. Would not this result in a reversed picture when finished, in the case of the permanently-mounted tissues?"—Yes; but if the picture is required non-reversed, it is developed on a temporary support and transferred from that to the permanent one. As you appear to be quite unacquainted with the carbon process, we should advise you to get a manual on the process, say that of the Autotype Company.

DISCOLOURED PRINT.—"SEPIA" writes: "I should esteem it a favour if you would kindly tell me (1) the cause of the peculiar colour of enclosed print? It is Velox, toned with uranium, and has been done only two months. I am extremely careful and cleanly in all my work. (2) In your article in current number 'Gas v. Electric Light' you say 'papers ot Velox type, when sepia tone is desired, are entirely dependent on exposure.' Can they not be toned except by this? (3) Your issue of last week gives formula for sepia. Is this suitable for papers of Velox type? I am extremely anxious to obtain sepia tones, but up to the present have not been successful?"—In reply: (1) From the appearance of the print, it is obvious that you have not been so careful in your manipulation as you thought you were, otherwise it would not be in the state it is within two months. (2) With a properly-timed exposure and suitable development, sepia tones are obtained without after-toning with Velox paper. (3) Yes.

COPYRIGHT.—"ANXIOUS" writes: "A photographer having been made a bankrupt, the Receiver, through an auctioneer, sold by auction all bankrupt's goods. I bought the mounts, with bankrupt's name and address printed thereon, also some negatives and positives of celebrities and public and private persons. (1) Can I legally print and sell copies of such photos, mounting them on the printed mounts. (2) Can I legally print copies of the photos and exhibit them in shop windows and sell them to the public? I refer more particularly to the celebrities and public personages. (3) If I am not entitled to use the printed mounts, can I publicly sell the prints, if on plain mounts? I have no means of knowing if the sitters paid for their photos and acquired a right to the copyright or not."—In reply: (1) We presume so, unless the sitters object. (2) Yes, unless the bankrupt holds a copyright in them, and that was not sold with the negatives. (3) Yes, unless there is an existing copyright in them. But you are not entitled to sell copies of private sitters, who have paid for their portraits, without their sanction.

STUDIO INSURANCE.—"POLICY" writes: "On my commencing business here, eight years ago, I built a substantial wooden studio, on brick base, to the requirements of the local Dean of Guild Court. Although I can only use a gas stove for heating studio, I had great difficulty in getting it insured against fire, and could only get one company to take it at all, at a premium of 7s. 6d. per cent., which covered the negatives. Now they refuse to renew the policy at any price, and, after trying a great many insurance companies, I have got the London and Lancashire to take it up at the rate of 10s. 6d. per cent., but they won't cover the negatives at any price. Now, I see in last issue of the JOURNAL that Edinburgh photographers are charged at the rate of 4s. 4d. to 5s. per cent., and want it reduced to 3s. I will feel much obliged if you can give me name of any firm that would be likely to give me a policy at a much less rate than 10s. 6d."—In reply: We are sorry we cannot. Better write to the local secretary of the P.P.A., Mr. F. P. Moffat, Princes Street, Edinburgh; he may be able to give you the desired information.

COLLODIO-CHLORIDE PAPER.—P. ACKARY writes: "I want to make some collodio-chloride paper on a suitable support, but have some difficulty in getting an emulsion that will not crack whilst either washing, toning, and fixing (as per print No. 1). How can I remedy that? I have added 2 drops of castor oil and 6 of glycerine to the ounce of emulsion—result, No. 2. What is the cause of reticulation also in Nos. 3 and 4. No. 4 is Liesegang's Transfer Collodion Paper, made for the purpose, but it cracks even more than the other. The formula I use is about as follows, per ounce:—Ether, ½oz.; alcohol, ½oz.; celloidin, 10gr.; nitrate of silver, 10gr.; lithium chloride, 1½gr.; citric acid, 3gr. Both the silver and chloride, etc., are first dissolved in part of the alcohol and carefully added to the collodion. The silver first, then the lithium-citric solution, shaking well all the time. The paper prints well, and lays perfectly flat until it is washed; then it curls up, and any tendency to uncurl it causes cracks all over it, rendering it useless."—In reply: It would seem from the prints that the pyroxiline used is not suited for the process. In the example No. 2 it is evident that too much castor oil and glycerine were employed. The curling in the washing water may be, doubtless, avoided in the following way:—When the prints are first immersed in the water, keep them pressed flat on the bottom of the dish for the first few minutes; they will then be found to lose their curling and cracking propensities.

APPRENTICESHIP, ETC.—"ETUM" writes: "I have for four years been with a local photographer, who, however, proved a very neglectful master, restricting me to minor rudiments of the trade; consequently I was not let into the secrets of various toning-bath formulæ, and even in burnishing line—that my master did entirely by himself, or his daughter, in a private room. I started on own account a year ago, and have established a fair connection, but I find customers invariably require up-to-date colours in toning—such as rich brown, etc.—and I find other professionals are very reticent in enlightening me, even when I offered them £1 or £2 for the tip. Can you help me? (1) Formula for rich brown tone for portraits and groups. (2) What is the usual brand of P.O.P. as used by most portrait photographers? (3) Where can I obtain information as how to burnish (hot) properly? N.B.—On the completion of my four years' service I had to leave to make way for another apprentice, so you will understand my position."—In reply: "If you were duly apprenticed you should have enforced your master to teach you the trade properly, and you could have done so. (1) Use the formula supplied by the makers of the paper you employ, and, for the brown tones, stop the toning at an early stage. (2) Every photographer uses the brand of paper he prefers, and all the recognised ones are good. (3) We should imagine that any employee in a photographic establishment would show you how to burnish prints for a trifle, if you do not know how to do such a simple thing yourself.

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*** *The Editor can only be seen by appointment.*
*** *We do not undertake to answer letters by post.*

EX CATHEDRA.

Reparing Cracked or Broken Negatives.

In the *Bulletin de la Société Française* Monsieur H. Reeb describes the means by which the repair of a cracked or broken negative may be considerably facilitated. Take an old negative, or preferably an undeveloped fixed plate, and soak it slightly in water, so that the gelatine is only partly swelled. The cracked or broken negative should be placed upon this, with its back to the gelatine, and gently but firmly pressed down. By the swelling of the gelatine the air is excluded, and the two plates become firmly attached to each other. If an old negative has been used as support, the broken negative must be coated with enamel collodion, and stripped in the usual way, but in the case of a cracked negative mounted upon an unexposed, fixed plate, stripping is not a necessity.

* * *

The Troubles of the German Photographer.

We recently drew attention to the impoverished condition of a large number of German photographs, as shown by the small average consumption of dry-plates in that country. Further evidence of the fact is afforded by the bitterness which seems to have prompted some persons to draw the attention of the Prussian Minister of Commerce to the practice of some amateurs who accept payment for their photographs. Happily a better feeling prevails in this country between amateur and professional photographers. As a consequence of the interference to which we have referred, the Minister of Commerce has issued an order that any amateur who takes a photograph for money outside his own place of domicile, without the same having been previously ordered, must pay for a licence, if the negatives are exposed and developed at the place of the person giving the order, and the prints made by the photographer at home. The order can only apply to comparatively few cases, and is quite useless so far as the improvement of the position of the professional photographer is concerned. It seems that the wandering professional in Germany has to provide himself with a licence, and some idea of his class may be gathered from the following official description of one of his calling:—"Following the industrial occupation of a photographer, in search of subjects for the camera and for the preparation of prints. Vendor of fancy articles, cigars, slippers, cheese, fish, small household requisites, and photographs prepared by himself."

* * *

Photography and Perspective.

La Nature recently published an article by M. Bartholdi on the use of photography for the purpose of ascertaining the best proportions for monuments, or buildings, when the architect, or sculptor, may be in doubt as to the dimensions that should be adopted to suit the surroundings. It was used by him in the case of the Palais de Longchamps, the Statue of Liberty at New York, and the Lion at Belfort. A small model of the projected monument should be made and photographed in a strong light. A print should be coloured to resemble the material to be employed, and after cutting out, it should be fastened on the top end of a thin wire This wire should be wound round a walking stick or umbrella, so that the print may stand upright, when the stick is brought to the shoulder and sighted like a gun. If a pole, marked with a scale of feet, or yards, be then placed at the spot where the monument is to be erected, the most suitable proportions for it may be easily ascertained by placing oneself at the best point of view and looking along the stick at the photograph. The coil of wire permits of the photograph being slid backwards or forwards, and when the best distance is found the height may be read off the scale marked upon the pole The principle underlying the method is, of course, the angle of view under which the photograph is seen, with that to be adopted for the projected monument. The same effect may be observed by looking at a photograph, with one eye closed, at the focal distance of the lens with which it was taken. The various parts will then assume natural proportions.

The Causes of Defective Definition. A very interesting communication from Messrs. A. and L. Lumière and M. Perrigot is published in *Le Photogramme* concerning the principal causes of the want of sharpness in a negative. These are grouped under three headings:—Diffusion of light in the sensitive film; errors in focussing, due to want of agreement between the position of the surface of the focussing screen and that of the sensitive film; and residual chromatic aberration. In the apparatus used for examining these three sources of error, the focussing screen was a perfectly flat piece of glass ruled with fine lines. The image was examined by aid of a microscope, with rack and pinion adjustment, and the objective was focussed with a micrometic screw. To ensure perfect register of plate and screen, the latter could be removed, and the former placed in the same position. The objective was a planar of 130 m.m. focus and *f*3.8 aperture. The test object was a scale placed at 6 metres distance in full sunlight. The first experiments were concerning the influence of the grain of the plate, and it was found that coarseness of grain was the principal cause of unsharpness. Scarcely a trace of the image of the scale, formed upon a rapid plate, can be seen under a magnification of 75 diameters, whilst a fairly good rendering of it was obtained under similar conditions upon a plate coated with Lippmann emulsion. To ascertain the permissible limit of inaccurate focussing, or false registration, the objective was thrown slightly out of focus, and it was found that a difference of $\frac{1}{8}$ mm. was sufficient to render the definition worthless, under a magnification of 75 diameters, when the full aperture was used. Residual chromatic aberration was also found to be the cause of imperfect definition with some lenses, but in the case of the planar it was a negligible factor. Diffraction due to the use of the diaphragm was also considered. In the use of the telescope and microscope, a larger aperture is always preferred when more perfect definition is required, and the same conditions should also be observed in photography, when the objects to be photographed lie in one plane. The definition of the lens which was used showed a great falling off in quality at *f*12.5, when compared with that of another photograph taken at full aperture, both negatives being magnified 75 diameters. The authors come to the following conclusion upon the subject, in reference to photographs of objects situate in a plane perpendicular to the axis of the lens, or in the vicinity of that plane, when the negatives are required for subsequent enlargement of considerable magnitude:—

1st—The plate should be free from grain like those used in the process by interference.

2nd.—The use of special means for focussing, such as described, so that the registration of screen and plate may be as perfect as possible.

3rd.—The use of lenses as free as possible from chromatic aberration, and, should it be present, to make a corresponding allowance for the error.

4th.—To use full aperture, if the lens is satisfactorily corrected.

* * *

Camera Construction. The remarks of Messrs. Lumière and Perrigot, quoted in the preceding paragraph, point to the necessity of the utmost precision in camera construction if full advantage is to be secured of the great improvements in lens construction which have been made within the last few years. Not only is this the case with hand cameras, which are so often used for obtaining negatives for subsequent enlargement, but also with large copying cameras. The modern copying lens is four times more rapid than the older type, for which it has been substituted, and we think that photographers engaged in photo-mechanical work would do well to test the register of their dark-slides. It is quite possible that wear and other defects deprive the operator of the full advantage of the lens which is being used. We were strongly impressed with this fact recently when examining test negatives made by two photographers upon whose skill and care we could fully rely Although the photographs were taken with the same lens, there was a marked difference in the sharpness of the two photographs, and it is highly probable that the camera used by one of them was at fault.

* * *

The Bill to Amend the Patent Act. When Mr. Gerald Balfour introduced his New Patent Bill, and it was read a first time, he said that it would be as well for a considerable time to be allowed between the first and second reading, in order to give an opportunity to those interested to study its provisions. He also said that he would be prepared, with an open mind, to give consideration to any representations that might be made to him in the interval. This is as it should be, for there is no question that our Patent Law requires amendment in more than one direction. This Bill, as is tolerably well known, is the outcome of the report of a committee appointed by the Board of Trade in 1900 to inquire into the matter of the Patents Acts. One of the objects of the new Bill is to prevent the granting of patents for inventions that have obviously been anticipated. It is mentioned that of a hundred complete specifications filed about forty-two could be shown, from information in the office to have been anticipated. Had the hundred specifications been excusively relating to photographic patents, we venture to say that the proportion of the anticipated ones would have far exceeded forty-two. Under the present Acts the office makes no inquiry, it simply takes the money and asks no questions. For example, "A" may apply for a patent, and next week "B" may lodge an application for essentially the same thing, and in due course both will be sealed, unless the sealing is opposed by one or other of the applicants, or, perhaps, by some other party. The Patent Office does not interfere on its own initiative. The new Bill proposes that the Patent Office shall examine the specifications of previous patents to see if they contain any anticipations of the invention for which a patent is claimed. This, of course, is a step forward, but it does not go far enough, at least as regards photography, because many good inventions have freely been given to the public, through the journals, that have afterwards formed the subject of letters patent. If we go back to the early volumes of this and other journals, we shall find many things published in them that have since been patented, and the patents have passed as being valid, though, of course they would not had they been contested. Take, for example, the turntable in the camera that was patented some years ago; it was used in the early fifties. Again, in connection with roller slides with daylight spools one was described in 1855 for wax paper negatives, in which the inventor says, "As a further precaution against light, and to guard against the evil effects of the air upon the prepared paper, I leave the black calico band a foot longer than is necessary to carry all the (sensitive) paper, so that when all are wound on the roller, the last five or six folios are plain calico, thus excluding the light." This is precisely what is done in the case of present-day rollable films and black paper. What is really required, particularly with reference to photography, is that the Patent Office inquiry should not be confined to previous specifications of patents that have been taken, but also to what has previously been published on the subject. This is actually done by the German Patent Office, and, possibly in a less complete manner, by the

American Patent Office. When a patent is granted in either of these countries it may fairly be assumed that it is a valid one. This is far from being the case with those ranted here without any inquiry whatever.

* * *

Battle Photographs. When the present deplorable war in South Africa broke out, now nearly two-and-a-half years ago, it was believed by many that, owing to the number of cameras carried by our officers, and others, a plentiful crop of photographs would be secured, and that in this way the struggle in the Transvaal would be illustrated in a manner never before found possible. It was those, as usual, who had never handled a lens who anticipated the most, and the public were led to believe that, by means of the perfect apparatus now available, hand-to-hand fights, struggles for the standard, captures and recaptures of guns, and such like episodes, made familiar to us all in every recent war by the pencil of "our special artist at the front," would be presented to them in the guise of truth-telling photographs. We are now, after all these months, in a position to estimate how far these prognostications are likely to be verified. Thousands of photographs have been taken on the South African veldt, and many of these have been exhibited by the Kodak Company, or published in the illustrated newspapers. Some of them, we fully admit, are of the greatest interest as records of episodes in one of the greatest wars of modern times. But, truth to tell, they are not battle subjects, and can be more correctly described as studies in still life. They show us how swollen rivers were crossed by means of hastily-constructed pontoon bridges; how "Long Toms" were trained on distant Boer earth-works; how the besieged residents of Ladysmith, Kimberley, and Mafeking were fed, and sheltered from the hurtling shells of the enemy; how the victorious troops entered Pretoria; how the abortive proclamations were posted up on pillar and post; and how buildings were reduced to matchwood by projectiles made in Germany. But of battle scenes there are none, and competent photographers well know the reason why. A man with a camera is as much out of place on a battle-field as is a bull in a china shop, with the difference that it is the intruder who would be smashed up, and not the china. The only successful battle scenes which we have come across are of the cinematograph kind, and although these have been received with thunders of appreciative applause by music-hall patriots, it is an open secret that the pictures have been faked from carefully-trained models. Possibly a camera concealed in a block-house might, with the aid of a powerful flash-light apparatus, be made to record a real incident of warfare, and perhaps such a photographic feat may be accomplished before De Wet is captured, and the drama in South Africa comes to a close.

* * *

Photographs by Wire. The death of Mr. Rupert G. Williams, which occurred on Saturday last, at Heywood, removes from the field of invention one of those engaged in the seemingly almost impossible task of conveying sketches and photographs, or, rather, of reproducing such pictures at the end of a telegraphic wire. He is spoken of in the obituary notices as being the inventor of the telepantograph, an instrument for sending sketches by wire, and is said to have been well known on both sides of the Atlantic. This idea of telegraphing pictures, so that, for example, a war correspondent could illustrate his own articles with more or less authentic representations of the scenes described, has had a strange fascination for many, but as far as we can remember, in most of the schemes brought forward theory has outpaced practice. Nearly all these schemes are based upon the circumstance that a selenium cell will vary its resistance to a current of electricity according to the amount of light concentrated upon it. But as yet nothing practical has resulted from the efforts of those who have rung the changes upon this phenomenon. The last invention (?) of the kind was reported from Paris, where, it was stated only a few weeks ago, a dentist had discovered a means of seeing a correspondent who was miles away, while he talked to him through the telephone. How the miracle was wrought, deponent said not, nor did he hint at the use of selenium. Probably he did not know of the existence of such a substance. Proceeding from the consideration of romance to that of reality, we may note that pictures of a kind have been successfully reproduced at the end of a wire. Bakewell in 1850 designed a workable instrument for this purpose. The drawing to be reproduced, at a distance, was executed in resinous ink on tinfoil, which foil was attached to a cylinder. As the cylinder revolved, it was traversed by a pointer spirally, the electric connection being broken whenever one of the resinous lines was crossed. A similar revolving cylinder at the receiving end was traversed by a like pointer, which caused decomposition of a chemically prepared paper stretched on the cylinder so long as the current was uninterrupted. It will be seen that by this means a negative image of the original drawing was produced. Thirty years later d'Artincourt improved upon this method, and about the same time Cowper's writing telegraph was invented, which within certain limits would reproduce at one end of a wire the lines made with pen and ink at the other end. There were grand things prophesied for these inventions at the time of their production, but they never came into general use. We may assume from this circumstance that, if a more perfect system of telegraphing pictures were introduced to-morrow, it would prove to be, like its predecessors, but a nine days' wonder. Those who know the difficulties attached to picture making, when the entire work is under the control of hand and eye, are best able to appreciate the difficulties of automatic reproduction at the end of a wire.

SOME BUSINESS ASPECTS OF PHOTOGRAPHY.

I.

The professional photographer occupies a somewhat singular position with regard to what may be termed the business aspect of his work, inasmuch as while most professional or business men have been trained to their work, served an apprenticeship to it, in fact, the majority of professional photographers have taken up the art from the dictates of a natural aptitude or from a feeling that it will offer a commercial field to their artistic proclivities. Even those who have "learnt their business" in an established sudio too frequently are not at all brought into touch with the business departments, their work being confined to studio, dark-room, and printing-room. A very natural, and, unfortunately, too frequent corollary to this lack of business knowledge is business disaster. It must be within the cognisance of many of our readers that some of the best photographers who ever developed a plate have become the most egregious business failures. It has occurred to us that an occasional treatment of such subjects as are indicated by the title of this article may be found useful to such of our readers as have been without that business experience which is of such value in the conduct of any profession or business whatever. We do not propose to treat the subject in ordered sequence, but rather as accident or casual occurrences may dictate. Our own experience of one particular

department of this business ineptness has been so pronounced that we will first treat of it. We refer to—

THE PACKING OF PICTURES AND GOODS,

including in our purview both the receipt and despatch of photographs and all the numerous incidentals that go to make up the business of professional photography. In the large towns a photographer will naturally have most of his goods delivered by hand from a local dealer, but in smaller places he may have to receive the bulk of his goods through the medium of railway or canal. The phase which has been most in evidence in our own experience is the mode of packing photographs, and especially negatives. It is often enough considered sufficient to wrap a negative in two or three folds of paper, put it in an envelope, duly addressed and stamped, and to drop it in the letter-box, the sole precaution against damage being a notification on the outside "with care," or "please do not stamp," or "glass, with care." The value of this latter precaution may be gauged when it is shown that the post-office authorities specially instruct the letter sorters and others that they are not to pay attention to any message written on the outside of a letter-parcel, such notices as "fragile" excepted. Then again, it is forbidden to send by post any hard object likely to cause damage, so that a parcel containing slightly-protected glass is liable to be detained, and a notice of the detention sent to the sender, who must then send to the detaining office for his rejected parcel. The extent to which the flimsy packing we allude affords protection can be estimated when we remind our readers that every envelope is submitted to a heavy blow in the process of stamping the post-mark and another in obliterating the stamp, facts that, it might be thought, would be patent to everybody.

But such despatches would only be of occasional occurrence, negatives sent out for enlarging bearing a small proportion to posting of the cartes and cabinets of the usual output of the studio. Here the first advice to be given is to use the utmost neatness and care in packing up. Much depends on first impressions, and a carelessly and untidily-wrapped parcel at once creates a feeling of disfavour. It is not our province to suggest the kind of package to employ—that may be left between the photographer and the stock-dealer; but whatever kind be chosen, it should be able to withstand the violent blow of the post-mark stamper. Even a single photograph needs a strong board on each side to protect it against injury of this kind. These precautions are nowadays of double importance, in view of the large proportion of wide-margin mounts now used. There is, however, one possible cause of injury which is impossible to provide against; that is, the breaking of a packet of photographs when sent from one or two places where the mails are delivered by automatic machinery from a train going at full speed. The bag drops into the wire nettings at such a rate as to render certain the destruction of any parcel which lies in the bag near the point of impact. We have seen scores—nay, hundreds—of photographs so injured. Under all circumstances, a parcel should be carefully and tightly tied with a knot that cannot slip, the non-adherence to such a recommendation leading to such *contretemps* as the delivery of an envelope alone, for instance, the pictures themselves being lost in the post. Many photographers, knowing the liability to injury photograps are subject to when sent under ordinary conditions, recommend their clients to have their pictures sent by parcel post, and so give facilities for extra packing, the cost of the postage being charged to the sitter. It should be remembered that there is now (except where the postage is one half-penny only) no occasion to mark on the outside of the wrapper "Book Post," seeing that, with the exception referred to, there is no difference in rate between letter post and book post.

A most useful business precaution to take in the matter of postages is one that a well-known photographer at a recent convention describes as always being done at his place, and that is to have a "postage-book" in which to enter the address and cost of postage of every letter or packet sent to the Post Office. The gentleman referred to stated that he found it an excellent plan in a double sense. First, it afforded an efficient check on the cash disbursements for postage stamps—always a heavy item in a photographer's business—and prevented their illegitimate employment, stamps often being looked upon as common property; and, secondly, the list of parcels, etc., dispatched proved a most useful record when occasion arose to verify the dispatch of any particular letter, etc., which had not arrived at its destination.

This leads to another point of the highest importance, especially so as so many photographs are sent by "parcel" post rather than under "letter" regulations. We presume it is the experience of almost every photographer to have had some of his parcels gone astray, sometimes through his own fault, the packing twine not having been securely knotted, and the contents being strewn all over the place, and sometimes through the carelessness of the Post Office people themselves. The "postage book" we have described is simply of the nature of a memorandum or an *aide-mémoire*, and would not be received in evidence by the authorities of St. Martin's-le-Grand. But every local office will supply, without charge, little slips of paper, with printed headings, on which to enter the name and address of sender and receiver of any parcel-post package, and they will stamp it with the office stamp when handed in along with the "parcel." No claim for loss or damage will be entertained by the Post Office in the absence of such an official acknowedgement of receipt. Now it is within our own knowledge that very many photographers never think of making use of these receipt forms, and do not, indeed, even know of their existence, which is rather singular, seeing that the Postmaster-General, "as an act of force," and not as a matter of right, will afford compensation to the amount of two pounds on the loss or damage to any uninsured parcel, the receipt of which has been acknowledged on one of these official receipt forms. It should here be noted that no compensation will be given for damage to a fragile article unless the word "fragile," or its equivalent, appears on the cover. We will conclude this section of our subject with a very useful elaboration of this system. It is found in practice that the accumulation of these tiny receipt forms becomes awkward, and the liability to lose them is great; hence, some stationers, with the authority of the Post Office, offer for sale at an insignificant price, a book, with numbers of leaves, each page of which contains spaces for entering names and addresses in a single line, the office receipting mark being stamped at the end of the line upon presentation of parcel and book. A dozen or two entries can be made in a single page, and the book then is always at hand as a record of goods dispatched, or containing the necessary receipt in the event of a claim for loss or damage.

EGHAM Debating and Literary Society.—A photographic exhibition and competition, open to members of the Society and residents of Egham and Staines, will be held in connection with closing night, Thursday, April 3rd. Entries must be sent in not later than March 15th next, to the hon. sec., Mr. H. L Muriel, Bank House, Egham. The following are the classes:—A.—Figure studies: Single figures, groups. B.—Landscapes, seascapes, and river scenery. C.—Architecture: Interior, exterior. D.—Still life. E.—Animal studies. F.—Lantern slides: Any subject. G.—General: Enlargements, copying, scientific photography, etc. Entrance fee: Members, 1s.; non-members, 2s. 6d. (admitting to all classes). The judge will be Mr. Thomas Bedding, F.R.P.S., editor of the BRITISH JOURNAL OF PHOTOGRAPHY.

NOTES ON EARLY TELE-DIOPTRIC LENS-SYSTEMS, AND THE GENESIS OF TELEPHOTOGRAPHY.*

[Abstract of a paper read before the Royal Photographic Society.]

II.

Although many of the writers on optical subjects about this period discuss the optics of the telescope, few of them refer to its use for the projection of images. In his treatise on Dioptrics, published at Leyden in 1637, Descartes discusses fairly fully and correctly the phenomena of the camera obscura with and without a lens: also the effect of two or more convex lenses separated from one another to a certain distance in giving an erect image instead of a reversed one. In the ninth discourse he deals with telescopes, and recommends hyperbolic object glasses with a concave, but says nothing about using the telescope for projection of solar or other images.

Marius Bettinus, like Descartes, very strongly recommends in his *Apiaria* (1641) the use of hyperbolic lenses in the telescope. In Cap. V. he discusses the projection of images by means of lenses, the formation of a reversed image by a single lens and its being made erect by a second lens. He says that at best with ordinary lenses the rays do not all converge at one point and thus produce an indistinct reversed image, while if the image be made erect by the use of more lenses, there is less illumination, and rays are lost which would give effect to the picture. He recommends the hyperbolic lens because it focusses rays and images at one point; it never causes confusion; it has two foci of perfect definition; it does not require another lens to erect the image; whether the image produced be reversed or direct it is far more perfect than with any other lenses. He gives an elaborate figure to illustrate the principle of the formation of two images, and says that the second image will be almost the same in every way as the first except its erectness, and will be equal to it in size. In his *Selenographia* (Gedani, 1647), Hevelius mentions the use of a plano-convex lens of 12 feet focal length in a darkened room for observing outside objects, and the necessity for regulating the size of the aperture neither too large nor too small to get the most distinct image without too great loss of light. He also suggests the use of concave, spherical or parabolic specula in place of a paper screen to show a more brilliant image. In Cap. II. he deals with the telescope, and gives a method of testing them by projecting images of the sun with them, and then comparing the size and definition of the images. In Cap. V. he discusses observations of sunspots and faculæ and the use of the helioscope with coloured glasses, and Scheiner's apparatus which was then commonly in use for the purpose. He points out that the latter being fixed rigidly together has to be moved bodily to follow the sun and keep the image in its place on the paper, so he recommends a modification in which the telescope is fitted into a spherical wooden block, which can be moved in any direction in a socket fixed in a window of the darkened room of the observatory. The paper is placed on a board attached to an upright stand or easel, so that it can be raised or lowered as required by long screws at each side, but there is apparently no arrangement for keeping the paper at right angles to the axis of the telescope. It could be worked by the observer himself instead of requiring an assistant, as with Scheiner's arrangement. In his later work, *Machinæ Coelestis* (Gedani, 1673), he describes and figures an improved instrument of the same kind, in which there is an elaborate arrangement for properly adjusting the paper screen and keeping the image of the sun in position following the movement of the earth. It has the same ball and socket fitting for holding the telescope. He does not seem to have noticed Scheiner's "Telescopium Heliotropicum" figured above. Though there is a great deal of information about lenses and the working of them in the two books, Hevelius has not gone into the optics of the combination of concave and convex lenses for telescopic or projection purposes. In his *Ars Magna Lucis et Umbræ* (2nd edition, 1671), Lib. X., Part II., Cap. 7, Kircher very briefly notes the effect of a concave placed behind a convex and a little in front of its focus, and the effect of moving the lenses to and fro—also the use of two convex lenses or a concave between two convexes. The helioscope with coloured glasses is also mentioned, but the whole account seems to have been taken from Scheiner. Gaspar Schott only very casually mentions the projection of enlarged images with a convex and concave combination (*Magia Universalis Naturæ et Artis*, Herbipoli, 1657, Part I., Optica, Syntagma I., Lib. II., Proposition 4), and also the erection of the projected image by using two convex lenses. There is, however, some interesting information about the telescope in Syntagma III., and he refers to Eustachio Divini, the famous Roman optican, making achromatic telescopes giving images free from any colour by several refractions, a fact which is also noted by Traber, but which I have not seen in modern accounts of the telescope. James Gregory has fully discussed the principles of the telescope in his *Optica Promota*, published in London, 1663, as well as some of the calculations involved. In Proposition 72 he shows how to observe the apparent diameter of celestial bodies by the projection of their images through a lens on a white screen, and in Propositions 52 and 53 he has given the theory. He does not, however, mention the use of the Galilean telescope for this purpose. The well-known French mathematician, Claude Francois Milliet Dechales, has discussed the effects of the combination of lenses, both for vision and projection, in his *Cursus seu Mundas mathematicus* (Leyden, 1674), the second volume of which contains his *Optica*, *Perspectiva*, *Catoptrica*, and *Dioptrica*. In the second book of the *Dioptrica*. In the second *Dioptrica*. In the second book of the *Dioptrica*, after other problems relating to combinations of convex with concave lenses, he deals, in Proposition XL., with the case of a concave glass placed behind a convex lens giving a larger and more distant image than the convex alone, and gives the following curious demonstration.

In the following year, 1675, Fr. Zacharias Traber, Rector of the Jesuits' College in Vienna, published a treatise on optics, under the title of *Nervus Opticus*, dealing with Optics, Catoptrics, and Dioptrics, and seems to have made some advance on his predecessors with reference to the properties of lenses in their graphic applications. For instance, in Chapter XII., Proposition 3, he notes the want of definition due to oblique rays falling on a plano-convex lens and focussing at shorter distances than the parallel rays, or what we now call "spherical aberration." In Chapter XV. he gives a number of problems relating to the use of convex lenses, and in Problem 6 he shows how the height of a distant object may be measured by the size of its image on the screen of the camera obscura, and gives a practical illustration on the basis that as the size of the visible image on the screen is to the focus of the lens, so is the actual height of the object to its distance from the lens. In this way Traber seems to have been the first who made an attempt to apply calculation to these problems; though it is possible that others did so before him. In Problem 7 he treats of the observation of eclipses in the same way by means of long focus lenses. In Chapter XIX., Proposition 4, he deals with the projection of erect images on a screen in a dark room through a system of two convex lenses more fully than the writers mentioned above, and illustrates it with a figure showing the paths of the rays from the object, through the two lenses on to the screen.

Speaking of telescopes, he says that those with two convex lenses or a concave and a convex were comparatively common, but those with more lenses were much more expensive and not so efficient for ordinary purposes on account of the chromatic aberrations. He also mentions a telescope made by Eustachio, the Neapolitan, with nineteen convex lenses enclosed in a tube

* In the full paper published in the Journal of the Royal Photographic Society for January General Waterhouse gives several illustrations and appendices.

19 cubits long, which showed objects with less colour, this being effected by the use of some very fine (*subtillissima*) glass, which, while neither increasing nor enlarging anything, prevented the discolouration of the objects. These accounts of Eustachio Divini as the inventor of an achromatic telescope seem worthy of further investigation.

In Chapter XXI., Proposition 2, he deals with the combinations of concave and convex lenses, and discusses the calculation of their relative distances—a problem which, as we have seen, Scheiner did not attempt, but preferred to work out practically. He notes this and says that he sees no reason why they should not be calculated as well as the positions of the two convex lenses already done by de Rheita and Schott, and he gives a calculation of sixteen to one, which seems much more suitable for eye telescopes of long focus than for a projecting arrangement with lenses of comparatively short focus. In Proposition 10 of the same chapter he discusses the projection of images with the combination of a concave with a convex lens. He gives a good figure, but his demonstration seems somewhat like Kepler's in attributing the enlargement of the image to the mere divergence of the rays after passing through the concave. He gives a great many other problems regarding concave and convex lenses which are of interest, though not immediately connected with the subject of this paper.

Some ten years after Traber's book, the first edition of Johann Zahn's well-known *Oculus Artificialis Teledioptricus* was published in 1686, at Würzburg, in which place he was canon of a religious order, but the second enlarged edition, which I have followed in this and in my former paper, appeared in 1702, and was published at Nuremberg. In 1900, Dr. von Rohr published a paper in the British Journal of Photography (47, 294), in which he quoted passages from Zahn which showed that even in 1686 the tele-objective combination of a convex lens of longer and a concave lens of shorter focal length was already developed; but as we have seen, Zahn did not originate this combination, and in fact it had been known for some 75 years. His account has, however, an interest of its own, because he describes and figures a small camera fitted with such a combination for throwing an enlarged image upon the focussing screen, which in its proportions and application comes very near our modern telephotographic objectives.

In the second part of his book, *Syntagma* II., Chapter III., he first describes the effects of a combination of a concave lens in front of a convex, and the conditions under which images are formed, and in Proposition X. he demonstrates the old theorem of the formation of a larger and more distinct image by placing a concave lens behind the convex and a little in front of its focus, giving the same figure as Dechales in his 40th Proposition, already noticed, and the same demonstration almost word for word. Then follow the four corollaries given in Dr. von Rohr's extract. In the first he shows that a concave lens thus placed between a convex lens and the image formed by it, can, in transmitting the image, portray it larger than any single convex lens whatever at the same distance. In the second he says the secret and wonderful artifice used in show-boxes and camera obscuras to greatly magnify the images transmitted at a short distance may be inferred. In the third he shows how a large image may thus be produced with such a combination at a short distance instead of using a single convex lens of greater focal length, and so a more contracted and shorter tube may have the same or even greater power than a longer tube with an ordinary object lens. In the fourth corollary he shows, as Scheiner did before him, that as the concave lens, within the proper limits, approaches the image, the less the pencils are lengthened, and the image becomes smaller at a shorter distance; and the further it is placed from the image formed by the convex lens, so that it is nearer the convex so much the larger an image will be formed at a greater distance. As quoted by Dr. von Rohr from the first edition, Zahn has reversed the conditions given in this corollary and made them wrong, but has corrected them in the second edition which I have followed. It will be seen from the above that Zahn has very clearly recognised the advantage of the combination in practically shortening the focal length and distance of the screen for the size of image obtained.

In the two following propositions he demonstrates the various cases in which no image is formed, the rays issuing from the concave either parallel or diverging, and he formulates the general rule that if the concave is so placed behind any convex lens that the foci of both, or the position of the image from the convex lens, coincide with the centre, or better, with the focus of the concave, the rays from the most distant objects will be transmitted parallel. If indeed the focus of the concave falls within the focus, or image formed by the convex lens, and the convex lens itself, the rays will diverge. If the focus of the concave is beyond the position of the image, or focus of the convex, the rays in such a combination will be sent on converging to form an image.

In *Syntagma* III., Chapter XII., he discusses various methods of observing the sun in safety, fully describing Scheiner's method, giving the reasons why the telescope tube must be more drawn out for purposes of projection and repeating the rules already given regarding the positions of the lenses and the effect of moving them in or out in increasing or diminishing the size of the image. He also considers the method with two convex lenses, and gives a figure of the course of the rays. Several other propositions concerning the combination of convex and concave lenses are given, enlarging upon his theoretical demonstrations, but space does not allow me to consider them further.

The third part of the book is more practical, and in *Syntagma* III., Chapter V., he fully expounds the principles and construction of the Dutch telescope—and gives several tables relating to the proportions of the convex and concave lenses, and the magnifying power of the combinations. In the following chapters he considers in the same way the telescope with two convex lenses; binocular telescopes of which many figures are given, and various kinds of reflecting telescopes, and enters into various details of their construction. He next discourses on the astronomical telescope and observing instruments, and in *Syntagma* IV., Chapter III., he gives an account of the first arrangement proposed by Hevelius in the *Selenographia* and the same figure, but does not mention the improved form. In Chapter VI. he notices Dechales' method of observing the apparent diameter of the sun by projection and gives a copy of the figure of his apparatus. In *Syntagma* V. he describes several practical applications of the teledioptric principle, and in *Technasma*, II. (p. 689), there is a description, with figures, of a parastatic box for showing enlarged images, in which a convex lens is combined with a concave, very much in the same way as in our modern telephoto lenses—the image being received on a mirror and reflected upwards. His convex lens in the outer tube would have a focus of $\frac{60}{100}$, presumably of a foot, say $7\frac{1}{4}$ inches; a plano-concave lens of $\frac{25}{100}$ focus, say 3 inches, was fitted in a smaller tube sliding into the other and the focus adjusted by the rules given before. The two tubes were fitted into a larger one and fixed on the camera. Ordinarily the images were reversed, but could not be made erect by means of the mirror (see illustration, appendix). It will be noted that the proportions of his lens are very close to those of modern instruments.

If Zahn did not make any advance in the theory of the tele-objective combination, he seems to have done so in the practice. His book is a valuable repertory of information on early optics on account of the numerous extracts from and references to earlier writers.

Christian Huyghens has discussed the theory of the method of observing eclipses, etc., with the Galilean telescope by projection in his treatise on dioptrics, which was published with other post-

humous papers in 1703, but has not gone into the relative proportions and distances of the convex and concave lenses for projection, though he has done so for the observing telescope.

In Proposition 33, Cap. VI., of the *Elementa Dioptrica*, in the second volume of the *Elementa Matheseos Universæ* (Halle, 1715), Christian Wolf has shown how the astronomical telescope may be shortened from its ordinary length, but at the same time give a larger image by the insertion of a double concave lens, so that the focus of the object glass should be behind it and nearer its virtual focus. His demonstration differs in his two editions, and is not very clear. Though not new, his problem is interesting, because Sir J. Herschel (*Ency. Brit.*, 8th edition, Article, *Telescope*) refers the principle of the Barlow telescope back to it, saying that the interposition of an uncorrected concave with an achromatic O.G. would destroy the achromaticity of the image, but that nothing prevents a negative or concave lens being rendered achromatic as well as a positive one. It is only necessary to make the stronger lens of the combination (the crown) concave and the weaker convex, and the result will be a negative achromatic lens, which interposed on Wolf's principle will be free from the objection. The principle, however, really goes back far beyond Wolf, as we have seen, and Herschel's remarks would apply equally well to Kepler's or Scheiner's arrangements, if achromatic combinations were used instead of uncorrected glasses. From Zahn we also know that the advantage of the combination in giving a large image with short focal length was commonly recognised and used for show boxes. It may be noted that there is a very useful classified bibliography of writers on mathematical subjects at the end of this second volume of Wolf's treatise. In the later edition of 1735, the *Dioptrica* is in the third volume, which does not contain the bibliography. Robert Smith also has fully explained the construction of the Galilean telescope in his *Compleat System of Opticks* (Cambridge, 1738), but only alludes incidentally to the projection of images with it. He mentions Horrock's observations of the Transit of Venus in this way on the 24th November, 1639, and in the interesting appendix at the end of the second volume he gives a short notice of the method (p. 23, para. 128). In all the cases hitherto noticed the lenses used were uncorrected glasses, and the images produced on the screen were more or less accompanied by chromatic fringes which marred their beauty and distinctness, and as the telescopic methods of observation were improved by the use of achromatic glasses, the method of projection seems to have fallen into disuse. John Dollond first brought achromatic object glasses for the telescope into use about 1758, but even with them there was a certain amount of residual secondary spectrum, to the removal of which the efforts of many workers were directed, one of the earliest and most successful being Dr. Robert Blair of Edinburgh, who, in 1787, conceived the idea of making an achromatic concave fluid lens which should refract the green less than the united red and violet and *from* the axis, while a similar achromatic convex lens should refract it *to* the axis, and by the combination the green should be united with the red and violet. The unsuitable nature of the fluids used, a solution of chloride of antimony in muriatic acid being one of them, and the difficulty of constructing the lenses prevented their coming into general use. (A full account of Blair's researches will be found in Vol. 3 of the *Transactions of the Royal Society of Edinburgh.*)

In 1828, Professor Peter Barlow made experiments with achromatic negative lenses for the double purpose of shortening the telescope and reducing the secondary spectrum. He also used a fluid lens, the liquid used being the highly refractive bisulphide of carbon (*Phil. Trans. R.S.*, 1828, p. 105). About the same time Mr. A. Rogers constructed a compound correcting lens somewhat on the same principle as Barlow's, but consisting of a convex crown and concave flint, the foci of which were such as to cause the combination to act as a plain glass on the mean refrangible rays. Such a glass being interposed between the object glass of a telescope and its focus will lengthen the focus for violet and shorten it for red rays, thus producing an achromatic union of all the rays at the focus. The correcting lens could also be made negative, so as to reduce the length of the telescope for the same focal power. This arrangement was improved by Plössl, of Vienna, and brought out under the name of "Dialytic telescope" in 1839. In 1834 Dollond succeeded in making an achromatic negative lens on a principle suggested by Barlow which was found to work satisfactorily. It is described in a paper by George Dollond in the *Phil. Trans. R.S.*, 1834, and in a letter attached Barlow lays down the principle of achromatising by making the foci of the lenses proportional to their dispersive powers, but the crown lens must be concave and the flint convex. The principle does not, however, seem to have been used or suggested for purposes of projection, and this method of utilising the Galilean telescope does not seem to have been revived till Ignazio Porro made a combination of the kind in 1847, and used it for observing an eclipse in 1851. The positive lens used seems to have been an ordinary achromatic single landscape lens, but although Porro published the principles on which his negative lens was based, in the early volumes of the French Photographic Society's *Bulletin*, he gave no details of its construction. In 1857, the first photo-heliograph was designed by Dr. W. De la Rue for the Kew Observatory, and consisted, like its many successors constructed for other observatories by Messrs. Dallmeyer, of two converging or positive lenses, the hinder one picking up the image from the focus of the object glass, and throwing an enlarged image on to the photographic plate.

In 1869, Messrs. Borie and Tournemire brought out a portable combination on the same principle, for taking enlarged pictures of architectural details and other purposes of telephotography, but it does not seem to have come into use on account of the want of sensitiveness of the plates, and the small intensity such a combination would have. The later history of the modern teleobjective is well known, and I need not enter into it.

In giving this brief and necessarily very cursory sketch of the development of the teleobjective, I do not for one moment intend to compare the practice and theory of the early forms of apparatus with the latest improvements in tele-photography and the complete way in which the theory and construction of these instruments has been worked out by our President and others, but it seemed of interest to trace their progress from Kepler downwards, and I regret that I am not better able to do the subject justice. The references I have given may, however, be of use to anyone desirous of following up the inquiry.

MAJOR-GENERAL J. WATERHOUSE, I.S.C.

TIMING DEVELOPMENT.

I HAVE been expecting a reply on developing by time such as that from "H. E. S." The best answer I can give is to test the method carefully. We think that we can do a great deal to modify the resulting negative in development, but, as Mr. Watkins has pointed out again and again, the chief means of altering the gradation is the time of development, and we all unconsciously use it. I felt exactly as "H. E. S." on the subject, and considered that the method was suited to every-day studio work, but now I am quite satisfied that it is by far the best method, and that it is exactly *the* method for professional photographers. I experience all the various difficulties, and know quite well that it is not always possible to give correct exposures in the studio, but certainly three-fourths of the day's exposures should be correctly exposured. If the timing method is adopted, one of its great advantages will be that the photographer will be more careful to make his exposure correct, and will abandon the mistaken idea that "I can put it right in development." Many photographers produce negatives that need an extra-

ordinary amount of dodging in printing, and some will almost make up the whole negative with matt varnish and blacklead. I hold that this is wrong, especially for professional work, and endeavour to secure a negative that can be printed by almost anyone. This is an ideal to which one seldom attains, but still it is an ideal worth striving for, as a little extra care in securing a good negative is well repaid by the saving of retouching, printing, &c., at later stages. All exposures are matters of compromise, and it is, of course, impossible to make them correct for all tones in the subject, as an example, black velvet and white satin, a terrible combination for the photographer. The combination mentioned by "H. E. S." of black hat and white dress is common enough, and I should suggest that two seconds would be far too long for the dress. In my own work five seconds is a long exposure; the average is about one second, and as the face is usually the most important part of the portrait, I should expose for that, and let the other parts take care of themselves, developing by the timing method, and, after fixation, reduce the white dress with Farmer's reducer, *if necessary*. I should like to know what is meant by "mixing brains with the developer." I have generally heard it put as "mixing the developer with brains," which means something quite different. I should be glad if "H. E. S." will tell us how he would treat such a subject as he mentions, and how he would develop it.

As to concentration or dilution of the developer, I would advise everyone to try the experiment of exposing a plate, cutting it in two, and developing one half with concentrated developer, noting the time of appearance and the total time of development, then, having found the multiplying factor, develop the second half with diluted developer, again noting the time of appearance and multiplying by the factor found with the first half, and develop for the time it gives. I don't wish anyone to take my word for it, but to try it for themselves.

Unless each set of exposures are developed at once, it is almost impossible to use much discrimination in development, and it is much better to expose correctly and time development. I have seen Mr. Watkins develop four plates at once, of vastly different subjects, without looking at the plates at all, but by using a test strip. The four negatives were excellent, although one was a cloud, another a street snapshot, the third an architectural interior, and the fourth a piece of black oak furniture. I do not advise photographers to attempt to do likewise, but I am sure they would find great advantage in using a set method of development where possible. It is quite easy to put aside those plates that have had abnormal exposures and develop them separately. I am sure if the professional will try this method he will find it has many advantages, and he will unconsciously take greater care in his exposing, and will find it better to do so than to attempt to play tricks with his developer. But I repeat I don't ask anyone to take my word for all this, but to give it a fair trial.

HAROLD BAKER.

PHOTOGRAPHIC Club, Anderton's Hotel, Fleet Street, Wednesday, March 12th, at 8 p.m. "Open Night." Members and others are invited to bring up objects of interest.

BATH Photographic Society.—The following circular has been sent to members of this Society by the hon. sec.:—"I am directed to inform you that there will not be any meetings during the present year, but that everything will remain in abeyance. This course has been reluctantly forced upon the committee by the lack of interest shown in the Society's proceedings for some time past by the members. No subscription will be received this year."

AT the last meeting of the Royal Institute of British Architects, Sir Benjamin Stone, M.P., gave a short account of his work in connection with the National Photographic Record Society, explaining the importance of obtaining faithful records of buildings in all parts of the world for preservation and subsequent reference. He exhibited about 100 photographs of architectural work, forming part of the collections of the National Photographic Record Society, which are to be deposited in the British Museum.

NOTES ON THE DEVELOPMENT OF INTERFERENCE PHOTOCHROMY.

XV.—OTTO WIENER.

ONE can easily abstract from both suppositions. First of all, let the first supposition fall, and let, therefore, the elementary layer have any thickness between zero and a half wave-length. Let their limits coincide with the places of strongest variation of the index of refraction, and, provisionally retaining the second supposition on account of facility of understanding, take the index of refraction inside and outside the elementary mirror layer as constant.

The wave reflected from an elementary mirror is in reality compounded of two waves, the first of which is reflected from an optically denser medium, the second from one optically less dense, if one ascribes to the layer of the elementary mirror a greater index of refraction than outside it. The phase and amplitude of the compounded wave are then found by Fresnel's rule. (1)Representing a wave (or the line vibration produced by it at a point) by a radius vector (Fahr. strahl) whose length gives the amplitude and whose angle with a base-line gives the phase, the geometric sum (2) of the vectors corresponding to two vibrations of the same period represents the compounded vibration in amplitude and phase.

In this case, let the base-line be so chosen that it represents the phase of a wave W_0 approaching the symmetry-plane of the elementary mirror. The wave reflected at the second limit of the elementary mirror (thus at the medium optically less dense) experiences with respect to W_0 a phase-retardation, which is only conditioned by the doubled distance from the middle of the elementary mirror layer to its lower limit at the distance d, and thus has the value (expressed in wave-lengths) $\frac{2d}{\lambda}$ in arcual measurement the value $\phi = 2\pi\frac{2d}{\lambda}$; W_2 thus forms with W_0 the angle ϕ; thereby the phase *retardation* is represented by rotation of the exit-radius vector in a counter-clockwise direction. The wave reflected at the first boundary of the elementary mirror (thus at the optically denser medium) experiences with respect to W_0 a phase-retardation of half a wave-length owing to the act of reflexion; but since, compared with W_0 it has travelled a path less by $2d$, the total retardation expressed in arcual measurement only has the value $\pi - \phi$. Thus is found the direction W_1, by taking away the angle ϕ in the sense of decrease of the angle on the direction opposite to W_0. Drawing the diagonal of the parallelogram constructed from W_1 and W_2, then is found the vector W_r representing the compounded wave. K stands by construction perpendicularly to W_0, so the total wave reflected from the elementary mirror experiences at it a phase-retardation of a quarter of a wave-length.

The phase-variation is the same however great is the thickness $2d$ of the elementary mirror. The magnitude of $2d$ has influence only on the magnitude of the amplitude, which disappears with $2d$ and for $2d = \lambda/4$ attains a maximum, *i.e.*, for the special case of Schutt's schema.

The above proof may be transferred at once to the case of constant variation of the index of refraction. Instead of the straight lines, two continuously curved portions of a curve enter, but which likewise proceed as from a mirror to the normal of W_0, and must accordingly compound to one of the lines W_r lying in this normal.

Thus the above assertion is generally proved; *under the specified conditions the phase-variation by reflexion at an elementary-mirror referred to the geometric mean-plane of its layer is a quarter*

(1) A simple geometrical proof is given in E. Mach's "Leitfaden der Physik" (2 Aufl., 1891, § 137, p. 87); cf. also A. Wüllner, "Lehrbuch der Experimentalphysik" (5 Aufl., Bd. i., 1895, 703).

(2) The more usual term now is "vector-sum"; the "resultant" of two quantities combined by the parallelogram law.

of a wave leng'h; and a phase-*retardation*, if, as is here supposed, the layer of the elementary-mirror has a higher index of refraction than its neighbourhood; a phase-*acceleration* of an equal amount if it has a lower index.

It is certainly thereby supposed that the amplitudes of the waves reflected at both the boundary surfaces of the elementary mirror may be taken as equally great. In reality the amplitude which belongs to the second reflexion must be the smaller, on account alone of the loss of intensity of the light by the first reflexion.

If this difference of the amplitudes is brought into consideration, it is seen that the phase of the resulting wave W_r must become somewhat greater than 90 deg. ($\lambda/4$) when $W_2 < W_1$ and the more, the smaller the amplitude ratio v of W_2 to W_1 and further greater, the smaller the angle ϕ (with the same v).

Quantitatively it is easily seen that the increase ϵ of the phase-retardation over 90 deg. may be calculated from v and ϕ by means of the following equation:—

$$\tan \epsilon = \frac{1 - v}{(1 + v) \tan \varphi}$$

From this formula it is seen that, even in unfavourable cases, ϵ will attain to no great amount. According to approximate measurements (not communicated here) v could hardly be smaller than 0.85, with the colour photographs with which Wiener experimented. Further, with the supposition that the place of the most abrupt change of the index of refraction lies distant from the trough-plane only in $\frac{1}{4}$ of its distance from the node-plain, ϕ becomes 45 deg. and ten ϕ unity; thence ϵ is (in round numbers) 5 deg., corresponding to an increase of phase-retardation of 0.015 wave-lengths; if the place in question only in $\frac{1}{8}$ of that distance from the trough-plane, ϕ would be 22.5 deg. and ϵ about 11 deg., corresponding to a retardation of 0.031 wave-lengths. The latter supposition is, however, very improbable.

PHILIP E. B. JOURDAIN.

Exhibitions.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

The thirteenth annual exhibition of the South London Photographic Society was opened on Saturday evening last, at the Public Baths, Church Street, Camberwell, by the Mayor of Camberwell.

In our reviews of the exhibitions of metropolitan societies in recent years it has been our pleasing duty to record a steady improvement in the work of the members almost without exception. The South London Society is one of those which has received our warm congratulations over and over again, and in one branch of photography—architecture—we have looked upon the work in the members' class as the standard of work of the kind. This year we regret to find that progress has not been maintained. In the members' architecture class in particular, this is manifested, and, as a whole, the exhibit hardly rises above the average. By a curious turn of fate, however, the open class in architecture is one of the strongest we have met with. It is only two or three years ago we had occasion, in reviewing this exhibition, to point out that the members' class more than held its ground against all comers in the open class. Unfortunately, the falling off is not confined to this one class; the landscapes, etc., though to a less degree, show signs of flagging interest, and the soundness of our opinion on this point is confirmed by that of the judges, who only awarded the second medal in the class. There seems to be a return to the aimless practice of some years ago, when most of the members of a society were too uncertain of their technical skill to be able to devote that attention to that pictorial effect which is necessary to success. It is true that on scanning the catalogue we miss the names of many of the members whose work made the fame of the society, and this means probably that the exhibition suffers nearly as much from absence of their influence upon the work of the less advanced members as from the absence of their own work. In architecture this is no doubt the case, and instead of the rich, deep prints full of tone that used to characterise the society's work, much of it in the present exhibition is of that flat thin nature that seems to be the feature of bromide paper when used for printing architectural subjects.

The class for pictures which have received a medal since the last exhibition is naturally where one would expect to find the members' best work, and it is satisfactory to find that it affords proof that some of the members at least have not lost their cunning. That the members' side of the exhibition is not up to the standard is freely asknowledged by many of the members themselves, and we trust that their consciousness of the necessity for fresh energy will result in an exhibition next year showing the old form. Among the members who show creditable work are E. W. Taylor, C. F. Dickenson, J. T. French, F. W. Gregg, W. Kilbey, W. E. Nicholls, G. J. T. Walford, A. E. Allen, G. Brown, J. W. Bannister, F. Dyball, W. Calder Marshall, W. Howell, J. Moyser, E. R. Ball, and C. J. King

The Edwards' Memorial competition for the best copy of a coloured picture attracted ten competitors. The results will be sent to Mr. E. J. Wall for adjudication.

The open classes are exceedingly well supported. The architecture forms quite a wonderful collection, but hardly less representative are the portraiture and landscape classes. The society is to be congratulated upon the success of its exhibition, on this side of the gallery, at any rate. Among the principal exhibitors sending noteworthy work are A. Werner, C. M. Wane, Graystone Bird, W. H. Wilshere, H. W. Bennett, E. J. Felce, E. M. Horsburgh, E. Jakeways, H. C. Leat, A. J. Loughton, C. J. Marshall, F. G. Fryhorn, A. J. Ward, F. W. Bannister, A. Allen, G. H. Capper, P. C. Cornford, H. G. Crabb, A. W. Hackney, W. J. Marriott, A. B. Moss, D. Murray, and we might add many others.

The arrangements are, as usual, efficiently carried out. Lantern entertainments are given each evening, and other scientific attractions are provided. The exhibition will remain open until Saturday evening.

The trade exhibitors are the Aerograph Co., Altrincham Rubber Co., Beck, R. and J. Ltd., Bird, Graystone, Burroughs and Wellcome, Crayon Art Company, Evendon Bros., Griffin, J. J. and Sons, Harris, A. T., Howell, M. and Son, Imperishable Coloured Picture and Portrait Company, Lawson, H., Lockyer, Wm., Mann's Photographic Stores, Photo Appliance Co., Prosser, Roberts, Rosenberg, A. and Co., Rotary Photographic Co., Sandell Film and Plate Co., Ltd., Seabrook, Bros. and Co., Watkins Meter Co., Webster, T., Willway, J. S. and Sons, York and Son, Zimmermann, A. and M.

The judges were Messrs. J. C. S. Mummery and J. A. Sinclair.

THE AWARDS.

MEMBERS' CLASSES.

Class A.—Portraiture, etc., bronze medal, E. W. Taylor.
Class B.—Architecture, silver, F. W. Gregg; bronze, C. Churchill.
Class C.—Landscape, etc., bronze, E. W. Taylor.
Class D.—Excursion pictures, bronze, W. Kilbey.
Class E.—Lantern slides, silver, F. W. Gregg.
Class F.—Pictures medalled since last exhibition.—Gold medal, F. W. Gregg.

OPEN CLASSES.

Class H.—Portraiture, silver, A. Werner; bronze, E. M. Wane.
Class J.—Architecture, silver, H. W. Bennett; bronze, Howard Esler; bronze, F. W. Gregg.
Class K.—Landscape, silver, G. H. Capper; bronze, W. T. Marriott.
Class L.—Lantern slides, silver, H. Wild; bronze, W. Mc Lean.
Class M.—Stereoscopic slides, silver, Rev. W. Smith; bronze, L. S. Wilks.
Trade exhibits.—Silver, Prosser Roberts' Drug Stores; bronze, R. and J. Beck, Ltd.

CRIPPLEGATE PHOTOGRAPHIC SOCIETY.

To the ordinary visitor to London on sight-seeing interest, there is little in the neighbourhood of Cripplegate of great attraction, but the antiquarian will still find much in this quaint corner of the City which is worthy of his attention. Cripplegate Church probably presents pretty much the same appearance that it did when Oliver Cromwell was married there; not so far away stands St. Bartholomew's Church, the finest, if not the only, specimen, of Norman ecclesiastical architecture in London, and Cloth Fair, which still gives one the feeling of having slipped back a couple of centuries. Milton Street, the great street of literary fame, has lost its literary connection, and Whitecross Street Prison is happily improved away. But much as we sentimentally deplore the march of modern improvements, we can fully appreciate and feel thankful for the enlightened spirit of the age which gives us such institutions as the Cripplegate Institute.

The society is indeed fortunate in its opportunities afforded its exhibition. Most societies have to content themselves with a schoolroom for their annual show, and even with the most capable management the effect is generally somewhat depressing. The hall of the Cripplegate Institute is admirably adapted for the purpose of the exhibition, and the society, though not sufficiently strong to make a very imposing show on its own account, succeeded in attracting a

considerable amount of good and interesting work from outside. A lavish offer of medals may have been helpful of this success, for in the open classes there were offered six gold, six silver, and five bronze medals—seventeen in all. The judges withheld three of the gold medals, but even with this diminution in their number, if a Cripplegate Society's medal is to be considered as a token of real merit, the number awarded was far in excess of the requirement. Rivalry among societies with regard to their exhibitions is healthy, but the offer of an excessive number of medals is not a fair weapon in the competition.

The members' work was satisfactory, and this exhibit, as a whole, was undoubtedly rendered more attractive by not being divided up into subject classes. Had the same common sense system been adopted throughout, the exhibition would certainly have gained in interest to the ordinary visitor, who naturally loses some interest, say, in church interiors when they are presented to him in wholesale quantities. The open classes, however, as we have said, contained a considerable amount of good and interesting work, and, in addition to the medalled pictures and others by the same authors, we noted work by Dr. E. G. Boon, Graystone Bird, J. W. Bannister, Mrs. A. Le Blond, H. C. Leat, W. Kilbey, S. C. Stean, C. J. King, A. N. G. Evershed, W. A. I. Hensler, Dr. T. G. Crump, F. H. Read, and others.

The trade exhibitors were the City Frame Co., Messrs. A. Rosenberg and Co., Seabrook Bros., Burroughs Wellcome, A. E. Mackintosh, E. G. Wood, R. and J. Beck, and the Columbia Optical Company.

The catalogue was illustrated by a photogravure portrait of the Lord Mayor. The judges were Messrs. J. H. Gear, A. Horsley Hinton, and J. B. B. Wellington.

The Awards.

OPEN CLASSES.

Class A.—Champion pictures, gold medal, G. H. Capper.

Class B.—Champion, gold medal, withheld; silver medal, F. W. Gregg.

Class C.—Portraiture, gold medal, withheld; silver medal, T. Fitz-Gibbon Ford; bronze medal, R. S. Webster.

Class D.—Landscape, etc., gold medal, withheld; silver medal, W. T. Marriott; bronze medal, G. H. Capper; bronze medal, Dr. T. G. Crump.

Class E.—Architecture, gold medal, H. W. Bennett, F.R.P.S.; silver medal, J. C. Holloway; bronze medal, A. J. Loughton.

Class F.—Beginners' class, silver medal, W. D. Gordon; bronze medal, A. E. Large.

Class G.—Lantern slides, gold medal, W. A. I. Hensler; silver medal, F. W. Gregg.

MEMBERS' CLASSES.

Class H.—Gold medal, B. C. Wickison; silver medal, A. T. Ward; bronze medal, W. H. Wilshere and A. B. Moss.

Class J.—Beginners' class, silver medal, G. Taylor; bronze medal, G. Pitt-Smith.

TRADE EXHIBIT.

Silver medal best trade exhibit, R. and J. Beck, Beck-Steinheil Lens and Telephoto Attachment.

A HOME-MADE STEREOSCOPIC ADAPTER.

[Transactions of the Edinburgh Photographic Society.]

To many amateur photographers the purchase of a stereoscopic camera, or even a pair of photographic lenses with the necessary fittings for rendering a whole or half-plate camera suitable for stereoscopic work, is a serious matter. It is quite unnecessary for me to dilate upon the charms of stereoscopic photography; that has been done oftener than once in this hall by masters of the subject. In this short note I merely wish to show how a half or whole plate camera, furnished with removable front, can be readily adapted for stereoscopic work at a very small outlay. I have here the necessary materials for converting my whole-plate camera into a stereoscopic camera. Simple and crude though they appear, they are sufficient for ordinary purposes, as one or two of the results will show. The lenses, which are round, are such as are used in those vulcanite folders which can be bought for about a shilling a pair. They should be carefully examined before being selected for this purpose, as, like all cheap spectacles and eye-glasses, many of the frames are glazed with lenses that are not pairs. For our purpose we must have two lenses that are optically a pair. A focal length between 6½ and 5 inches, corresponding to + 6.0 and + 8.0 diopters, will be found suitable for most purposes.

The lenses are mounted in stout cardboard tubes of convenient length. Stops of any required value are easily made from pill-boxes which fit into the lens tubes, and two pill-box lids fixed to a flat piece of wood or cardboard form the caps for the lenses. The lens tubes are glued to a piece of stout cardboard having two circular holes a little smaller than the diameter of the tubes, the distance between the lens centres being about 3 inches. This cardboard "front" replaces the panel carrying the lens of the camera, and is made rigid by two pieces of wood. It is now only necessary to divide the camera to prevent overlapping of the images. This is easily effected by fixing to the back of the camera a narrow strip of wood carrying a piece of cardboard of suitable size. It is convenient to indicate on the focussing screen the position of the centre of each picture. Of course, such lenses as I have referred to are simply double convex spectacle lenses, with all their inherent spherical and chromatic aberration; but the size of a stereoscopic picture is small, and these lenses, when stopped down to, say, F/20, give very fair results, the area of sharp definition being sufficiently large for stereoscopic purposes.

J. A. Forret.

LIGHT FILTERS FOR COLOUR PHOTOGRAPHY.

[From the Journal of the Camera Club.]

Dr. George Lindsay Johnson, who, on the occasion of Sir William Abney's lecture, promised to communicate to the Journal of the Camera Club the results of an exhaustive series of experiments recently made in Vienna to determine the best media for light filters for use in colour photography, has sent the following note upon the subject:—

For coloured process work and for photography in colours, glass slides, coated with collodion or gelatine films, stained with aniline dyes, will enable one to get more perfect colours for such purposes than coloured glass. But even better still are glass troughs, consisting of two parallel sides of thin plate glass cemented on to thick pieces at the sides and bottom, and having their faces separated by about 3 mm. to 5 mm. interval. This, filled with a filtered aqueous solution of the selected aniline dye, will give a very perfect colour-corrected screen.

The dyes found most suitable are:—

For the yellow negative, *i.e.*, for the negative which will produce the block or print to receive the yellow colour, an aqueous solution of marina blue.

For the red negative, acid green "Grünsaure," aurantia aqueous solution of each, equal parts.

For the blue negative, acid, fuchsine, "Saürefuchsin," aurantia, equal parts.

As regards the plates used, for taking red colours the Warwick plate is to be recommended. For blue colours, Lumière's special spectrum plate. For the yellow colours an ordinary non-orthochromatic plate give good results. But Edward's, Cadett's, Lumière's, and the Ilford orthochromatic plates are also to be recommended for special kinds of work, but as a general rule the first-named plates will give the best and most uniform results.

The stains above named may be had in powder or in solution from Grübler and Hollborn, 63, Baierischestrasse, Leipzig. London agent, C. Baker, 244, High Holborn. The glass troughs from Zeiss and Co., Jena, or from Baker, or Townsend and Mercer, Bishopsgate Street, E.C.; Squire, chemist, Oxford Street; and Martindale, New Cavendish Street, also keep excellent stains, and are very well informed, as they both make stains a speciality.

THE METRIC SYSTEM.

The following is the list of members of Parliament who have notified their approval of the compulsory adoption of the metric weights and measures:—

Allen, C. P.; Archdale, E. M.; Arnold-Forster, H. O.; Ashton, T. G.; Balfour, Major K. R.; Banes, Major G. E.; Bell, Richard; Bentinck, Lord Henry; Bhownaggree, Sir M. M., K.C.I.E.; Bignold, A.; Bill, Charles; Black, Alex. W.; Boland, J. P.; Bolton, T. D.; Boulnois, E.; Boyle, James; Brigg, John; Broadhurst, Henry; Brown, G. M.; Brunner, Sir J. T. Bart.; Bull, W. J.; Burt, Thomas; Cameron, Robert; Campbell, Right Hon. J. A., LL.D.; Carew, J. L.; Carvill, P. G. H.; Cavendish, R. F.; Cayzer, Sir C. W.; Channing, F. A.; Coghill, D. H.; Cohen, B. L.; Corbett, A. Cameron; Cox, I. E. B.; Craig, R. Hunter; Cremer, W. R.; Crombie, J. W.; Cross, Alex.; Cullinan, J.; Denny, Colonel J. Mc.A.; Dewar, John A.; Dewar, T. R., J.P., D.L.; Doogan, P. C.; Douglas, C. H.; Doxford, Sir W. T.; Duke, H. E., K.C.; Duncan, J. H.; Dunn, Sir Wm., Bart.; Edwards, F.; Esmonde, Sir T., Bart.; Evans, S. T., K.C.; Fenwick, Charles; Ffrench, P.; Field, Wm.; Fielden, E. B.; Fison, F. W.; Flavin, M. J.; Flower, Ernest; Fortescue-Flannery, Sir J.; Foster, Sir M., K.C.B.; Foster, P. S.; Freeman-Thomas, F.; Fuller, J. M.; Furness, Sir Christopher; Goddard, D. Ford; Gladstone, Right Hon. H. J.; Godson, Sir A. F.; Gordon, W. Evans; Gordon, Hon. J. E.; Graham, H. R.; Grant, Corrie; Gray, E.; Green, W. D.; Greene, Sir E. W. Bart.; Greville, Captain Hon. R. H.; Guthrie, W. M.; Hall, E. Marshall-, K.C.; Hambro, C. E.; Hardie, J. Keir; Harmsworth, R. L.; Harris, F. L.; Haslett, Sir J. H.; Hayter, Right Hon. Sir A. D., Bart.; Heath, J.; Hermon-Hodge, R. T.; Hickman, Sir A.; Holland, W. H.;

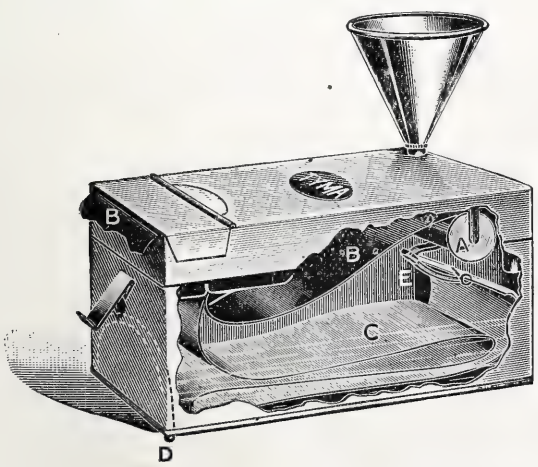
Hope, J. D.; Horniman, F. J.; Houldsworth, Sir W. M., Bart.; Hoult, J.; Houston, R. P.; Howard, Captain J.; Hudson, G. B.; Hughes, Colonel E.; Hutton, A. E.; Jacoby, J. A.; Jameson, Major J. E.; Jessel, Captain H. M.; Jones, D. B., K.C.; Jordan, J.; Kay-Shuttleworth, Right Hon. Sir U. J., Bart.; Kennedy, P. J.; Kinloch, Sir J. G. S., Bart.; Labouchere, Henry; Langley, Batty; Laurie, Lieut.-General J. W.; Law, A. Bonar; Lawrence, Joseph; Lawrence, W. F.; Layland-Barrett, F. L.; Legge, Colonel Hon. E. H.; Leigh, Sir Joseph; Leng, Sir John; Levy, Maurice; Lewis, J. H.; Lough, Thomas; Lowther, C. H. W.; Lundon, W.; McArthur, Charles; McRae, George; M'Govern, Thomas; McLaren, C. B. B., K.C.; Macnamara, Dr. J. T.; Malcolm, Ian; Manners, Lord Cecil; Mansfield, H. R.; Mappin, Sir F. T., Bart.; Mather, W.; Mellor, Right Hon. J. W., K.C.; Melville, Beresford; Middlemore, J. T.; Minch, M. J.; Mitchell, William; Molesworth, Sir L., Bart.; Mooney, J.; Morton, E. J. C.; Moss, Samuel; Munro-Ferguson, R.; Murray, Hon., A.O.; Nannetti, J. P.; Norman, Henry; Norton, Captain C.; O'Brien, J. F. X.; O'Brien, P. J.; O'Connor, James; O'Connor, T. P.; O'Donnell, John; O'Donnell, Thomas; O'Dowd, John; O'Kelly, Conor; O'Malley, William; O'Shee, J. J.; Palmer, Sir C. H., Bart.; Parker, Gilbert; Parkes, Ebenezer; Partington, Oswald; Pearson, Sir W. D., Bart.; Pease, Alfred, E.; Perks, R. W.; Pierpoint, Robert; Pilkington, Colonel R.; Pirie, V. D.; Price, R. J.; Priestley, Arthur; Pryce-Jones, Lieut.-Colonel E.; Pym, C. Guy; Quilter, Sir C., Bart.; Randles, J. S.; Rankin, Sir James, Bart.; Rea, Russell; Reckitt, H. J.; Reid, James; Remnant, J. F.; Renshaw, C. Bine; Renwick, G.; Rickett, J. C.; Ridley, S. F.; Roberts, J. B.; Robson, W. S., K.C.; Roe, Sir Thomas; Rolleston, Sir J. F. L.; Runciman, W.; Sadler, S. A.; Samuel, S. M.; Sassoon, Sir E., Bart.; Scott-Dickson, C., K.C.; Scott-Montague, Hon. J. W. E.; Sharpe, W. E. T.; Shaw, C. E.; Shaw, Thomas, K.C.; Shipman, J. G.; Skewes-Cox, T.; Smith, H. C.; Soames, A. W.; Spear, J. W.; Spencer, Sir J. E., D.L., J.P.; Stanley, Hon. Arthur; Stevenson, F. S.; Stone, Sir J. B.; Taylor, T. C.; Thomas, D. A.; Thomas, J. A.; Thomson, F. W.; Trevelyan, C. P.; Tufnell, Lieut.-Colonel E.; Vincent, Sir Edgar, K.C.M.G.; Vincent, Colonel Sir Howard, K.C.M.G., C.B.; Walker, Colonel W. H.; Walton, John L., K.C.; Walton, Joseph; Wanklyn, J. M. L.; Warde, Colonel C.; Warr, A. F.; Wason, E.; Webb, Colonel W. G.; Weir, J. G.; Welby, Sir C. G. E., Bart., C.B.; White, G.; Whiteley, George; Whitley, J. H.; Whittaker, T. P.; Willoughby de Eresby, Lord; Willox, Sir J. A.; Wilson, C. H.; Wilson, H. J.; Wilson, John (Durham); Wilson, John (St. Rollox); Woodhouse, Sir J. T.; Wrightson, Sir T., Bart.; Young, Samuel; Yoxall, J. H.

In addition to the above, 29 members of Parliament have signified their approval, but withhold authority to publish their names; total, 260.

New Apparatus, &c.

The "Tyma" Developing Trough. Manufactured and sold by George Houghton & Son, 88 and 89, High Holborn, London, W.C.

All users of rollable films should possess themselves of this cleverly-designed piece of apparatus, by means of which—to state in a nutshell its peculiar and valuable office—a roll of exposed celluloid may be inserted in a light, tight receptacle, the black paper removed, the film subjected to the action of the developing solution, and the finished negative fixed and washed without the necessity of using a dark-room. The sectional illustration shows the system in actual operation, and an examination of the "Tyma," together with some negatives produced in it, persuades us that the little machine is so practically efficient that we have no hesitation in recommending it as a thoroughly useful piece of photographic apparatus. We append the full working instructions for the use of the "Tyma":—



A. Spool in position.
B.B. Black paper.
C. Film.
D. Syphon outlet.
E. Rubber spring and clip.

Take off the lid and put sufficient water in the trough to come just below the top inside curve of the syphon tube, and place the exposed spool in the spring holders so that when unwound the black paper is nearest the lid. The bowed wire spring should press lightly against the spool to prevent its unwinding when released from the fingers. Then pass the end of the black paper through the slot to the outside of the lid; pull gently until the end of the film appears, care being taken not to expose too much, or the first picture will be affected. Bend back the rubber spring clip and attach to end of film, put the lid on, and the film is ready to be lowered into the water, which is done by gently pulling the paper through the slot until the second white figure appears. Then stop for about a minute to allow the film to soak, but do not rock the trough. When the minute has elapsed, continue pulling the black paper gently till just after the figure 1 appears, when a slight resistance will be felt; then pull a little harder, till about a quarter-inch more comes through. The black paper, the end of the film, and the tissue paper that holds film and paper together will now be jammed tightly into the slot and held there, the position of the film being as shown in the block.

The paper can now be torn off flush, and the flap clasped down to the trough, which should be taken in both hands, with one finger on the syphon outlet at the bottom, and well rocked, first lengthways and then breadthways, for about two minutes. The water can then be syphoned off by slightly tilting towards the syphon end till all has run off. Immediately the last drop of water has run off, developing is started without delay by pouring into the trough through the funnel about the same quantity of the following developing solution as there was water for soaking the film:—

DEVELOPING FORMULA.

Metol	50 grains.
Hydroquinone	40 grains.
Sul. Soda	500 grains.
Bro. Pot.	25 grains.
Carbonate Soda	500 grains.
Water (boiled) to	20 ounces.

To obtain the best results use at a temperature of about 60deg. F.

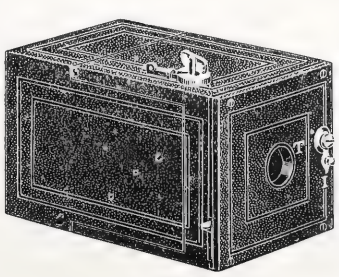
This developer can be used a number of times, allowing each time a little longer for development.

If the exposure is about correct, eight to twelve minutes will be about the time to bring up all detail.

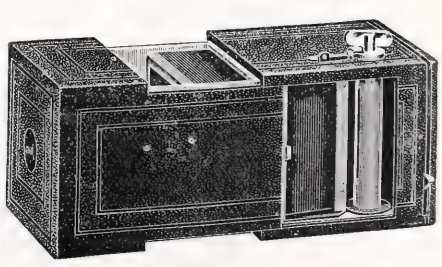
Great care should be taken that the developer is poured in as quickly as possible after the water is poured off. Immediately the developer is in, rock briskly for a minute or two, first lengthways then breadthways. This is the only means of keeping an even flow of developer between the layers of the film, and if not done, developing will be uneven. Rocking must be continued the whole time, but after the first two or three minutes it need not be quite so brisk, but keep the solution gently flowing both ways continually. When development is complete the developer can be syphoned back into the bottle and can be used for another occasion. Washing is done by letting the water from a tap run into the funnel for five minutes and the film will be washed automatically. To Fix.—The lid can be lifted off for a moment in order to pour in the fixing solution, or it can be poured through the funnel as before, and rocked for five minutes. The lid can be taken off to see if all the white surface has gone. When this stage is reached the film is ready for final washing, which is done by letting the water from the tap run into the funnel, which will take away any traces of hypo, both from film and trough.

The No. 1 Scout Daylight Roll Film Hand Camera. Manufactured and sold by George Houghton & Sons, 88 and 89, High Holborn, W.C.

Retailing at 5s., the No. 1 Scout is, in our opinion, bound to go. Designed for rollable film, it takes a photograph 2½in. square. The instrument weighs about 9oz., and measures 5⅛ by 3⅜ by 3⅛, so that it is both light and compact. It is covered in waterproof cloth, and has nickel-plated fittings. The "Everset" shutter allows of either time or instantaneous exposures, and the number of the film to be exposed is seen through a posterior ruby disc. We have examined the No. 1 Scout with interest and surprise, for it is astonishingly good money's worth,



Showing "No. 1 Scout" closed ready for use.

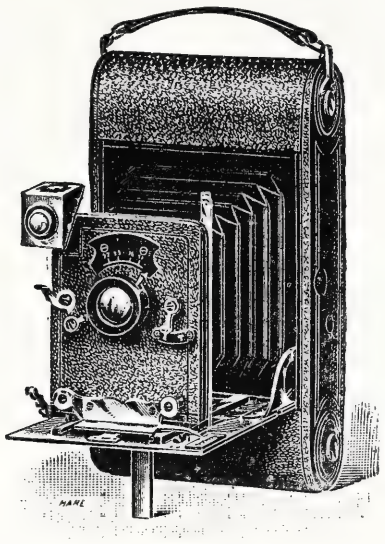


Showing "No. 1 Scout" partly opened for inserting Spool, &c.

the workmanship and construction being really excellent. The choice of the name "Scout" is a happy one. We wish the little camera the fate of ubiquity.

The No. 3 Ensign Hand Camera. Manufactured and sold by George Houghton and Son, 88 and 89, High Holborn, London, W.C.

By means of an easily-applied attachment carrying a detachable focussing screen, this camera, which is primarily of the roll-film type, can be converted into a plate camera taking thin metal single slides. Here, again, as in the case of the little "Scout," noticed elsewhere, we have

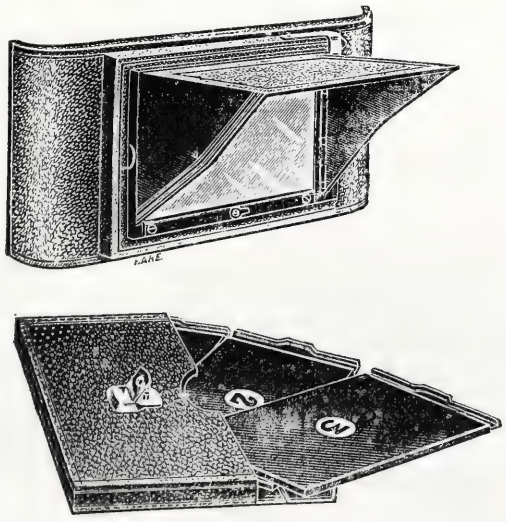


Showing Camera Open for Use.

to congratulate Messrs. Houghton on the excellent workmanship of the camera before us. The instrument "is of the folding pattern, with falling baseboard and extending front. An infinity catch—adjustable for either plates or films—automatically fixes the front, when drawn out, at the correct focus for distance."

The official specification of the camera is as follows:—

"Camera.—Constructed of mahogany, polished inside, red leather bellows, folding aluminium baseboard, covered outside in seal grain leather; nickel fittings. Lens.—Rapid rectilinear, with iris diaphragms. Shutter—'Everset' type, working between the lenses, giving either time or instantaneous exposures. Finder.—Reversible, ground glass or brilliant form, showing the image the correct way up; fitted with revolving mask, which gives vertical or horizontal pictures. A direct vision view-finder, with sighter, is also provided, which folds up on the front of the camera. Focussing scale, indicating the various distances at which objects are in focus up to within 1½ yards. Size.—Taking pictures 4¼ by 3¼, the camera measures, when closed, 8 by 4½ by 1⅜in."



Showing Plate Attachment and Slides.

We have critically examined the cardinal movements of the "Ensign" and find no difficulty in coming to the conclusion that the instrument has been carefully designed with a view to simplify the essential operations of hand-camera photography. Qualitatively the instrument appears excellent value (£3 12s. 6d.), whilst the plate attachment with three single slides costs 11s. 6d. Decidedly the "Ensign" is a well-built machine, easy to handle, and simple to use; and one capable, we should judge, of yielding high-class results on films or plates.

Studio Gossip.

Opening of the New Crown Studios, Sydney, N.S.W.—Recently there was a large gathering of citizens present at the Crown Studios to celebrate the opening of Mr. Blow's new premises, situated in George Street. Amongst those present were the Mayor of Sydney, the Mayors of Ashfield, Auburn, Burwood, Camperdown, Concord, Canterbury, Darlington, Drummoyne, Ermington, Kogarah, Marsfield, North Sydney, Parramatta, Redfern, Randwick, St Peters, Strathfield, and Waterloo; also Aldermen J. L. Mullins, M'Elhone, Perry, and Evan Jones. An inspection of the premises showed that the front shop has a frontage of 37ft., with a depth of 95ft. The show-room at the back of the shop is fitted with improved cabinet show-cases, to hold a large number of engravings and samples, so that the attendant may turn over sample after sample until the whole stock is exhausted, the customer seated in one place the while. A new revolving show cabinet for picture mouldings is a great improvement on the old wall display. Above the shop there is a fine picture gallery, well lighted, which makes a good promenade. The framing department is a large factory, where over thirty persons are employed. The reception-room, which is on the first floor, is lofty, well lighted, and unusually large, while the decorations show good taste. The two studios are spacious and well lighted, and contain every modern improvement. The height of the walls is 14ft., with a framed principal roof running up to 25ft. high. They are supplied with a good series of new backgrounds and accessories. There are three dark-rooms, five dressing-rooms, and thirteen work-rooms, with a set of three rooms for making dry plates and various sensitive papers. After the guests had been shown over the premises the company gathered in the reception-room, and Mr. Blow asked the mayor to declare the studio open. The mayor said he had great pleasure in declaring the new premises open. It was also a great pleasure for him to be present as this was the first opportunity he had had, since he became mayor, of congratulating a public-spirited citizen, not only upon helping himself to succeed, but in doing so much for the city. He had some little knowledge, as an amateur, of photograhpy, and he knew how difficult it was to turn out anything worth looking at. Thus he could appreciate the work he saw around him that day. Mr. Blow was a man of whom Sydney might well be proud. He was one who had done much to make Sydney what it was. It was pleasant to see the place fitted up with so much taste and effect. Mr. Blow had told him that, from beginning to end, all the work of the process was done in Sydney by artistic labour. Mr. Blow was entitled to high credit as a courageous and enterprising citizen. He had much pleasure in declaring the studios open. Champagne was then uncorked, and after the loyal toasts had been honoured Mr. Blow proposed "The Mayor and Aldermen of Sydney." The mayor responded, and said he and his colleagues had never grudged time, labour, or effort on behalf of the city. A better state of things was opening for the city of Sydney. He believed the citizens appreciated the fact that they were doing their best. The mayor then proposed "Success to the Crown Studios." He said they knew the work Mr. Blow had done. They had only to look around them and see groups of practically every distinguished man in Australia. Mr. Blow was well known for his work, and for his capacity in the profession he had chosen. They wished him every possible success, and felt sure he would attain it. The toast was honoured with cheers. Mr. Blow, in responding, said it had been a hard fight to bring the business up to its present position. In 1889 he began in Park Street, with one assistant. He had a most elaborate entrance by a side door 3ft. wide. It was a hard fight, and there was one gentleman in the room from whom, many years ago, he had had to borrow £50. He attributed his success to the fact that he had applied himself diligently to his business, and had kept his eye on all the advances of the profession. He was the first to introduce the flash-light in Australia, in 1892. After that he patented in Sydney a process which had since become popular in England and America, viz., positive photographs in celluloid. He was also the first to introduce the popular enlargement, which had brought him into somewhat bad repute with some of his fellow-photographers, because it brought the prices down a good deal. He was also the first to introduce the X-rays as a photographic instrument in Australia. He had kept his eye well on the profession, knew what was going on, and did his best to keep Sydney abreast of the times, and they had the best available artists in their employ that could be found in Australia. He thanked them for the manner in which they had drunk the toast. The company was then photographed and the proceedings terminated.—"The Australian Photographic Journal."

A novelty in the way of luncheons was that given by a New York photographer a few days ago. The room was dimly lighted by ruby dark-room lanterns, and the menus were printed on dry plates, while the guests found placed before them what were apparently a box of dry plates, a jar of paste, a tin can of platinum paper, and a small glass tube labelled with scull and crossbones. These contained the eatables.—"Invention."

Daily Sport Syndicate, Limited.—The above-named company was registered with a capital of £5,000 in £1 shares. The objects of the Company are to carry on business as printers, photographers, and photographic printers. Table A mainly applies. No initial public issue. The directors: C. Shurey and R. A. Chiffins. Qualification, £100. Registered office: Caxton House, Gough Square, E.C.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

March.	Name of Society.	Subject.
10	Oldham Photographic Society	Members' Slides.
11	Newcastle-on-Tyne	*Process Plates.* By A. B. Gardener.
11	Leeds Photographic Society	Annual Lantern Exhibition.
11	Thornton Heath Polytechnic	Demonstration. *The Platinotype Process.* By W. H. Smith, Esq. (The Platinotype Co.)
11	Stonehouse Camera Club	Elementary. *Various Printing Processes.* Mr. S. H. Paynter.
12	Southsea Photographic Society	*Home Portraiture.* Mr. P. R. Salmon.
12	Photographic Club	Open Night.
13	Rodley, Farsley, and District	*Carbona.* Mr. H. Crossley.
13	Oldham Photographic Society	Lantern Lecture. *Rambles with a Hand Camera.* Mr. J. H. Brierley.
13	Liverpool Amateur	Lecture: *Portraiture.* Mr. E. Rimbault Dibdin.
13	Richmond Camera Club	*Timing Development.* Mr. E. R. H. Wingfield.
13	Woolwich Photographic	Exhibition.
13	London and Provincial	Open Lantern Night.
14	West London Photographic	Lantern Night. *The South-Western Highlands.* G. Lamley
14	Borough Polytechnic	*Enlarging by Reflected Artificial Light Without a Condenser.* Mr. P. C. Cornford.
14	Woolwich Photographic	Exhibition.
13	Liverpool Amateur	Lecture: *Portraiture.* Mr. E. Rimbault Dibdin.
11	Birmingham Photographic	*A Description of Burford.* By Mr. J. Ward.
13	Ashton-under-Lyne	Practical Demonstration: *Carbon Process.* Mr. R. T. Marsland.
10	Croydon Natural History	Mr. Rudler's 8th Lecture.
11	Croydon Natural History	Geological.
14	Croydon Natural History	Photographic.

ROYAL PHOTOGRAPHIC SOCIETY.

FEBRUARY 25TH.—Technical meeting. Mr. J. C. S. Mummery in the chair.

Mr. Archer Clarke showed an electrical alarm clock for

TIMING EXPOSURE AND DEVELOPMENT.

He said that, accepting it as an uncontested fact, that the utilisation of every particle of light during dull weather was essential, especially amongst process workers, a means of advising the operator that a predetermined exposure of some length had run out, was a boon, because it enabled him to see to other things with freedom and ease. Any ordinary clock may be used, and the extra electrical fittings can be easily added. These extra fittings consist of a third hand, independent of the clockwork and free to be placed at any point of the dial. A small battery is connected in a convenient way with this extra hand and with the minute hand, the circuit being completed when the latter hand comes into contact with the adjustable third hand. The bell rings and warns the operator that his attention is required. The clock as an electric alarm has a radius of from 30 seconds to 59½ minutes, and can be set for any intermediate stretch of time.

HALF-TONE SCREEN RULINGS.

Mr. William Gamble offered some interesting notes upon the increasing fineness of half-tone screen rulings. The most recent outcome of this tendency was Max Levy's screen of 400 lines to the inch. Not only was such a screen ruled, but a block had been made from it and printed. He passed round a portion of the unsealed screen so that the ruling could be easily examined with a glass. The block had been printed in the last issue of the "Process Year Book," and was one of eight that had been printed together in the ordinary way. If printed with special care and separately the result would, no doubt, be much better; but the proof he showed was ample testimony that the block was commercially printable. The naked eye failed to detect the ruling, so fine was it, and the pull from the block had a close resemblance to collotype. Screens having 150 lines and 133 lines to the inch appeared extremely coarse when compared with the 400-line screen. Mr. Gamble said that he had heard that a screen actually embracing 500 lines to the inch had been made and applied to block work. Of course, the ruling of screens to this degree of fineness was not a serious matter when one compared it with that of diffraction gratings, which ran up to 15,000 per inch. He passed round a celluloid replica of one of Thorpe's rulings mounted on a silvered concave lens Speaking of another phase of half-tone screen-making, Mr. Gamble referred to the irregular grained screens such as Mr. Sanger Shepherd and others had worked at. They were all made with an opaque grain, either by means of dust deposited on the plate or by etching the plate rather deeply and afterwards filling in with black material. Screens of this character seemed to give results that could only be called "dirty," and they did not promise at all well. Irregular grained screens of the type introduced by Mr. James Wheeler, and styled Mezzograph screens, were transparent screens that seemed to have a better future, however. The glass plate, after a particular etching process it went through, had a beautiful embossed grain, or series of reticulations, which acted as small lenses or prisms and deflected the light into alternate dark and light spots. Prints from blocks made with these screens were passed round. They were in every case letterpress blocks; that is to say, the ink attached itself to the top of each grain and the impression was from the surface of the block. The process had lately, however, been applied to intaglio printing, and two prints by the method were shown. They seemed to indicate that the screen was likely to be useful in this branch of printing, as well as in letterpress block printing. A copper block made by means of this screen and etched for ten minutes was passed round. Mr. Gamble then showed a piece of metal composed of zinc and copper in a state of mechanical adhesion. Years ago it was thought to save the cost of copper by coating zinc plates with a layer of copper, but when the image was put on and baked for the enamel process the copper came away. A German firm was now rolling two metals together in layers and producing a combination which was used for purposes quite outside photography. Mr. Gamble had found it possible, however, to use the combination in process work by the enamel method, and that it passed through the etching satisfactorily and also the bevelling machine at high speed. Two or three metals could be combined in any percentage by the method—copper and zinc; copper, zinc, and copper; copper and aluminium; zinc and aluminium, etc. The principle seemed to be that a sheet of aluminium foil inserted between the two layers acted as a sort of solder under the heavy pressure brought to bear. The combination was largely used for sheathing ships, roofing, etc.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

FEBRUARY 27TH.—Mr. R. P. Drage in the chair.

Mr. F. O. Bynoe offered some interesting remarks upon lens construction as applied to the more delicate and precise instruments now so universally employed. Showing, in the first place, by means of a mechanical slide, the principle of the undulatory theory of light and how its propagation was brought about by wavelike vibrations, and not by actual movements of the molecules of matter in the direction of the course of the light, he proceeded to explain the principle of the image-forming pinhole, the simple action of which helped so much to a proper understanding of the functions of the more complex lens. The advantage of the lens over the pinhole was seen, in the first place, to depend upon its capacity for receiving many more times the amount of light passed by the pinhole. The lens was therefore superior in rapidity to the pinhole, inasmuch as even a lens of small diameter exceeds by very many times the diameter of the pinhole. It was instructive to follow Mr. Bynoe in his attempt to show how the high-class lens differed from that of the ordinary type. The simple lens was shown, in the first place, to possess many inherent defects, the correction of which necessitated a more complex and costly system. Diagrams showing what befel a beam of light in passing through a prism were put upon the screen. Besides the bending aside there was the dispersion of the beam into its component parts. An ordinary lens was an assemblage of prisms, and, if uncorrected, would bring a beam of light, not to a definite focus-point, but a series representing the different spectrum colours. Thus the more luminous yellow rays might be selected for focussing an image upon the screen; but if the plate were placed in the same plane the image would be all blurred, because the more actinic rays find their focus at a different plane to the yellow rays. In the old days one had to ascertain the difference between the chemical and visual foci, and, after focussing, move the lens a certain distance so as to bring the chemical rays to a focus on the plate. Opticians now perform this correction, however, in the lens itself. To the single lens we have been referring to up to the present is added a negative or minus lens, having a degree of dispersion and refraction calculated to combine with those of the single lens, and bring as nearly as possible to identical focus all the spectrum rays. One sometimes heard people talk of achromatic spectacle lenses, but no lens could be achromatic unless it consisted of at least two elements. Colour correction was most important in lenses for process work. As a matter of fact, the Beck-Steinheil orthostigmat gave a circle of confusion of less than 1-300th of an inch. In flatness of field it was also in the front rank. Copying such as this lens was used for required absolute flatness of field, and the Beck-Steinheil orthostigmat practically fulfilled this condition. A stigmatic error was a great trouble in lens construction. In the lens under notice both elements are corrected in themselves for astigmatism. Each combination consists of three lenses, and the corrections for the various aberrations depend entirely upon their calculation The most perfect lens is only a compromise between these several errors, but the skill of the optician has brought the compromise very near to the theoretically perfect lens. Mr. Bynoe then touched upon the use of the telephoto lens, and by means of a clever mechanical slide showed how the negative attachment gave practically a lens of greatly-increased focal length by throwing the optical centre of the lens to the front, without anything like a corresponding increase in camera extension.

PHOTOGRAPHIC CLUB.

FEBRUARY 19TH.—Mr. John Nesbit in the chair.

Mr. A. S. Newman gave the second part of his paper upon

KINETIC PHOTOGRAPHY.

He dealt at great length with the practical applications and mechanical requirements of the apparatus, and having accumulated a heavy indictment against any claim to perfection on the part of Kinematography, proceeded to indicate how the defects might be reduced. Some were due to methods of working and some to imperfect design and unsuitable material. The perfect machine, which, of course, includes the apparatus for taking the negative printing the positive and projecting the picture, should only be simple so long as simplicity of construction does not impair excellence of result. One and the same machine, though *able* to perform the three processes, is not likely to do them so well as three separate and specially suited machines. The taking apparatus should be capable of being immovably fixed with facility, yet it must be port-

able. The printing machine is generally used in a dark-room, and neither portability nor stability is required to a great extent. The projecting machine requires, in the first place, to be stable. Heaviness is an advantage rather than otherwise, as stability is helped thereby. Extreme portability in this machine is not absolutely necessary, but it is a feature to be provided as far as other considerations will permit. The lecturer said a few words about celluloid, the material which really made possible the Kinematograph. It was not an ideal substance, but it was at present the best. It suffered from inflammability, but the defect was exaggerated. The gelatine covering reduced the risk of fire very much, and, as a matter of fact, left it on a par with a heap of wood shavings of the same bulk. It was not explosive, however, and its flame was low in temperature. The unstable nature of celluloid was brought home to one when the perforations come to be considered. The perforations should be absolutely regular and at right angles to the run of the film. Gradual shrinkage of the celluloid tended to create trouble by altering the gauge, as also does unequal exposure to the atmosphere, the changes of temperature in and out of the lantern, etc. But with all these drawbacks it remains the best available substance, and its durability and flexibility are qualities that must be duly appreciated. Mr. Newman discussed the trouble caused by static electricity set up in the celluloid by friction, and in due course dealt with the various methods of perforating in vogue. He explained the mechanical contrivances for passing through the film at high speed with a minimum of injury to the film, and, as an expert, discussed the claims of differently-shaped perforations, which play an important part. To close a long chapter, Mr. Newman explained a number of machines embodying his own ideas, and ultimately showed on the screen a number of pictures. The extreme freedom of the results from the flicker that usually mars these displays was a strong feature, and earned for the lecturer a cordial demonstration of thanks and approval.

February 25th.—Mr. G. E. Brown in the chair.

The chairman passed round several portfolios of reproductions of the work of the foremost pictorial photographers of Great Britain, America, and the Continent. The collections were brought together by Herr Ernst Juhl, of Hamburg, and are published by Wilhelm Knapp, of Halle.

Mr. Oliver G. Pike gave a lecture entitled

"Birds of the Forest, Field, and Shore."

Mr. Pike is one of the small band who in recent years have set themselves the task of depicting bird-life in its natural haunts. The work is such as to call forth unwonted exercise of patience and of plodding determination, and very considerable devotion to the pursuit of this particular phase of photography must have been necessary to produce the comprehensive collection of pictures that Mr. Pike put before the meeting. The lecture dealt with the bird-life to be found in and around Enfield, the Bass Rock, and the Farue Islands. Mr. Pike pointed out that, contrary to a somewhat general belief, birds were not found in strongest force in the remote parts of woods and forests; they preferred to frequent the outskirts of the woods or the paths used by man, whose company they might be said to seek. The haunts and ways of every bird common to London and its environs were touched upon in the lecture, and very interesting it was to follow Mr. Pike in his photographic inquiries into the habits of some of our water-birds, notably the dabchick, whose nest and eggs are so cunningly secreted. Extremely long waits have to be faced if one wishes to secure pictures of the rarer and more timid birds. In the case of the kingfisher Mr. Pike tells a story of endless patient endurance of the scant comforts afforded by the branches of a tree whence he purposed actuating his camera shutter by means of a bulb when the bird rested within the area previously focussed. In course of time Mr. Pike arranged for an electrical release of the shutter by the bird itself. He showed the disposition of the wires and the method of making contact, and demonstrated in the resulting pictures that some extremely fine effects could in this way be secured. The sea birds on the Bass Rock and the Farne Islands were portrayed only, in many instances, after a display of nerve and cliff-climbing that would daunt those of timid nature, and those who take up this class of work need to possess no mean powers of endurance and plucky resource. The photographs, taken under all sorts of conditions, rank very highly on technical and sometimes pictorial grounds, and Mr. Pike richly deserved the commendation that he received at the close of the lecture.

LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

The monthly meeting of the above Association was held on Thursday, February 27th, at the rooms in Eberle Street, Mr. E. R. Dibdin (president) in the chair. There was a large attendance of members present. The business of the meeting included the presentation of medals to the successful competitors in the late competition, and the announcement by the president that the demonstration of the Lumière colour photography process would take place at the meeting to be held on March 13th. Five new members were elected. After the usual business had concluded, Mr. Dibdin introduced the lecturer of the evening, Mr. J. Shaw (Manchester), whose lecture on "A Tyrolese Valley" was listened to with marked appreciation. Mr. Shaw, starting from Innsbruck, took his audience to Cortina, Walle di Cadore, and Schluderback. His description of the various scenes en route was most vivid and interesting, especially so of the sunset in the dolomite region. The slides, which in the general opinion of the members were among the finest ever exhibited in the rooms of the Association, were very numerous, and frequently called forth applause. They included some magnificent mountain scenes, and the rendering of the cloud effects was exceedingly fine. At the conclusion a very hearty vote of thanks was proposed by Mr. P. Lange, who himself has visited the same region, and unanimously carried.

CROYDON CAMERA CLUB.

The photographic exhibition of the Croydon Camera Club was appropriately and pleasantly wound up on Wednesday night, the 26th ult., by a soirée in the Art Gallery, Park Lane. There was a good attendance, and the interesting programme which was provided being efficiently carried out, the evening proved an agreeable one.

The musical portion of the programme opened with a pianoforte selection by Miss Ethel Waine. Other excellent items were Charles Vincent's ballad, "The King," and V. M. Capel's song, "Love, could I only tell thee," finely sung by Mr. C. A. Swain, whose rich voice was heard to great advantage. Two cleverly-played violin solos by Mr. A. G. A. Chalmers made up the remainder of the musical selections. The technical items of the programme included a display of the prize slides and an exceedingly fine display on the screen by Mr. Henry Stevens, who showed some excellent slides of domestic animals—cats, dogs, fowls, and the like—landscapes, groups of flowers, and so on; and demonstrations of the Tyma developing apparatus by Max Reichert, and of the Platinotype printing process by Mr. W. H. Smith. One of the most popular demonstrations of the evening, too, was that of the Sanger-Shepherd colour photographic process. The method of taking red, blue, and yellow negatives, the positives being superimposed, was first illustrated, after which some highly interesting specimens were shown to demonstrate the satisfactory results obtained. Colour toning, by Mr. B. E. Edwards, and the Röntgen Rays, by Mr. G. W. Watson, were also among the attractions of the evening. An interesting stall which has been on view during the exhibition, and which has attracted much attention was the stall of Mr. D. P. Roberts, chemist and dealer in photographic requisites, of North End, Croydon. Mr. Roberts exhibited a large collection of cameras and photographic sundries of all kinds, and in variety enough to suit the requirements of all.

During the evening the ceremony of presenting the prize medals was performed by Mrs. Maclean, who was presented with a handsome bouquet by Miss Rogers, the little daughter of the Exhibition Secretary.

The president, Mr. Hector Maclean, who prefaced the distribution with a few introductory observations, remarked upon the considerable success which had attended the efforts of the Club. They would long remember some of the salient features, notably the capital display of members' prints. It was a matter of unusual gratification that the gold medal, open to the whole of Great Britain, had been gained by a Croydon man. They might also congratulate themselves on the fact that in the class for residents of Croydon, whether members of the Club or not, the two medals had been taken by members of the club. The president also touched on the stimulus which the operations of the Club gave to the study of art and even in some cases to its practice.

The medals were then distributed by Mrs. Maclean in accordance with the list which has already appeared in our columns.

Mr. Kough (vice-charman of the club) proposed a vote of thanks to Mrs. Maclean, remarking that it was a source of gratification to know that she took an equal interest with her husband in the Club.

Mr. Salt (hon. sec. of the Club) seconded the proposition, and added the hope that when they had a ladies' section of the club Mrs. Maclean would be the first president.

PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION (LIVERPOOL BRANCH).

A meeting of the Liverpool Branch was held on Friday, February 28th, 1902, at the Alexandra Hotel, Dale Street, Liverpool, Mr. G. Watmough Webster in the chair. Present: Messrs. W. Warrington, J. S. Saroni, G. Latimer, S. Smith, A. Priestly, S. Hibberd, E. Vanderbilt, D. Seamon, J. Spratley, A. F. Mowll, etc.

The minutes of the previous meeting were passed, and the president was authorised to insert an omission which had occurred at the last meeting.

The president proposed, and Mr. W. Warrington seconded, that professional photographers within a radius of 25 miles from Liverpool shall be eligible for membership of the Liverpool and District Branch of the P.P.A. Carried *n.c.* Mr. Morris, of Chester, who was a member of the Association, was elected a member of the Liverpool Local District Branch. Mr. Priestley proposed, and Mr. Vanderbilt seconded, that the establishment of a benefit fund for professional photographers is most desirable, but that definite steps in the matter should be deferred until the Association is older and stronger. A long discussion then took place *re* paragraph 3 from the London hon. sec., and it was decided to defer the matter, and each member bring forward a written opinion.

The next meeting was arranged for Friday, April 4th.

GATESHEAD CAMERA CLUB.

At a meeting of the above Society, held in the Berwick Assembly Rooms, on Saturday, March 1st—the president, Mr. W. Fitzjames White, A.R.C.A., in the chair—a lecture was delivered by Mr. C. H. Hewitt, the editor of "Photography Notes" in the "Newcastle Weekly Chronicle," and a well-known writer in the photographic press, upon "Choosing the View." The lecturer divided his subject into six parts: selection, standpoint, focus of lens, choice of lighting, introduction of sky, and the use of figures. Mr. Hewitt dealt with these several points in a conversational manner, and illustrated his remarks by means of rapid sketches made upon the blackboard, and also by exhibiting examples of the work of H. P. Robinson and A. Horsley Hinton. The lecturer succeeded in sustaining the attention of his audience for one hour and forty minutes, and it is felt that the teaching of Mr. Hewitt, who is a remarkably clear exponent, will have great effect upon the work of the Society during the coming summer. Upon the motion of the president, a hearty vote of thanks was accorded to Mr. Hewitt for his interesting address.

FEDERATION OF THE PHOTOGRAPHIC SOCIETIES OF NORTHUMBERLAND AND DURHAM.

THE delegates of the Federation of the Photographic Societies of Northumberland and Durham met at the County Hotel, Durham, on Wednesday, February 26th, 1902, Mr. J. Davenport in the chair.

The hon. sec. (Mr. Arthur Payne) reported that the Leamington Camera Club and the Heaton Amateur Photographic Society had joined, whilst the Newcastle-upon-Tyne and Northern Counties Photographic Association had withdrawn from the Federation. He was in communication with the Sunderland Photographic Society and also the Societies at Haltwhistle and Blyth.

Mr. Cluff, upon behalf of the Durham Camera Club, invited the Federated Societies to visit Durham on Whit Monday. Upon the motion of Mr. C. H. Hewitt the invitation was enthusiastically accepted. Mr. J. Davenport, upon behalf of the South Shields Photographic Society, announced that they would be pleased to see Federation members at their forthcoming exhibition; they would be admitted free upon production of their pass. It was decided to petition the North-Eastern Railway Company to grant reduced fares to members of the Federation when travelling with the camera. Permission for members to photograph at various places of interest will be solicited by the local Societies upon behalf of the Federation.

NEWCASTLE-ON-TYNE AND NORTHERN COUNTIES' PHOTOGRAPHIC ASSOCIATION.

FEBRUARY 25TH.—The president of the Association, J. S. B. Bell, C.E., gave a lecture on "Wet Plate Photography." Mr. Bell brought to the meeting the apparatus he used in the wet plate days, which, for its weight (though considered light at the time), was a revelation to some of the younger members. The dark-room, silver bath, dishes, etc., all had to be taken into the field when any landscape work was attempted; but, in spite of the great difficulties, some excellent work was done, and Mr. Bell handed round some of his early negatives, which were much admired, and it was particularly pointed out that there was an almost entire absence of halation in several very difficult interiors, in spite of the plates not being backed.

The early photographers' *bête noir* was dust, and most elaborate precautions had to be taken to avoid it, but it was very difficult to entirely eradicate. Mr. Bell's chief advice was not to use a brand new silver bath, hold the developer close to the plate when pouring it on, and to clean the glass preparatory to coating with strong soap and afterwards with a weak solution of potass cyanide. "Doctored" baths, the lecturer did not think, were "worth the candle," but a bath could be kept for a considerable time if used with care and a little "Kaolin" added, and occasionally "sunned." At the conclusion of the demonstration he exposed a plate by magnesium ribbon, and afterwards developed, getting a very good result of a black and white subject on the wall, by several "intensifications" or the application of a little silver to the developer.

Commercial & Legal Intelligence.

ALLIANCE Roll-Film Camera Company, Limited.—The above-named company has been registered with a capital of £10,000 in £1 shares. The objects of the company are to carry on in all or any of their respective branches the businesses of manufacturers of and dealers in roll or continuous films for photography, and cameras adapted for the same, papers, chemicals, and other substances; to acquire and turn to account any patents, patent rights, inventions, etc., in relation thereto, or any other business which can be carried on in connection with the same. No initial public issue. Qualification, one share. No names of directors given. Remuneration not specified. Registered office: Gwyder Chambers, 104, High Holborn, W.C.

ANOTHER Death from Cyanide of Potassium.—The number of deaths from cyanide of potassium during the past few months seems almost phenomenal; indeed, they have been more frequent than in the days when this salt was so largely used in photography. Last Saturday an inquest was held on the body of a man, a military tailor, who employed the cyanide for cleaning gold lace. According to the evidence, he drank some of the solution in mistake for whiskey, it being kept in a bottle of the same kind as that in which the latter was kept, and in the same cupboard. The man died within about four minutes after swallowing the poison. This shows the deadly nature of the poison and the rapidity of its action; also that if any real antidote for it were known it is doubtful if it would have been of any avail in this instance. In the report of the inquest, we read, there was no mention of where the cyanide was obtained from, but as its sale is at present restricted to pharmaceutical chemists, we may assume that it was got from one, and that the conditions of its sale were duly complied with according to the laws. The danger with poisons, as in this case, is more due to the way they are dealt with after they are sold than in their sale. In this instance the solution was kept in a similar bottle to that in which whiskey was kept, hence the mistake. In cases such as this—and there are many like it—it makes no difference whether the poison is sold by a pharmaceutical chemist or one who would be licensed to sell poisons for trade and technical purposes under the proposed new Act. The danger of accidents with all poisons is not in their sale, but in the way that they are kept afterwards.

LAST week, at the North London Police Court, Albert Edward Cooke, 23, optician, of Forest Road, Dalston, was charged, on a warrant, with the theft, as a bailee, of a photographic camera worth £2 10s., entrusted to him by the International Photographic Supply Company, of Seven Sisters Road. Mr. A. Ross prosecuted. The prosecutor, Mr. Max Thomas, said that in December last the prisoner, in the name of Hudson, replied to an advertisement for travellers to sell photographic cameras He gave a name as a reference, and this appearing satisfactory, he was engaged. The arrangement was that he was to have 4s. on each sale effected, and, if he proved useful, he would have a salary of £3 per week. On December 18th and 21st the prisoner brought orders, purporting to be signed by persons who had purchased cameras on the instalment principle, and received his commission; but it subsequently appeared that the names on the orders were fictitious, and that the letter of reference was addressed from the prisoner's father's house, and, in witness's opinion, was in the handwriting of the prisoner himself. The prisoner also said he was a householder in Graham Road, but this was false, and up to the present the cameras supplied to him had not been traced. When pressed on the subject, the prisoner was impudent, and said that the prosecutor might fish for himself—he was no servant of his. The prisoner now asserted that he had made genuine sales, and if the purchasers could not be found he could not help it.—Mr. Chapman: But the addresses on these order forms are fictitious, and the goods cannot be found.—The prisoner, who said he was innocent of the charge, was committed for trial. The prisoner told Detective-sergeant Stacey that he gave a false name for trade purposes, and with no felonious intent.—"Standard," March 1st, 1902.

A CLERGYMAN Promotes Public Companies.—The public examination of the Rev. Alfred Allen Barratt, M.A., vicar of Holy Trinity Church, Claygate, was resumed at the last sitting of the Kingston Bankruptcy Court, before Deputy-Registrar Mr. F. J. Bell. Mr. F. Cooper Willis (barrister) appeared for the Right Hon. Lord Foley, the petitioning creditor; and Mr. F. Brinsley Harper (Messrs. Lumley & Lumley) represented the debtor. The Assistant Official Receiver (Mr. T. W. J. Britten), who examined the bankrupt before, was not in attendance. When before the Court on the last occasion, the debtor stated that he had acted as the working chairman of various limited companies now in liquidation, and he attributed his failure to a judgment obtained against him by the petitioning creditor in respect of a guarantee given him for the benefit of a company now in liquidation, for which guarantee he received no consideration.—Mr. Cooper Willis: Now, with regard to these companies in which you were interested. I see the Linoleum Tile Company was registered on February 16th, 1893; the Paragon Bolt Syndicate, Limited, on July 18th, 1893, with offices at 59 and 60, Chancery Lane; the Engineering and Patents Development Company on July 25th, 1893; the Artistic Letter Company, Limited, on September 18th, 1894; the Cresco-Fylma Company on August 30th, 1895; the Cresco Fylma and Hannam Company on February 15th, 1897; the Linoleum Tile Company again on March 17th, 1897; Photo, Limited, on December 4th, 1897; and Stationery, Limited, on January 4th, 1900. Have any of these companies ever paid a dividend?—A.: I am afraid they have not.—Q.: Can you point to a date when, at the formation of any of those companies, you had any moneys of your own available for the promoting or the purchase of any shares?—A.: I don't remember.—Further examined, debtor said that the Cresco-Fylma Company was floated with a capital of £10,000 in 1895, and that was the year when he first became acquainted with Lord Foley, as far as finances were concerned. His brother, "H Allen," was secretary of the Company. A demonstration of the patent was given at Claygate by a Mr. Hill, and proved most successful. Lord Foley, who attended, was very pleased with all he saw, and afterwards called on him and asked whether he might have an interest in it. Debtor promoted the Company, and Lord Foley became one of the first subscribers. In that Company debtor admitted that he took altogether 2,275 shares. On May 31st, 1897, an agreement was entered into between the Company and Hannam, Limited, the arrangement being that Hannam should be paid the sum of £2,072, £970 of which was to be satisfied by fully paid-up shares and the balance in cash.—Q.: Was that paid to Mr. Hannam?—A.: I suppose it was. I don't know. The directors had as much to do with it as I had.—Q.: Who was managing director?—A.: I was working chairman.—Q.: Didn't you control the whole board?—A.: I should not say so.—Q.: Who was it you did not control?—A.: Mr. Hannam, Mr. Richards, Mr. Crombie, and Lord Foley were all directors.—Answering further questions, debtor said that in May, 1898, Lord Foley guaranteed him a sum of £3,400, which was to be invested in shares in Photo, Limited, but denied that he used a large part of this sum to pay his creditors. Stationery, Limited, was formed to help Photo, Limited, and had offices at 72, Gray's Inn Road. Of that Company he was also managing director and working chairman, at a salary of £1,000 a year, but he never received a penny. His wife kept her own banking account, and had £3,000 left her about three years ago by her uncle. He admitted that from time to time he had paid moneys into his wife's account. The examination was further adjourned.

RE Henry Vander Weyde, photographer, 182, Regent Street, W.—The first meeting of the creditors concerned under this failure took place at the London Bankruptcy Court, on February 26th, under the presidency of Mr. Burgess, Assistant Official Receiver. The statement of affairs filed by the debtor showed gross liabilities amounting to £13,714 0s. 3d., of which £6,121 17s. 7d. was due to unsecured creditors. To partly-secured creditors £4,445 9s., the value of the securities being estimated at £836

6s. 6d., leaving a balance of £3,609 2s. 6d. to rank for dividend. To preferential creditors £2,896 13s. 8d. The total liabilities expected to rank against the estate were returned at £12,627 13s. 9d The assets consisted of cash at bankers, 2s. 4d. There was also some stock-in-trade valued at £250, but that had been distrained upon by the landlord, and book debts amounting to £404 were covered by a mortgage, so that the net assets only amounted to 2s. 4d., and the deficiency was returned at £12,627 11s. 5d. It appeared that the debtor commenced business at 182, Regent Street, W., in 1877, as a photographer, having been for some years previously a portrait painter. He had no capital of his own when he commenced business; in fact, he was then owing some hundreds of pounds. For many years prior to 1877 he had interested himself very largely in inventions, but, with one or two exceptions, they proved unsuccessful. The invention with which his name was principally associated was that of photography by electric light, and being unable to sell it at a fair price he commenced business as above, with a view to exploiting his invention. To do that he borrowed several thousand pounds; he could not state the exact amount, but his books would show. He should think that between 1877 and 1880 he borrowed £3,000 for the purpose of carrying on the business. In 1879 he was forced to call his creditors together. His liabilities were then about £3,000 or £4,000, largely made up of borrowed money. His creditors consented to accept a composition of 2s. 6d. in the £, which he paid down, and obtained a release from all his creditors, with the exception of one, who was secured. He continued trading at 182, Regent Street, on borrowed money, obtained from Capt. Austin, who lent him £3,000 to £4,000 at 10 per cent. interest, on a mortgage of the lease and goodwill and stock. He paid that off by instalments from the profits derived from his business, and in about 1888 the balance due to that gentleman of about £1,000 was transferred to Mr. Henry Taylor, of Messrs. Courtrauld and Co., crape manufacturers, of Aldermanbury. Upon the death of that gentleman, about ten years ago, he paid off the debt by arrangement, and obtained a release. Since then he had carried on business principally with borrowed money. The business had not paid for some years, and by arrangement with the landlord he had been carrying it on since 1898 (when the lease expired) on a monthly tenancy. The landlord had allowed the rent to run since, and there was now due to him nearly £3,000, representing arrears of rent, under the lease and the monthly agreement. The rent was £500 per annum, and on June 1st last the landlord distrained. The bailiffs have been in possession ever since, and according to their valuation there was not enough, if sold by auction, to cover six months' rent and costs. The business was now practically at a standstill. The landlord had been induced to wait for his rent by the prospect of debtor being able to pay him out of his profits of companies formed to work his patents. A company called "The Star Ice Company, Limited," was formed to work one of his patents about three years ago. Premises were secured at the National Skating Palace, in Argyll Street, Regent Street, W., and the business done there consisted of trade-marking pure ice so as to be able to identify it even in the glass. The capital of the company was £35,000 nominal, of which £30,000 was issued. Some months ago, however, the company went into liquidation, and consequently his shares were valueless, unless the company could sell its patent rights. He alleged his failure to have been caused through liability for borrowed money used for the purpose of working his inventions, inability to realise his inventions, and loss on trading, owing to his want of business habits. As the debtor had no offer of composition to submit to the meeting he was adjudicated bankrupt, and Mr. Angus Scott, of Arundel House, W.C., was appointed trustee of the estate.

The German Ambassador, Count Metternich, has been commanded by His Majesty the Emperor of Germany to convey to the veteran photographer royal, Mr. Horatio Nelson King, his thanks for photographs supplied by him of the Royal Palaces, Houses of Parliament, Tower of London, and Westminster Abbey.

The late Mr. J. A. Boolds, of Devonport.—Devonport Camera Club sustained a very great loss in the death of Mr. J. A. Boolds, of 5, Paradise Place, who was associated with the venture from its commencement, and occupied the position of president, two years ago. At various times he has given good and valuable art instruction to its members. Not only was he a photographer, but he had real artistic perceptions and could show good work in water-colours. In photography he was not only an expert in the manipulation of the camera, but a good optical worker, as the best portion of the instruments used by him was of his own manufacture. He was ever ready to assist others in their work if necessary, and in social life his loss will be felt by many.—"Western Morning News."

Royal Institution.—A general monthly meeting of the members of the Royal Institution was held on March 3rd, Sir James Crichton-Browne, treasurer and vice-president, in the chair. It was announced that his Royal Highness the Prince of Wales had graciously consented to become vice-patron of the Institution. Sir William Agnew, Bart., Mr. Hilder Daw, Mr. J. F. W. Deacon, Mrs. Deacon, Mr. A. St. John Clerke, Miss Agnes M. Clerke, Mr. E. Figgess, Mr. M. Fitzmaurice, Mr. F. M. Guedalla, Dr. J. Harold, Mr. F. Legge, Dr. H. Lewkowitsch, Miss A. H. Little, Mr. W. F. Preedy, Dr. A. M. Robson, Mr. M. M. Samuel, Mr. F. A. Smith, Mr. J. J. Torre, Major-General James Waterhouse, Mr. Philip Watts, F.R.S., and Mr. C. Tweedale, were elected members. The special thanks of the members were returned to "An Old Member" for a donation of £50 to the Fund for the Promotion of Experimental Research at Low Temperatures.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

FLASHLIGHT PHOTOGRAPHY.

To the Editors.

Gentlemen,—I am surprised that Mr. Milner has located himself as the one man who answered to his own description of having made three visits. He was one who appeared to me to be trying to get at all my working methods without intending to buy my apparatus, hence he was not shown all the details of it, therefore could not judge of what he did not understand, and as he did not pay another visit, as he intended, he could not possibly say that the apparatus did not meet his requirements. On the contrary, according to his printed conditions, mine entirely fulfils those. Moreover, he is radically wrong in saying that I questioned his education on the "subject." What I implied was, that he had not followed continually the information contained in the Journal. If Mr. Milner has anything original to bring before the public (without infringing upon my rights), it will be a surprise to many and of interest to all.—Yours faithfully,

J. Hubert.

138, High Road, Chiswick, W.
March 2, 1902.

COLOUR PHOTOGRAPHY.

To the Editors.

Gentlemen,—I beg to inform you that on the 12th inst. our president, Mr. Charles B. Howdill, A.R.I.B.A., will give a demonstration of "Natural Colour Photography" to the Leeds Camera Club at the Technical School of the Leeds Institute, Cookridge Street.

It is the intention of Mr. Howdill to make an exposure in the lecture room, and demonstrate the various stages of the three-colour process to the finished slide in the lantern.

It is believed to be the first time a demonstration of this nature has been attempted in public.—Yours faithfully,

F. G. Issott,
Hon. Sec.

P.S.—All members of Yorkshire societies are cordially invited.
62, Compton Road, Harehills, Leeds.
March 1st, 1902.

THE EFFECTS OF LOW TEMPERATURE IN PHOTOGRAPHY.

To the Editors.

Gentlemen,—At this season of the year, and especially during the recent severe storm of frost and snow, photographers experienced, not only much discomfort in all-round general working, but were at times somewhat puzzled to account for certain failures and difficulties in carrying on their accustomed method of procedure, which are unknown at other periods of the year.

It may appear strange to many, but it is true all the same, that abnormally cold weather affects nearly every solution that is required in the practice of photography, and often to such an extent as to make good results impossible of accomplishment. Were the question asked, what is the best temperature to provide in a photographic dark room whereby each and all of the solutions could be relied upon to work in their normal condition, the correct answer to such a question would very probably be found in 65 degrees Fahr., and when arrangements are such in a studio, or developing room, whereby this degree of temperature is steadily maintained, all will go well, and no trouble ensue. But how many workers are there, especially among professional workers, who have at their disposal facilities for providing an even temperature of about the figure stated? But very few. During the recent storm, and especially in the month of March, when the sun is gaining strength day by day, the changes of temperature are not only very sudden, but cover a wide range of fluctuations, often ranging at night from 15 degrees Fahr. to 60 degrees at midday in sunshine, a state of matters that in some parts of the kingdom has continued for a period of six weeks.

Of the numerous solutions liable to be affected by an abnormally low temperature, first, there may be mentioned those that are required in development, for this is probably the most important of all to a professional photographer. If this solution be much below the regular temperature, its action becomes very slow, until at certain degrees it almost ceases to show any action on the plate at all, and then inexperienced workers are liable to imagine that they have committed some error, or actually never exposed the plate, and even when development has commenced, the reduction of the silver becomes suddenly slow, and only inferior results produced. Others,

again, are to be found who are quite aware of the shortcomings that follow employing a developer solution in such a condition, and to provide against failure, merely take precautions in the shape of warming the same, forgetting all the time that cold dishes and cups will, in a very few seconds, undo all that has been done in the way of raising the temperature of the solution. It follows, therefore, that in all situations where there are no facilities for keeping a dark room at an equable temperature, whereby every solution bottle, dish, measuring glasses, etc., etc., exist, some arrangement should be made whereby, temporarily, at least, during and before development, all such articles are kept at an even temperature. There are many ways of providing for such a condition of matters, among which may be mentioned a large saucepan of hot water, into which, not only some of the more important solutions can be placed, but also the dishes to be used can have a liberal supply of water introduced into them just prior to being used. The writer of this letter quite recently was somewhat amused at seeing an enthusiast in photography resorting to what many would deem a ludicrous proceeding, to maintain a developing solution, contained in twenty-ounce bottle, at something like an even temperature, whilst engaged in developing a batch of plates. The expedient resorted to partook of the homely tea-cosy method, only in this instance he commandeered from his wife a pair of clean stockings. These were made to do duty like a tea-cosy, and proved of much use for the purpose, from an amateurish standpoint.

Next in importance to the developing solutions, there falls to be mentioned what has been termed the photographer's best friend—viz., the hypo. bath. It is well known, of course, that a frozen hypo. bath will not work, and when such is a long way below its normal temperature the process of fixing becomes painfully slow, as well as being very liable to induce plates being removed from the bath before the fixing has been perfectly performed. Perhaps there is no better method of guarding against such contingencies than a liberal addition of hypo. from time to time, followed by a corresponding supply of hot water from the saucepan or kettle. At this time of the year the liability to imperfectly fix a plate is very great indeed, and special attention should be paid to the temperature of this bath.

In country situations during winter there is much trouble in the washing of plates and prints, by reason of the water freezing during the operation, and quite recently the writer had brought under his notice a case where several dozen lantern slides were practically ruined by being placed in a wash-house over night, where the temperature was permitted to fall as low as 14 degrees Fahr. The cure for this condition of things is, of course, obvious. Apart entirely from the want of success in working under such conditions as have been enumerated, there falls to be noted also another very important factor—viz., personal discomfort, for under such an uncomfortable state of affairs no one can expect to do his work as well or effectively as when working under normal conditions as regards temperature. The lesson to be derived from this state of affairs, naturally, is, that in all cases at this season of the year precautions should be taken to raise the temperature of all solutions, and also, if possible, the atmosphere of the dark room to its normal temperature of about 60 degrees to 65 degrees Fahr.—I am, yours, etc.,

AN OLD PHOTOGRAPHIC HAND.

March 1, 1902.

THE OLDEST LIVING PHOTOGRAPHER.

To the Editors.

Gentlemen,—Reading your letter respecting "the oldest photographer now living" reminds me that fifteen or more years ago an elderly gentleman, a solicitor, many years deceased, told me that his firm conducted a case in the law courts between Fox Talbot and Daguerre. I believe the firm is still in existence, and if you would care to search up this very interesting matter I think it very possible a relative of this gentleman may be found who could give the name and address of the firm. If the record of these proceedings is still in existence they would be an invaluable addition to the early history of photography.—I am, dear Sirs, yours,

GEO. T. JONES.

A PHOTOGRAPHIC SURVEY FOR SURREY.

To the Editors.

Gentlemen,—The excellent little collection of prints that has been got together and has been on view in the Lecture Room at the Central Public Library, Croydon, well illustrates and forms a foundation to much greater efforts, and something to stimulate others in the matter by placing prints at the disposal of the committee, either by lending or giving them to the borough.

If means and help can be found to further and enlarge this very useful method of obtaining old records of our town, borough, and county in the past, why not during the present time, and time to come?

Firstly, by the liberality of our older Croydonians by placing their old prints of our county in the Free Library (there must be many in existence), and secondly, but not least, of a thorough and careful photographic survey of our town and county, carried out upon lines of the Photographic Survey of Warwickshire, or the Worcestershire Photographic Survey Society, both of whom are excellent guides to follow in this matter. There must be at the present time a mass of interesting material in Croydon and neighbourhood to start such a survey. The prints could be sent to Mr. Jast, a gentleman who, I know, would welcome such an addition, and at the same time might act as curator to the survey, classifying and arranging such pictures as might be received from time to time.

The co-operation of the many clubs and societies in our town and county can be asked to contribute for help, and periodical exhibits of the work could be made of the prints similar to the one that has just taken place. All professional photographers might be asked to place prints of subjects that come within the survey with the librarian.

It is impossible to over-estimate such a method of work as this sort, for, although we who are here now may not perhaps to some extent feel the benefit and usefulness of such a scheme, the value will arise in another 25 or 50 years, when our town and county will have considerably changed in many ways.

This note being but a preliminary one, and apologising for trespassing upon your valuable space, I may, in conclusion, say I shall be pleased to hear from anyone interested in this subject with a view of instituting and setting a scheme in motion for the foundation and carrying on of such a survey.—Believe me, yours faithfully,

HARRY D. GOWER.

55, Benson Road, Croydon.
24th February, 1902.

THE SWANSEA PHOTOGRAPHIC SOCIETY.

To the Editors.

Gentlemen,—Some of our members think you are treating us badly by leaving out, in the "British Journal Photographic Almanac," the name of our society, seeing we are affiliated with the Royal Society, and have been in existence longer than some of those you have in it.—Yours faithfully, C. H. ROGERS.

33, Glanmor Crescent, Swansea.
February 24th, 1902.

[We will see that our Swansea friends are not neglected in the 1903 Almanac. The omission from the 1902 volume was, of course, unintentional.—Eds., B.J.P.]

BACKGROUNDS BY THE POWDER PROCESS.

To the Editors.

Gentlemen,—The article on "Portraits with Backgrounds from Nature," in the issue of your Journal of February 28th, reminds me that I invented and published a simple process, about thirty years ago, for adding pictorial backgrounds to negatives so as to avoid the labour and delay of double printing. It was a simple and easy powder process, that gave great freedom to the scope and taste of the photographer, and enabled him to introduce artistic and suitable backgrounds of outdoor scenery, or interiors, of great variety. All that was required to enable the photographer to introduce scenes suitable to either single figures or groups was a choice selection of negatives from Nature, either external or internal, or copy of suitable engravings, and the pictures by Sir Joshua Reynolds contain very suitable and beautiful examples of backgrounds for such purposes. The worst phase of that is the difficulty of obtaining them, for they are becoming both scarce and dear. I saw an engraving sold at Christie's the other day for £00 guineas—but there is still the print room of the British Museum to resort to.

I send you a whole-plate example of negative and print for inspection, and, as I have a few of the printed instructions on hand, as enclosed, I shall be very pleased to send a copy, on receipt of a penny stamp, to any photographic society that will be at the trouble to apply for one.—I remain, yours very truly,

JOHN WERGE.

50, Ainger Road, N.W.
March 1st, 1902.

THE ILFORD PLATES.

To the Editors.

Gentlemen,—In your report last week re the use of Ilford plates in connection with chromo photography by Dr. Morokhowetz etc., you make use of the following:—

It is *curious* to note that the Empress were found exactly half the

speed of the Special Rapid and the Ordinary half the speed of the Empress, etc.

I should like to know in what the curiosity consists, whether in the fact that the instrument recorded such, or that the Ilford Company correctly describe their goods.—Awaiting information, I am, yours truly,

R. Field Dodgson.

Briarwood, Balfour Road, Ilford.
March 1st, 1902.

[The dilemma presented to us is one we do not feel compelled to accept. From the context of the paragraph it will be seen that, by "curious" we meant "interesting," which is a well recognised definition of the word. It was not merely to the agreement, but the *exact* agreement between Dr. Morokhowetz's results and the speed standard of Ilford plates, that we drew attention. Since our motive is called in question, we desire to say that it was rather a feeling of national pride that prompted us to record this scientific confirmation of the reliability of a British dry-plate. We take this opportunity to correct a printer's error in the paragraph referred to. In the second column of page 163, line 15, the words should read:—"From the middle of the top arc *ten* ½ cm. spaces are set off on each side."—Eds. B.J.P.]

ISOCHROMATIC PLATES.

To the Editors.

Gentlemen,—In your issue of February 22nd, a writer, while recommending the occasional use of isochromatic plates, lays down the restriction that they should be developed within a fortnight after exposure. There is already sufficient prejudice against these plates without this difficulty being created, unless with good reason. I have used isochromatic plates exclusively ever since they were obtainable on the market, and have not met with deterioration as the result of moderate keeping after exposure. In fact, as I have a great dislike for dark-room work in summer, I habitually keep a considerable number of my exposures till autumn—say, not less than two months—yet I can distinguish no difference between these negatives and others developed immediately after exposure. It occasionally happens that owing to the lapse of time a few odd plates are forgotten. Recently I found two small lots of plates, which had been overlooked for 27 months and 38 months respectively, after exposure, yet on development they gave quite satisfactory negatives. The enclosed rough prints will show you that there is nothing abnormal about the 28 month lot, but certainly the negatives are thinner than they would have been if developed at once; the shadows are quite clear, also the rebates. The plates were packed face to face, with nothing between, in the original boxes, without wrapping paper. The writer of the article probably uses a different brand of plates, hence his different opinion, but I think no one need hesitate to use isochromatic plates when on tour, even if he cannot develop them for a month or so.—Yours truly,

Wm. Goodwin.

Glasgow.
March 3rd, 1902.

THE CROYDON CAMERA CLUB EXHIBITION.

To the Editors.

Gentlemen,—Enclosed is criticism of the C.C.C. Exhibition in the "Norwood News," and my reply in the "Croydon Advertiser." The "News" did not insert my reply.

Should you see fit to reprint my reply I shall not object.—Yours faithfully,

J. H. Baldock.

"Overdale," St. Leonard's Road, Croydon,
March 3rd.

"The exhibition was opened by Sir W. de W. Abney, who made a speech especially eulogising the pictures exhibited by the members of the Croydon Camera Club, and hoping that before long, with such an array of talent at their command, they might be able to confine their exhibition to the works of their own members only, instead of admitting the works of outsiders as well. Sir William drew attention to the fact that all advance in photography had been due to the work of amateurs.

"On looking round the room visitors will be struck by the remarkable superiority of the members' classes over those of the outsiders, but residents of South Norwood will probably be interested most of all in Class G, in which will be found, under the number 215, a portrait of General Bedford, by Mr. Norton Collins, which has been awarded a silver medal as the best picture in Class G, and a gold medal as the best picture in the exhibition. We congratulate both artist and sitter on a most successful portrait.

"A magnificent series of 17 large pictures, in green bichromate, by Mr. Charles Moss, are shown, well illustrating the remarkable pictorial possibilities of this process."

Dear Sir,—A good deal having been said in the Press and elsewhere as to the undesirability of admitting the work of outsiders, especially as such work was so inferior to that of the members of the club, I should like, in the first place, to ask if this is not a little unfair and wanting in courtesy? Outsiders were asked to send in exhibits, and these were selected, hung, and charged for, and the money so raised goes far to help to pay expenses. In the next place, let me point out a few facts in connection with the exhibition. The number of *members* exhibiting is only 32, while the number of *outsiders* is 62, or nearly two to one. Of the 277 entries in the picture classes, 157 are by outsiders. Of the 152 lantern slides, no less than 96 are by outsiders, while only 56 are by members. In Class K (pictorial post-cards) the number of outside exhibitors is nine, as against only six by members. In Class L (also pictorial post-cards) the number of members exhibiting is only 13, as compared with 16 outsiders.

Turning to the prizes, what is found there? Why, that while the members and outsiders each get four silver and four bronze medals, yet the gold medal for the best picture in the exhibition goes to an outsider. Much has been made of the 17 pictures in gum bichromate by Mr. Charles Moss (the "Norwood News" reporter amusingly calling them "green bichromate," apparently having confused the frames with the pictures), but Mr. Moss is, I believe, also an outsider.

Of course, as everyone knows, the Croydon Camera Club stands very high in the photographic world; but after the facts I have stated above I think I am fairly entitled to ask—What would the Croydon Camera Club exhibition be without the outsiders?—I am, dear Sir, yours faithfully,

J. H. Baldock.

St. Leonard's Road, Croydon.

BROMIDES FOR PLATINOTYPES.

To the Editors.

Gentlemen,—In the issue of the Journal for 14th February I read with interest a paragraph by "Free Lance" on the palming off of bromide for platinotype prints. I certainly hope that the P.P.A. will take this matter up, for to my own knowledge it is practised by, at any rate, one individual, who advertises himself as being a member of the P.P.A. I take it that it does not require a highly-educated individual to designate himself an artist, and to be able to pass off crude bromide prints as "plats" or "platinos," but I think that such persons are not required, as members of an association which is seeking to keep and to heighten the honour of the profession. It seems to me that the more cunning and deceitful a man is the more he is liked and prospers. But I trust that when the P.P.A. gets into full working order such men will be rooted out and put on a black list, so that all in the profession who esteem honour as a virtue of daily practice will be able to avoid that which is so grossly dishonourable.—Faithfully yours,

W. E. Dixon.

Morning Stars.—Mr. E. W. Maunder writes as follows in the current "Knowledge" under the heading "Astronomy without a Telescope":—"It is well worth noting what stars are the last to rise before the dawn drowns them with its growing light. The next morning it will be found that those same stars are visible just a little longer, and the next morning longer still, and so on, until some other star shows itself as the one to climb up from the eastern horizon just before the opening daylight becomes strong enough to overcome its shining. Such stars are each in their turn 'morning stars,' and their first appearance in the faint dawn-glow of the east before sunrise is the 'heliacal rising' which was made much of by ancient astronomers and poets. Not without reason, for it is an observation of very considerable exactness, and one which requires absolutely no instrument; not even the simple one of an obelisk or an upright spear, still less of the solid masonry of a 'solstitial' or 'equinoctial temple,' or the huge trilithons of a Stonehenge. And it fixes the return of the sun to the same part of the heavens at the end of a year quite as exactly as those more cumbrous contrivances could do; if, indeed, they were ever used for such a purpose."—"Knowledge."

The Acetylene Light in Omnibuses.—It is not many weeks since the acetylene lamp was made to replace the dirty, time-honoured oil-lamp in most of the London omnibuses, and very general appreciation was expressed of the great improvement in the interior lighting of the vehicle which is thereby gained. The acetylene lamp undoubtedly gives a powerful white light, and the consumption of gas for this brilliant effect is comparatively small. Unfortunately, the acetylene generated from carbide of calcium possesses a very disagreeable odour, suggesting at the same time garlic and the fumes from the moistened tip of a phosphorus match. The least escape of gas is thus instantly detected by the nose, and omnibus passengers have raised strong complaints about it, while the drivers themselves confess that it has sickened many of their number. It is doubtful whether pure acetylene is poisonous, and it is certainly only faintly odorous, but the gas from carbide of calcium is very impure, and contains usually a very perceptible proportion of phosphoretted hydrogen and sulphuretted hydrogen, to which is due its smell. The former gas is, of course, intensely poisonous, and may easily give rise to symptoms of poisoning, having an exciting action upon the respiratory tissues and an irritating action upon the skin. Sulphuretted hydrogen is also poisonous, but not to the same degree. Acetylene prepared from commercial carbide of calcium may, therefore, easily prove injurious to health, and there seems to be little doubt that some bad effects are being experienced by the drivers of the acetylene-lighted omnibuses. Health, however, must not be sacrificed for the sake of increased light, and something should be done to remove this reproach from the acetylene lamp. "Phossy jaw" amongst omnibus drivers and travellers would be a startling sequel to the installation of acetylene lamps in London omnibuses.—"The Lancet."

Patent News.

THE following abridged description is specially drawn for the BRITISH JOURNAL OF PHOTOGRAPHY, by Messrs. Hughes & Young, patent agents, 55 and 56, Chancery Lane, London, who will give advice and assistance free to our readers on all patent matters:—

PATENT APPLICATIONS.—No. 3,347.—Carl Peter Hermann Ahrle and the Metalline Platten Gesellschaft, M.b.H., 36, Chancery Lane. "Bronze-coated plates prepared and sensitised for photographic, photo-mechanical, and other printing processes."

No. 3,354.—Percy Lund, High Holborn. "An adjustable 'slip-in' mount for photographs or pictures."

No. 3,366.—Jean Antoine Pautasso, Chancery Lane. "Improvements in and connected with photographic cameras."

No. 3,371.—Alfred Julius Boult, Hatton Garden. "Improved manufacture of gelatine films for photographic purposes."

No. 3,463.—Austin Edwards, Chancery Lane. "Improvements in film-spools for photographic cameras."

No. 3,476.—Thomas Knight Barnard, 151, The Grove, Hammersmith. "Improvements in apparatus relating to colour photography."

No. 3,536.—Henry James Spratt, Alfred Sidney Spratt, and George Albert Spratt, Tudor Works, Tudor Road, Hackney. "Improvements in photographic shutters."

No. 3,599.—David Allan, 157, Whitfield Street, London. "A film and plate adapter for camera dark slides."

No. 3,600.—David Allan. "A folding, fixed head for alpenstock or walking stick tripods for use with hand and stand cameras."

No. 3,900.—Andrew H. Baird, Vincent Street, Glasgow. "An improved frame for framing photographs; also applicable as a photo printing frame, and for other purposes."

No. 4,073.—Samuel Dickinson Williams, 8, Faulkner Road, Newport, Mon. "Improvements in photographic apparatus."

No. 4,219.—Charles Champion Bradshaw, 4, St. Ann's Square, Manchester. "Improvements in or applicable to photographic printing frames."

No. 4,365.—Arno Baurmeister, Chancery Lane. "Process for the production of colour filters for taking photographs."

No. 4,392.—Francisque Pascal and Louis Izerable, Kingston-on-Thames. "Improvements in photographic cameras."

PATENTS ILLUSTRATED.—No. 19,331.—Photography. Patentee: A. Watkins, Imperial Flour Mills, Hereford. Exposures, calculating, actinometers.

Relates to an instrument for measuring the chemical intensity of light, combined with a slide-rule apparatus for calculating photographic exposures. The instrument is in the form of a watch. At the back is a disc of photographic printed paper, an unexposed part of which is brought opposite the aperture, and exposed to the light till it just perceptibly darkens, or till it darkens to a standard tint. From the time required for this the actinic strength of the light is determined. By turning the tongue the number denoting the sensitiveness of the plate is brought opposite the aperture plate, and by turning the tongue a number denoting the stop is brought opposite the aperture stop. The watch glass is then turned till the light-valve appears at the aperture act. The correct exposure is then read off at the aperture. The two discs on which the scales are marked.

No. 19,396.—Photography. Patentee: J. W. Meek, 24, Nightingale Lane, Hornsey, London, N. Developing, fixing, washing.

Relates to a device for developing, fixing, or washing rolls of photographic film. The end of the film is attached to the surface of a cylinder by a wedge, which fits into a corresponding recess in the cylinder, the surface of the wedge being flush with the surface of the cylinder. The film is then wrapped round the cylinder, which is connected by elastic bands to the standards. The lower side of the cylinder dips in a dish containing the developing or other solution. When the film is pulled, the roller rotates, and twists up the elastic bands. The energy thus stored up rewinds the film when the tension is relaxed. The film can thus be moved backwards and forwards through the solution.

EDINBURGH Photographic Society.—An exhibition and competition of members' lantern slides, varied with the latest animated pictures by the cinematograph, will take place in Queen Street Hall, on Friday evening, March 14th, at eight p.m. (doors open at half-past seven).

OLD Photographs.—At the Croydon Camera Club Exhibition visitors had the opportunity of seeing many early examples of photography in the shape of Daguerreotypes and glass positives, some of which, on account of their beauty and delicacy, took many by surprise. At the present time many are inclined to sneer at these early works, but the best of them were very beautiful examples of photography, though the choicest specimens are becoming rare and historically valuable. The much-despised glass positive of to-day is a very different thing from what used to be produced in the fifties. A good Daguerreotype or glass positive is not surpassed, for detail and delicacy, by anything that is done now. While the colouring, when it was well done, surpassed anything that is done to-day, it harmonised better with the photograph. By the way, the colouring of all Daguerreotypes and glass positives was done with powder colours, specially prepared for the purpose, and we rather doubt if they are obtainable now. Most of those who possess good examples of Daguerreotypes or glass pictures prize them highly—and well they may.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY, 24, *Wellington-street, Strand, London, W.C.*" *Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

PHOTOGRAPHS REGISTERED:—

A. J. Ashbolt, 10, Exmoor-road, Southampton. *Photograph of Southampton Football Cup Team.*

T. E. Innes, 108, Wellington-road, Heaton Chapel. *Photograph of "The Stockport Garrick Society."*

T. Garth, 170, St. Thomas'-road, Preston. *Photograph of E. Barton.*

C. H. Fletcher, 212, Wheeler-street, Lozells, Birmingham. *Photograph of combined picture of the King's photo with drawing.*

T. W. STEVEN.—In our next. Not yet have had time to examine the sample sent.

BOOK WANTED.—E. LEWTHWAITE writes: "Would be greatly obliged if you would be so kind as to give me the names of the best books on camera construction or making hand, stand, stereo, etc."—In reply: One of the "Work" series published by Messrs. Cassell & Co., La Belle Sauvage, Ludgate Hill, E.C., gives such particulars.

TRACING CLOTH.—W. H. R. says: "I should be glad if you can inform me where I can get the tracing cloth mentioned in the JOURNAL of February 7th, in an article by Mr. G. W. Webster?"—In reply: Tracing cloth may be had from such houses as Rowney's, Winsor & Newton's, etc. It is kept by most artists' colourmen.

LENSES FOR STUDIO WORK.—P. W. writes: "(1) Would a portrait lens, and a lens of the rectilinear type, of the same focal length, working at the same aperture, give the same result? (2) Or does a portrait lens possess any peculiar property, for studio work, over a rectiliner, other than that of speed?"—In reply: (1) Yes. (2) None, except in rapidity of exposure.

ADDRESS WANTED.—"BLACK AND WHITE" writes: "Would you be good enough to give me the address where I could get a medium such as artists use for working up bromide enlargements in black and white."—In reply: No special medium is necessary if ordinary water colours be used for the work. If you find the surface repellent, just apply a slight wash of prepared oxgall diluted with water.

REGISTRATION OF INVENTION.—"SHUTTER" writes. "I have invented a new form of shutter, which I think is very much better than anything that has been done before, and I wish to protect the invention. Can I do it by registering it, as registration costs much less than a patent? If so, how should I proceed? Thanking you in anticipation."—In reply: Registration is of no use for an invention of this kind. The only way by which you can secure protection is by a patent.

COMBINATION PRINTING, ETC.—F. R. writes: "(1) What photographic work deals with the combination of negatives such as might be employed for blackmailing purposes? (2) What moderate polyglot photographic foreign paper can you recommend—English, French, German, Spanish, etc.—and who is the publisher?"—In reply: (1) We cannot recall any work dealing with the preparation of blackmailing photographs. (2) The only magazine that at all answers to the requirements is "Camera Obscura," published monthly by Williams & Norgate, Henrietta Street, Covent Garden, W.C., which contains English, French, German, and Dutch sections.

STRETCHED BLINDS.—WILTS says: "We have had our studio blinds (white) taken down and washed to make them clean for the brighter weather. Now they are refitted they all sag, and will not run on the rollers. They all roll up in puckers, and are almost useless. Can you tell us how to remedy it?"—In reply: We are sorry we cannot. This is a very common trouble with holland blinds after they have been washed. The only thing we can suggest is that they be sent to a collander's to be collandered. That may improve them somewhat. But we doubt if it would be worth the cost.

STUDIO BUILDING.—"SUNSET" writes: "I have a studio 14ft. by 8ft.; 8ft. high to eaves. Eight feet of the roof each side is glazed in the centre, leaving a yard each end. The front side faces south; the back (north) is against another building, which is as high as the eaves of the studio, so the light on this side comes from roof only. South is glazed down within a yard of the ground. The two ends are east and west. What I want to know is, which end should sitters be placed to be properly lighted?"—In reply: It does not much matter which; but it will, perhaps, be more convenient to place the sitter at the west end in the earlier portion of the day, and the opposite end at the later part of it.

GUM-BICHROMATE.—A. CROSBY says: "I have made several trials of the gum-bichromate process, but cannot get on with it at all. After exposure the pigmented gum will not dissolve at all, even when hot water is used for the development. I have followed the instructions to the letter. The gum I used was ——'s prepared office gum, and it was very clear and fresh. Can you indicate the cause of my failure, as I wish to work the process?"—In reply: It is clear that you have *not* followed "the instructions to the letter," for the

instructions are to use gum Arabic, and you have employed "office gum," which is a very different compound and often quite innocent of any gum whatever. Try with what is recommended by the advocates of the process—gum Arabic.

RAILWAY FARE.—F. G. says: "In answer to an advertisement in the JOURNAL for an operator I applied for the berth and obtained it, subject to going a month on trial, my railway fare from London being paid. At the end of three weeks I was told I should not be required after the month, as my work did not suit. I asked for my fare back to London, and was told that they should not think of paying that, as my work was not so good as the specimens I had shown. Cannot I demand my return fare?"—In reply: You can demand it, but we do not see how you can recover it, unless there was a specific agreement that it should be paid if you did not suit. This is very unlikely, and it is not customary.

SPIRIT PHOTOGRAPHY.—T. G. R. writes: "I should esteem it a great favour if you would be good enough to tell me whether, in the opinion of photographic experts, it is conceivable that the enclosed pictures were produced by means of quinine drawings on the sensitive plate. The idea has recently been suggested as an explanation of these appearances, but although I have no very definite theory as to the origin, I cannot conceive how so striking and lifelike an effect could possibly be produced by the use of quinine or any other substance."—In reply: There are many dodges by which "spirit photographs," similar to those sent, may be produced; but we may safely say they were not made in the way suggested. The prints have been returned.

STUDIO BUILDING.—W. N. L. writes: "I intend having a studio built, and am in a doubt as to the best light to work with. If I work with the north aspect there will be a 4ft. wall facing the glass side of the studio, and 9ft. the other side of the said wall is a shed 8½ft. high, and to the east will be houses. Would there, do you consider, be sufficient light to work with? If, on the other hand, I have to work with a south aspect, and use a screen to catch the sun's rays, as advised in the "Photographic Studio" by Bolas, there will only be a 4ft. wall in front and houses to the east. Which position would you advise me to work with?"—In reply: We should say, for convenience, have the north light. If you can raise the floor of the studio a foot or so from the ground, you will practically reduce the height of the wall and shed, and that we should advise you to do.

TRICHROMATIC PHOTOGRAPHY.—"ERIMUS" writes: "I have seen the frontispiece to Bolas's book on colour photography. It is in three colours. Has it been done by photography right through or the ordinary machine colour printing? I should like to know how three-colour work is applied to the illustrating of books and catalogues."—In reply: The frontispiece mentioned is produced by lithography or machine colour-printing, and photography plays no part in its production. The illustrations in books and catalogues are, of course, produced by three printings, or if there is letterpress as well in black this necessitates a fourth printing. Sometimes, as with the Christmas number of a well-known magazine, the letterpress is printed in blue at the same time as the blue printing-block, and thus an extra printing is saved. The method of producing the block is described in the work you have.

YELLOW STAIN.—S. J. A. writes: "(1) When I take the plates from the fixing-bath they are quite clear, but turn yellow on washing. I have tried the alum bath, but this only removes some of the stain. I have tried different kinds of plates with the same result. The developer I use is pyro and nitric acid, and carbonate and sulphite of soda. (2) Will you also tell me the name of a good book on the use of all modern printing papers, and where it can be obtained?"—In reply: (1) The difficulty of the stain is probably caused by the pyro solution being old or to insufficiency of sulphite of soda. If instead of using nitric acid as a preservative an ounce of metabisulphite of soda or potash were used to every ounce of pyro, the stain would be prevented. The use of an acid fixing-bath is also advisable. (2) "Photographic Printing," by W. K. Burton, published by Marion & Co., 22, Soho Square, London, W., would probably answer all requirements.

PANTASCOPIC CAMERAS—"PANTOS" writes: "There has just come into my possession, for disposal, an instrument which, I am told, is Sutton's pantascopic camera. It bears the following legend: 'Pantascopic Camera, No. 23. 3, Red Lion Sq., London,' (Grubb lens), and I should be greatly indebted to you if you are able to inform me, through your 'Answers to Correspondents' column, whether it is of any use nowadays, and what, roughly, should be its present value. I presume it was intended for astronomical photography and 'panoram' views. It appears to be in excellent condition and seems to have been little used. The dark slide has scarcely a speck of silver stain on it. I hope I have stated enough to enable you to give me some idea of its value, however rough, as, for all I know, though it may be worth £10, it may also be so out of date as not to fetch as many shillings."—In reply: The apparatus is not a Sutton's panoramic camera, but a Johnson & Harrison's "pantascopic" camera, for panoramic views. It is an efficient apparatus, but has now but little commercial value, except, perhaps, for a museum.

OLD PLATES.—"AMATEUR" writes: "I have quite a store of unused plates which I have purchased from time to time, dating back five or six years. Would you kindly tell me how I may know if they are fit for use? What are the characteristics of a too-old plate, and is it possible to ascertain by developing in the dark-room without exposure? Any information will much oblige."—In reply: "The characteristics of an old plate are marginal and general fog. The former generally makes its appearance first during development, and may extend from a quarter to half an inch all round the plate, and presents sometimes, after fixing, quite an iridescent appearance. The general fog appears after the marginal fog, and with some plates is so slight as to be negligeable, though this depends upon how and where they have been kept. To test the plates a developer should be made up that will not give fog readily, such as ferrous exalate or pyro-soda with bromide, or hydroquinone, bromide, and an alkaline carbonate. The plate to be tested should be placed in the developing dish, either in the dark or else right away from the dark-room light, and the dish kept covered during development, which should be allowed to continue for at least five minutes.

HAND CAMERAS.—C. R. GRIFFIN writes: "I have lately purchased a 'Korona' ¼-plate camera. The shutter is 'Time' and 'Instantaneous,' the latter in two speeds, but there are no speed numbers given. Would you be so kind as to tell me a simply way to find these, and to give me your opinion of the lenses fitted to this make of camera? I find that I get a splendid definition with full aperture (f/8) and also with front raised quite an inch and a half."—In reply: (1) There are several methods of testing a shutter; one is by allowing a body to fall and photographing the same in its fall. This necessitates some calculation. An easier method is to fasten some bright object to a bicycle wheel; turn the bicycle up on its handlebars, and set the wheel spinning till it revolves once in a second, and then photographing it, when 360, divided by the number of degrees the bright object has moved, will give the speed. Yet another method is to hang a bright object, such as a small piece of looking-glass, at the end of a string 39in. long, and, starting from a line level with the string, mark off in the arc of a circle fifty equal marks on each side; then, if the pendulum is set swinging so that it just swings from the end of one set of marks to the other, and if it is photographed when near the middle, the number of divisions that the image of the pendulum covers on the negative will be number of hundredths during which the shutter was opened. (2) With such results as described, we should say the lenses were very good.

COPYRIGHT.—"PATERSON" writes: "I have promised a friend to make an inquiry through your JOURNAL. He had some views (similar to our local views) of Paterson (America), the town which was nearly burnt out quite recently. He wrote to a newspaper, saying he had these views, and it occurred to him that they might be of interest to them for publication, asked what terms they would offer for use of same. In reply: 'Editor sends compliments, and begs to say he would be glad to see photos if Mr. G. would be so good as to submit them on approval.' He did so; heard no more, but saw that they had published some of the views. This morning he received cheque for 7s. 6d., with printed acknowledgment for him to sign 'for publication of views of Paterson, also giving them the copyright.' They have not returned views. Ought they not to have offered terms before publication, and, as to copyright, it's simply foolish for them to expect to get same for 7s. 6d.? Can he fix his own price (reasonable, of course), without giving them the copyright, and denying them any further use of same unless they submit to his terms. These views were *not* taken by himself, they were sent him by a friend. Of course, they are of great interest now."—In reply: On the facts, as stated, and the interest in the pictures, the sum remitted seems small. Your friend should, however, have set a price on the photographs when he sent them. It seems, however, that he had no copyright in the pictures. Probably the prints will be returned to you if you write for them.

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*** *The Editor can only be seen by appointment.*

*** *We do not undertake to answer letters by post.*

EX CATHEDRA.

The Mita Light. The *Photographisches Wochenblatt* publishes particulars of this new form of incandescent lamp, which should be particularly useful in the hands of amateurs for enlarging and optical lantern purposes. Benzine, ligroine, or gasoline may be used as the illuminant, but benzine seems to be preferable. It is said to give a light of 300 to 400 candle power. A horizontal tube, with the burner at one end and the bezine-holder at the other, is attached to a vertical rod fixed on a stand, so that the height of the light may be regulated as desired. Air is pumped into the benzine-holder by means of an indiarubber ball, and the benzine thus burns under pressure. A small tray near the burner is filled with spirit to heat the benzine at starting, and the lamp will then give a steady light for some time without attention, at ordinary temperatures. Ordinary coal gas and oxygen give a light equal to about 150 to 250 candles. The new light is consequently about twice as powerful.

* * *

Exhibitions. We have received the prospectuses of two exhibitions which are about to be held in France. An international exhibition, relating to commerce, industry, science, and the fine arts, will be held by the City of Lille from May to September next, and photographs will be included in the fine art section. Applications should be made to Monsieur l'Administrateur-Délégué de l'Exposition Internationale, à Lille (France). The charge for space is 30 francs per square metre, and there is a charge of 20 francs for inscription and delivery of the certificate of admission. The second exhibition is that of the Salon de Photographie, organized by the Photo Club de Paris, 44, Rue des Mathurins. This will be open from the 1st May to the 1st June. Applications for admission should be made to the Secretary at the above address before the 1st April, and the pictures should be delivered there before the 20th April. The object of the exhibition is essentially artistic. No charge is made for wall space, but the pictures must be passed by the Committee of Selection.

* * *

Foregrounds in Portraiture. We recently drew attention to the method advocated by Herr Trant, of Munich, for obtaining backgrounds of a higher order, to replace the hackneyed types which are too frequently used by photographers. Herr Trant's article has elicited some supplementary suggestions from Herr Kuten, of Weidling, near Vienna, which are published in the *Atelier des Photographen*. Herr Kuten remarks that the foreground requires quite as much attention as the background, if the picture is to be harmonious in its effect. It should be suited to the background so that the surroundings should produce a perfectly natural portrait. To obtain this effect Herr Kuten advocates the use of vignetted backgrounds, which are exposed in contact with the plate in the camera at the time of sitting. The foreground may be built up of weather-beaten stones, sand, tufts of grass, roots of trees, etc. By placing the vignette upon the focussing screen, a true arrangement can easily be made. Some examples are given, but they do not appeal to our taste.

* * *

The Keeping and Packing of Dry Plates. Three years ago the Société de Photographie Française appointed a committee to enquire into the question of the preservation of sensitive materials, and the report upon the subject has just been published. The enquiry appears to have been made in a rather half-hearted manner, and does not add to the knowledge we already possessed upon the subject. It may, however, interest some of our readers to learn the conclusions to which the committee has arrived with regard to extra rapid plates, which were the only ones tried. The constitution of the emulsion was found to be the principal element affecting the life of the plate, but the mode of packing was of importance as a secondary factor. The keeping quality was considerably prolonged by substituting sheets of suitable paper for the strips of cardboard placed at the edges. The sheets were cut 1 to 2mm. smaller than the plates, small post rives

(10 kilos weight), royal rives (30 kilos weight), and bichromated exercise paper were used, and it was found that small post rives, and especially the royal, were of great value for the purpose. For obvious reasons the names of the plate-makers were withheld.

* * *

The Powder or Dusting-on Process. The letter from Mr. John Werge, in our last issue, directing attention to a method he brought out many years ago for introducing backgrounds from nature in portrait negativing by the powder process, calls to mind the many applications of the powder process and its value. The present generation of photographers seem to know it only in name, yet it is capable of yielding most excellent results, with great scope for artistic treatment. Many of our older readers will remember the charming pictures the late Mr. Robert Faulkner produced by this process on opal glass and similar ones by Mr. Alexander Cowan. The process, however, seems to have almost passed into oblivion, as the principal use now made of it appears to be in the production of vitreous enamels, the powder in this instance being vitreous colours. At one time the powder process was used and patented, we think, by the late Mr. Window for the production of photographs on canvas, to be coloured in oils, and for that purpose it has the advantage that it has, practically, no intervening film between the canvas and the subsequent oil colours, as in the case of the carbon process or the bromide process, while the pigment in which the image is formed is permanent. It may not be known to everybody that the powder process is a very good one for a mechanical method of intensifying weak negatives, and that it was published in our pages some years ago; also, that it offers some advantages over the chemical system of intensification, inasmuch as the operation may be conducted locally or uniformly either on the back or the face of the negatives, or on both, with the further advantage that if the result is not satisfactory it can be cleaned off and the work commenced afresh, without any injury whatever to the negative. One reason why this process has been, comparatively, so little used is that those who have essayed to employ it have not fully grasped the principle upon which it is based. Its successful working depends entirely upon the hygroscopic conditions, and in this variable climate of ours these have not been sufficiently taken into condition by them, hence many have failed of success. But when once the necessary conditions are realized, all is tolerably plain sailing.

* * *

Telephotography. Those who have used a telephoto attachment will have a vivid recollection of the difficulty of estimating the correct exposure by mere examination of the image upon the focussing screen. Herr Hans Schmidt, who has had considerable experience in this branch of work (some of whose results we have seen), writes, in the *Photographische Mitteilungen*, upon the subject of calculating the exposure in telephotography. A scale, representing the separation of the positive and negative components, is engraved upon the tube of the Zeiss attachments, and from this the equivalent focus of the system, as used, may be calculated. Other opticians, however, do not follow this system, and some attachments are sent out without any indication whatever from which the focus may be deduced. Herr Schmidt gives the following method, as that he is in the habit of using: The object is correctly focussed and the distance measured from the ground glass to the centre of the negative lens. By dividing this distance by the focus of the negative lens and adding one, the linear magnification of the image is obtained. If the focus of the positive lens is multiplied by the linear magnification, the equivalent focus of the system, as then used, is found. As an example, let the distance between the screen and the centre of the negative lens be 55cm., the focus of the negative lens 5cm., and the focus of the positive lens 24cm., then the following simple calculation will give the equivalent focus of the system under those conditions:—

$$55 \div 5 = 11 + 1 = 12 \times 24 = 288\text{cm.}$$

If the positive lens is stopped down to $f14$, and the exposure for an ordinary photograph, without the telephoto attachment, should be half a second; then the exposure, with the same stop, may be calculated by multiplying half a second by the square of the linear magnification. In the example given the magnification is 12 times. The square of twelve being 144 and half a second the ordinary exposure, we arrive at 72 seconds for the exposure with the telephoto attachment. The focus of the negative lens may be ascertained in the following manner: Pierce a card with two small holes about 1½cm. apart, place this in position in front of the lens so that a distant source of light shall form images of the holes, upon a screen, exactly twice as far apart as upon the card. The distance between the screen and the centre of the lens is equal to the focus.

* * *

A National Trait. It was recently our lot to look through a large number of French caricatures, which dated from twenty to fifty years back, and we noticed —what must, of course, have been evident to other observers—that whenever our lively neighbours wished to represent an Englishman or woman, that individual was drawn with projecting teeth. For some reason or other, the French artists are under the impression that this is a national characteristic, and that the idea is still current is shown by certain postcards now exhibited in our shops. These cards each represent a different city—Paris, Berlin, London, etc.—typified by a bicycle-rider of comic aspect, and the Londoner is distinguished by the dental deformity in question. It would be curious if we could find out the reason for this tradition, for we take it that the idea is a mistaken one, and that prominent teeth are not more common among us than they are with other nations. Walking along the crowded streets of the City, we may go a long distance without meeting a person with the peculiarity named. Possibly half a century ago some well-known caricaturist in France met with a family of English origin with teeth of this kind, and then and there, through pure ignorance, adopted the style as the hall-mark of the Anglo-Saxon race. It would be interesting if photographers, part of whose business it is to study the physiognomy of their fellow-creatures, were to give their opinion as to the prevalence among English people of the facial peculiarity to which the French artists have given so much attention. It is certain that a peculiarity of this kind would in no way dissuade the average person from having his or her portrait taken, for, by a comfortable arrangement of Nature, we are quite blind to our own personal defects; and even if we were not so, there are few among us who are competent to compare the commonplace countenance with the classical model of the Greek sculptors, and to recognise the shortcomings of the former. Neither does the ordinary man bother himself about Camper's facial angle. As a rule he regards himself as being a good-looking fellow, and the accident that his mouth, or any other feature, is abnormal does not trouble him one iota. Photographers, therefore, ought to be in a position to tell us whether the French caricaturists are justified in portraying their English neighbours with the teeth of the baboon. Even if the libel be

true, it is hardly neighbourly to remind us of it so continually. Is French politeness, which is almost proverbial, only skin deep?

* * *

The Aurora. Among the very few subjects which have hitherto defied the art of photography, and the artfulness of photographers, must be placed that beautiful and somewhat mysterious play of light in the Northern heavens which is known as the *Aurora Borealis*. In the discussion which followed Dr. Lockyer's paper at the Camera Club, reported in another column, the lecturer incidentally mentioned that a photograph of the Aurora had, within the last few months, been actually taken, but he vouchsafed no further particulars. He also said that, as part of the scientific equipment for the Antarctic Expedition now on its way towards the South Pole, special plates had been secured wherewith to photograph the Aurora—in this case, of course, the *Aurora Australis*. We presume that the phenomenon in Southern skies differs only in name from the Northern variety of Aurora, but probably there are few men living who have had the opportunity of comparing them. There have been many attempts to photograph the Aurora. We may at once disregard the aërial displays seen in our own country, for they are few and far between, and, so far as we have been able to judge from our limited opportunities for observation, the light given is of such a feeble and fitful character that it would be insufficient to impress the most sensitive chemical surface. Turning to our bookshelves, we come upon a volume which, from its title, ought certainly to afford some information upon the subject. It is Tromholt's "Under the Rays of the Aurora Borealis," published in 1885. This book contains an exhaustive account of the different forms assumed by the phenomenon; indeed, the author went to Lapland with the prime object of studying it. The chapter dealing with auroral displays is very fully illustrated with drawings, but drawings only. Every attempt made to photograph the Aurora, the author tells us, resulted in absolute failure. He used the most sensitive plates, exposed them for from four to seven minutes, and yet did not succeed in getting the very faintest trace of an image He attributes this failure to the weakness of the light emitted by the Aurora and its feeble chemical action. He gives no information as to the plates employed, or the lens he used, and although we know that rapid gelatine plates were available eighteen years ago, when the experiments were made, it is certain that special plates could be made now which would give a far better chance of success. Indeed, as already noted, we have it on the authority of Dr. Lockyer that the Aurora has recently given up its image to a photographic plate. We can only hope that the picture to which he referred may soon be exhibited or published. In Tromholt's book there is a quaint old drawing of Lapps hunting by the light of the Aurora, dated 1767. The phenomenon as represented here bears little resemblance to the Aurora as pictured in the excellent drawings by the author. It is quite possible that photographs of the "Northern Dancers" will be as unlike the modern drawings, and will exhibit features not discernable by the eye. Be this as it may, the result of the promised experiments in the Antarctic Circle will be looked forward to with much interest.

London and Provincial Photographic Association.—On March 20th Mr. A. Haddon will read a paper of great interest to photographers generally. Visitors interested in photography are always welcome at the meetings, which are held at the White Swan Hotel, Tudor Street, Blackfriars, E.C.

At the Royal Photographic Society of Great Britain's lantern meeting, on Tuesday, March 18th, at 8 p.m., at 66, Russell Square, the subject will be "Photographs from Pharaohland." Mr. A. Barton Kent, F.R.G.S., will show a series of slides of a trip up the Nile, from Cairo to the second cataract. Ladies are specially invited.

NAMING AND FRAMING PHOTOGRAPHS.

In the matter of finding appropriate titles for his prints, the worker usually experiences considerable difficulty. This sentence merely represents the normal position of the average photographer, for, while the artistic workers who build up their photograph to suit the title or theme they wish to illustrate, may be numbered almost upon the fingers of one's hand, the alternate method of first taking the photograph and then finding a more or less suitable name for it is the system which commonly prevails. If his work is for the most part confined to architecture, the representation of churches, abbeys, ruined castles, and the like, the photographer may proceed somewhat on the lines of the famous Mr. Pecksniff, who, it will be remembered, modestly showing Martin Chuzzlewit "some tracings of our doings here," refers to Salisbury Cathedral "from the north, from the south, from the east, from the west, from the south-east, from the nor'-west; a bridge, an almshouse, a jail," and so on. "The Tower Bridge, from the nor'-east by north" might look a trifle novel in an exhibition catalogue, but it is easy to imagine that it might more correctly represent the case than "Evening on the Thames," applied to the same picture. Such photographs, combined with similar titles, are common as dead leaves in the autumn.

The assumption of titular names which are literary, poetical, or fantastic and wierd, as the case may be, has the effect, of course (if one looks at the catalogue first), of drawing one's attention to the photograph and to a critical examination of its good points, or defects. Take a favourite subject such as "The Seasons," "Spring," for example. Even with the aid of suitable figures, there are very few photographers indeed who could give a really artistic rendering of the seasons, Spring, Summer, Autumn, and Winter in what is called *genre* style of photography, but these subjects, quite suitable for, indeed, almost easy of, treatment in *pure* landscape photography, are frequently essayed by our ambitious amateurs. A print before us is called "Spring." It is in effect simply a very ordinary photograph of a young girl, taken against a background of trees not in their full bloom. The figure is a mere trifle in the big expanse of semi-foliage. A similarly treated print is called "Summer." The trees are by this time heavily clothed with leaf, and a female figure of older growth takes the place of the child. The lady is posed in the foreground; she has her hands clasped behind her, and her eyes are gazing ecstatically upwards. Now, it is impossible to truthfully say that these photographs, so airily and perfunctorily treated, give one, by any stretch of imagination, the idea of Spring and Summer. By judicious and careful selection, it is not difficult to find a suitable bit of landscape which, by itself, without any extraneous figures, will give a quite satisfactory and pleasing realization of these subjects. We look for, in Spring, the birth of life in nature, the budding leaf and verdure, all the outside world awakening—after the long, dreary winter sleep—to the first warm breath of sunshine. The picture should be, in its essentials, sharply focussed; we want to see, or imagine that we see, and hear all the busy insect life on the bark of the trees and in the undergrowth, and there must be over all tiny glints of sunshine. There are such photographs where this, and more, is easily seen. "Summer," too; what necessity to be confined to one prosaic garden hedgerow, when, within a mile or so, may be the old mill, and the pond, and the ducks, and the rustling trees, and the glimpse of waving, ripening corn?

Here is a title from a recent catalogue: "Time changeth all things, maketh all things new, save memory." Now if one must choose a title of this sort—and we would not wish to discourage any ambitious photographer—it would

be only reasonable to devote some time and thought to the working out of the idea. We know that time is the great healer, that the most acute and painful griefs and disappointments after the lapse of long years become covered with a soothing cloud and mist, so much so that, if memory survives, we can look back dispassionately, even interestedly, scarce convinced that we ourselves figured in the tragedy; but there must be a sufficient efflux of time. Take a cabinet photograph of any handsome young woman—the average family album will furnish this. The features must be good and the expression pensive, but would such a photograph be a satisfactory exposition of such a title?

Now, although we are often disposed to say that the titles given to prints show a paucity of imagination on the part of the workers, this may be doing them an injustice. It may well be that exhibitors have a very clear notion of their own limitations, and steer a safe line by means of such titles as "The Pathway Through the Wood" or "The Corner of the Pool," which, if bordering somewhat on the commonplace, are quite correct and inoffensive. "Softly Falls the Evening Light" is good—vastly better than "Fast Falls the Eventide"—but most of these evening effects are so good that we take small notice of the name given them.

However good the condition of frames may be when on show at the Royal or the Salon, by the time they have gone the round of the exhibitions and reached the town of Eatanswill, they are, in great measure, in the last stages of dilapidation. Presumably the practice of photography takes up so many of the spare shillings devoted to "hobbies," that the amateur has nothing left for frames. Presumably, also, this bad state of finance leads to the cultivation of still another little hobby, and the amateur forthwith essays the manufacture of picture frames. This would be all very well if he would devote some few hours of practice and some few bits of inexpensive wood to the hobby before putting the work to such practical proof as the framing of his exhibition prints. There appears, of recent years, to have developed an idea that *anything will do* for framing purposes, and in place of the neat, well-made frames of years lang syne—frames of common deal—packing-case stuff, in fact, is freely used. "Ouida," in one of her popular novels, puts a very sapient and up-to-date sentiment into the mouth of one of her characters, relative to the important matter of ladies' dress, somewhat to this effect: "You may wear sackcloth, my dear, but it must be well cut and tailor-made." Certainly, if the amateur has a taste for old, common, valueless (except for fire-lighting), moth-eaten wood, by all means let his wish be gratified; but let the *best* be made of it. This is the more important because our amateurs not infrequently append a price to their work, and it is really only fair to the prospective purchasing public that he or she should have a frame which shall at least hold together until the purchase and transfer is completed. It is now many years since Oxford frames were very properly barred entry into our exhibitions; it may be that, sooner or later, some stipulation will have to be made relative to, not only the quality and condition, but the colour of the frames, sent in. At a recent exhibition nearly the whole of one side of the gallery was hung with frames almost uniformly black, not a stained black, a moulded composition black, which, however congenial in an undertaker's showroom, was painfully dismal in a gallery devoted to social and pictorial purposes.. Now it is conceded that the shape and style of a frame must bear some proportion to the size and tone of the subject—the mount and frame may be considered as one—the mount being intermediary to the print and the wood. It might very well be arranged that in an exhibition of photographs there should be some uniformity; there might be a stipulation in favour of plain oak or certain stained woods. That everyone should be allowed to go *his own way* is, on the face of it, *absurd*. A conglomeration of oak frames, the black, funeral composition, and a go-as-you-please collection of common wood frames (not too neatly made), stained each one according to his taste, do not lend an attraction to an exhibition in any way. A frame is intended to catch the eye and draw attention to the picture which it encloses, and it should, therefore, be pleasing in style and colour. Eccentricity might very well be rewarded by the judges awarding minus points. Next to being well and neatly made, the width of wood should be moderate and conformable, not apparently made to look as if elbowing other pictures out of the way; and the colour of it should be in harmony with the picture, or a suitable contrast. Photographs do not vary so much in tone that some rule or rules would be difficult to formulate.

ON THE NEGLECT OF TRUTH BY PHOTOGRAPHERS.

It is quite open to question whether I should have written this at all, but though it is the direct result of an attack of spleen, I nevertheless have reviewed it after my recovery, and am not wholly dissatified with it. You may well wonder what I am talking about, but perhaps you have not grasped the meaning of my title, "On the Neglect of Truth by Photographers." Do you notice that Truth is written with a capital T? Therein lies the secret—we need not go any further; my friend, this Truth is the groundwork of our existence, and it is the lack of cultivation of Truth that keeps so many of us working in such narrow grooves. Photographers have to deal with many Truths, if they would comprehend the mechanism of their profession; there is physical Truth, chemical Truth, and mathematical Truth, all to be harnessed to our chariot, and it is because we do not appreciate this sufficiently that so many of us are such commonplace workers. Of course, I know that you, dear reader, are not to be included in this generalisation, but you will know how vastly inferior one of your friends is to yourself, and in your charity you will wish to elevate him to higher matters; so hand him this, and then run away and plume your feathers before your admiring family. Has it ever occurred to you that the ordinary professional photographer is a very incomplete individual, that outside the daily run of his work he is very much at sea? Let me give you an instance or two:—The other day a trade printer complained to me that his carbon-paper wouldn't keep sensitive this weather so long as in dry weather—it became insoluble, and so he kept it in a damp place, that it should not get too hard, I suppose! Now observe this case, for it is interesting; the man has a complaint and gives you the remedy, but fails to grasp it himself. Now what is his fault, simply an inability on his part to appreciate the value of evidence.

I gave him the remedy, and he saw it at once, and laughed at his mistake. There is much hope for that man; in fact, he is preferable, I fancy, to a more enlightened individual I once had conversation with. He was an advanced process worker and used collodion emulsion; his complaint was that the time of exposure was too long sometimes. He professed to know all about the ripening of emulsions, especially that the presence of a halogen was a cause of an emulsion being slow, but yet he could not suggest a remedy. I advised that the coated plate should be soaked in a very weak solution of some halogen absorber and then washed for a short time, and the exposure could be made much shorter. The experiment was a success, but the details cannot be discussed in this paper. The point is that this man was unable to help himself, because he also failed to appreciate the value of his evidence. I must go further and take these faults down to a more stable basis. I said they failed to

appreciate the value of evidence—yes, of the evidence of facts, and what are facts?—merely illustrations of law, and law is what we are all governed by; we are all subject to it—not, mind you, to a mere set of rules drawn up by legislators, oh! no, but inviolable law, that is Truth. And so, you see, I bring these two simple cases down to a want of the knowledge of Truth; and I could, with great pleasure to myself, give you many more examples of a much more complicated nature, and deduce them all down to the same fault—the want of the knowledge of Truth—but it would be a waste of time, as I have shown you in these two elementary cases all you want to know as a guide to whether I am worth listening to or not. You must see this defect manifested every day of your life by all conditions of people. It manifests itself in such various ways; it may be sheer ignorance, or only unreasonableness, or, worse still, bigotedness—it is all the same, one is worse than another, that is all. Have you ever thought what a great wealth of education lies in a scientific knowledge of photography, and, if you are professionally engaged in it, how very useful it would be to understand it? An immensity of time and money could be saved, and you would take more interest in your work, and so it would be better for you and for those you deal with. I wonder how many of you practise the teachings of Messrs. Haddon and Grundy on print-washing? Why, the paper manufacturers don't, so, of course, you can't be expected to, can you? And then, again, there are very few of you ever think of using anything but ordinary plates, forgetting probably that there are colour-sensitive ones on the market, and so you get false tone values, and have to spend a deal of time on re-touching. You will say you haven't time to learn now, but that's only an excuse. If you read your B.J.P. every week, and practised its teachings you would be a long way better off than many of you are now. Undoubtedly it is late to learn in the midst of your professional work; you should have done so in your apprenticeship days, but you must remember that half of the men who take apprentices cannot teach them because they do not know it themselves! But, my friend, even if after reading this invective you make up your mind to try to work more scientifically in the future, it will help you if you can grasp the necessity for a knowledge of Truth, and so I will try and assist you, and will write you a few remarks on the cultivation of physical Truth:—

Physical Truth is merely chosen by me as being particularly suitable for parallel comparison, and the fundamental principles are what I want attention paid to. I wish I could help you to think properly, to read properly, and observe properly, but the task is beyond my powers, I fear. The majority of people go about with their eyes shut, or if not shut, only half open, and so they miss a lot of the good things scattered around. The reason why you see so many discontented people is that these people never take the trouble to think or use the brains they have. They vegetate, and, like all vegetating things, they are all right as long as they do not try to progress. Long years of vegetating has removed the capacity for evolution, and so when they do move they generally rapidly degenerate. This must by no means, though, be taken as a law, as there may have always been the latent desire for progress imbued in the individual, but the opportunity for action may have been long in coming. Normally, though, the presence of dissatisfaction in a person is a sign of germinating power, but, again, the full state of perfection is rarely met with. A momentary or short period of evolution often takes place, but it is generally of a spasmodic character, and has no continuity. After it the individual will relapse into its old comatic state. This is particularly noticeable among photographers, so many of them go on from year to year in the same old way; they never seem awake to the world's movements or try to keep abreast of them. Love of knowledge is not in them; they are generally so narrow-minded, and are merely content to drift. They won't help themselves, and if one does not do this you may be sure they will never do much. But the wonder to me is that so many of them claim to be scientific workers. Why, it is conceivable that the meaning of the word science is unknown to them. Science is only another way of expressing knowledge, not as a mere accumulation of facts, but of various phenomena in their relation to one another. It is consequently that a really scientific man is always the best balanced, for the observation of external realities is insufficient for him, and it is essential that the internal facts are also familiar to him. He is not surface-wise, but strikes deep and discovers hidden Truths, where others can only see an external coating. We are all born with a certain amount of natural faculty, and it should be the aim of each individual to bring this faculty to a perfect state of development. The one-sided man therefore must necessarily be without balance, and is out of place in the symmetrical systems of the intellectual and moral world. It is true that great work requires concentration of force on a comparatively limited area, nor will human power admit of indefinite diffusion without being thereby deteriorated; and it is possible for a great mind, through an error in this direction, to so divide and waste its strength as to become comparatively feeble in the struggle for Truth. One must therefore strive to give the mind the greatest amount of force with the least possible amount of one-sidedness. I can express this perfectly lucidly to myself as an equation, and the whole problem is to me a clear mental vision. You must picture for yourselves the mind wandering in space doing nothing, and, like the rolling stone, gathering no moss. Wasted energy, misdirected force—yes, yes, it is a great pity—you have so much in your powers as photographers, if you will only use it; but the majority of you don't—your art is wrong, your science faulty, and you yourself vegetating animals. Those of you who cultivate this mental force are indeed to be envied for the rich and lovely field you have to labour in; and your productions, are they not splendid? Do you know, there are some photographs I have looked at which are so perfect as works of fine art that I have felt a thrill of aesthetic pleasure run through me as I have looked at them, and then, cooling down, I have critically examined them, bit by bit, and throughout—in the modelling of the face, the lighting, drapery, mounting, &c., they bear evidence of deep and careful study, and the knowledge I want you all to try and acquire—the knowledge of phenomena in their relationship to one another. Education has a two-fold value, that of knowledge and discipline. As knowledge it is too obvious to need demonstration, but its value as discipline will bear explanation. The method of the physical sciences is eminently healthy, cultivating the finest faculties of the mind; it teaches one to draw conclusions from data, while at the same time refusing to accept them unless they are verified by experiment and observation, and so it strengthens our judgment and teaches us to appreciate the value of evidence which is of the utmost importance in every-day life. In mathematics the reasoning is different, for the mind is here compelled to admit the truth of the evidence as an absolute and essential Truth, which from the nature of things cannot be otherwise.

In physical science the evidence may be less constraining, but the mind would no more hesitate to accept or act upon it than if it had the absolute certainty of the mathematics. You will have seen by now how important it is for us all to sharpen our wits and use our mental faculties to our utmost, taking care, though, not to disperse our energy uselessly, but to work in an orderly and sober fashion. If you will only do this you will assuredly be the gainer in many ways, and you will find life to be much more cheerful. Some people will tell you that science destroys your idea of the beautiful, but this is ridiculous, as you can easily see that it only increases it, because it teaches you to understand it so much better. There are many people in this world whose emotions are not at all open to external influences, whilst others will immediately respond to them, and it is these people who should be the happiest. The pessimist is the most evil person you can deal with, and I would cure him, had I my way, by a

thorough course of physical science, when he would soon realise that law is inviolable and that his results depend solely upon his labours. The altruist is a saner man than the pessimist. I would that I could only state my case more clearly than I have been able to, but it is a difficult matter to tell you what is really after all an abstract feeling rather than a concrete reality, but if there should be one among you who may have benefited by this essay, let me extend my hand to him, and at once disclaim the honour of teaching him anything. It is not me, I assure you; these thoughts are not mine, and the very sentences are unoriginal. They are the thoughts and teachings of many whom I love as friends who have so often put me right when I have been going wrong, but come, let me introduce you to them; they are—the seekers after Truth in bye-gone days. And so I here bid you farewell, sincerely trusting that you will not be angry with me if I have been too outspoken. I mean it, my friend, as wholesome advice, but the spleen is not the mildest of the many disturbing factors that our bodies deal with. A. V. KENAH.

PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION ANNUAL DINNER.

The first annual dinner of this Association was held on Thursday, March 6th, 1902, at the Criterion Restaurant. Mr. Thomas Bedding occupied the chair, supported by Mr. T. R. Dallmeyer and Mr. Frank Bishop, and a company of over one hundred members and guests was present.

LIST OF TOASTS AND PROGRAMME OF MUSIC.

Their Majesties the King and Queen and the Royal Family.

The National Anthem.

The Professional Photographers' Association.

Song ... ... "When all the World is Fair" ... ... Cowen
Mr. Frank Tebbutt.

The Local Branches.

Humorous Recitation "A Change of Treatment" ... ... Jacobs.
Mr. Valentine Hill.

The Officers of the Association.

Song ... ... "Mighty Warriors" ... ... Hedgcock.
Mr. Alfred Moore.

Musical Sketch "How I Obtained the Post of Organist" Ulph-Smith.
Mr. Ulph-Smith.

The Visitors.

Song ... ... "Take a Pair of Sparkling Eyes" ... Sullivan.
Mr. Frank Tebbutt.

A Few Short Stories ... ...
Mr. Valentine Hill.

Song ... ... "Brother Ambrose" ... ... Bevan
Mr. Alfred Moore.

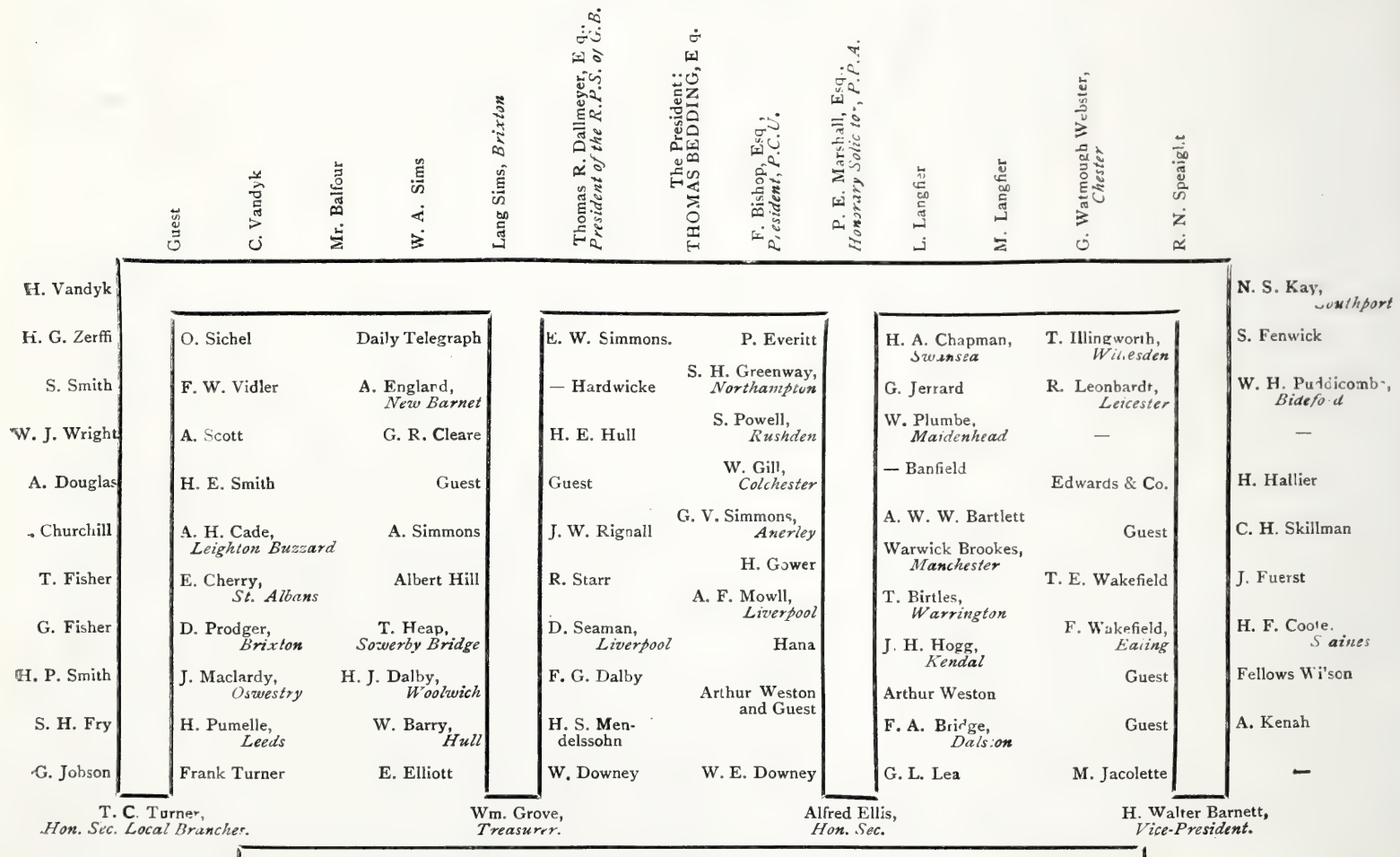
Musical Sketch ... .
Mr. A. Ulph-Smith.

The Chairman.

Duet ... ... "The Battle Eve" ... ... Bonheur.
Mr. F. Tebbutt and Mr. Alfred Moore.

Accompanist ... ... Mr. Albert Fox.

THE TABLE PLAN.



TOTAL 101.

THE MENU.

Hors d'œuvres.
Consommé Princess. Purée St. Germain.
Suprême de Barbue Duparc.
Eperlans à l'Anglaise.
Vol au Vent à la Toulouse.
Selle de Mouton Nivernaise.
Poulet du Mans à la Broche. Salade.
Pudding Diplomate.
Bombe Criterion.
Petit Fours. Dessert.

The Chairman, in asking the company to drink to the health of the King and Queen, said that this toast would appeal to them all as loyal upholders of the existing order of things, and, secondly, if further incentive were needed, in virtue of the fact that photographers, perhaps, as much as any other class in the community, were brought into very intimate personal relations with the Sovereign. Continuing, he said: We live in an historical year, a year in which that somewhat unique event, the Coronation of an English King and Queen, is to take place. Take your minds back to the year 1837, when the young Queen Victoria was crowned. She was only known by name to the majority of her subjects. Contrast with that condition of things

the present state of affairs. We, subjects of their present Majesties, have the great advantage of knowing what manner of man and what manner of woman it is that reign over us, and to what cause do we owe this great privilege but photography? The King and Queen have both shown great practical interest in what is called the most beautiful art of the Victorian era, and we are fortunate in having amongst paper their lineaments from time to time. We have cause also to us several eminent photographers whose duty it has been to photograph their Majesties from time to time. We have cause also to thank their Majesties the King and Queen in that they are the respected patrons of the principal Photographic society in the British Empire, if not the world, the Royal Photographic Society of Great Britain.

The toast was honoured with the usual demonstrative exhibition of a patriotic gathering.

The Chairman, proposing the toast of the evening, that of "The Professional Photographers' Association," adopted the somewhat unusual course of beginning at the end and coupling with the toast the name of the Association's Honorary Secretary, Mr. Alfred Ellis. In justification of that course he said that, some seventy-two hours before, two persons met in a certain office which should be nameless. It might be easy to guess the identity of those persons. To throw off the mask, he, the Chairman, said to Mr. Alfred Ellis: "I have to propose this toast. I think I ought to say so-and-so." But Mr. Ellis said, "No, I have to say so-and-so." Well, said the Chairman, I cordially agreed, because what Mr. Ellis has to deal with is the dry statistical record of the last twelve months, facts and figures. He has to look back, and I have to look forward. An eminent thinker has said that the pleasure or pleasures of this world may be equally divided into two—retrospection and anticipation. It is not a year ago—in fact, eleven months—that the idea of this Association was first mooted To-night we are gathered together at a dinner which is the largest, numerically, that photography has seen for many years. I deduce from this fact, and the fact that many of the gentlemen around this board have come from very distant parts of the country, the happiest possible augury of the future success of the Association. Now, as regards the future. I have been pleasantly chaffed about the inscription on the first page of our menu—"The First Annual Dinner"—but although this may not be grammatically correct, the sentiment is right. It is the first dinner, but not the last by many a score. Unlike the shady heroine of the modern drama, we have no past: we have only eleven months to look back upon; but, gentlemen, as was the state of things when Adam and Eve started upon the business of life, the world is all before us. For sixty-two years has professional photography been in existence, but never till this year has it had a representative organisation, a fountain head or guiding hand, something to which those who practise photography may look to as a final court of appeal for advice and help, something that will help them in their quest of daily bread, and support them in their endeavours to earn a livelihood, make a business, and elevate the quality of their work higher and higher. To help us in the pursuit of our ideal we have the support and sympathy of many friends. The exhibition of the premier photographic society, whose President is our guest to-night, has established a professional section and placed a room at the New Gallery entirely at the disposal of the profession. One cannot expect to see a marked effect at once, but in a few years, there can be no doubt, professional photographers will recognise that the inauguration of this useful section by the R.P.S. started a new era in professional photography. The great public, the outer public, the vast mass of the forty millions of people inhabiting this country are absolutely ignorant of what a good photograph is, whether technically or artistically considered. But the R. P. S. has come to the help of the profession and offered you a gallery for your work, the work of educating the great public. This fact will not be forgotten in the history of this Association or of professional photography. A distinguished professor of portrait photography, Mr. William Crooke, of Edinburgh, known to many of you, and a former President of the Photographic Convention of the United Kingdom, addressing a large audience, let fall one sentence which I shall never forget. It ran thus: "There is a growing demand amongst the educated public for artistic photography." Gentlemen, this is the truth. We are members of a great profession, numbering in these islands some six or seven thousand masters and exponents. But so far we have had no interest in common. We have been too ready to cut one another's throats, and the public has played us off one against the other. Now, every man, I hope, in this profession will feel that he has a community of interest with all his brother practitioners, be they distant or merely across the road. Your Honorary Solicitor, Mr. Marshall, who has devoted some thought to our future, is disposed to suggest to us the possibility of our one day getting a charter. A charter is a large order, no doubt, but it means that no unqualified exponent of the particular art or profession it is granted to is allowed to enter it. Gentlemen, the enactment of some legislation whereby no man will be allowed to set up in business or engage in the profession, unless he is qualified by his knowledge to produce portraits of the public, is at present a dream; but let us push it to a reality. For the first time, then, not the last, success to the Professional Photographers' Association.

The toast was drunk with much enthusiasm.

Mr. Alfred Ellis, in reply, read out a list of names of those who, unable to attend, were with them in spirit, and wished the Association all success. He thanked those present for their kind reception of his name in connection with the last toast, and said: I think I was right in persuading your chairman to talk about the future, leaving me to give you a few facts about the work of the past nine months. I cannot talk, but, gentlemen, I can work. On March 28th, 1901, there was a preliminary meeting, at which the Association was brought into being. I went to that meeting with a certain amount of curiosity to see who would be present and what they thought of doing, and owing to the beautiful flow of language of our chairman, before I knew where I was, I found myself secretary for three months, charged with the duty of organising this Association. By circularising some 5,000 photographers, we managed to get together 370 men who agreed to join if an Association were formed, and by the kindness of the Royal Photographic Society we held our inaugural meeting on July 2nd of last year. We have increased our membership until at the present time we claim the support of 513 members, with 10 or 12 awaiting election. During the nine months we have had four members' meetings in London, twelve committee meetings, and ten sub-committee meetings. The average attendance at the committee meetings has been 12 out of a possible 20, which, I think, is an excellent record. Moreover, whenever a committee meeting has been held, absentees have always been represented by letter or telegram accounting for their absence. We have formed a branch at Hull with 26 members, at Liverpool with 23 members, at Edinburgh with 23 members, and at East Kent with 14 members. It is a slight tax on the country members, because not only have they to pay their subscription to the Association, but they have to bear the slight expense of their branches. We have been asked on several occasions—What have you done? As far as we can tell you, we have protested against various tricky advertisements and offers of cheap reproductions by people not engaged in photography as a profession. The "Liverpool Daily Post" has had the good sense to withdraw their advertisements which set forth that for 6s. 6d. the public could have an enlargements which would cost two or three guineas in the usual way. The "Sporting Times" received my protest, but I think we got the worst of the argument. "Free Lance" volunteered no answer to our protest, but the offensive advertisement has since been withdrawn. The Sunlight and Ogden Companies have also withdrawn their advertisements. A deputation of the Professional Photographers' Association has also waited upon the Plate and Paper Makers' Association with a view to securing better terms. Nothing being settled, I am, of course, at liberty to say nothing more on this head, but in many other directions, by our advice, we have assisted to settle disputes, etc., and one man at least would have saved me the cost of a lawsuit if he had followed our counsel. We have sent out 6,600 circulars and letters during the past nine months, and have received about 1,000 letters which called for answer in one way or another. This correspondence might have been reduced if I had consented to personally discuss the matters that arose, but I have insisted that all communications shall be made by letter. With reference to the secretarial work, the idea at first was that it could be done after business hours, but much of it, I find, cannot be done in the evening. I therefore suggest that if the Society increases and prospers as it should, we shall have in the future our own offices and our own permanent secretary. This is, of course, when the Association can afford it. But, gentlemen, you must not take the past nine months' work as a sample of what we can do for very little money. We have to thank the Royal Photographic Society for their loan of rooms for our meetings. I have also been pleased to have the committees meet at my place in Baker Street, but this should not always go on. There is one thing that photographers have been doing that has been most annoying to me. I have a host of letters from them congratulating me upon the success of the Association, and saying that the writers have been watching its progress with much interest. But this is not what we want. We do not want photographers to stand aside and look on. There can be no progress unless the help of *all* is available. According to my reckoning, there are some 4,500 professional photographers, and if the profession is to be represented, 530 members will not do. It is not strong enough. Each member should try during the coming year to get in one or more recruits. The Association can then go forward, and perhaps deal with a very serious question—Where are we to get experienced assistants? The majority I have come into contact with seem very deficient in many respects, and if we cannot improve this state of things ourselves we should help some of the technical schools, and so get more qualified assistants. As members of a profesion that we all wish to strengthen, we should also take steps to no longer let slip work that we can do ourselves. For instance, the photographic postcard. If the professional gave his mind to it, the work need not be in the hands of the people who now monopolised it. Process blocks also are legitimately the work of photographers, and

so is menu and programme work, which goes, instead, to the printer. However, I hope that we shall be able to report still more success next year. I thank you very much for your reception of this toast.

Mr. Ernest Elliott, in proposing the toast of the "Local Branches," said: I have much pleasure in proposing this toast and the prosperity of our local branches, connecting with it the name of that most energetic and able organiser, Mr. T. C. Turner. I do not think that many of us can appreciate the amount of work and thought that this organising work entails. I had no idea of it until Mr. Turner showed me certain piles of correspondence which certainly astonished me. I have heard also rumours of very late hours, necessitated by the heavy work. We feel very much indebted to him, for without his energy and thought our local organisation would not exist, and I think that these local centres are prime factors in our life as an association. London cannot know what is going on in the provinces without these local branches, which bring into touch the central committee and the large body of country supporters.

Mr. T. C. Turner thanked the members for their toast and replied: Nobody has the interests of the branches of the P.P.A. deeper at heart than I have. As you now, what London thinks to-day the provinces think to-morrow. When London decided that the P.P.A. was to be formed and that it was to be a success, the country felt that they also must get to work, and I must say that the local branches have done, and will do, much valuable work. He was frequently met with the assertion that trade jealousies would prevent the local branches from forming or doing good, but their establishment had done much to disprove this erroneous idea. He spoke about the large numbers who had taken up photography, under the mistaken notion that huge fortunes were awaiting them. The resulting competition brought about by the excess of workers over business had done much to lower the dignity and position of photography, and it behoved them to take the necessary steps to place photography once more upon that basis from which it could inspire the respect that it so much deserved. He spoke appreciatively of the great assistance rendered by the organisers of the local branches in other districts than his own, and thanked the members for their toast.

Mr. S. Herbert Fry said that it was his pleasant duty to ask those present to drink the health of the Officers and Committee. Their deeds spoke for themselves, and they had the satisfaction of knowing that the Association thought well of them. In an organisation like this, good officers were a *sine qua non*, and it could be justly said that the Association had a first class committee and very efficient officers. It was a moot point with him whether it was easier to start or carry on a business. The man without a business was apt to reflect, that if only he had one he could easily carry it on, but having got one he found at once that it required all a man's ability to sustain it. He feared that this was the position in which the officers and committee would find themselves in the coming year. To have gathered in 500 members from a total of 5,000 photographers was an achievement to be proud of. If the committee could repeat that performance in the second year they would deserve well of the members; but, with assistance, they could do it, the willingness was already theirs. He called for the health of the officers and committee, not only for what they had done, but what they were going to do in the coming year. The toast was coupled with the name of Mr. William Grove, hon. treasurer, and Mr. Martin Jacolette, and was received with applause.

Mr. W. Grove replied that the very kind words spoken by Mr. Fry and the hearty reception they had evoked, would constitute a further incentive, if one were needed, to continued effort on the part of the committee in the interests of the Association. As an inducement to him to take up the office of treasurer it had been said that a penny account book would meet all his requirements, but looking at the membership he thought that forecast went hardly far enough. He was very glad that the committee included men of such zeal, enthusiasm, and business aptitude, without which things would soon languish and die. With their continued help, however, he saw a very bright future for the Professional Photographer's Association.

Mr. Martin Jacolette, responding for the committee, said that he had been much impressed since he joined the Association by the energy which the members had thrown into the work. He could assure the Association that there was still much latent energy in the committee to be developed. It was remarkable that people came so far to the meetings and sat so long over the details of the scheme. It made a record in photographic organisation, of which he was proud. In a recent newspaper paragraph it was said that professional photographers could never combine successfully. All he could say was that it was very unwise to prophesy unless one knew. That man was a little in front of himself when he wrote the word "never." The members had scored their first century that evening; there were 101 people present at that dinner, and he looked upon the fact as an index to a large amount of success in store for the Association.

Mr. F. A. Bridge, proposing the toast of the Visitors, said that they might have been disposed of in few minutes, but that the Association happened to be honoured with the presence of two very distinguished persons, Mr. Thomas R. Dallmeyer, the president of the Royal Photographic Society, and Mr. Frank Bishop, the chairman of the Photographic Copyright Union. The name of Dallmeyer, however, went back farther than its present connection with the R.P.S. His first lens, he well remembered, bore the name, and for the work it was intended to undertake he had still to find a better instrument. As head of the great firm bearing his name, Mr. Dallmeyer had a great claim to their regard, for he had not only sustained the laurels gained by his father, but he had done good work himself. Mr. Bishop was the representative of that institution, which dropped like the proverbial thousand of bricks on those who take what they know does not belong to them, but seem surprised when they learnt that it belongs to somebody else. He only hoped that at the next dinner the professional visitors would be fewer, and that they might have the proud privilege of dining with the others as members of the Association. He appealed to them to come inside, so that together they might see what could be done for the benefit of photographers. In conclusion, it had been said that photographers did not know enough of one another. Come, then, he said, to the Cambridge Convention, July 7-12, a meeting that would go far to remove any little misunderstanding that might trouble anybody.

Mr. Thomas R. Dallmeyer expressed, in the name of the visitors, his gratification at the reception accorded to the toast, and thanked the Association for its hearty welcome. He thought that the president and the committee were to be congratulated on the magnificent meeting they had been able to bring together. There had been imputations that the ranks of the professional were troubled with jealousies, but he thought that such an imputation could not live when one regarded the spectacle of over one hundred professional photographers from all parts of the country dining together in so happy and pleasing a manner. No better refutation of the base idea could be sought, and he was extremely happy to observe that the community of professional photographers was entirely free of anything of the kind. The Association, in its 500 members, had a solid foundation for its future work, the work of raising an edifice typical of the best characteristics of the profession. The Earl of Crawford, his predecessor in the presidential chair of the Royal Photographic Society, had said that one of its first efforts should be to look after the interests of the professional. The Royal Photographic Society had been able to do a little for the professional man, and he hoped that during his third year of office it might be the means of doing a great deal more. Mr. Dallmeyer referred to the facilities afforded by the Society at its annual exhibition for the furtherance of professional interests, and looked back with pleasure to the fact that of five medals awarded last year three had been captured by professional photographers in the pictorial section. The Royal Photographic Society was pre-eminently the leading society devoted to photography in the world. Its power to perform its allotted task was limited only by its purse, and he appealed to those present who were still not members to make a point of joining and adding to the ability of the Society to carry on its work. As its president, he would assure those around him that the interest of the Royal Photographic Society in the profession was no innovation. Whenever their interests could be served and advanced they could be sure that the necessary steps would be gladly taken. Mr. Dallmeyer also spoke a few words in favour of the work of the "National Photographic Record," the furtherance of whose objects he considered a most worthy and important branch of the duties owing to the present generation to the future.

Mr. Frank Bishop assured the members that anything he could do to assist them would be gladly done. As regards the cutting of prices, he said that many trades had found themselves compelled to combine to stop it, and professional photographers could do much work, useful to themselves, in that direction. The cutting of prices spelled ruination of trade and fortune. He thought also that the Association would do well to bring together each grade of its members rather than the whole body, at least on some questions, and he thought that the local branches would prove a tower of strength. He was extremely gratified to see a promise of professional photographers combining for their own interests, and he was sure that if they would only pull together they would be able to perform much helpful work.

Mr. G. Watmough Webster proposed the health of the chairman, and regretted that he found himself unable to do full justice to his subject. There was no doubt that he had been one of the mainstays of the fabric of the Professional Photographers' Association, and its success was very largely due to his personal effort. He never failed at the proper moment to say the right word, he worked hard and long, and the Association owed him its best thanks. He therefore had much pleasure in asking the members and guests to drink the health of their respected chairman. The units composing their association were now in harness and ploughing their furrows, and in a little time the Association would be second to none in this country. The chairman had done much to wipe the slate clean and bring about unity, concord, and good fellowship in the photographic ranks. May his efforts continue to be successful.

Mr. T. Birtles, of Warrington, as a country member, comparing

himself to a milestone in the progress of photography, insisted that such as he should not be set aside. Young men were quite naturally setting up amongst them, but the old practitioner still called for the display of some respect while they remained. As a man who had borne the brunt of the day in the wet-plate days, he was glad to meet so many friends, many known only by name. He did his present-day work with the Dallmeyer lenses, and was pleased to meet the head of that old-established firm. He sincerely hoped that next year the Association would be able to show yet a further proof of its stability.

Mr. H. A. Chapman, of Swansea, spoke in testimony of his appreciation of the objects of the Association, and, addressing himself to the younger members, said that no fame was impossible to the photographer. Integrity of purpose and a willingness to do by others as you would be done by opened up a large range of possibilities, and if he had to commence life again he would unhesitatingly embark upon the photographic career which he had followed so long, in fact, since the year before the Crimean War.

The chairman thanked the members for the reception of his toast, and in a few appropriate remarks again testified to his hearty interest in anything that carried with it the success of the Professional Photographers' Association.

The National Anthem brought the proceedings to a close at a very late hour.

[By a Visitor.]

The sharp rap of the President's mallet summoned the members and friends of the Professional Photographers' Association on Thursday evening last, in the Victoria Hall of the Criterion Restaurant, to a function which may become memorable in the history of British photography. We were privileged as a guest to watch the proceedings, and must describe the gathering as one of the most remarkable we have seen for many years in connection with professional photography. The president of the Association, Mr. Thomas Bedding, Editor of the British Journal of Photography, occupied the chair, and he was supported on the right by the president of the Royal Photographic Society, Mr. Thomas R. Dallmeyer, and on the left by the president of the Photographic Copyright Union, Mr. Frank Bishop. The combination indicated the warm feeling of friendship the Association has already won in the eleven short months of its existence. Had it been prophesied eighteen months ago that within so brief a lapse of time an organisation would be formed comprising nearly 600 photographers, engaged in business in various parts of the country, the idea would have been received with incredulity. But such is the fact, and the explanation is a simple one. The Association has been taken in hand by men of energy and business capacity, and it needs but a glance to see that the executive is in earnest, and determined to command respect for the interests of the professional photographer. About one hundred members and friends of the Association assembled in the Victoria Hall, and it was a sign of greatest promise that one quarter of these had travelled from the provinces; Leeds, Chester, Liverpool, Northampton, Bideford, Leicester, besides many other towns, and even the Principality of Wales, were represented. Seated at the long tables the group was most characteristic in its aspect. Some of those present could probably claim to have been in touch with the period of the daguerreotype, whilst it was evident that many had passed through the days of the wet plate. In contrast with these were younger men, whose business career had been associated exclusively with the modern dry-plate, and this fact seemed to find its expression in an air of keener alertness and more sensitive temperament. The dinner was of the best, and the speeches which followed instinctively dwelt upon the future of the Association. The right note was struck by the chairman in discussing the hopes of the honorary solicitor, Mr. P. E. Marshall, that in the near future a charter might be obtained, under which the practice of professional photography might be restricted to those who were thoroughly competent. Although the remoteness of this event was emphasised by Mr. Frank Bishop, who advised the Association to use its influence to check ruinous competition, the practical common sense of the honorary secretary, Mr. Alfred Ellis, was manifested in one feature of the speech, which he made to explain the work that had been accomplished and that which might be done. We refer to the suggestion that the Professional Photographers' Association might in time become sufficiently strong to create its own school for the training of photographers. Given a high standard of efficiency, this would be a practical step in the direction to which the president referred. The attention which is now given to technical education might be utilised by a powerful association for the benefit of the photographer, and the ardent wish of the honorary solicitor might then be attained in some practical form. But these are dreams of what may come, and meanwhile there is much work of importance to be done. If the efforts of the executive meet with loyal support there can be no doubt that work will be taken in hand with spirit and effect. It is impossible to urge too strongly that every professional photographer should join the Association. The movement is a most hopeful sign that a brighter future lies before us, and the skill with which it has been organised augurs well for its success. The interests photographers have in common are of greater importance than those which kept them apart in the past. This is seen by the men of to-day, and we trust that the Association will form a bond of union for mutual protection and advancement.

A PHOTOGRAPHIC TOURIST IN ORKNEY.

[Abstract of a Paper read before the Edinburgh Photographic Society.]

Having spent a very enjoyable holiday in Orkney last summer, I shall attempt to-night to describe these interesting islands from a tourist's point of view. I was altogether about five weeks there, and during that time got over a good deal of ground with the help of steamboats, dog-carts, and a cycle. Orkney is a place rich in relics of the far past. There, for instance, are the Standing Stones of Stenness, dating back to the time of the Druids. When one stands amid those mighty stones, erected on a lonely moor, where they have stood for over two thousand years, the mind wanders back to the time when white-robed Druid priests conducted their mysterious rites amongst those barren hills. However, we shall come to this all in good time. I must begin at the beginning. We arrived at Stromness at four in the morning, the fog gone and the sun shining brightly. We had still nine miles to go to Dounby, which we intended making our headquarters. On arriving we found Mr. Spence, proprietor of the hotel, waiting for us on the pier with a dog-cart for the ladies and a cart for the luggage. The rest cycled. Dounby is a small hamlet on Loch of Harray, consisting of the hotel and post-office, a schoolhouse, and four shops. These shops will supply everything, from a fishhook to a marriage outfit. In Orkney they have quite a number of travelling shops, which perambulate all over the Island. They carry a miscellaneous variety of goods—bread, brushes, baps, boots, biscuits, gingerbread, ginger-beer, pails, flour, cutlery, spoons, and garden implements—in fact, all the necessaries, and a good many of the luxuries of life. There is a well inside the conveyance in which the man can sit and dispense his goods. The Orcadians are an enterprising people. They have boat-shops as well, both steamers and sailing vessels trading in the same way among the Islands. I was informed that the man who first started boat-shops had made a large fortune out of them. The great event of the year in Dounby is the cattle show, which occurs in August. The arrivals on the show day begin early in the morning. Here comes a country belle, got up in her best clothes, leading a cow; then an old man with a couple of pigs, which insist upon going in opposite directions. These are followed by a large and very consequential sow, with a very turned-up nose, all scrubbed for the occasion; mares with playful foals scampering after them; horses innumerable; Shetland ponies not much larger than collie dogs. Bulls, cattle, and flocks of sheep all gather in a field below the town. Sixpence for admission is charged. The price has been raised this year from threepence, so several indignant individuals refuse to go in, but walk round outside the three-foot wall which encloses the field and view the show for nothing. There is also a flower, fruit, and dairy produce show in the schoolhouse, including oatcakes, photographs, and needlework. This is followed in the evening by a concert. The schoolhouse, not being large enough for the audience, the windows, which are all open, have a cluster of heads round each. (Here again economy scores, and the conscientious non-payer gets fresh air as well as music.) The audience is not a very attentive one, except when a comic song is going on. During a sentimental one they talk and laugh quite freely. It reminded me of an incident which occurred at a smoking concert at Portobello. A friend of mine who plays the 'cello was invited to perform. The commencement of his performance seemed to be the signal for a general friendly talk, so loud that the music was only heard quite near to the performer. After wading through the first half of his piece, he rose and made a polite little speech, in which he hoped "that the music was not interrupting the conversation." The latter half was played in dead silence. We had a variety of talent at the Dounby concert. One youth came in with a cabbage over his head and sang, "What ho! she bumps."

I discovered a native photographer on the moor, who had a portable studio and dark room. He was also a carpenter, and possessed an ingenious sawing arrangement driven by a windmill. The roof of the studio he had procured from London; the other parts he had made himself. He was very obliging, and showed me all his premises and work, and offered me the use of his dark room. There was one man in Dounby whom I wished to photograph, but I did not succeed in bagging him. He was a very shy bird. Some one had told him I wanted to take him, so whenever I approached he began to walk away very fast, keeping a wary eye fixed upon me. This man was chiefly celebrated for never having been known to wash his face. He lived on the moor in a cottage about the size of a henhouse. I need hardly say he was a bachelor. It was not from the want of

water that he did no washing, as he had a loch almost at his door. In fact, one can hardly walk a mile in Orkney without tumbling into a loch. There were half a dozen within easy walking distance of Dounby, Loch of Harray being the largest, 4½ miles long and about 2 miles broad in some parts. The fishing in some of these lochs is fairly good for trout up to half a pound. I had twenty-three one forenoon fishing from a boat. Twice I hooked three at a time, one on each fly. I landed the lot on one occasion, but only two of the other three. It is pretty exciting when you get them in this way. This was on Loch Bosquay. There are a number of small proprietors round about these lochs, who are called Bonnet Lairds. They claim the right of netting the fish, which they either salt or send to London in ice. This is very like killing the goose that lays the golden eggs. If they were to preserve the fish, and charge a small fee for the right to fish on each loch, they would attract thousands of fishers, and reap a golden harvest; and not only they, but all the inhabitants of Orkney would benefit from this influx either directly or indirectly. At present all fishing is free. There are still a few large trout left in the lochs. A 21-pounder was got on Harray when I was there, but it was caught on a night line. Two trout weighing respectively 6lb. and 6¾lb. were taken on Stromness a few days before in a legitimate manner. One of them was hooked from the side of the loch with a small fly and trout rod. It took the lucky fisher two hours to land. You cannot get very far away from the sea in Orkney. About four miles from Dounby is Skail Bay, a very lovely stretch of sand upon which the breakers rush in between cliffs on either side. A little farther round the coast we come to Birsay, a quaint little hamlet with the ruins of a palace dating from the time of the Norsemen. Near the palace dwells Betsy Hunter, a reputed witch. The elder fishermen, should they happen to meet her when going to fish, turn back and do a loaf instead, as they firmly believe they will get no fish after meeting Betsy. The younger ones are, however, not so superstitious. I interviewed Betsy, whom I found feeding her hens. If I had not been told she was a witch, I should not have known it, as she struck me as being a very harmless "auld wife." She at once agreed to have her photograph taken, but wanted to put on her Sunday clothes. I had to impress upon her that it was quite unnecessary, as she looked splendid as she was.

We now arranged to go for a short trip to the Northern Orkneys. So one fine morning we started for Kirkwall, from which town, after remaining for a day or two, we intended to take the small steamer "Orcadia," which visits these islands three times a week during the summer. Kirkwall being the capital of Orkney, having a cathedral and two distilleries, is a place of some importance. The fine old cathedral of St. Magnus is well worth a visit, although it might be made a little more beautiful inside. The Orcadians are not celebrated, however, for decorating their churches. Most of them resemble barns. On our entering the church the man in charge received us kindly, and collected sixpence a head from us; after which he seemed to think he had done his duty, and left us to find our way about the building as best we could, and to pick up any information we desired to know from the guide-book. Some boys were going to the top of the Tower, so we followed them. Rather more than half-way up, we came upon four large bells, which some more boys were amusing themselves by ringing as hard as they could. This is a favourite pastime of the Orcadians during the Fair at Kirkwall. The noise made by these bells, which were being rung without any attempt at unison, was simply deafening, and the discord awful. We were not long in getting out of that part of the Tower, and soon reached the top, from which we got a splendid view. I took a snapshot from the top of the town and bay, which gives you a fairly good idea of the size of the place. We had to hire a boy for twopence to show us the way down again, the winding stairs and passages being rather intricate and very dark. As it was, I heard my friend, who was a little behind me, stumble and fall down one flight of stairs. The noise he made in falling was only equalled by the flow of language that followed, but he reached the bottom without breaking any bones. The streets in the Orkney towns are very narrow, only from 6 to 10 feet wide, with a causeway about a foot and a half wide in the centre for the horses to run upon. The remainder is paved with flat stones. The principal street in Kirkwall is called Broad Street, and it is in places at least 15 feet wide—hence the name. There is a solitary tree growing in this street where it widens out into a sort of square opposite the Cathedral. Trees are by no means plentiful in Orkney. There is also a small plantation consisting chiefly of sycamore trees, on a portion of the ground formerly occupied by the Bishop's Palace. Why the Orcadians made their streets so narrow in olden times is a mystery. It was certainly not from lack of ground. I suspect that the real reason was that narrow streets were more easily defended than broad ones, which was a serious consideration in those times, when the inhabitants might wake up any morning and find a fleet of Vikings or Norse pirates lying in the bay.

One of the principal photographers in Kirkwall is a lady, Miss Sinclair. I called upon her to ask for the loan of her dark room, which she kindly placed at my disposal. After changing my plates I had a chat with her. She informed me that on the Fair Day in Kirkwall, a few days previous, she took 140 sitters, and 90 the day following. I calculated that if she worked the first day straight on for twelve hours, she must have taken a sitter, on an average, nearly every five minutes. Not bad for Orkney. We started on a Saturday morning in the small steamer "Orcadia" for the Northern Orkney Islands. We were told at the hotel that if there was anything punctual in Orkney it was the starting of this vessel. Nine o'clock was the hour advertised, so we were on the quay at 8.45, where we found a large crowd waiting while the cargo was being stowed into the vessel. This included two flocks of sheep, about four dozen cows, a herd of Shetland ponies, and the whole of the household furniture of the new parish minister of Sanday, who had landed that morning from the "St. Rognvald" with his family and effects. The captain point blank refused to take the furniture, and so the poor parson was obliged to leave it where it was, with a promise that it would be brought on the following Tuesday. I was sorry for him, but felt glad on our account, as it would have taken an hour to get the furniture on board, and probably another hour to land it at Sanday. As it was, this punctual boat started at 10.15, only an hour and a quarter late. The guide-book informed us that the "Orcadia" had no sleeping accommodation, but carried a steward, cold meat, and temperance drinks. The last I did not mind, as I carried a flask, but I tried the cold meat, and of all the lunches I ever partook of that was the worst. Not that the meat was bad in itself, but it was put down in such a filthy manner on a dirty napkin, and the steward rubbed up the tumblers with a cloth which I think he must have used for cleaning the brasses. We found out afterwards that the way to get lunch was to leave the steamer at Sanday, where she lay for an hour, and have lunch comfortably in the hotel. We passed the island of Shapinshay, near which, on a small rocky inlet, we saw three seals lying basking in the sun, while several others were playing about in the sea. From Papa Westray we steamed to Pier-o'-Wall on the Island of Westray, where the boat lay until Monday morning. The name Pier-o'-Wall means the Pier of the Valley, the same as Kirkwall is the Kirk of the Valley. We found the Pier-o'-Wall Hotel very comfortable, although it was a good mile round the bay from the pier. The hotel yawl took all our luggage and some of the passengers across the bay in ten minutes. The village straggles all round this very pretty bay, which is almost circular in form. The Pier-o'-Wallians use their boats largely as a means of conveyance, there being quite a number of small stone jetties all round. After a comfortable dinner, we strolled over to have a view of Noltland Castle, about three-quarters of a mile from the village. This castle is the prototype of Burgh-Westra in Scott's novel, "The Pirate." It is an enormously strong building, with walls fully five feet thick. It is not inhabited, but is quite complete in some parts. The dining hall is still intact as regards walls and roof, and must have been capable of accommodating two hundred people. The castle is five centuries old, and was built by a Bishop of Orkney. It fell into the possession of Sir Gilbert Balfour, Master of Queen Mary's household, who was exiled for his devotion to her cause.

A succeeding proprietor was celebrated for having thirty-six children, and standing 6 feet 7 inches in his stockings. He kept open house for four months on the occasion of the marriage of one of his daughters, and only cried "halt" when the contents of his larder were reduced to the last joint of his last beast—the bull. History does not relate what he did when the remaining thirty-five got married. There are traces of some very fine carving all over the castle, especially on the staircase leading up to what has evidently been the ladies' apartments. On Sunday we resisted a strong inward conviction that we should go to church, and took a walk round the coast instead, which is well worth seeing. Noup Head is a cliff 240 feet high, standing at the extreme north-west of the Island, and the Stack of Noup a huge standing rock separated from the main cliff by a narrow fissure. All along the coast are steep cliffs in which the sea has made numerous caves and arches. These cliffs are very disappointing to photograph, as without a boat there is no means of getting to the foot of them, and if photographed from above they are always dwarfed. I should not, however, care to venture very close to them in a small boat, for even in what is considerel a calm sea, in Orkney, the waves rush in with terrible force. This picture is a specimen of a calm Orcadian sea. We had the good fortune to have with us a professor of the Birmingham University, who was greatly interested in geology. He discovered during our walk a fossil fish embedded in a lump of rock. He said he could not estimate its age, probably a million years at least. We arrived back at the hotel, after walking half round the island, in time for dinner, to which we did ample justice. We were waited upon by a lassie quite six feet high, with a very bushy fringe of hair. She might have been a descendant of one of the thirty-six children of our 6 foot 7 inch friend of Noltland Castle, but at all events she was an uncommonly smart waitress.

On Monday morning we started at nine o'clock, and after a most enjoyable sail we arrived at Kirkwall about four in the afternoon. Our next move was to Stromness, where we remained a week. Strom-

ness is by far the most picturesque town in Orkney. It faces a fine bay, the houses being built close to the water's edge, with numerous stone wharfs attached to them. There are any amount of subjects here for the camera. The town itself consists principally of one straggling street a mile long. It is by no means straight, and one can seldom see more than a couple of hundred yards ahead. You fancy you have reached the end, when another slight bend shows you another 200 yards or so. The street is very narrow, and when new drain pipes are being laid, as was the case in two places when I was there, you have got to cut up a side close and go round another way. The inhabitants must find it difficult under these circumstances to get at their front doors. Stromness possesses a town hall and a museum, which contains a fine collection of sea birds. Perhaps the most interesting object in it is the asterolepis, or star-scale fish, a primeval monster which grew to 20 feet long. The specimen in the museum, however, must have been a baby star-fish, as it is only about six inches long. It was found by Hugh Miller. I was informed that a Mr. Fiddler, a Stromness baker, had planted a garden on the top of his bakehouse, so I got an introduction to him, and was duly invited up to see it. The bakehouse is attached to his dwelling, and is built down to the shore. The top of it is covered with concrete, upon which soil to the depth of 3 or 4 inches had been placed. In this he grows flowers and vegetables. Here he can retire after the labours of the day, smoke his pipe, and enjoy the fine view of sea and land without being overlooked by any of his neighbours. At one end of the garden there is a small greenhouse, in which he rears hothouse plants, no fire being required, there being sufficient heat from the bakehouse below and the chimney stack above, against which it is built. He has, I understand, gained several prizes for both flowers and vegetables. The idea struck me as being very ingenious.

I started one morning to walk round the coast past the Island of Hoy to the Black Crag. Before leaving I reloaded my camera in a comfortable dark room belonging to Mr. Heddle, chemist and druggist, who kindly placed it at the disposal of any who may require it. Hoy is about a mile across from the mainland. The sea is generally so rough that it is only on exceptionally fine days a landing can be effected. I asked a native where the best landing place was. "Just where the boat strikes," he replied. You cannot pick and choose on this coast. The cliffs at this end of the island are very precipitous and somewhere about 800 feet high. It was very curious to watch from a distance the effect of the waves dashing on those cliffs. You saw the wave approaching and break on the rocks, and then it appeared as if the water calmly and very slowly proceeded to walk half way up the cliffs. This was in comparatively calm weather. It was very different when you got near to those huge waves. On arriving at the Black Crag, we were shown a split in the rock, very wet and slippery, the tide being half out, by which it was possible to get on to a ledge of rock at the foot of the cliffs. Two of us ventured down and took some snap-shots of the waves rushing in. They did not look like crawling then. We felt as if the next wave would wash us off the ledge we were standing on. On our way back I visited one of the few remaining cottages containing the old-fashioned fireplace in the centre of the room, and a hole in the roof to let the smoke out. I had to use some diplomacy to get inside, as the inhabitants do not like prying tourists. I pretended to be very thirsty, which did not require a great stretch of imagination, and asked for a drink of water. I was courteously invited in and was offered milk. It was a most picturesque interior, and would have made a splendid photograph, but unfortunately I had only a hand camera with me, and my friends were waiting outside. The fire is kindled against a block of stone 2 feet high by 2 feet wide, and the smokes escapes by an oblong hole immediately above. The fire is always kept smouldering, summer and winter. The boy who spoke to me, a lad of about sixteen, said it had never been out since he could remember. Peat, of course, is what is burnt.

Maeshowe, near Loch of Stenness, is another very curious memorial of the far past. It is a stone vault supposed to have been built by the Picts as a place of burial three thousand years ago. It is inside a conical hill. The entrance to it is by a tunnel 20 yards long and about a yard high. The vault is almost circular, about 10 yards in diameter and 35 feet high. On three sides there are three small chambers or vaults about 2½ feet from the ground, evidently intended for sepulchres. They measure from 5½ feet to 7 feet in length, and about 4½ feet wide by 3½ feet in height. These are connected with the main chamber by small passages, once blocked by single stones, which now lie on the ground. Their roofs, floors, and walls are each composed of a single slab of stone. The central chamber is also paved with large stone slabs, and the walls built up with the same kind of stones. As they reach the top each stone projects slightly beyond the one it is resting upon until it reaches an apex, which is closed by a single stone. It was unearthed in 1861, but it was evidently known to the Norsemen probably about 1100, as the walls are inscribed with Runes, old Norse characters, or "Mysteries," which I understand have been translated, but merely tend to demonstrate that the old Vikings were a kind of "'Arries," and liked to carve their names and sayings on any convenient place. There is also a very well carved figure of a winged dragon and other animals, also the figure of a man. I tried to take a photograph of the interior, which was lit by candles and the light from the entrance. I gave seven minutes' exposure, but this is all the result I got. Loch of Stenness is about four miles long by one and a-half miles wide, and joins Loch of Harray. They are separated by a causeway called the Bridge of Brogar. Just beyond this are the Standing Stones, some of which are 20 feet high. Some have fallen down, but a large number are still in an upright position. Loch Stenness is a fresh-water loch, but is still connected with the sea by a narrow passage at one end, where, of course, the water is brackish. It is a capital fishing loch, in spite of a great deal of illegal fishing indulged in by the natives. We had a very severe storm, which lasted for some days, before the steamer going south was due; in consequence of which the steamer was obliged to lie up in Shetland for twenty-four hours, and arrived in Stromness thirty hours late. However, we benefited by this, as we had a splendid passage home; only on arriving at Aberdeen at 3 a.m., we were all turned out of our bunks to change into another steamer, as the one we were in could not leave Aberdeen until the evening. It was not a pleasant experience, but I secured a sunrise which I should otherwise have missed; so, as I believe, things always turn out for the best. After a splendid sail up the Firth to Leith we reached home safely, feeling very much the better for our summer holiday in Orkney.

FRANK P. MOFFAT.

MAXIMUM SHUTTER SPEED FOR SNAP SHOTS.

[Reprinted from the Proceedings of the Oxford Camera Club.]

IN photographing moving objects photographers are constantly spoiling a large number of plates, either through under-exposure or setting the shutter at too slow a speed to prevent blur. The first mistake could be obviated by the proper use of an exposure meter or table, and he proposed that evening to show a simple method of getting over the second difficulty. The rule for determining the slowest speed of shutter usable for objects moving broadside to the camera was usually stated thus: "The distance of the object from the camera, measured in inches, must be divided by the number of yards per hour at which the object is travelling and by the focus of the lens in inches. The result will be the fraction of a second, which is the longest allowable exposure that does not show movement in the resulting picture." That sounded complicated, but was more intelligible if they considered for a moment: (1) The faster the object moved the shorter the exposure must be; (2) the closer the object was to the camera the larger it would be, and therefore the shorter the exposure necessary; (3) the longer the focus, the larger the image and therefore the shorter the exposure. Besides these points they had to consider in what direction the object was moving. If directly away from or towards the camera the exposure from the broadside position might be multiplied by three. Another important point was that allowance had to be made for the fact that parts of an object might be moving faster than the object itself, as, for instance, the oars of a boat, the legs of a horse, etc. Again, in taking a yacht from a boat travelling alongside, the exposure might be made longer if both were travelling in the same direction, and shorter if in opposite directions. All these calculations were based on the assumption that sufficient sharpness was obtained when the image of the object had moved not more than 1-100th inch on the plate during the exposure. There were, however, reasons which often made even a simple arithmetical calculation impracticable, and at the best it caused trouble and delay. He had, therefore, devised an instrument which did not pretend to any originality except in its application to a new problem, by means of which the maximum exposures permissible for snap-shots under any ordinary conditions might be quickly found, using the familiar principle of sliding scales. The instrument could be made at home, and consisted of five discs of cardboard (or only four discs if the same lens be always used) of decreasing diameter, which were placed one upon another so as to turn about a common centre being threaded on a pin or rivet, each one projecting about ¼in. beyond the one above it, and each being free to rotate independently of the others, the largest disc being 3½ inches to 4 inches in diameter. The simplest plan for constructing the instrument is to cut out discs of smooth white paper of the right size first, as this facilitates the marking of the divisions on the scales. Let the largest one, as it has to have room for two scales, project rather more than ¼in. all round the one above it—say ⅓in. Then with a fine pen mark any point on the circumference of the largest (outer) disc, and with a pair of dividers mark off equal divisions—say, ¼in. apart all round—marking each point clearly by a fine stroke of the pen, and every fourth point by a slightly longer stroke. Now every scale is to be marked in equal divisions of the same angular distance apart as the first (*i.e.*, radially, so that a rotation of one division on any of the scales produces a movement through the same angle), and this is very simply done by piling the discs one upon the other in the positions they will eventually occupy,

and pinning them down to a board by a pin through their common centre. Then with a flat ruler and pen draw a radial guide line from the centre across the exposed part of every disc to the first mark on the outer ring. Then lay the ruler so as to join the second mark to the centre, and mark the points where it cuts the outer discs (except the smallest, which has no scale) with a fine stroke of the pen, similarly with the third and every other mark, marking every fourth one with a longer stroke. The discs may now be taken apart and mounted on cardboard, which is then cut round to fit the discs. For convenience in use, mount the largest disc on fairly stout and the others on thinner cardboard. In graduating the scales, clearness may be gained (as the figures must necessarily be rather small) by filling in the alternate scales in black and red ink. Each scale should be labelled "Exposures," "Distance," etc., in clear letters, say on the left of the original guide line. The graduation is effected as follows:—The exposure (outermost) scale is marked in fractions of a second, so that they are doubled at every fourth division from left to right. Starting with 1-1000th sec., the fourth next is marked 1-500th sec., the fourth next again 1-250th sec., and so on, the intermediate divisions being marked with the arithmetic means between these—viz., 1-800th, 1-660th, 1-570th, and 1-400th, 1-330th, 1-280th. Where the figures are cumbrous they are approximated. Similarly the distance scale on the inner ring of the outer disc started at 1½yds., the fourth next division being 3yds., and so on. On the distance scales the numbers increased from left to right like the exposures, but on the next, the speed scale, they started at 100 miles per hour and decreased from left to right, being halved at every fourth division. The fourth scale was marked with foci decreasing from 20in. to 2½in. The direction scale had its first division marked 90 deg. for objects moving broadside, and six divisions to the right was marked 0 deg. for objects moving towards or away from the camera. An intermediate mark of 40 deg. was put half-way between the two. The original guide line on each scale could be marked for a pointer. When all was complete and the parts fitted together, the indicating arrow had to be drawn in. This could be done by working out a test case and then setting the different scales to the figures used in it, when a line must be drawn across the centre of the smallest disc so that it pointed to the exposure found in the calculation. The instrument could be completed with a table of speeds of various common objects pasted on the back for reference.

E. H. Binney.

PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM: 17TH ANNUAL MEETING, CAMBRIDGE, JULY 7TH TO 12TH, 1902.

President: Sir Robert S. Ball.

The following notice has been issued to members:—

East Lodge, Dalston Lane, London, N.E.

Dear Sir (or Madam),—Enclosed I have pleasure in handing you particulars of the Seventeenth Annual Convention Meeting, to be held in Cambridge, July 7th to 12th.

An influential reception committee is being formed, several attractive excursions have been arranged, and the local executive (under the chairmanship of Mr. F. H. Sanderson) is doing its best to promote the success of the gathering.

I shall be pleased to send you any further particulars, and hope to receive an early intimation of your intention to be present.—Yours truly,

F. A. Bridge,
Hon. Sec. and Treas.

Members are reminded that the annual subscription (5s.) is now due.

PRELIMINARY ANNOUNCEMENTS.

PROGRAMME.

Monday, July 7th. Morning and Afternoon.—Conducted parties through the Colleges, etc. Evening at 7.30.—Conversazione and Reception by the Mayor, G. Kett, Esq., who will be supported by Members of the Corporation and other influential residents of the City. Presidential address, etc.

Tuesday, July 8th. Excursion to Bury St. Edmunds, Melford, Lavenham, etc. There will be no meeting in the evening.

Wednesday, July 9th. Excursion to Ely. Evening at 8.30.—A demonstration of Practical Enlarging.

Thursday, July 10th. Morning at 10.—Annual General Meeting. Morning at 11.—Meeting of the new council. Afternoon at 3.—The President, Sir Robert S. Ball, and Lady Ball will give a Garden Party in the grounds of the Observatory, which will be thrown open for inspection. Evening at 7.—Annual Dinner and Smoking Concert.

Friday, July 11th. Excursion to St. Ives, Hemingford, and Houghton. Evening at 8.30.—A demonstration of Lighting and Posing.

Saturday, July 12th. Visits to the Colleges, short excursions in and around Cambridge, etc., as may be desired.

The Meetings and Trade Exhibition of Apparatus, Pictures, etc., will be held in the spacious Guildhall, a very fine room, capable of seating 1,000 persons.

By the courtesy of the authorities, every facility will be given to those members desirous of photographing in the Colleges, College grounds and Gardens.

The Dean of Ely (The Very Rev. C. W. Stubbs, D.D.) has granted full permission for members to photograph in the cathedral, and has kindly promised for this occasion to allow the chairs, etc., to be removed from the lantern.

Cambridge is only 55 miles from London, with an excellent service of trains from both Liverpool Street and St. Pancras. Visitors from the Continent (via Harwich) can book to Cambridge at the same fares as to London, and return from the latter if preferred.

For further particulars of excursions, hotels, private apartments—of which a large number will be available—dark-rooms, dealers, etc., etc., see the official programme, which will be issued as soon as possible.

F. A. Bridge,
Hon. Sec. and Treas.

Patent News.

The following abridged description is specially drawn for the British Journal of Photography by Messrs. Hughes & Young, patent agents, 55 and 56, Chancery Lane, London, who will give advice and assistance free to our readers on all patent matters.

Patent Applications (1902).—No. 4,780.—Charles Spaulding, Chancery Lane. "Improvements relating to photographic printing machines."

No. 4,927.—Edward Russell Clarke, 35, Leinster Gardens, London. "Improvements in cameras for taking panoramic pictures."

No. 5,069.—Arthur Charles Smith, 26, Hanover Street, Peckham. "Improvements in or relating to photographic cameras."

No. 5,108.—Frank Stanley Ogilvie, Strand. "An improved solution for intensifying photographic negatives."

No. 5,171.—Richard Maudson Waterhouse, Danum Villa, Jones Lane, Bowes Road, New Southgate. "A photographic print and plate washer."

Patents Illustrated.—No. 925.—Photography.—Patentee: F. A. Roebuck, 39, Rosendale Road, W., Dulwich. Shutters.

Relates to an addition to rebounding shutters to adapt them for slow as well as for rapid exposures. To set the shutter a loop of the elastic band is passed over the pin on the shutter, the shutter being held closed by a stud bearing against an arm of the lever. To release the shutter the arm is raised by the expansion of the air ball till the stud escapes. When the shutter flies up the stud is caught by an elastic band which forces the shutter down again and closes it. For slow exposures the stud is moved to the left-hand end of the groove. In this position it is caught by a jointed arm in its descent, and the shutter is thus held open till the pressure in the air ball is released.

No. 20,015.—Photography.—Patentee: J. E. Thornton, Rokeby, Oldfield Road, Altrincham. Roller slides; cameras.

A spool for a roll-holder has metal flanges with rims formed from sheet metal. One rim is indented on the circumference, or on the edge to form a toothed spur or crown wheel, so that the spool may be rotated by a pinion, on a spindle mounted in the side of the roll-holder or camera, and having an external handle. Recesses, with semicircular ends, are formed in the camera or roll-holder casing to receive the flange rims which form the bearings for the spool.

No. 20,226.—Photography.—Patentee: H. P. Tattersall, 6a, Devon Terrace, Palace Gates Road, Wood Green, N. Cameras.

Relates to a method of mounting the front of a camera so that the lens fixed to the front can be rapidly focussed. Then lens is fixed over the aperture of the front, which slides on two parallel rods. In the lugs are round holes which fit exactly the rod, but on the lugs on the other side the holes are replaced by slots. This arrangement permits the front to be moved easily backwards or forwards on the rods. The movement is imparted to the front by a lever, having a fulcrum, which is clamped at any required point on the rod by the set-screw. In another arrangement the movement is imparted to the front by a crank-pin on a disc turning in the baseboard of the camera.

It will no doubt be a surprise to many who have been interested in the work of the County Council Technical School, Bolt Court, to learn that its director, Mr. Charles W. Gamble, has resigned his position and will retire from his duties about July next. However, the numerous friends of Mr. Gamble will be pleased to hear that his resignation is but a preliminary to his acceptance of a similar, but more important, position at the Municipal School of Technology, Manchester. There can be no doubt that Mr. Gamble has been the life and soul of Bolt Court during his connection with it, which has been practically since its inception, and the present successful and well-organised state of the school is largely due to his efforts. The Technical Education Board have paid him the compliment of saying that his place will be very difficult to fill, and that they extremely regret his retirement. We feel sure he will carry with him the good wishes of past and present students, as well as of the trade in general.—"Process Work."

Commercial & Legal Intelligence.

We have received the latest price list of Messrs. Lindsay Hemery & Co., artists in oil, water-colour, and black and white; enlargers in bromide, carbon, and platinotype; printers, retouchers, and general trade photographers. Messrs. Hemery's address is Brockley Road, London, S.E.

We have received the latest list of Messrs. R. Flamank & Son, printers in all processes; artists in oil and water-colour, and black and white; enlargers in bromide-paper and glass negatives. Messrs. Flamank's address is Stafford House, "The Retreat," Sutton Street, Aston, Birmingham.

We have received the special list of surplus stock and odd lines to be sold at greatly reduced prices to make room for fresh stock, now being issued by Mr. Jonathan Fallowfield, the Central Photographic Stores, 146, Charing Cross Road, London, W. The list, which occupies 64 pages, and is sent free, on application, embraces over 2,000 lines of photographic goods in very great variety.

Mr. S. J. Beckett, of 20, Baker Street, W., writes:—I have retired from the partnership firm of R. Beckett & Sons, whose business was carried on at No. 6, The Grove, Hackney, as from December 31st, 1900. The business will be continued by Messrs. Robert Beckett and Ernest Alfred Beckett, under the style "R. Beckett & Son," instead of R. Beckett & Sons, and they will pay and discharge all the debts and liabilities of the late firm, and receive all outstanding accounts.

Messrs. J. J. Griffin & Sons, Ltd., of 20-26, Sardinia Street, Lincoln's Inn Fields, write:—It may interest your readers to know that we have considerable space at the Crystal Palace, and are exhibiting our latest styles of Poco and Cyko cameras. This is in connection with the Printing Trades Exhibition. Those of your readers who are interested in the new model cameras will have an opportunity of seeing these new instruments during the next four weeks. Needless to say, they will receive a very hearty welcome at our stall.

W. Smith & Co., Ltd.—The above-named company has been registered with a capital of £1,000 in £1 shares. The objects of the company are to acquire the business carried on by W. F. Smith, at 23, High Street, Abingdon, Berkshire, and elsewhere, and to carry on the business of wholesale and retail chemists, druggists, manufacturers of photographic, optical, surgical, dental, and scientific apparatus and materials, etc. No initial public issue. Registered without articles of association. Registered office: 23, High Street, Abingdon, Berkshire.

We have received the catalogue of photographic materials, cameras, lenses, tripods, chemicals, and sundries, issued by the Service Photographic Society, 292, High Holborn, W.C. The following extracts from the company's prospectus give an idea of the nature of the business conducted:—"We are prepared to supply apparatus by all good makers at the lowest possible cash prices, or on our gradual payment system. In any case where a customer does not feel confident to act on his own judgment, we shall be pleased to make a selection for him. Free instruction is given in the use of all apparatus purchased from us, either personally or by letter. A reference library has been formed for customers' use, and will be available at any time during business hours. The best works on all branches of photography will be included. All apparatus included in our list, and any other of first-class make, can be purchased on our gradual payment system. Speaking generally, interest at the rate of 2s. in the pound is added to the advertised cash price after deducting any payment over and above the first instalment, which may be made at the commencement."

Judgment was given on Thursday last by Sheriff Henderson in the Edinburgh Sheriff Court in an action at the instance of William Hamilton, S.S.C., against Messrs. Barclay Brothers, photographers, of Princes Street, Edinburgh. The plaintiff sought to have it declared that he did not purchase from the defendants of a print of a photograph of the S.S.C. Society, or alternately to have the defendants ordained to remove the print of the picture from his office. He also stated that the picture failed to conform to the essential rules of art, and was incongruous in appearance. The case was debated as to relevancy on the previous Tuesday, and in his interlocutor the Sheriff dismissed the action, and found the defendants entitled to expenses. In a note, the Sheriff stated that the first conclusion of the petition was for declarator that the plaintiff did not purchase the photograph from the defendants, and that he was not bound to retain it, as if purchased. If the plaintiff wanted to get rid of what he held to be an objectionable picture he would have placed it in neutral custody, to return it to the defendants. It would be time for him to fight the question of sale, or no sale, when the defendants sued for the price of the photograph, but on his own showing the plaintiff signed an order form for the photograph, and it was vain for him to set up a verbal condition upon an order that had been signed by himself. He ordered a photograph of the S.S.C. and obtained it, and the Sheriff's advice to him was to pay for it.

The Rev. A. A. Barratt, vicar of Claygate, Surrey, attended at the Kingston Bankruptcy Court on Tuesday to undergo examination in bankruptcy. The petitioning creditor, and the only creditor, was Lord Foley, of Ruxley Lodge, Claygate. The debtor attributed his insolvency to a judgment obtained against him by Lord Foley in respect of a guarantee for £3,400 given by Lord Foley to float one of a number of companies with which the debtor was connected. The debtor was examined at some length by Mr. Cooper Willis as to his company transactions with Lord Foley. He admitted that Lord Foley gave him a guarantee of £3,400 in respect of a company called Photo (Limited). He could not give much information about the company, though he admitted he was the working chairman of it. The Deputy-Registrar said it was ridiculous for the debtor to say that. He was a company promoter and the chairman of Photo (Limited), and as such he ought to be able to give the court all the information necessary. The debtor said he could not give any more information.—Mr. Cooper Willis: Did you have £150 from Lord Foley on one occasion, and keep £50 for yourself?—Mr. Barratt replied that he might have kept £50 for himself, but he disclosed the fact to Lord Foley. Mr. Cooper Willis denied that this had been done. He asked how the debtor would have met the guarantee for £3,400 if he had been called upon to do so. The debtor said he kept a private school whilst he was vicar of Claygate, and earned by that means from £1,200 to £1,400 a year. The examination was adjourned pending the private examination of Mrs. Barratt and several other parties concerned.

The following notice is in circulation:—We beg to announce the organisation of The Anthony and Scovill Company, a corporation formed under the laws of the State of New York, with a capital stock of $2,500,000, for the purpose of acquiring, controlling and extending the business of the several companies hereto subscribing. The executive offices and salerooms of the new company will be located at Nos. 122-124, Fifth Avenue, New York, with a branch office in the Atlas Block, Randolph Street, and Wabash Avenue, Chicago. The officers of the company are: R. A. Anthony, president; F. A. Anthony, vice-president and treasurer; C. B. Stanbury, second vice-president; A. C. Lamoutte, secretary, formerly the vice-president and manager of The Scovill and Adams Company, of New York. W. I. Lincoln Adams, former president of The Scovill and Adams Company, of New York; Thomas W. Stephens, former president of the Columbian Photo-Paper Company; and W. T. Wisner, formerly a director of E. & H. T. Anthony & Co., will, with the above-named officers, constitute the board of directors. It will be the policy of the new company to prevent as far as possible the contraction of credit by extending to customers in good standing a line in accordance with the credit limit allowed them by the various constituent companies. The Anthony and Scovill Company will also be trade agents for the Hammer Dry Plate Company, of St. Louis, Mo.—Very respectfully, E. & H. T. Anthony & Co., New York; The Scovill and Adams Company, of New York, New York; Columbian Photo-Paper Company, Westfield, Mass.; Goodwin Film and Camera Company, Newark, New Jersey; The Monarch Paper Company, Binghampton, New York; American Optical Company, New Haven, Conn., New York, February 1st, 1902.

Re Thomas Edward Parkin, who had been in business with Frederick George Fry, and traded as Parkin & Fry, photographic material manufacturers, at the Etna Mills, Old Swan, Liverpool.—This debtor made an application for his discharge at the Liverpool Bankruptcy Court, on Friday last, before his Honour Judge Collier. The failure took place in October, 1899. The proofs admitted on the joint estate amounted to £712, and the assets realised were £90 9s. 5d., and no dividend had been declared. Mr. W. F. Terry, of North John Street, Liverpool, was the trustee, and he had not yet been released. He reported that he had £9 4s. 7d. in hand, and he claimed for expenses and services £120. It appeared that Parkin was in business as a draper and house furnisher at Doncaster, but seeing an advertisement by Fry for gentlemen to form a syndicate to bring out a new process in manufacturing photographic plates, he got into communication with him, and the result was a partnership. Parkin was to pay £250 for the goodwill and to find £3,000 capital, of which £1,500 was to be treated as a loan to Fry, at 6 per cent. interest. In August, 1899, having ascertained certain things relating to Fry's antecedents, and seeing that the business was not going satisfactory, Parkin gave notice of dissolution. But prior to this he appeared to have sold his business at Doncaster for £1,900, of which he paid £1,000 to his wife, who had advanced him money, and the balance to the more pressing of his separate creditors; the liabilities of Parkin's separate estate being now set down at £434 15s. 3d., and the assets at £2 10s. Mr. Torey, of Doncaster, who appeared for the applicant, said that Mrs. Parkin's money advanced to her husband was settlement money, and her trustees were pressing for it. In any case, the joint estate would not have benefited. Mr. Terry made a statement, and said that the money might have been recovered for the estate, but there were no funds in hand, and the committee of inspection had declined to find the money necessary to contest the case. The applicant was examined, and said that he was now employed by the purchaser of the Doncaster business at 45s. per week. This gentleman wished to sell the business, and there was a possibility of his (applicant's) wife purchasing it, but that was not the object of his applying for his discharge. Nothing had been arranged. The applicant was closely questioned by his Honour, and by the Official Receiver, as to the possibility of his making some reasonable offer to the creditors, who, so far, had received nothing. His Honour said that in any case he must suspend the order of discharge for two years, and he should also add the condition suspending the order of discharge until 10s. in the £1 had been paid. At the end of two years a further application might be made.

Photographic Club, Anderton's Hotel, Fleet Street, Wednesday, March 19th, at 8 p.m. Messrs. Beck will demonstrate the utility of the Beck-Steinheil orthostigmat lens. The Quincey portable dark-room will also be shown. Visitors will be cordially welcomed.

At a meeting of the Aeronautical Society of Great Britain, held in the theatre of the Society of Arts, Adelphi, on Tuesday last, Miss Gertrude Bacon gave an address on "Balloon Photography," illustrated by photographs taken by herself and her father. Miss Bacon described the difficulties and limitations which attended attempts to take snapshots from a balloon. It was almost impossible to take one at a lower altitude than 250ft., and the best were obtained at a height of from 2,500ft. to 3,000ft. from the earth; whilst she placed the highest limit at 4,000ft. One of her best pictures was secured in the damp-laden atmosphere over Scilly, which she described as the paradise of photographers.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

March	Name of Society.	Subject.
15	Woolwich Photographic	Exhibition.
17	Southampton Camera Club	*Beating the Bounds, Southampton.* T. G. Vivian and W. A. Max-Mills.
17	Glasgow and West of Scotland	Illustrated Paper on *Photographing Night Scenes*, by Mr. J. C. Oliver. Exhibition of Prize Slides.
17	Oxford Camera Club	*Some Artistic Possibilities in the Photography of Children.* Mr. H. M. Underhill.
17	Camera Club	*Stone Churches and Châteaux on the Loire.* Professor R. Elsey Smith.
18	Brentford Photographic	Annual Exhibition.
18	Sunderland Photographic	Demonstration by Messrs. Kodak, Limited.
18	Birmingham Photographic	*What are our Aims?* Mr. Smedley Aston.
18	Croydon Natural History	Ordinary meeting.
19	Photographic Club	*Demonstrations on Photographs taken with the Beck Steinheil Orthostigmat Lens. The Quincey Portable Dark Room.* Messrs. Beck, Limited.
19	North Middlesex Photographic	*Landscape Work with a Stand Camera.* E. R. Mattocks.
19	Southport Photographic Society	*Carbon Printing Demonstration.* J. Noton.
19	Southsea Photographic Society	*An Amateur's Cruise in Norwegian Waters.* Col. R. Barrington Baker.
20	Darwen Photographic	*Photographic News* 1901. Prize Slides.
20	Maritzburg Camera Club	*Panoramic Photography.* H. Leigh.
20	Liverpool Amateur	Lantern Lecture: *Switzerland and Its People.* Mr. F. K. Glazebrook.
20	Richmond Camera Club	*What Can be Done with a Hand Camera.* Paper and Slides lent by Mr. C. P. Goerz.
20	London and Provincial	Paper by Mr. Haddon.
20	Camera Club	*Historical Notes on Photographic Optics.* Major-Gen. J. Waterhouse.
20	Ashton-under-Lyne Photographi.	Annual meeting.
21	Bognor Photographic Society	Paper. F. Reynolds.
21	Glasgow and West of Scotland	Prize Slides
21	Borough Polytechnic	*Bromide Prints: Toning and Re-developing.* Mr. F. W. Bannister.
21	Croydon Natural History	Photographic, Illustrated.

ROYAL PHOTOGRAPHIC SOCIETY.

March 11th.—Ordinary Meeting.

Mr. Thomas R. Dallmeyer, president, said that it gave him much pleasure to announce that a letter had just been received from Sir Arthur Bigge conveying the welcome intelligence that their Royal Highnesses the Prince and Princess of Wales had been pleased to signify their willingness to become vice-patrons of the Royal Photographic Society. The announcement was received with much applause.

Our report of the meeting is held over until next week.

CAMERA CLUB.

An attractive subject, or one which arouses curiosity, is sure to find a full room at the Camera Club, and Dr. Lockyer (son of Sir Norman Lockyer, the astronomer), had no reason to complain of empty benches when he commenced his lecture on "Some Uncommon Uses for Hand Cameras." It would have been better, perhaps, if for "hand cameras" the term "small cameras" had been employed, for at an early stage of his remarks it was evident that the Kodaks and other hand cameras used by the lecturer had mostly been in a fixed position when they recorded the various phenomena of which he gave such an interesting account.

He commenced his discourse by pointing out that there were various applications of photography with small instruments which were rather neglected, and he hoped, for the sake of science, that many of his hearers would turn their attention in that direction. He had no doubt that most of them possessed cameras of various descriptions and sizes, and devoted themselves to some particular branch of photography. He also, although he did not pretend to be an expert photographer, had worked with one special object in view. His idea was to keep the camera still, with its lens open, so that anything which came across the field of view—and he spoke more particularly of bright objects at night—would be self-recorded. In this way the personal equation was eliminated, and one could obtain pictures of stars, meteors, and lightning with very little difficulty.

It is true that the starry heavens are always with us, but they are often obscured by clouds, and although thunderstorms are frequent they do not always occur at night, when lightning photographs alone are possible. He believed that this would not always be so, for he had heard that a special form of camera was coming, which would allow of photographs of lightning being taken in the full light of day. He had no particulars of this instrument, but the idea was to bring about the exposure by the action of electric waves, as in the case of Marconi's wireless telegraphy.

As far as his own individual efforts were concerned he must at once confess to many disappointments, but he had been fortunate enough to secure the co-operation of friends, who had given him copies of their photographs, and these would fill in the gaps caused by the failure of his own camera. It was easy enough to get star trails with a small camera, and he showed how these trails assumed the form of concentric circles if the lens were pointed towards the pole. If a meteor happens to cross the sky you get its trail, and by noting its direction with reference to the star trails, you can learn more about it. A fast-moving meteor may not leave any trail at all. He showed a photograph, taken by a friend, with a ¼-plate camera, which showed a meteor in the act of bursting. The securing of this image was a very lucky accident. The meteor first appears in the picture as a thin line, which gradually broadens until the explosion shows a disc of light; the attenuated substance of the meteor is then seen to take an altered path.

In using cameras for astronomical work it is best to employ several and to point them in different directions. He would also lay stress on the advantage of mounting a camera on an equatorial, so that the lens follows the motion of the stars. A prism, or better still, a photographed grating, put in front of the lens, will secure the spectrum of an object as well as the object itself. [The lecturer here showed a picture of an equatorial stand, with three cameras mounted on it, as arranged for the long-expected November meteors.] It is interesting to compare star photographs with star charts, so that many of the principal stars can be readily identified. In a picture of the constellation Perseus, taken with a hand camera, the Nova Persei was beautifully shown, a subsequent picture of the same quarter of the sky showing how the new star had dwindled away to a quarter of its former brightness. These pictures proved that it was possible to photograph variable and new stars with small apparatus. He might mention that many such objects had been discovered by photography, and even when some of them had been first noted by the eye, reference to photographs previously taken showed the images, which had been overlooked.

Dr. Lockyer next showed upon the lantern screen a number of photographs of a solar eclipse. Many of these were taken with small cameras, and compared very favourably with those secured by much larger apparatus. In many of them the coronal streamers were much longer than those exhibited in the more pretentious pictures. In the year 1900 he used a small camera with a grating, so as to get a direct image of the corona and its spectrum at the same time. This spectrum showed by its separated rings the presence of calcium, helium, etc., besides evidence of the presence of an unknown element, which has the provisional title "Coronium."

The lecturer next dealt with the subject of lightning photography, which at present is only possible at night. There are many different types of flashes, and photography has proved very useful in classifying them. The first four types he named were: (1) the stream, (2) the sinuous, (3) the ramified, and (4) the meandering flash. In addition to these there were certain flashes which came under the head of "peculiar forms of lightning," and these he subdivided into (1) the beaded, (2) the ribbon, (3) the multiple, and (4) the much-discussed dark flashes of lightning. This arrangement would provide a rough classification, and he would show, by means of lantern slides, examples of as many as he could.

Stream lightning exhibits a broad river of light with very few branches, and several typical photographs were shown. Among these was a remarkably beautiful picture taken at Lucerne by Mr. Harborough. The prime object in this case had been to secure the image of a burning timber-shed on the farther side of the lake, but a thunderstorm supervened and a most remarkable picture of lightning was the result. One splendidly-branched flash was half hidden by Mount Pilatus, the outline of the mountain being brought into strong relief against the illuminated sky behind it.

Another very beautiful example was by M. Forestier, of Paris. It showed the French capital lighted up from end to end, with the forked flashes playing above the wet roofs.

The meandering flash would often refuse to strike towards the earth, remaining horizontal above a stratum of air, or apparently tying itself into knots and loops.

With regard to the group which come under the head of "peculiar" flashes, he might mention that some of the effects produced were undoubtedly due to vagaries connected with the camera, either to movement or to light reaching the plate. Multiple flashes would show like a bundle of fibres, all following exactly the same path. Ribbon lightning would often show five distinct flashes side by side, and he attributed this effect to the column of incandescent air being moved laterally by the action of the wind. The article "Lightning" in the "Encyclopædia Britannica" gives lightning a speed of one-millionth of a second, but it often lasted longer than this. One observer in South Africa is said to have noted a flash which had a duration of fifteen seconds. Of course, in tropical climes lightning assumed a far more pronounced character than here in England. Dr. Lockyer brought his remarks to a conclusion by showing pictures of dark flashes, and he compared these with spark pictures taken in the laboratory with an induction coil reproducing the same phenomena.

A short discussion followed the reading of the paper, in which Mr. Inwards (past president of the Meteorological Society), Mr. Cadett, Mr. Gordon, and others took part. In his reply Dr. Lockyer expressed his gratification that his remarks had aroused so much interest, and thanked his audience for the attention which they had given him. The chairman (Mr. Staples) brought the proceedings to a close by proposing the usual vote of thanks, which was carried by acclamation.

"I am very glad to see you," said Mr. G. A. Storey, A.R.A., when he commenced his lecture on "Perspective," a lecture which attracted a goodly audience, in spite of the fog which hung like a yellow pall over London. For conscientious photographers are well aware that their work is too much of the "rule of thumb" order, and that they ought to know something of the principles which underlie the making of a good picture. It was therefore something in the way of a relief when Mr. Storey announced that he would treat the subject on the supposition that

none of his audience knew anything about it, not even the derivation of the word "perspective," the meaning of which was "to look through."

It would seem to be almost superfluous to speak on such a subject to an audience of photographers, seeing that the lenses at their disposal made the perspective of the pictures which they produced quite perfect. This art of delineating objects on a plane surface as they appear to the eye is best understood by making use of the model which they saw on the table before him.

[This model consisted of a rectangular sheet of glass, about 18 by 12 inches, held in a light frame, with two strings attached, one to represent the horizon, and the other placed vertically. At the intersection of these strings were two others (loose), one of which could be held in contact with a moveable cube of wood placed behind the glass, and the other held to the eye.]

The lecturer then explained how, upon a certain occasion, he stood in front of a window, keeping his eye in one fixed position, and was able to draw upon the glass window-pane the details of the landscape outside. In that way he produced a true perspective view, which he was afterwards able to transfer to paper. He *saw through* the glass. He subsequently took a photograph of the same view, and it was not a bit like his drawing; but both were right, from their own point of view.

Mr. Storey illustrated his further remarks by means of the blackboard and straight-edge, showing the rules which governed the position of the point of sight, the point of distance, and so on, deducing from those facts several others.

He next showed a sketch of some ruined arches, which he had made at Beaulieu, in the New Forest, and compared this picture with a photograph which he had taken of the same subject with a short-focus lens. In a very interesting manner he then reproduced on the blackboard the perspective conditions upon which the two pictures depended, showing how, by bringing the distance-point too near, the short-focus effect is brought about.

The discussion which followed the reading of the paper proved how much interest it had aroused, and, as usual, some of the speakers wandered far away from the main track; hence the customary vote of thanks to the lecturer for his admirable discourse was postponed until a late hour.

HACKNEY PHOTOGRAPHIC SOCIETY.

The annual general meeting of the Hackney Photographic Society took place on the 4th inst. The report of the council showed the Society to be in a very flourishing condition in all respects. The result of the election of the new executive was as follows:—

President, W. Rawlings, Esq.; hon. sec., W. Selfe; treasurer, W. L. Barker; asst. sec., A. D. Fort; curator, G. Parks; excursion sec., S. C. Stean; lanternist, H. H. Dunkley; council—G. J. Avent, E. Farmer, F. E. Roofe, Dr. Burton, W. F. Fenton-Jones, L. S. Wilks, A. W. Cook, F. W. Gosling.

BURNLEY CAMERA CLUB.

The annual meeting took place in the Mechanics' Institution on Thursday evening, March 6th, under the presidency of Mr. Frederick Heap, and there was a satisfactory attendance. The secretary (Mr. Percy Brotherton) presented his report, which was a very satisfactory statement, showing that the Club had a nice balance in hand, whilst the two exhibitions had been the means of providing the Club with a new and splendidly fitted up enlarging apparatus. Mr. Heap was re-elected president, Dr. Crump, Mr. Slater, and Mr. Sutcliffe vice-presidents, and Mr. Percy Brotherton secretary, the latter receiving special thanks for his services to the Club and to the exhibition. In place of the late Mr. J. Butterworth, J.P., whose death was regretted, Mr. F. Pinder was appointed a vice-president. It was decided to have monthly competitions during the summer on given subjects, but to continue the rambles. On the motion of Dr. Crump the meeting resolved to affiliate the Club with the Royal Photographic Society. The members then adjourned to the dark-room, Mr. Heap formally opening the new enlarging apparatus by exposing the first piece of bromide paper. The negative used was that of Mr. Bellingham's prize picture "Burnham Beeches," and the resulting print will be presented to the Club.

CROYDON CAMERA CLUB.

The twelfth annual dinner was held on Wednesday, the 5th inst., at the Greyhound Hotel, under the chairmanship of the president, Mr. Hector Maclean, F.R.P.S.

The Rev. Harry White, in proposing "The Croydon Camera Club," spoke of the many advantages which it offered to its members, and bore personal testimony to the help it had been to himself.

The president, in the course of his reply, referred to the good impression made by their exhibition. In view of the practice which is gaining ground—not, however, in Croydon—of "doctoring" prints, he suggested that next year they might institute a special class for photographs "done by hand," a notion which induced considerable laughter. As regards exhibits in general, he held that prints should be, like Cæsar's wife, above suspicion. An anecdote which illustrated that, in spite of Keats, truth and beauty are not synonymous, led up to the definition of a pictorial photograph being a "refined rendering of a happy moment."

Other toasts were "The Kindred Societies," "The Visitors, Council, etc.," and "The President and Mrs. Hector Maclean," which, proposed in happy phrases by Mr. W. H. Smith, was received with much enthusiasm and musical honours, etc. A similar reception was accorded to the healths of the exhibition secretary (Mr. W. H. Rogers) and the dinner secretary (Mr. S. H. Wratten).

The entertainments included an oxy-magnesium photograph of the Company, taken with a battery of the Platinotype Company's lamps, by Mr. W. H. Smith, humorous songs by Mr. Albert Spearpoint, violin solos by Mr. A. G. A. Chalmers, and recitations by Mr. Jack Chick and by the Rev. Harry White, all of whom received well-merited encores. In addition, some stirring ballads were excellently well rendered by Mr. Harpur, Mr. Isaac, Mr. Kough, and Mr. S. H. Wratten. The most surprising event, however, was a conjuring display by the popular and genial hon. sec., Mr. E. A. Salt, during which he performed wonders with swords, billiard balls, handkerchiefs, and cards, etc.

SOUTHAMPTON CAMERA CLUB.

The above Club held its fortnightly meeting at the Philharmonic Hall on the evening of the 3rd inst., under the presidency of Mr. G. T. Vivian. It was announced that at the next meeting, on the 17th inst., Messrs. Vivian and W. A. Max Mills would give their illustrated lecture entitled "Beating the Rounds" of Southampton, to which visitors, including ladies, are cordially invited.

News and Notes.

Rotherham Photographic Society.—Carbon printing was very successfully demonstrated by Mr. Thos. A. Scotton, of Derby, at the meeting of the Society held on Tuesday, March 4th. A number of beautiful examples by the Autotype Company were on view. The lecturer also gave a description of the Ozotype process. There was a large attendance. Mr. E. Isle Hubbard, M.S.A., presided.

Photo-Zincography Superseded.—The immense amount of work done by the process of photo-zincography for the ordnance maps is known to all, and it will be matter of surprise, almost of regret, that it is possible that it may be abandoned, for from the same source we read: "Record is made of a most useful invention in the printing-office by a R.E. foreman, which enables the process of photography to be eliminated from the cumbersome method of map-reproduction by photo-zincography. There can be little doubt of the value of the invention which is fully described, and which has been patented in India. It has already enabled the printing-office to deal with a vast number of maps in excess of the normal outturn. We are glad to learn that the method has met with prompt recognition by the Government of India."

Star Maps and Star Magnitudes by Photography.—At a meeting of the Paris Academy of Sciences M. Lœwy, the head of the Paris Observatory, read a paper on the determining of the exact places of stars delineated on a photographic plate, a question the importance of which will become evident when it is remembered how immense must be the number of negatives taken all over the world in the production of the great star map. He says: "In every negative, however made or however great the variations of exposures, the star-images of the last two magnitudes only imperfectly correspond with the brightness and the position of the stars themselves." And again: "The law expressing the relation between the diameter of the images and the brightness of the stars can be no more applied to the stars of the last two magnitudes depicted upon the plate. The decrease of diameter is then more rapid than would be observed in the case of the same stars upon a plate which would have registered fainter ones if a prolonged exposure had been given."

Photographic Surveying.—It is a good old proverb that "an ounce of practice is worth apound of theory," and is an apposite one to recent observations of ours upon the use that can be made of photographic records for the purpose of the surveyor. In the General Report of the operations of the Survey of India Department, 1899-1900, issued a short time ago, there is some specially interesting matter bearing upon the point.* Experiments were made with the Bridges-Lee photo-theodolite, and with the Jaderin base-measuring apparatus, which promises, if not to supersede the complicated adjustment of compensating bars altogether, at least to simplify the process of measuring bases for all but the most rigidly accurate geodetic purposes. The former is pronounced to be a very promising auxiliary to the plane table (especially in mountainous countries), "but it will never supersede." This, it may be remarked, is nearly coincident with the opinion of Canadian surveyors, who have tested photo-topography far more exhaustively than has been done in India.

The British Association.—The seventy-second annual meeting of the British Association will be held at Belfast on September 10th to 17th, under the presidency of Prof. James Dewar, F.R.S. The presidents of the sections will be as follows:—A (mathematical and physical science)—Prof. J. Purser; chairman of department for astronomy and cosmical physics—Prof. A. Schuster, F.R.S.; B (chemistry)—Prof. E. Divers, F.R.S.; C (geology)—Lieut.-General C. A. McMahon, F.R.S.; D (zoology)—Prof. G. B. Howes, F.R.S.; E (geography)—Colonel Sir T. H. Holdich, K.C.B.; F (economic science and statistics)—Dr. E. Cannan; G (engineering)—Prof. J. Perry, F.R.S.; H (anthropology), Prof. A. C. Haddon, F.R.S.; I (physiology)—Prof. W. D. Halliburton, F.R.S.; K (botany)—Prof. J. Reynolds Green, F.R.S.; L (educational science)—Prof. Henry E. Armstrong, F.R.S. The evening discourse on September 12th will be delivered by Prof. J. J. Thomson, F.R.S., on "Becquerel Rays and Radio-activity," and the discourse on September 15th will be on "Inheritance," by Prof. W. F. R. Weldon, F.R.S. The lecture to

* "Nature," Vol. LXV., p. 424.

the operative classes, on September 13th, will be by Prof. L. C. Miall, F.R.S., on "Gnats and Mosquitoes."—"Nature."

Shooting Stars.—In the last published of a series of papers in the "English Mechanic," upon the study of shooting stars, the author, Mr. G. McKenzie Knight, M.B.A.A., he writes:—"So far, photography has some extremity weak link in this field of research, nor does it seem probable, without great improvements, that the eye of the photographic camera will furnish better results than have hitherto been achieved. Many attempts have been made to obtain records of the paths of meteors with the aid of the camera, but the proportion of successful results have been very small, and the matter remains in much the same parlous state as when the proposal to photograph meteoric tracks was first mooted." Seeing that nowadays we have lenses (dear to purchase, it is true), of the intensity of f/3.6 and at full aperture, giving crisp and sharp definition over a flat field of over 40deg., it might be fairly anticipated that their employment would be more fertile of results than the remarks we quote would indicate as being probable. A lens of Petzval type would be as quick as, or quicker than, this, but is out of the question on account of its curved field and limited area of good definition, so that up to a recent period f/8 would be almost a maximum aperture, and upon a curved field that would be available. This would require an exposure five times as great as the lens just mentioned, and the sharpness would be confined to a much more restricted area.

Perth Exhibition.—A nice little exhibition was opened on Friday, in the picture gallery of the Sandeman Free Library, Perth, by the members of the Photographic Section of the Perthshire Society of Natural Science. The exhibition, which is confined to members, is conducted on the Salon principle—no prizes and no classes—but it goes further than the Salon in so far that there is no charge for admittance. We believe, owing to the exhibition being held in the Free Library, that no admittance charge is permissible, and this may tend to prevent the section holding an "open" exhibition. We trust, however, that they may see their way to hold such an exhibition, say next season, when their exhibition-time comes round, and thus give the members and the public of the Fair City an opportunity of seeing what photographers elsewhere are doing. If Dundee can hold a successful exhibition, why not the city of Perth? But there is really no question in the matter, as they did hold a very good "open" exhibition some years ago. Over 140 photographs are hung, an increase of about forty on last year's exhibition, and while some really good work is hung, much of it shows that a number of the members would be benefited by an inspection—a careful inspection—of really "class" exhibition work. The members are to be envied the admirable hall placed at their disposal for their exhibition, and we trust the Perth public will patronise it sufficiently to tempt the members to more ambitious flights in the exhibition line.

Advertising Disfigurement.—This was the title of a paper read by Mr. Richardson Evans at the Women's Institute one day last week. Of course, its author denounced the disfigurement of picturesque landscapes, towns, etc., by unsightly advertisements of seeds, soaps, pills, etc., as many have done before. No one feels more aggrieved at these hideous advertisements than the landscape photographer, as he must, perforce, include them in his picture or forego it altogether. But there is another side to the question. The owner of the land has a perfect right to put, or allow to be put, anything upon it that he likes, and it would be hard if he could not. For example, a farmer has his rent to pay, and if he can lighten it by allowing a couple of posts carrying an advertisement board, however ugly it may be to those having artistic notions, we expect he will continue to do so, and it would be hard upon him if he could not. He would naturally consider any legislation that would prevent him from doing it would be a hardship to him, and it must be admitted that it would be when viewed in a commercial sense. We were recently travelling in a train with a friend, where the fields by the side of the railway were studded with unsightly advertisements, and he drily remarked that the farmers about here seem to find it more profitable to grow advertisement boards than grass on the ground they occupy; and doubtless they did, but who could blame them.

"Devonia."—The first number of a new journal with this title has reached us. It is published (price 2d.) by the United Devon Association, 17, Bedford Circus, Exeter. The objects of "Devonia" are to bring Devon, as a place of travel and of residence, before the whole world, and to endeavour in every way to promote the interests of the county, for the benefit of its inhabitants and to the advantage of those who may become temporary residents. "The sons of Devon within Great Britain and all over the Empire have rallied to the work which the United Devon Association has been pursuing since 1899, and, with great zeal and patriotism, have forwarded what has been done, so that the circulation of this journal in the outer reaches of the Empire is assured. As it is intended to give in the fullest possible way information for the benefit of the visitor—and the resident—it is hoped that, so far as possible, all will help, by affording information and pointing out how improvements may be made. Certain portions of the journal will appear the same in each issue, such as descriptions of towns, railway fares, and such other matters as are obviously what is necessary to be at hand always, but contributions on many subjects will be given from time to time. Among those which will be dealt with in subsequent issues are:—The archæology of the county (with which will appear a map showing how the most interesting places may be reached), information touching agriculture; coaching tours; railway excursion and touring arrangements; golf; hunting; art crafts; and other matters."

Absolute Dryness.—A singular series of experiments bearing upon this subject was recently explained and discussed at a meeting of the Chemical Society. The question of the absolute inhibition of moisture has often played a most important part in chemical theories and practice. One of the most famous trials which took place in the very earliest days of the coal tar dye manufacture (when it was a purely English process) was founded on the question of what was meant by dry arsenic acid—did it mean chemically dry, *i.e.*, absolutely free from moisture, or popularly dry, *i.e.*, apparently free from moisture—often two very different conditions. The experiments we refer to were with mixtures of oxygen and hydrogen gases, from which every trace of moisture had been removed. For many years the author, Mr. H. B. Baker, had devoted much attention to the subject, but until quite recently had failed in obtaining an entirely water-free gas; but finally, by a process of electrolysis, he obtained what he was seeking, and working with a mixture of the absolutely anhydrous gas he found that, though he passed electric sparks through the mixture or exposed it to intense heat no combination or explosion took place; yet when he added the slightest trace of moisture he at once obtained a violent explosion. Reasoning on these premisses it is a natural question to ask, Are dry plates dry, or is it possible to make them absolutely so? There is a rich field of experiment here open, and it is quite an open question whether the sensitiveness under such conditions would be interfered with, or even destroyed, should it be possible to eliminate every trace of moisture.

"The Country," the new monthly journal published by Messrs. J. M. Dent & Co., of Bedford Street, Strand, publishes particulars of the following prize photographic competition:—Each month the proprietors of "The Country" will offer prizes for the best photographs which may be sent in illustrative of various aspects of country life. The first competition is for the best photograph illustrative of animal life. Three prizes will be awarded in this competition—a first prize of £3 3s., a second prize of £2 2s., and a third prize of £1 1s. (1) All photographs should be silver-prints, preferably of not less than ½-plate size, and desirably mounted on a plain, firm card. (2) In making their award, the judges will take into consideration (a) the excellence of the photograph, and (b) the interest of its subject. Such subjects as fish, birds, insects, and other animals among their natural surroundings, young birds in their nests, animals other than horses employed as beasts of burden, and the like, are especially desirable. (3) On the back of each photograph must be written a short explanation of its subject, a statement that it is original, and that it has not previously appeared in any publication, and the name and address of its sender. (4) Each competitor must send also the coupon (to be found in our advertisement columns) duly filled in. With one coupon two photographs only may be sent. (5) All photographs must reach the editor of "The Country," Aldine House, Bedford Street, Strand, not later than April 15th. (6) The right of reproducing any photograph sent in competition is reserved. (7) The names and addresses of successful competitors will be published in a subsequent number of "The Country."

Sir James Timmins Chance, of 51, Prince's Gate, and 1, Grand Avenue, Hove, head of the firm of Chance Brothers, glass manufacturers, Birmingham, and for some years a director of the London and North-Western Railway Company, died on January 6th, in his eighty-eighth year, leaving an estate of the gross value of £252,629 19s. 5d., of which the net personality is £207,356 10s. 1d., and his will, dated October 16th, 1897 with five codicils, has been proved by his sons Sir William Chance, of Orchards, near Godalming; George Ferguson Chance, of Clent Grove, near Stourbridge; and James Frederick Chance, of the New University Club, St. James's Street. Sir James bequeathed £20,000 each to his sons George Ferguson and James Frederick, in addition to provisions already made for them; an annuity of £800 to his daughter Frances Elizabeth Chance; £20,000 each on trust for his daughters Margaret Annie and Marion Georgiana; £15,000 on trust for his daughter Mrs. Eleanor Phœbe Bedford; £300 to his man, Frank Keays, and legacies to servants, and he made no further provision for his daughter Mrs. Edith Mary Dobbs, having already provided for her. He also bequeathed £1,000 each to his daughters Margaret Anne and Marion Georgiana, and during their life or spinsterhood the use of his residence at Hove and the income of £30,000, and subject to such interest the said sum of £30,000 is to be held on trust for his son George Ferguson, and his wife and children. Certain plate, pictures, the Telford Gold Medal presented to him by the Institute of Civil Engineers, and the addresses presented to him at the opening of the West Smethwick Park are to devolve as heirlooms with his real estate. All other his property he left in trust for his eldest son William.—"The Times."

Improved Acetylene Gas Lighting.—Speaking of intensified gas lighting at a meeting of the Manchester Association of Engineers, Mr. Joseph Nasmith expressed the opinion that we shall in a few years see better and cheaper mantles for gas lighting than are now placed at the disposal of the public. This would have happened before now had it not been for the monopoly obtained by the Welsbach Company. The light from an electric arc lamp is brilliant, but it is coldly penetrating and diffuses itself to a very slight extent. It is this property which causes it to cast so great a shadow. The air is not filled with light as it should be, and outside the direct range of the rays there is no communication of light. How different is the light of the incandescent mantle! Within its range of illumination it seems to suffuse the air with light and make all the space within that range luminous. Widen its range and you increase its usefulness. It produces no violet shadows like the arc light, but distributes the light with remarkable uniformity. It is the object of the system of intensified gas lighting to widen the range of the ordinary incandescent mantle and thus increase its illuminating value. It is not alone in usefulness and illuminating power that the gas excels, but it can be easily proved that it is much more economical. In the discussion following the reading of the paper the speakers generally admitted that the electric light could not compare with the modern forms of gas lighting for cheapness. Nor was the superior brilliance of the intensified gas light questioned. The opinion was, however, expressed by one member, that

unless a stronger form of mantle was obtained, the incandescent system had not come to stay. Mr. Nasmith remarked that when the Welsbach patent rights expired several improved mantles would be available.—"Invention."

ACETYLENE Generators.—A Parliamentary paper has been issued, containing the report of the Committee on Acetylene Generators appointed by the Department of his Majesty's Inspectors of Explosives. Forty-six different generators were tested by the committee, who, in presenting their report, state that they consider that in the selection of an acetylene generator regard should be had to the following *desiderata*:—(1) Simplicity of action and design; (2) strength of construction; (3) high efficiency, as indicated by the yield of gas per pound of carbide; (4) low pressure in generator, (5) facility of removal of the residue. The conditions which, in the opinion of the committee, a generator should fulfil before it can be considered as being safe are specified as follows:—(1) The temperature in any part of the generator, when run at the maximum rate for which it is designed, for a prolonged period, should not exceed 130deg. C. This may be ascertained by placing short lengths of wire, drawn from fusible metal, in those parts of the apparatus in which heat is liable to be generated. (2) The generator should have an efficiency of not less than 90 per cent., which, with carbide yielding 5 cubic feet per pound, would imply a yield of 4.5 cubic feet for each pound of carbide used. (3) The size of the pipes carrying the gas should be proportioned to the maximum rate of generation, so that undue back pressure from throttling may not occur. (4) The carbide should be completely decomposed in the apparatus, so that lime sludge discharged from the generator shall not be capable of generating more gas. (5) The pressure in any part of the apparatus, on the generator side of the holder, should not exceed that of 20 inches of water, and on the service side of same, or where no gas-holder is provided, should not exceed that of 5 inches of water. (6) The apparatus should give no tarry or other heavy condensation products from the decomposition of the carbide. (7) In the use of a generator, regard should be had to the danger of stoppage of passage of the gas and resulting increase of pressure which may arise from the freezing of the water. Where freezing may be anticipated, steps should be taken to prevent it. (8) The apparatus should be so constructed that no lime sludge can gain access to any pipes intended for the passage of gas or circulation of water. (9) The use of glass gauges should be avoided as far as possible, and, where absolutely necessary, they should be effectively protected against breakage. (10) The air space in a generator, before charging, should be as small as possible. (11) The use of copper should be avoided in such parts of the apparatus as are liable to come in contact with acetylene.

AMERICAN ADVERTISING.—There are exceptions, of course, but for skill in "catching the eye," and compelling you to read, the Americans are unquestionably far ahead of our advertisers. In the matter of ruination of landscapes by posters in fields and on bridges and cliffs we must all most heartily wish the American system confined to America. Mr. Balfour—"brilliant, brainy, bi-metallic Balfour," as an American admirer described him—was observed to read one of those field advertisements which desecrated the neighbourhood of the golf links, and the vicious way in which he struck at his ball all the afternoon gave the impression that he took it for a certain pill, and was calculating its presumable worth at a guinea a box was a great opening for a much-needed new tax on field advertisements. "Is 'Munsey' out for March?" we asked a bookstall clerk recently. "There it is," said the clerk, pointing to a pile of it, with an attractive picture of a fair American golfer, who is just about to make such a drive as would clear any bunker—and Bunker's Hill as well. "Munsey" will sell well this month; it always does so, for that matter, and deservedly, for it always shows as much "vim" and "go" and is as bright and as attractive as the fair young golfer on its March cover. "They are spoiling it," said the clerk regretfully, as he took our sixpence. "How?" "Why, they are taking advertisements." And sure enough, on opening our "Munsey" in the dim but hardly-conducive-to-religious-feeling light of the dirty old oil-lamp of a C(——) & D(——) & S.wE.aR. compartment, we found that "Munsey" was full of "ads." But there are ads. and ads., and our disappointment at the trick Frank A. Munsey has played on the British public speedily vanished when he found they were American ads. When his magazine first appeared here it was with the bold announcement that there were no ads in it. That itself was a clever ad. But in this March number there are no less than 117 pages of advertisements, and they are so interesting that we have not yet had time to do more than glace at the 150 pages of contents; but we know the reading will be as attractive as the illustrations, and that is not saying a little. "Munsey" is immense—especially at sixpence. Trust Mr. T. J. Barrat to know a good advertising medium and to get the best place in it. It is quite gratful and comforting to find our old friend the Soap of Pears at the head of this really grand array of ads. Yes, "it's a good habit," as Mr. B.'s ad. says, and reminds one of Scadder, the "Eden" promoter, who said to Martin Chuzzlewit, "Feel of my hands, sir. Air they dirty or air they clean?" while displaying a pair which would have tested the cleansing qualities of even Pears." But we mere men must take to fans, as Andrew Lang suggests, if the advertisements addressed to the fair sex go on at this rate. Really, Mr. Munsey, you are a little too-too with your pictures of the female figure in "erect form" corsets (the newest has "a very long hip," fancy that) in budding forms dressed in dainty corsets and—split infinities—and in forms which can be made to bud. It is quite "shocking," as the British matron would say, only that she is as extinct as the Dodo. "Pneumatic bust forms—inflated by a breath, light as air, natural as life"—described by an "eminent woman" as "more an inspiration than an invention," "a grateful relief to nursing mothers"—do American babies live on air? One would like to hear their opinion on these "inspirations."—"The Publishers' Circular."

THE Social Status of the Chemist.—At a well-attended meeting of the Barnsley and District Chemists' Association, held on Thursday, February 27th, at the Royal Hotel, Barnsley, an interesting discussion on the social status of the chemist was opened by Mr. J. P. Norwood, who said:—"Probably the average chemist has too little leisure to bother about his social standing; the fact that he is not invited to dine with the Vicar or to Lawyer A.'s card party does not trouble him in the least, even though the wife of his bosom does not look upon it with the same indifference. That he is classed socially as a tradesman and not as a professional man is, I think, beyond dispute, however much we may regret it. But is the chemist entitled to consider himself the social equal of the clergyman, lawyer, doctor, or even vet.? This naturally raises the question, what is the difference between a trade and a profession? and it is one which I will not attempt to answer. The mere buying and selling of goods, whether across the counter or otherwise, does no more define a trade than does the exercise of skill and knowledge constitute a profession. The barber, the cabdriver, and also the sweep talk about 'our profession.' Is it for this, too, we strive? Self-advertisement has a great influence on the social status of the individual, and is in inverse ratio to it. Socially speaking, the doctor, who does not advertise, has a higher standing than the chemist, who does. Of course, there is a wide range in our own ranks; much depends upon the individual himself. The free and easy man who is 'hail fellow well met' with every person who enters his shop, and who so far forgets himself as to exchange ribald bandinage with female customers, need not be surprised if he is looked at askance by the more refined residents of his particular locality, whilst the supercilious individual who serves a 'pennyworth of hair oil,' with an air of condescension, and who bows and scrapes to the parson's wife, is beneath contempt. To associate with gentlepeople one must at all times conduct one's self as a gentleman. Given, then, a gentleman in the true sense of the word, by virtue of his preliminary education, his apprenticeship, his scientific training and qualification, along with the conscientious fulfilment of his duties to the public, which at times are in direct opposition to his pecuniary benefit, the chemist is entitled to rank as the social equal of any man who has not graduated at a university, even though between whiles he has to mix a pound of paint, retail photographic goods or other side-lines of a commercial nature. How is it that the chemist of to-day is not regarded with the same respect as his predecessors? Can it be possible that his position in the social scale becomes lower as his term of apprenticeship shortens. Originally of seven years' duration, each decade sees a tendency to shorten the years of apprenticeship, and the youth of to-day also expects to draw a salary and generally to place himself on the same level as the grocer's boy. For this unhappy state of affairs the master is to blame, for instead of faithfully and conscientiously training his apprentice as of yore, he has come to look upon the latter as a source of cheap labour, to the detriment of both. Again, the advent of the 'Drug Company, Limited,' and the ignorant proprietor of the 'drug store,' who too often is a promoted errand-boy, and who has had neither the education nor possesses sufficient brains to pass the qualifying examination, must have a very prejudicial effect against the genuine druggist in the estimation of the public, who only too frequently are unable to distinguish between the host and the parasite, the ass and the ass in the lion's skin."—"The Pharmaceutical Journal."

New Books.

"Deutscher Photographen-Kalender, 1902."

We have again the pleasure to acknowledge the receipt of the two handy little volumes issued as an almanack by the publishers of the "Deutsche Photographen Zeitung," the organ of the German Photographers' Association. The first volume, in the form of a pocket book, contains a vast amount of statistical information and a very complete set of photographic formulæ. We suppose English weights and measures are so peculiar in their idiosyncracies that even the painstaking German mind breaks down in their investigation, for we find the same mistakes repeated to which we referred on a previous occasion. We pity the German photographer who attempts to make up an English formula for development by the aid of these tables. The second volume may be looked upon as a German photographic directory, and it will be found very valuable as a guide to the membership of German and Austrian Photographic Societies.

"Lehrbuch der Praktischen Photographie." Dr. Adolf Miethe. Halle-a-S: Verlag von Wilhelm Knapp.

The success which has attended the publication of this work has induced Dr. Miethe to revise it and issue a second edition. The first edition was reviewed by us in 1895. Since then many forms of new apparatus, many new developers, and other novelties have been introduced. Dr. Miethe has thought it desirable in the present issue to include only those which have proved to be important; but we differ in some instances from the selection he has made. For instance, we do not find any reference to the Unar and Aristostigmat lenses, both of which have met with favour. On the other hand, we think some of the older forms of apparatus and some of the illustrations, which have done service for so long, might have been excluded with advantage. These, however, are minor points, and we can recommend the work both to the professional photographer and the amateur, as a good text book on practical photography, written in a popular style. The various divisions deal with light in relation to photography, the chemistry of photographic processes, photographic apparatus, negative and positive processes, copying and enlargement, orthochromatic photography and photography by artificial light, and finally photographic æsthetics in portraiture and landscape.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

THE BECK-STEINHEIL TELEPHOTO ATTACHMENTS.

To the Editors.

Gentlemen,—It has been mentioned to us by one or two gentlemen who have an intimate knowledge of optics that the method we adopt of engraving the Beck-Steinheil telephoto attachments with the magnifying power, whatever lens they may be fitted to, is open to a very serious objection, and is not of the value we attach to it, and it is suggested that they are misleading. We are fully aware that the magnifying power cannot be the same for objects close to the camera, and also objects at a great distance; at the same time, even if we were to adjust our attachments and engrave the magnification for objects at infinity, in preference to those nearer, the error when photographing objects at 100 yards distance would only be about 1 per cent., and at 50 yards about 2 per cent. This is considering a magnification of about 6 with the half-plate Beck-Steinheil lens, or its equivalent by other makers.

Considering the great advantage as to rapidly estimating exposure, etc., our system has, we believe that the majority of amateurs will find the errors introduced sufficient to be negligible; as a matter of fact, the attachments are adjusted for a distance of between 200 and 300 yards, and so the error is even slighter than those figures suggested. We fully realise that if the attachments were to be used exclusively for telephotography, or photography of objects that are distant but a few feet, the magnification would be totally incorrect, and likely to lead to confusion; but far the greater percentage of workers will use the attachment for great distances, as indeed must be obvious.

The saving of time in the calculation of exposures resulting from the adoption of this system will more than compensate for the small error introduced.

We should esteem it a great favour if you could find room for this communication in the correspondence column of your valuable paper.

—Yours faithfully, R. and J. Beck, Ltd.

68, Cornhill, London, E.C.,
March 6th, 1902.

KODAK, LIMITED.

To the Editors.

Gentlemen,—I have to inform you that my directors have passed the following resolutions:—

"That an interim dividend of 1½ per cent., less tax, for the quarter ending March 31st, 1902, be and is hereby declared upon the preference issue."

"That an interim dividend of 2½ per cent., less tax, be and is hereby declared upon the ordinary shares in respect of the quarter ending March 31st, 1902, and that a further bonus of 2½ per cent. be distributed in respect of the year ending December 31st, 1901."

"That the above-mentioned dividends be payable on or after the 1st proximo."

"That the transfer books of the company be closed from the 10th to the 31st inst., both days inclusive."

I am, dear Sir, yours faithfully, T. Hallett Fry,
43, Clerkenwell Road, London, E.C., Secretary.
March 5th, 1902.

WEIGHTS AND MEASURES.

To the Editors.

Gentlemen,—What is a fluid ounce? As defined in the schedule accompanying the Weights and Measures Act, 1896, it is 1-20 of a pint, both in the case of avoirdupois and apothecaries' measures.

Having occasion to check the ½-ounce, or tablespoon, divisions on a medicine bottle, I was surprised to find that they contained 15.5 c.c., instead of the 14.2 c.c. in the above-mentioned schedule.

This may be due to the idiosyncrasy of the glassblower, so I repeated the experiment with a graduated medicine glass, and obtained the same result.

I now thought it time to study the schedule, and found that it defined the apothecaries' ounces as 28.4 c.c. by measure, but 31.1 grains by weight, a difference of some 8½ per cent.

En passant, it has been urged against the metric system that there is an infinitesimal want of agreement between the weights and measure, *i.e.*, that a cubic centimetre of water does not weigh exactly 1 gramme. Yet apothecaries' ounces, as defined by Act of Parliament, differ 8½ per cent. according to whether they are by weight or measure.

But to return to our medicine measures. The explanation appears to be that medicine glasses and bottles are graduated to an unauthorised measure, corresponding with the apothecaries' ounce by weight. Of course, I am assuming that there is nothing abnormal about the bottles which I have measured. If so, and my conclusions are correct for all sizes of bottles, ordinary medicine bottles can be used by the metric photographer. The 8 ounces on the bottles corresponds with 250 c.c., but slightly under, the error being less than ½ per cent, as against 8½ per cent. in excess of what the Act says it is.

This curious coincidence appears also rather important from the view that the change to the metric system is only a question of time.—I remain, yours faithfully, Chas. Louis Hett.

P.S.—The above result was confirmed by the measurement of an ordinary conical measuring glass.

Springfield, Brigg, March 8th, 1902.

THE OPENING OF THE SEASON AND OUR APPARATUS.

To the Editors.

Gentlemen,—The warmer weather and improved light we have had during the last few days, as well as the calendar, reminds us that Easter will shortly be with us. Now Easter is generally looked upon by many outdoor workers as the opening of the photographic season, although hand cameras are in evidence all the year round; the case, however, is different with stand cameras; they are, as a rule, put aside in the autumn, and are not again seen till the advent of spring. Too often it is the case that when the apparatus is looked up from the "lumber room," where it has been stored, it is found to be not in the same working condition as when it was put away. If the apartment where it was stored happened to be somewhat damp, as many lumber rooms are, the shutters of the dark slides will not be found to work freely, or, possibly, cannot be worked at all; or perhaps the focussing arrangement works stiffly, owing to the swelling of the wood. Very frequently when this is found to be the case, and the apparatus is required to be used in a day or two, it is put near the fire, and the aid of glass or glass paper is invoked to ease the shutter, with the result that in the summer, when the wood has shrunk to its normal state, light is admitted and the slides become almost useless. All this may, however, be avoided if time were given for the woodwork to regain its original condition. Hence, my writing on the subject just now, as yet there is a fortnight to Easter, and that is ample time to allow for the apparatus getting, spontaneously, in good working order. If it is found that the shutters of the dark slides work stiffly, no force should be employed to withdraw them. The slides should simply be opened and placed in a dry room, not too warm—the shutters not being withdrawn. If they were there would be the risk of their warping as the wood dried. At the end of a week or so it will be found that, generally, they will work as freely as they did when last used. Should, however, they still draw rather stiffly, a little French chalk rubbed in the rabbits will usually set things right. The same treatment applies to the focussing portions of the camera; plenty of time should be given for the woodwork to get back to its normal size. With magazine cameras, if they have been stowed in a damp room, it will often be found that the metal parts, particularly the sheaths, have become rusty, thus preventing their working freely, and, moreover, detached particles of iron rust are very undesirable on the surface of a bromide film. The best way of dealing with rusty sheaths is to clean off as much as possible of the rust, and then give them a thin coat of dead-black varnish. The pivots of the changing arrangement may be dealt with by a piece of fine emery cloth. Should the bellows of the camera have become somewhat mildewed the mould should be wiped off and a thin coat of boiled linseed oil applied, or, better still, one of bookbinders' varnish. After either application the bellows should be left fully distended, and exposed to the air for some days before it is again closed up. If after that there should be found any trace of tackiness when it is folded up it should be rubbed over with French chalk, and all will go well. If the above precautions are taken before apparatus which has long laid out of use, even if it has been stored under unfavourable conditions, is again employed, it will usually be found that no very material damage has accrued. That is, of course, assuming that it was constructed in the first instance of wood that had been fairly well seasoned.—I am, yours, etc., G. Whitworth.

March 11th, 1902.

BIRD PHOTOGRAPHY.

To the Editors.

Gentlemen,—Would Mr. Pike give your readers some particulars of his arrangement of electric switch actuated by the bird which he wishes to photograph? I have tried one, but find that it is too rapid; the bird is taken before it has time to regain its balance after alighting on the perch.—I remain, yours faithfully,

Chas. Louis Hett.

Springfield, Brigg, March 8th, 1902.

THE P.P.A. DINNER.

To the Editors.

Gentlemen,—I think you are to be congratulated on the success of the dinner—a crowning function to your efforts on behalf of the P.P.A.

But some of the older members were inclined to get a bit out

of hand towards the end; another time you might call a special general meeting in the forenoon, and if previous formal notice were given that any and every subject were to be open to discussion the rest of the day till dinner-time might afford sufficient opportunity to work off all grievances.

Hearty congratulations; I didn't think it could be done.—Yours, etc., A YOUNG MEMBER.

March 7th, 1902.

KODAK, LIMITED, AND THE TRADE.

To the Editors.

Gentlemen,—I have read with great interest Mr. W. E. Dunmore's letter, and I shall profit in the future of what he says, and of which I had no idea before, and that is that a very large number of photographic dealers in England depended already on Kodak, Limited, for a large amount of their profits. No; I did not know that American goods had so much taken the place of English manufactures already.

I would not advise Mr. W. E. D. to go on the fence; or, if on it, to remain so any length of time, as this waiting on a fence is a rather pointed affair, and specially unpleasant if one is liable to kick easily.

Indeed, Mr. W. E. Dunmore seems now so very much concerned about a mere rumour of a reduction in discount of a paltry 5 per cent. only on plates, that he must inevitably feel considerably hurt when we come to the reduction of 10 per cent. and 15 per cent. I promised him and others in my last letter. Why not, as I advised, look now around and find and help at the same time a less fortunate competitor that may have similar goods. That is the way to do, and not to remain bound to the big one, and swallow the less discount . . . until the next one comes up, and until the smaller competitor has been driven out by lack of business and help in time. You may object that the small beginner will grow up and be a large one in time. Well, what of it; if he does it will make two large dealers, liable to compete in prices, and, if not, a new one is sure to come up, and so on. Better stand by beginners; they constitute in time useful safety valves.

Now Mr. W. E. Dunmore seems much concerned about not having a first-class camera to replace the Kodaks. I am sorry to see that he does not read more carefully the BRITISH JOURNAL OF PHOTOGRAPHY, and especially the Almanac, as else he would not complain of any scarcity in that line of goods. For three years past there has appeared in the Almanac an advertisement speaking of a camera as a most marvellous instrument, absolutely reliable, never any failures, and last, but not least, having the largest sale in the world. Here it is, the camera which is so badly wanted, and made so long ago. See Almanac 1900, pages 1371-1378; and for 1901, pages 568-579; and later, for 1902, page 30.

Don't wait any more on the fence, and go on selling the camera which is to upset the Kodaks.

Now to conclude, I will not ask the proprietor of the Tella Company to have other papers please copy, but if he wants to send me a Tella camera, as a proof of satisfaction, he may have my full address by calling on the Editor of the BRITISH JOURNAL OF PHOTOGRAPHY.—Yours very truly, ALBERT LEVY.

P.S.—I read that you have the approval of 250 M.P.'s to the metric system. How about "Free Lance"? I hope you will join, or else convert the M.P. to his Conservative views. Now, "Free Lance," here is your chance to fight the good battle.

Asnières (Seine), March 9th, 1902.

BEWARE OF FORTIFICATIONS ABROAD.

To the Editors.

Gentlemen,—Doubtless many amateur photographers will be spending a few days on the Continent at Easter, and I should advise them to avoid taking pictures anywhere in the neighbourhood of fortifications, particularly in France, or they may find themselves in trouble, as the police there are always on the look-out for "spies," and every English photographer, just now, is looked upon, more or less, as being one. I cull the following from an evening contemporary:—"To-day's 'Petit Journal' states (says Dalziel) that a Cherbourg photographer received a letter recently from England asking for photographs of all the ports along the coast between Cherbourg and Barfleur, and for a plan of Cherbourg. The letter was communicated to the police, and a reply was sent, with the result that a man came from Southampton. He stayed about a fortnight, and took some photographs, but, evidently feeling himself under observation, committed no offence for which he could be interfered with."—I am, yours, etc., PATRIOT.

March 10th, 1902.

PHOTOGRAPHIC COPYRIGHT.

To the Editors.

Gentlemen,—I enclose N.P. cutting re a case that has been before the Glasgow Sheriff's Court, and which may interest your readers, so far as it has gone.

It appears to me such cases as these are what the Professional Photographers' Association ought to go thoroughly into, and at least suggest a course which all professional workers ought to follow, so as to avoid any action on their clients' part. It should not be difficult to suggest a course of procedure whereby when a sitter offers himself for being photographed that some simple and brief contract should be signed reserving to the photographer certain rights as to all negatives, prints therefrom alone being the property of the sitter. It is high time some taction was taken to alter the law as it now stands, or to apply a fence around it protecting the professional.—Yours truly,

T. N. ARMSTRONG.

Viewfield House, Shettlestone,
March 6, 1902.

"COPYRIGHT OF PHOTOGRAPHS.

"IMPORTANT SHERIFF COURT CASE.

"In the Appeal Court, County Buildings, Glasgow, Sheriff-Principal Berry issued judgment recalling Sheriff-Substitute Strachan's decision in a case of considerable interest to the general public.

"A writer, named Thomas M'Cosh, sought interdict against Messrs. George Crow and Co., photographers, Buchanan Street, printing, publishing, exposing for sale, or exhibiting in their studio photographs or enlargements of photographs of applicant's daughters.

"It appears that the photographs had not been taken by the respondents, but by their predecessors in the premises occupied by them.

"The respondents set up the defence that the copyright was not the property of the applicant, and that there had been no privity of contract between pursuer and the photographers.

"Sheriff Strachan refused interdict, but Sheriff Principal Berry recalls the decision, allowing proof, and remitting the case back to Sheriff-Substitute for further procedure.

"In a note, the Sheriff-Principal remarked that he was unable to hold that the pursuer's right to stop the exhibition of enlargements of his children dropped when the former firm sold their business to the defenders."

PHOTOGRAPHS of Maoris.—Although we have no Maori Society in New Zealand specially devoted to the interest of the Maori race, the Auckland Institute would be glad to add to their splendid collection of Maori antiquities a portrait gallery of photographs of the people before they have quite lost their distinctive personality. The average Maori of to-day—man or woman—wishes to appear, in his photograph, dressed as much like the European as possible. And when the camera-man comes on the field the natives beat a hasty retreat, so that, in order to secure representative pictures of "the Maori at home," it is necessary to win their confidence. We want photographs of Maori people in their primitive costumes, and with primitive surroundings—not only the most beautiful of their women, but some of their most ancient relics. We want photographs of Maori occupations—mat-making, weaving, planting, fishing, carving, making fire, cooking, etc.—and illustrations of native amusements—their old games—and dances. We want the old warrior and his weapons, his mode of using them, and his postures of attack and defence; his hideous grimace of defiance; his terrible war dance, etc Any of these subjects would be of national interest, and successful photographs would be of great value commercially, as well as of great scientific importance. Opportunities for this work are becoming every year more and more rare. Every photographic club in the colony should have a Maori section, and at every exhibition a department for studies of Maori life should have due prominence.—"Sharland's New Zealand Photographic Journal."

ART in Whitechapel.—The annual report of the Whitechapel Art Gallery, by Canon Barnett, which has just been issued, shows that the whole of the £16,000 required for land and building has now been raised, though funds are much wanted for maintenance. "The trustees are more than satisfied by their experience. Their aim has been to open to the people of East London a larger world than that in which they usually work, to draw them to a pleasure recreating to their minds, and to stir in them a human curiosity. The people came in greater numbers than was expected; they came both to enjoy and to question, they bought catalogues by the thousand, they attended lectures, and they welcomed guidance. There was always perfect order, and the donations of small coin have marked the general approval." The spring exhibition, opened by Lord Rosebery on March 12th last, was visited by 206,000 people, including large numbers of Board School children. The Chinese exhibition, from July 25th to September 4th, had 137,000 visitors; and in the first five weeks of the Scottish exhibition, which was still open when the report was written, the visitors numbered 90,000. The catalogues sold during the first two exhibitions numbered 38,200 and 21,000 respectively. It is not proposed to make a permanent collection at the gallery, but it is proposed "that a library of books on art, a collection of lantern slides to illustrate lectures on pictures, sculpture, and architecture, and a collection of photographs and process reproductions of pictures should be formed. These would be lent to people or institutions interested in studying art or in spreading interest in art in the East-end. A lending picture gallery might also be established, from which the people might borrow pictures as they now borrowed books at free libraries. Gifts of sketches, photographs, engravings, books, or slides for these purposes would be gladly welcomed by the director. A small beginning has already been made."—"The Times."

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY, 24, *Wellington-street, Strand, London, W.C.*" *Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

PHOTOGRAPHS REGISTERED:—

T. E. Innes, 108, Wellington Road, Heaton Chapel. *Photograph of The Levenshulme Operatic and Dramatic Society.*

Spence Lees, Queen's Promenade Studio, Douglas, Isle of Man. *Photograph of Dan Leno.*

E. F. B. Holloway, 32, Cambray Place, Cheltenham. *Photograph of members of The Cheltenham Musical Festival Society.*

Dr. F. Ward, 22, Museum Street, Ipswich. *Four photographs of pike. Three photographs of trout ova. Six photographs of trout alevins.*

"ENQUIRER."—The Chemists' Directory, published by Messrs. Kelly & Co., Holborn, London.

J. P.—Communicate with Messrs. W. G. Parker & Co., Southampton Row, Holborn, W.C.

R. BURNETT.—A matter for a patent agent. Consult Messrs. Hughes & Young, 55 and 56, Chancery Lane, London, W.C.

H. J. S.—A matter that you must decide for yourself. It is strictly against our rule to recommend particular makes of plates.

B. R. (Swansea).—Fairly good work, but insufficient of it to enable us to judge of your ability. Try an advertisement and submit specimens.

L. BLOCK.—Messrs. Sichel, Bunhill Row; Messrs. Marion, Soho Square; Messrs. Houghton & Sons, High Holborn, W.C.; are amongst the houses most likely to supply you.

T. W. STEVEN.—The sediment is metallic gold. When you next prepare the chloride use five ounces of hydrochloric acid, instead of four, to the ounce of nitric, and use a larger proportion of the mixed acids to the ounce of gold. You make no mention of water in the acids. Some should be used, say, two or three ounces to the quantity of acids named.

FIGURES ON FILMS.—J. A. W. says: "I have just developed a batch of rollable films, and I find on many of them an imprint of the number on the backing paper. Can you tell me an easy way of removing them, as, in some cases, they completely spoil the negatives?"—In reply: We know of no means of removing the figures. Possibly some reader can help our correspondent.

ADDRESS WANTED.—COL. GUBBINS writes: "Can you tell me the address of Mr. E. Openshaw? He published a 'Notebook of Photography,' at 24, Wards Buildings, Deansgate, Manchester. I wrote to him there, and my letter was returned, marked 'Gone.' I shall be much obliged if you can."—In reply: We cannot trace the address. Some reader, however, may be able to oblige our correspondent.

OPINION WANTED.—H. W. writes: "Enclosed you will find some prints; they are the usual work that I do, in fact, they are thrown aside. I did them from beginning to end. Could you be so kind as to give me your opinion of them, and how much wages I could ask for such work, as all-round assistant?"—In reply: The work, especially the circular print, shows promise. We should consider you well paid at £2 per week—if you can get it.

FIXING COLLODIO-CHLORIDE PRINTS.—C. EVERED asks which prints require the longest time in the fixing bath, gelatine or collodio-chloride?—In reply: Theoretically the former; inasmuch as the collodion, as a vehicle, is more inert than the gelatine. But it is well to, in either case, allow the fixing bath ample time to fulfil its function. In either case there is the free silver in the "baryta coating" on the paper to take into consideration.

PHOTO-BUTTONS.—"LIVERPOOL" asks where he can get the necessary appliances, press, etc., for producing photo-buttons, brooches, and the like?—In reply: So far as we have been able to ascertain, the presses and necessary appliances are only made in America, and we know of no one here who makes them. Possibly, some of the large houses, such as Marion's, Houghton's, and the like, would obtain them to your order. Communicate with them.

THE CARBON PROCESS.—"CARBON" writes: "(1) As I intend to use the "Carbon Process" entirely for printing, would you kindly inform me if a plate put in the slide, glass side towards lens, would yield as good a negative as one used the usual way? as I wish to use the single transfer process. (2) If I reverse the focussing glass I suppose the focus will be correct?"—In reply: (1) Practically, yes; in some respects better, provided the back of the glass be perfectly clean and it is free from air bubbles, and if the proper allowance for its thickness be made in focussing the image. (2) Yes; that is, if the thickness of the focussing glass is the same as that of the plates employed.

COPYRIGHT.—W. A. R. writes: "A plain card, used as a show-card, was handed to me simply to colour in oil. The proprietor has requested the order given me to be countermanded, as the picture was copyright. Am I not allowed to colour it?"—In reply: We do not see that because the card is copyright there is anything to prevent your colouring it. By merely colouring it you are not copying, reproducing, or in any way multiplying it. If, after you had coloured it, you copied it, that, of course, would be an infringement of the copyright.

GUM BICHROMATE.—BICHROMATE writes: "Enclosed please find print, the result of my first experiment in gum bichromate. Can you benefit me by your experience, and advise me how to proceed? The pigment basis is burnt sienna. Is paper properly coated and sensitised? Is it too deeply printed? Has it been improperly developed? The proportion of pigment I used is 60 grains burnt sienna to 1 ounce fluid gum arabic."—In reply: The print shows that the paper was not evenly coated with the pigmented gum. But the result, as a first attempt, is not so bad as some we have seen. This process, like every other, requires some experience and skill in order to obtain good results by it. Better get a work on the process. That by the late Mr. W. J. Warren is as good as any.

THE OWNERSHIP OF NEGATIVES.—TELEPHOTO writes: "I have become involved in a dispute regarding the ownership of a number of negatives. These negatives were taken by a photographer for a customer, who required one print from each, and for which he paid in the usual manner. The customer now claims possession of these negatives, but the photographer wishes to keep them in his own possession. No written agreements whatever have been made in any way, nor have the photographs been copyrighted. Can you tell me to whom these negatives really belong? I have seen similar points mentioned in the BRITISH JOURNAL, but have been unable to find any in looking over my copies."—In reply: The negatives are the property of the photographer who took them. That question has been decided over and over again. But, of course, he has no copyright in them.

HAND CAMERAS.—A. DAWSON writes: "I intend purchasing a 5 x 4 or ¼-plate camera for the coming season, but before I do so your advice would be very gladly accepted as to what kind of camera would be most suitable for taking the following:—Seascapes, vessels, and yachts in motion; landscapes, village, and country scenes? Perhaps I might want to take groups on board our yacht in summer. (2) Which of the sizes mentioned is best? (3) Would a reflex camera suit? I believe the reflex type is not so popular as the folding camera. (4) What is the reason or drawback to it?"—In reply: (1) Any of the cameras on the market, but we should advise one of the focussing kind. (2) The size is quite a matter of taste and convenience. (3) A "Reflex" would answer admirably, but, of course, it is more bulky than one of the folding form. (4) Only its increased size, so far as we are aware.

COPYRIGHT.—THOMAS JAMES writes: "Last September I photographed two music-hall artists, five positions, for which I received a small payment for prints on the understanding that they would want plenty more, and that it would be a good advertisement for me, especially as they were very showy prints. They came to me last Thursday and wanted to borrow the negatives for some large size litho. posters. I offered to let them have same on payment of fee, which they refused to pay, saying that they could easily get the original copied. Can they do so? On the next day I made negatives copyright."—In reply: The negatives are your property, and you did quite right in not giving them up without payment. But as the ladies paid you to take them, you have no copyright in them. They can have the prints you have supplied them with copied if they wish. The fact that you have now registered a copyright is nothing. It was not your copyright to register. You have simply wasted your money.

*** *Many Answers to Correspondents, Reviews, and Notices of Apparatus are unavoidably held over.*

*** NOTICE TO THE TRADE, WHOLESALE AGENTS AND BOOKSELLERS.—*A Contents Bill is issued with each number of the* JOURNAL, *and copies may be had on application to the Publishers.*

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*** *The Editor can only be seen by appointment.*

*** *We do not undertake to answer letters by post.*

EX CATHEDRA.

A Testimonial to Professor Abbe. It is with much pleasure we see that Professor Abbe, of Jena, has been the recipient of a testimonial expressing the thanks of the State Ministers of Weimar, Meiningen, Altenburg, and Gotha for the pecuniary advantages the University of Jena has derived through the Carl Zeiss Stiftung. Twelve years ago Professor Abbe relinquished his position as head of the firm of Carl Zeiss and converted the business into a trust, under which scheme the University has derived great advantages. The address was inscribed upon vellum with decorations of an appropriate local character. It was signed by the Ministers of State—Drs. Rothe, von Heim, von Helldorf, and Hentig, and enclosed in a portfolio of leather bearing as design the seal of the University encircled by an oak, with the monogram "E.A." entwined in the roots. The sides are decorated with the arms of Weimar, Meiningen, Altenburg, and Coburg-Gotha.

* * *

Photography in the Tropics. In the *Amateur Photograph* Herr Pfeiffer gives some account of his experience as an amateur photographer in German East Africa, where he resided for six years. The first attempt to develope a plate in an unventilated dark-room was attended with such feelings of discomfort that he had speedily to leave it. Unable to return for some time, in consequence of feelings of prostration, he then found the films stripped from the plates. Once again an attempt was made to work under similar conditions, but the same feelings were experienced, and an attack of malarial fever, which lasted a fortnight, supervened. Development and other operations requiring the exclusion of actinic light should be done at night in a well-ventilated room, with proper precautions for reducing the temperature. The water may be cooled in an earthen vessel by allowing it to stand wrapped in wet cloths during the day. The selection of a suitable plate is very important, and the alum bath should be used between development and fixing. Pyrogallic acid is strongly recommended for development in the tropics. Albumenised paper will be found very convenient for printing, and the slight trouble of sensitising is compensated for by the difficulties which are avoided.

* * *

A Notable German Patent Suit. Some time ago we referred to the law suit pending in Germany concerning the use of starch in emulsions as an ingredient for producing matt surfaces. Herr Junk, a German photographer, patented a process for making bromide paper more amenable to the brush, by adding boiled starch to the emulsion. The patent was bought by the Vereinigte Fabriken Photographischer Papiere, Dresden, and the Kodak Company and the Neue Photographische Gesellschaft, were sued for damages consequent upon the use of raw starch in the manufacture of their matt surface bromide papers. The claim seemed to be an enlargement of the scope of the patent, but for a time it seemed possible that the patentees might succeed. Fortunately it could be shown that starch had been used in this country some years before as an ingredient in the manufacture of emulsions, and that there was really no novelty in the supposed invention so far as bromide papers were concerned. The court of final appeal has now cancelled the patent. We refer to the matter because of the proposed alteration in the Patent Laws of this country. It is claimed that an invention which has stood the examination of the German Patent Office may be looked upon as trustworthy. Probably in the majority of cases this may be true, but there are serious objections to the German system.

* * *

Objections to the German Patent System. In the case we have cited above it is clearly demonstrated that the authorities had granted a patent which covered a process known to photographers many years before. What the Government officials had examined and approved might well be regarded as authoritative, and the claim thus acquired a fictitious value. The process of examining a

patent specification involves considerable delay, besides expense to the nation. We know of an application which has been under the consideration of the German Patent Office for a great length of time, and still remains undecided. Meanwhile the inventor deems it undesirable to exploit his invention, and the public is deprived of its advantages. The market for the invention may be jeopardised, or even lost. If a thorough examination of each patent specification is to be made, a staff of skilled officials becomes a necessity. In this case the patent fees must be raised, or the nation must bear the expense. The first alternative will be a hardship and a discouragement to the poor inventor, whilst the second calls upon the public to defray the expense of guaranteeing a monopoly for the benefit of a few. There is no doubt that the English system permits of many things entirely devoid of novelty being patented, but it is well known that a guarantee is not implied. In our endeavour to remedy the defects of the laws as they stand, we should be careful not to create an expensive system beset with dangers of a worse type.

* * *

Friendly Rivalry. Whenever painter-artists meet photographic artists in friendly converse there are generally a few good-natured passages of arms on the wide subject of art. These little skirmishes are always relished by onlookers, in the same way that a street fight invariably gathers an appreciative crowd. One of these interludes occurred the other night at the Camera Club during the discussion on Mr. Storey's paper on "Perspective," and it certainly gave additional zest to the proceedings. Mr. Storey, it is needless to say, was quite at home with his subject, as many budding academicians know to their profit, and he had been pointing out how painters could ascertain by rule how to give an object its proper relative size in whatever position it occupied between the base line of a picture and its horizon. As an example, he showed how a lighthouse on a cliff, having a total height of 120 feet, could, at a distance of 800 feet, be most accurately scaled in correct proportion by the artist. Thereupon a philistine among the audience, with the evident object of drawing the artist, not in the academical sense, innocently inquired why the immortal Turner, with these rules of perspective at his fingers' ends, should have fallen into the error of painting the castle-crowned cliffs of Dover and Hastings about four times as tall as they ought to be. Mr. Storey was on his feet in a moment. "Because Turner thought they would look better that way. Was that grand painter to be bound by rules? No, he was a poet, an idealist, and these wonderful works which he had left to posterity were so many monuments of his transcendent genius." That was the gist of the lecturer's reply, but he was bound, at the same time, to admit that Turner did exaggerate his distant objects, and threw exact measurements to the winds when he wanted to secure a certain effect. He even told his hearers how, upon one occasion, he was induced, by seeing Turner's picture of Honfleur, to visit that place. With the picture in his mind, he expected to find a grand site for this town, with a range of hills at its back about half-a-mile high. But the illusion was quickly dispelled, and he found Honfleur to be a squat place, with squat hills, and squat everything. Turner had idealised it out of all recognition. Now, why should not the photographer go the same way to work? By using a telephoto lens for the distant part of a landscape, and an ordinary lens for the foreground, and then dove-tailing the negatives together, he could "idealise" without stint. Here is a hint for those who want to start a new fad. We have had the impressionist photograph, and many other kinds which it is beyond our power to classify. The idealistic photograph, produced on the lines suggested, should be a success.

* * *

Histological Photography. In no department of human knowledge has photography played a more important part than it has in our medical schools. The student of to-day possesses advantages which were undreamt of thirty years ago, and one of the chief of these is seen in the wedding of the microscope with the photographic camera. To understand the great advance, in teaching facilities, which this union has brought about, it is necessary to call to mind the methods adopted in the seventies and early eighties. Peeping into the room occupied by an histological class, attached to a hospital, at that date, we should probably see a row of benches occupied by students, each with a microscope in front of him, eagerly looking for the particular appearances described by the demonstrator. But it stands to reason that each of the microscopic sections under examination must differ more or less from its fellows, and that an appearance shown clearly in one may be almost invisible in another. Now let us see how photography can obviate this. The best section is selected and reproduced, magnified, say, 500 diameters as a lantern slide, and this picture is thrown on the screen, its magnification being increased to, say, 15,000 diameters. It is plainly evident to all the students in the room, and can readily be compared with other pictures of a like nature which all can view at one and the same time. Moreover, if such photomicroscopes are of especial value in showing peculiarities of structure, copies can very easily be made for transmission to other medical schools, at home and abroad. In this way knowledge is rapidly spread, and the world is the richer for it. The name of Dr. Maddox is honourably associated with the first photomicrographs which were worthy of the name, but he worked in the old wet-plate days. It was not until the gelatine plate became available that students and teachers in our medical schools could conveniently take up photography to help them in their work. To-day this application of the camera is carried to the highest perfection, and wonderful are some of the triumphs achieved by those who are experts. We may instance the photomicrographs taken and employed by Dr. John Turner to illustrate his lecture on "the nerve cell." When we remember that the individual cell, of which there are millions in every brain, is too small for the unaided eye to detect, we can appreciate the beauty of the process which shows us these cells, largely magnified on a lantern sheet, each with its delicate fibres radiating from it. The cells have been happily compared to galvanic batteries, and the fibres to connecting wires, for by their joint aid sensations on the surface of the body are telegraphed to and from the brain. The perfect cell in the lecture referred to was compared, pictorially, with that in a morbid state taken from the brain of those who had been in life mentally affected. Is it too much to hope that a study of such records as these will, in the future, lead to the amelioration of those terrible forms of disease which at present seem so obscure in their origin and progress?

* * *

Exhibition Photographs. The Royal Exchange Colonial Exhibition has been so little advertised that even dwellers in the City of London may be excused if they do not know of its existence. The space available in this, the very heart of the City, is not large enough to afford accommodation for anything like a representative exhibition of the resources of our great empire, and for this reason, only a few of our colonies contribute to it. These comprise the Dominion of Canada, Rhodesia, Western

Australia, and British North Borneo. Visiting this Exhibition, which is open free daily, we found it uncomfortably crowded, and noticed with great interest how largely photography had been enlisted as a ready means of illustration. Indeed, we might truly say that more photographs are to be found here than in many a provincial exhibition devoted to camera work. Here the pictures are merely accessory to the other exhibits, but they are of large size, mainly 15 by 12, and are interesting apart from their surroundings. In the Canada section, for example, we are shown a number of specimens of the splendid woods grown in the Dominion, both in the rough and polished conditions, while above each there is a good photograph of the growing tree from which the specimens were obtained. In the section devoted to Western Australia are specimens of ores obtained from the various mines, from auriferous quartz to the more humble ores of lead and zinc. Accompanying these are striking photographs showing the entire process of gold extraction, from the stamping mills to the final process of recovering the last particles of the precious metal by means of cyanide. Rhodesia also shows a number of gold exhibits, accompanied by "the harmless, necessary," photograph, and in addition to these there are similar specimens and pictures relating to coal mining. British North Borneo is by no means behindhand in the matter of photographs, but they are presented in another form. To each purchaser of a sixpenny guide to the Exhibition is presented a bound album containing more than a hundred photographs of North Borneo, with a brief history of the colony. North Borneo, we learn from this really sumptuous little volume, is larger than Ireland, and not the little tract of territory that one is apt to suppose when looking at a map of Asia. The photographs which illustrate the book were mostly taken by Dr. Johnstone and Mr. A. J. West, both officers of the Chartered Company, and they reflect much credit upon those gentlemen. The United Kingdom seems to be only just waking up to the wonderful opportunities offered by her vast possessions beyond the seas, and although emigrants, crowded out by increasing competition from the Mother Country, may be tempted by cunning verbal description to find a home in this or that colony, they are far more likely to pay heed to the blandishments of well-executed photographs. For this reason, the directors of such exhibitions as that now in progress at the Royal Exchange do well to supplement the general attractions with photographic illustrations of the countries represented.

THE DUSTING-ON PROCESS AS APPLIED TO THE INTENSIFICATION OF NEGATIVES.

It will be remembered that in "Ex Cathedra" last week, when speaking of the dusting-on process, we referred to the use that may be made of it for the intensification, locally or otherwise, of thin and weak negatives, and mentioned that in some respects it offers advantages over chemical methods of accomplishing the same end. Since the article appeared two or three correspondents have expressed regret that, while speaking so favourably of the method, we did not give the details of the process so that our younger readers might, at least, give it a trial. Hence the present article. It may be as well to explain to our newer readers that the powder process is based upon the hyposcopic condition of a film which may be one of gum-arabic, dextrine, albumen, with glucose, honey, sugar, glycerine, etc.; the number of substances that may be utilised is very wide indeed. If we coat a glass plate with either of the mixtures, according to the formulæ given on page 1,091 of the *Almanac*, or several others that might be given, and dry it before the fire, the coating will be hard and firm at first. But after it has become cold, and it is exposed for a short time to the air, according to its humidity it will become more or less "tacky," when any fine powder rubbed over it will be found to readily adhere. But if, after the plate has been dried, it be exposed for a few minutes to good daylight it will not become "tacky" as before, and the powder will not "take." The action of the light has been to destroy the property of becoming "tacky." Now from this it will be seen that if we desire to make a positive by the powder process we must use a positive—a transparency—as a *cliché*, and if a negative, we must employ a negative, and this makes the process a very suitable one for our present purpose. What we really do is to supplement the negative with another one on its face—wholly or partially, according as to whether the powder is applied uniformly all over or only locally. Furthermore, and what is an additional advantage, whether a positive or negative be used for producing the picture it is desirable that it should be of a thin and not of a vigorous character in order to obtain the most satisfactory results.

As we have just said, great variation may be made in the formulæ employed. The one numbered 2 in the *Almanac* is a good one to be employed at this season of the year,. It stands thus:—

Dextrine	½ an ounce, or	5 grammes.
Grape sugar	½ „ „ „	5 „
Bichromate of ammonia	½ „ „ „	5 „
Water	10 ounces, or	100 cc.

It is convenient to mix the dextrine and grape sugar in half the water, and the bichromate in the other half, and then keep the two solutions separate as stock solutions. They are then mixed in equal proportions as required for use, and filtered. After keeping a week or so the dextrine and glucose solution may show a sign of mouldiness on the surface, unless an antiseptic has been added, but this appears to do no harm when the mixed solutions have been filtered.

The negative to be intensified should be varnished, and it will be well, as a further protection, to give it a coating of collodion before the varnish is applied. The negative is now flowed over, as collodion is applied, with the bichromated mixture, in a room with subdued light, drained and dried, either before the fire or over a spirit lamp. The heat should first be applied to the corner opposite to that from which the mixture was drained off, so that an even coating may be secured. The plate, still warm, is now laid, face downward, on another warm glass and exposed from the back to daylight for a few minutes. It is then taken into the room and again warmed to drive off any moisture it may have absorbed during the exposure. After the plate has cooled, and rested a minute or two, a little powder of any colour that may be desired is applied, sparingly at first, so "as to feel one's way," with a camel-hair brush, with a somewhat swishing motion. Whatever powder be selected, it is essential that it be in the finest possible state of division. If plumbago be used, and on the whole that is the best for our present purpose, that known as electrotyping plumbago should be employed. In a few minutes—according to the hygroscopic condition of the atmosphere—the powder will begin to "take" where the denser portions of the negative have protected the film from light, and afterwards to the less denser parts in proportion, while, if the exposure has been, approximately, correctly timed, none at all will attach itself to the deepest shadow of the negative.

Should it be found that, after a few minutes, the powder does not "take," simply brush it off and allow the plate to

rest for a few minutes longer to take up more moisture from the atmosphere, and then re-apply the powder. If then it does not adhere it is probable that the exposure to light has been too long. The plate, however, may still be utilised by putting it for a short time in a damp cellar, or by gently breathing upon it, though the former is the preferable procedure. If, on the other hand, it is found that the powder takes too freely, it shows that the action of light was insufficient—or that too much of the hygroscopic material was used in the mixture for the existing state of the atmosphere. In this case the plate must be at once warmed and the development re-commenced directly it has cooled. In abnormally dry weather a mere trace of glycerine may, with advantage, be added to the bichromated mixture, but it must be used with judgment, as a very little of it goes a long way in the powder process. When sufficient density has been obtained the plate must be exposed to light for a time—half-an-hour or so, or less to sunshine. This will render the whole of the film insoluble and non-absorbent. If it is found that sufficient density has not been secured, the negative, after sunning, may be re-coated with the bichromatic mixture, and the operations repeated again and again. In this way, with care, any amount of density may be obtained with even the feeblest of negatives. Instead of applying the bichromated dextrine to the face of the negative it may be applied to the back, and sometimes with advantage, and if vertical light be used for the exposure the image on the back will be, practically, as sharp as if it were on the front. It is obvious that the powder can, with a fine camel-hair brush, be applied locally to any parts of the negative, and withheld from others, so as to emphasise the intensification where required. The contrasts can also be enhanced by gently breathing through a small tube of paper upon those parts, so as to slightly add to the moisture locally, though this must be done with some care. It will not be found necessary to further treat the plate after the film has been finally fixed by light, as the very slight tint given by the bichromate makes no material difference in the time of printing. There is one thing we may direct attention to, which is that the plumbago gives a really greater printing density than appears to the eye, so that it is necessary that this fact should be kept in mind while working.

SOME BUSINESS ASPECTS OF PHOTOGRAPHY.

II.

Assistants Seeking Situations.

The present time being about the season when photographers are beginning to think of securing assistance for the coming season, we feel it will be an opportune occasion to speak a few words of advice to the large army of those who are wisely endeavouring to gain varied experience to fit them to become principals themselves in the near or distant future, or of the larger number who, through force of circumstances, look forward to a post where they can do a fair day's work for a fair day's wage. What we have to say will be equally applicable to both classes, and we may state at the outset that it will be largely founded on the observations, and, moreover, the complaints made to us by employers themselves. It is somewhat remarkable that though the numbers of assistants in various departments of photography must be exceedingly large there are many complaints of the difficulty in getting properly qualified men. To a certain extent this is explicable by the fact that so many men with a mere smattering of the art rush into the ranks of would-be photographic wage-earners, and it is difficult to readily separate the wheat from the chaff. The time is gone by when a man with a camera and lens and a few plates could start a business unless he be what might be termed a born artist, and even such an one will be greatly handicapped if he have had no previous business training, while, as to the principal himself, he wants a man of experience and ready resource to carry on a due share of the manifold branches of work demanded in studios where even a few assistants only are employed. Here *en passant* let us point out the great advantage that would accrue to any assistant if he improved his theoretical attainments either by home study of one or other of the many excellent manuals on photographic topics to be obtained at a reasonable price through any bookseller, or, what would be still better, attending some of the technical classes on photographic subjects, these, however, only being available in the large towns. The complaint has been made to us that the moment an assistant is asked to do anything at all out of the usual run he has no foundation of knowledge to enable him to satisfactorily carry out the demands made upon him.

Let us, however, now proceed to discuss the modus operandi of an assistant who, seeing in the advertising columns a post that he thinks he is capable of filling—whether as operator, printer, or in some technical branch—proceeds to apply. Judging from the statements we have referred to, in the majority of cases the applicant indites a hurried letter, collects a few specimens—they may be very good ones—wraps a piece of brown paper round, ties the whole parcel up with a piece of twine, and, after duly addressing the parcel, posts it, and expects an appointment at once (if it be his first experience in this direction).

Now, though, as we have just said, employers find it difficult to get good assistants, they experience no difficulty in getting applications; there are so many of all sorts in the field. Hence it ought to be patent to anyone of common-sense that to a certain extent the manner and style of an application may be instrumental in forming a decision, and a tendency must exist to look more favourably on a well-sent-out application than on one which bears the word "sloven" written large all over it. The first advice, then, is let your letter and parcel of photographs be neatly written and put together. And, before writing the letter, the advertisement should be read a second time, and care taken to answer all the requirements set forth. If a portrait is asked for, it is unwise to write, "I am just without one, but will get one printed if you expressly wish." If particulars as to kind of experience and length of time in a place are asked for, it is worse than foolish to write a long list of capabilities with no other warranty than ego; employers do not care to write to every applicant's reference at once; they wish to have materials for forming a judgment as to probabilities before troubling a brother professional to give his opinion upon an old employé. Again, if the advertisement asks applicant to state age, what is to be gained by the plan adopted by many of ignoring that demand? To return to the package itself, it would be doubly wise to separate each photograph by a neatly-cut piece of paper to protect the pictures themselves and prevent them being injured by frequent posting, and, finally, they should be protected by a piece of strong card or mill board back and front; the extra postage, if any, will be little. And here a nice point arises, which we do not pretend to decide. If an advertiser asks for specimens, he ought to pay the postage back of the rejected specimens, yet, as a matter of fact, he sometimes expects the applicant to pay. The point is the wisdom or otherwise of invariably securing stamps for return with every application. It is true that to do so would be a tax on a usually ill-paid profession; the question is one of policy.

We are now reaching a subject that has caused consider-

able heart-burning, brought about either by the applicant's own carelessness or, rarely, we would hope, by the iniquitous conduct of advertisers who have retained possession of specimens which were perhaps the only means of obtaining a situation that the sender possessed. For these thieves no words of condemnation are too strong, but we would like to believe that they are very rare. From what we have been told the fault usually rests with the applicant himself. We know it is a fact that replies sometimes come in to the number of upwards of five or six dozen. It needs little imagination to see what immense labour is involved in opening and sorting out the likely from the unlikely, and naturally there will be bias in favour of the one whose mode of application involves least trouble. As a matter of courtesy then, as well as policy, it will be most advisable for the applicant to enclose an addressed card wrapper (the inside of the original covering cards will suffice). This will, at the same time, lessen the probability of pictures being lost or mislaid. And, further, it is from every point of view most desirable that every picture sent, as also the writer's own portrait, should have the sender's name and address legibly written. Even employers are not all systematic, and it is readily to be imagined what disastrous results might ensue from the accidental upsetting of a pile of applicant's specimens all tumbled together without means of identification. Indeed, we go so far as to say it requires extremely systematic opening and classifying of letters when opened to avoid occasional mixing up of one applicant's specimens and portraits with another's so long as the plan prevails of sending pictures and portraits without name and address. We may add that some applicants write their name across the prints themselves to preclude their use in an improper manner.

In conclusion, we may repeat that the precautions we have named are dictated by common sense, by reports to us of those who have been personally interested in such matters, and by an earnest desire to see the interests of employers and employés alike conserved.

JOTTINGS.

The diminished public interest in next Saturday's rowing contest on the Thames between "eight young men from Oxford and eight young men from Cambridge," as a dead and gone sporting journalist once irreverently styled the University crews, will probably have no serious effect on the attendance of photographers along the river banks, and if the sun shines, the number of persons carrying cameras will no doubt be very large. Nowadays the race offers nothing that is novel from a photographic point of view, although the phases of the struggle, the flotilla of snorting, jostling, and plunging boats that follow the competing oarsmen, and the fun and life on the banks of the river between Putney and Mortlake supply the hand-camera worker with many opportunities for exposing his plates or films. The illustrated newspapers, however, very largely discount the interest and value of such photographs, in publishing results obtained by those whose business it is to use the camera professionally. The first photographs of the boat race, made on gelatine plates, were produced, I believe, by Mr. F. C. L. Wratten, in the year 1878, and they created considerable sensation at the time, as evidencing the rapidity to which the then comparatively unfamiliar dry process had been brought. A little while later Mr. C. F. W. Sage, a well-known amateur photographer, of Twickenham, also produced some excellent results, whole plate size, which were much thought of. Nowadays, river boats moving at a rate of about 12 or 13 miles an hour would not be generally accepted as the best means of testing photographic rapidity, but at the time of which I write the blue fever was very pronounced in London, and Mr. Wratten's photographs of the struggling crews struck the imaginations of photographers and the public as something very clever and uncommon, as indeed they were. It is worthy of note that Wratten's plates are still manufactured, and possess the esteem of numerous photographers at home and abroad. But, to quote Lord Beaconsfield, "many things have happened since" those plates were put on the market—photographically and otherwise.

Of the many reprints of photographic books that have recently come under my notice, I have not seen one of Bernard Alfieri's "Half-Holidays with the Camera." It is a great favourite of mine, as I have not only walked and cycled over the country which Alfieri so sympathetically writes about, but have also taken photographs in the "pasture lands of Middlesex, the woods of Berks and Bucks, the quiet village life of Surrey, and the sea-girt shores of Essex," to which he refers in his preface. The book, however, does not take the reader across the River Thames, but by the aid of maps, sketches, and half-tones (which might be improved in quality, by the way), and terse descriptions, gives the London photographer a good idea of the splendid opportunities for making pictorial photographs which are to be had between the Vale of Dedham, on the east, and Burnham Beeches on the west. Amongst London amateur photographers the concerted "outing" does not seem to be so popular as formerly, but a day's photography will probably never lose its charm for the individual. It is to the latter, especially if he be contemplative and fond of nature, that Alfieri's book appeals. With this volume in his pocket, the Cockney photographer can find work for a season lying within short journeys of the City and West End, and when autumn comes should have a sufficient number of negatives to keep him busy printing, lantern-slide making, and enlarging all the winter. I have no patience with the individual who must go gadding about remote parts of the country or abroad in order to secure pleasing photographs, when Nature, in her most entrancing aspects, awaits him, as it were, round the corner. A famous photographer of my acquaintance used to boast to me that he never went abroad, lest he should see scenery more beautiful than that of his own country. This, perhaps, was carrying one's insular prejudices too far; but, on the other hand, it is certain that in many cases the modern craze for foreign travel—the ambition to "see something of the world"—is apt to unduly depress one's estimate of the natural beauties and attractions of our own little island—which is really not by any means a bad place, after all.

And here a good word should be said for the useful work now being done by the Homeland Association in publishing a series of cheap illustrated handbooks of picturesque England south and west of the River Thames. Typical of these is "Wolfe-land," which deals with the country round Westerham in a manner which cannot fail to captivate the student of history and the lover of the picturesque. I would advise the tourist photographer to obtain the entire series, each volume being published at sixpence. The two latest take the reader into the West Country—Dulverton and Minehead. In the latter of these there is a reproduction of a photograph by Mr. H. M. Lomas, which is probably unique. It represents a stag brought to bay by the Devon and Somerset Hounds. The stag is in a river, surrounded by the dogs, and the members of the hunt are placidly seated on horseback on the river bank, watching the fun. Truth to tell, the photograph gives one the impression that the whole thing is a very tame piece of business indeed; nevertheless, Mr. Lomas, who, I believe, has used the camera in the hunting

field for several years, is to be congratulated on having secured an uncommon negative. Another illustration is that of a stag photographed within a few yards of the camera. I must not, however, go into too much detail, otherwise the reader's enjoyment will be heavily discounted. My object is to induce those readers of "Jottings" who tour England with the camera to add the "Homeland" series of handbooks to their summer equipment; they are well done, and quite devoid of the formal and dry-as-dust horrors of the manufactured guide book. Yet one more volume shall have mention here, and then I will quit bookland. This is "A Cotswold Village," by J. Arthur Gibbs, and published by John Murray, Albemarle Street. The young author, I am sorry to say, died a little while ago, but his book should keep his memory green. It is a graceful study of life and character on the Cotswolds; Burford, Cirencester, and Bibury being the principal centres of observation. The book, which is well illustrated, appeals to the naturalist, the sportsman, the archæologist, and the lover of country life. The ordinary tourist in search of excitement would probably find Mr. Gibbs' Gloucestershire haunts dull and uninteresting; the Cotswold country is not for him. But to those who take interest in the charms and beauties of an unspoiled bit of England not a hundred miles from London, "A Cotswold Village" will be found a sympathetic introduction. Scenically and architecturally, the Cotswold country is good ground for the studious photographer; if, besides, he shoots, fishes, hunts, or "'ologises," he may, in a sense, have the whole of this beautiful little world all to himself, for it is right out of the beaten track. I hope to make its acquaintance for the first time "when the May-fly is up."

At the National Arts Club, New York, there is on view this month an exhibition of American pictorial photography, arranged by the "Photo-Secession." Mr. Keiley, Mr. Holland Day, Mr. Steichen, Mr. Clarence White, Miss Weil, Mrs. Kasebier, and Mr. Frank Eugene are amongst the exhibitors, who are exclusively American. The catalogue bears the following footnote: "Many of these prints have been chosen from the pictures representing the United States at the International Exhibitions of the Fine Arts of Glasgow, 1901, the Photographic Salon at Paris, 1901, the London Salon, 1901, and the exhibition by the 'Secession' painters in Munich. Any persons wishing to know further particulars concerning prices of prints, concerning exhibitors and the organisation 'Photo-Secession,' may address Mr. Alfred Stieglitz, No. 3, West 29th Street, Manhattan." Perhaps Mr. Stieglitz, to whom I tender my thanks for the catalogue, will oblige with a little information about the "Photo-Secession." What is it, and from whom or what has it seceded? So far as one can form an idea from the growing mass of American photographic literature, there are numerous "Salons" in the United States. Chicago, Philadelphia, and San Francisco each make use of the grandiloquent word to designate exhibitions of photographs. "Secession," however, is something altogether new and startling. It looks as if there was something incompatible between Mr. Stieglitz and his supporters and the New York Camera Club. What next, I wonder? We start with a Society, out of which grows a "new movement," styled a "Salon," which, in its turn, gives birth to a "Photo-Secession"! A mighty pother, surely, over the making and showing of pictorial photographs!

"As a matter of fact, long distance, stereoscopic photography being out of the question, long focus lenses are not applicable." This sentence is taken from a letter published in the JOURNAL of February 28th, and the writer will perhaps excuse me for remarking that his ideas on the subject are erroneous. Long-distance, or as it might be termed, tele-stereoscopic photography is by no means out of the question, and consequently the limitations in the foci of our lenses cannot be arbitrarily fixed. It all amounts to this: we are limited, neither in the dimension of the base line of the parallactic triangle, nor in the foci of the lenses employed in making stereoscopic negatives. To put it another way. Suppose it be desired to secure a binocular representation of an object situated a mile off. One lens and camera of sufficient length of focus to render the object the necessary size will "fill the bill," lateral movement of the system between the exposures, of course, being carefully made, or by mechanical means, so that the two views are taken from an identical plane. Telephotography, *per se*, obviously suggests itself for the purpose. Even in these times, when stereoscopic Kodaks are being placed within the reach of all, only a few in the great photographic army probably aspire to the production of long-distance stereographs; but it is well to remove the impression that they are not made with tolerable ease. One of these days, perhaps, we shall be having telephotographs, and tele-stereoscopic photographs, in natural colours. It is dangerous, in this age of swift change and movement to talk of "limitations," particularly in photography, which has progressed so rapidly of recent years. As to stereoscopy: in itself, it supplies sufficient material for years of study. Such a text-book of theory as that of Le Conte is not mastered at a sitting; while Donnadieu, as a practical authority, is a fund of valuable information in himself. The collotype atlas of stereoscopic negatives and positives, failures and phenomena, which is issued as a supplement to the latter volume, should be in the possession of every earnest stereographer. It is a liberal education in an art within an art. Amongst the series is a view in which an object situated at a distance of 500 metres stands out in relief. I think this may reasonably be regarded as an example of long-distance stereoscopy.

Many photographers will appreciate the efforts of that enlightened and enterprising firm, Messrs. J. J. Griffin and Sons, to restore what they describe as "the old favourite albumen" to a leading position amongst photographic printing surfaces. From a batch of literature before me, I learn that Messrs. Griffin, "to meet the rapidly-growing demand for the papers, have erected larger works, fitted with every modern convenience, at East Molesey. The situation is eminently suitable for the manufacture of sensitised paper, as the air is far clearer and purer than at Shepherd's Bush, where our old works were located." Moreover, "being in direct telephonic communication with our works, we can at all times guarantee a supply of freshly-floated paper in execution of our customers' orders. The paper will be dispatched the same day as the order is received, provided that it reaches us by the first post." The following passage, from an informative pamphlet, relates to the preparation of the paper: "The most painstaking attention is given to the selection of the raw paper, all imperfect sheets being rejected. By a simple arrangement, it is made impossible for any sheet to be floated a longer or shorter time than its fellow, and all who understand the preparation of silver paper will see the value of this guarantee. Out of every two and a-half quires sensitised, a piece of paper is tested by an expert, and if there is the least sign of a falling away of quality, the work is stopped in that particular bath until the defect is remedied." I make these quotations for the purpose of illustrating the thoroughgoing spirit in which Messrs. Griffin endeavour to assure technical and commercial success to their Climax albumenised papers. In the manipula-

tion of an albumen print there are many physical advantages, and in the finished image itself certain attributes of a qualitative character which satisfy so many photographers and their patrons, that Messrs. Griffin's exploitation of "the old favourite" will be watched with something more than merely pious interest.

COSMOS.

A CHARTERED COMPANY OF PHOTOGRAPHERS.

[BY A CHARTIST.]

THE success of the Professional Photographers' Association is very gratifying proof of what may be done by steady, continued, and combined effort on the part of a small number of earnest men. Already some important results have been achieved, and more benefits will undoubtedly be seen and felt as time goes on: the point is that something has been done.

An all-round improvement in the ranks of professional photographers might be looked for if there were a central body (with or without a charter) in existence which might be held to represent all classes of photographic workers, conduct examinations, confer rewards and titles; in so many words, make its membership the reward of honest labour and study. Most of the skilled professions have, so far as they have been able, endeavoured to raise the standard of culture and ability of their fellowship. There is nothing to prevent a man commencing practice as an accountant or architect, but there is no doubt that he occupies a better standing and commands a better future if he can show proof of fitness as a fellow of the Institute of Actuaries or of the Royal Institute of British Architects, as the case may be. It is a well-known fact that the Pharmaceutical Society held examinations long before the passing of the Act of 1868, which made such examinations compulsory on all who desired to practise pharmacy. There was, as everyone with a memory long enough to go back to those years knows, a very considerable difference between those who had—to put it plainly—gone through the mill and those who had merely climbed the fence. The fact of having studied for, and passed, examinations such as those (in photography) of the City and Guilds of London Institute is evidence, not only on the part of the student to thoroughly understand the theory and practice of his profession, but it must have a good effect individually and collectively. Not all learned men are cultured—one cannot expect that consummation—but there is no doubt that if photographers were for the most part men who had gone through the curriculum afforded by apprenticeship in a good studio, and who had passed examinations such as those referred to, there would be a moral and intellectual elevation all round, and, as a result, less shoddy work and practice. All study tends to elevate, provided, of course, that it be well directed.

It has always been the writer's opinion that the "Royal" is the one existing society with the ability and prestige necessary to take the initiative in a matter of this sort. Let the "Royal" once take up—if only in a small and tentative way—a scheme of study, and, if not itself conducting examinations, more fully recognise those of the City and Guilds Institute, and we should be on the way to a better state of things. Now, what could be done as a beginning? It is not pretended that the answer is simple: such matters require full discussion and consideration. But why not adopt some scheme based on the following: Firstly, admit young people, at a considerably reduced fee, as students of the society; put such fee at 5s. on passing the ordinary examination of the City and Guilds of London Institute; admit them to an associateship or membership, with a fee of 10s 6d; then, having passed the Honours Examination, admit them to full fellowship of the society, with a subscription of one guinea. Whether the "Royal" could do better work for photography on lines somewhat of the foregoing type, with a greatly increased membership and with the fees for its fellowship not quite so prohibitive, is a matter for its council; but one thing is certain, it has the best chance of any body of photographic workers, and it is vastly better to move forward, if slowly, than to rest contentedly on one's reputation and past achievements.

POTASSIUM-AMMONIUM CHROMATE.

IN the November issue of the *Bulletin de la Société Française*, E. Kopp describes the production of the above new salt and its uses in photography.

Chemically pure potassium bichromate is placed in a stoppered glass flask, and liquor ammoniæ fort. .880 added, with constant shaking, till the mixture smells strongly of ammonia. The flask is then corked, and placed in a water bath till the bichromate is completely dissolved and a yellow solution obtained, which should be allowed to cool. When cold, a good crop of needle-shaped crystals of a pale straw colour will be found at the bottom, which must be dried in an excisccator. The new salt, according to Kopp, has the formula, $KO, CrO_3 + NH_3, HO, CrO_3$. If the crystals are heated or exposed to the air they gradually lose the ammonia, and bichromate of potash is left; if a solution of the salt is also heated, the same thing happens.

The most important feature of the new salt is that it exerts no decomposing or oxidising action when in contact with organic substances, such as gelatine, dextrine, gum, etc., when not exposed to the light.

It is therefore possible to coat paper with a fairly concentrated solution of this salt, and to keep it for a long time without any change. If paper thus prepared is printed under a negative, a vigorous brown image on a lemon-yellow ground is obtained, and it is only necessary to wash the print in plain water or in faintly acidulated water till the whites are pure, and the result will be a permanent brown picture.

If the washing is continued, the image becomes a pale green. The chemical processes involved may be thus explained: Light acts the same as heat, and in the presence of organic matter, sets free the ammonia from the double salt, which then becomes acid by the formation of chromic acid, which is reduced by the organic matter to chromate or chromic oxide. If the washing is continued, this chromate is reduced to chromium oxyhydrate, which is a pale greenish colour.

Both the green and brown images thus obtained may be the starting points for some interesting printing processes, as the one may be changed chemically and the other form a species of mordant for various vegetable colouring matters.

If the brown image, obtained as above described, be treated with a weak solution of silver nitrate, dark red silver chromate is formed. Mercuric nitrate gives a brownish red image, whilst nitrate of lead gives a bright yellow image. By treating the silver and lead images with an alkaline sulphide, black prints result, whilst a weak solution of sodium thiosulphate will convert the mercury image into a brownish black.

The pale greenish image obtained by continued washing of the brown chromate image forms the starting point of another series of images. The conversion of the brown into the green image may be hastened by immersion of the paper in a warm and weak solution of an alkaline carbonate and then thoroughly washing. If a print thus treated be laid in a warm decoction of Pernambuco, Brazil or Campeche wood, the chromium oxyhydrate acts as a mordant, and the colouring matter of the wood is deposited on the image, but, unfortunately, also on the high lights of the picture; but it can be readily removed thence

by a weak solution of chloride of lime. According to Kopp, alizarin and purpurin should act in a similar way.

Another property possessed by the chromate of chromium image is that it will oxidise such substances as will, when oxidised, give insoluble precipitates. Such substances are the aniline and naphthalin derivatives, and especially the ferric salts. If the chromate image is immersed in a dilute neutral solution of ferric chloride, oxide of iron will be precipitated upon the image, and if it be well washed and then treated with dilute gallic acid solution, the image will turn a rich blue-black. Another process is to coat paper with a mixture of yellow prussiate of potash, ammonium, chloride and potassium ammonium chromate, and expose to light under a negative, and then treat with neutral ferric chloride, when a very pleasant tone will be obtained.

A. D. Pretzl.

THE SULPHITE INTENSIFIER.

Dr. Georg Hauberrisser contributes an interesting article to the current number of the *Photographische Rundschau*, in which he calls attention to the fact that he has already pointed out that a negative bleached with mercuric chloride and blackened with sulphite of soda can be reduced by a solution of hyposulphite of soda, the same as one blackened with ammonia; and as this fact does not agree with the chemical process, which is usually assumed to take place, he made a series of experiments to clear the matter up.

By the action of the mercuric chloride on the negative, there are undoubtedly formed silver chloride and mercurous chloride, two white substances, according to the following chemical equation:—

$$Ag_2 + 2\ HgCl_2 = Hg_2\ Cl_2.$$

In order to study the blackening process, a considerable quantity of silver and mercury chlorides were prepared by mixing the nitrates of silver and mercury and salt, and the precipitate thus obtained was thoroughly washed, to free it from the sodium nitrate and excess of salt, and digested for a long time with 10 per cent. solution of sodium sulphite; and the mixture turned black.

Chloride of silver and chloride of mercury, when treated separately with sulphite of soda, do not turn black, but remain white. It is generally assumed that the sulphite reduces the mercurous chloride to metallic mercury in the presence of silver chloride, whilst the silver chloride is dissolved by continued action of the chloride, which explains the reduction of the intensified image if the sulphite is allowed to act for a long time. If this view be correct, then with the shorter action of the sulphite silver chloride must be present as chloride in the negative, and if so, it can be proved—for instance, as silver chloride blackens on exposure to light, the image on exposure must become darker, and as it is also reduced to metallic silver by a developer, the image will become darker also. To test these points, a plate was exposed under a photometer, developed, fixed, etc., and cut into four strips. Three of the strips were immersed in a 2 per cent. solution of mercuric chloride, and, after a certain time, were removed and well washed, and then immersed for a short time in a 10 per cent. solution of sodium sulphite, and were taken out when they showed black on the back.

One of the strips was treated with a hydroquinone and Eikonogen developer; another, after drying, was exposed for two days to diffused daylight; and four strips were placed side by side in a printing frame, with a piece of collodio-chloride paper. It was then seen that the intensification was fairly satisfactory, and about double as much density as the unintensified negative; scarcely any increase of intensification was seen in the strip that had been exposed to daylight, but the strip which had been treated with the developer was noticeably denser. The fact that the strip exposed to daylight had not become considerably darker is no proof that there is no silver chloride in the negative after treatment with the sulphite, because the quantity of chloride must be very small, and the black colour of the negative would considerably weaken the action of the light, and, moreover, it is not impossible that a complex compound of the chlorides of silver and mercury and sulphite of soda might be formed which does not blacken in light, or only slightly. Besides the intensification by the developer, the fact that the negative intensified by sublimate and sulphite is reduced by hypo speaks very strongly in favour of the presence of silver chloride. To test the black compound formed by the action of sulphite on silver and mercurous chlorides, a quantity was thoroughly washed with hot water, in order to remove any soluble substances such as sulphate or chloride of soda, and then some of the compound was heated with zinc and hydrochloric acid, so as to convert any sulphurous acid into sulphuretted hydrogen, and this was soon recognisable by its smell, and also by the lead paper test.

This test proved that a negative tested with mercuric chloride and sodium sulphite contains sulphur; or, in other words, that the black compound is a sulphur compound. If a negative intensified with sublimate and sulphite be treated with solution of hypo, it is very much reduced—a further proof that metallic quicksilver cannot be given by the sodium sulphite—for metallic mercury is not attacked by hypo. Moreover, the black compound is in heavy flocks, and even after boiling, globules of mercury could not be detected under the microscope, with 50 times magnification. In order to study the action of hypo more accurately, some of the black compound was boiled with hypo, filtered, and part of the filtrate acidulated with hydrochloric acid. A yellowish-brown precipitate was formed, which gradually turned black. When heated, the precipitate turned black immediately. Chemical analysis proved that the precipitate consisted principally of silver, with, however, a small quantity of silver. Another part of the filtrate was tested for chlorine by treating with binoxide of manganese and sulphuric acid, and immediately the characteristic smell of chlorine was noticed. In order to obviate any error, some of the escaping gas was passed over iodide and starch paper, which immediately became blue—a certain proof of the presence of chlorine, which sets free the iodine which combines with the starch, to form the well-known blue iodide of starch. This experiment proves that by treatment of negatives intensified with sublimate and sulphite with hypo-solution, silver and mercury go into the solution, and the former probably in the form of chloride.

The residue, which did not dissolve in hypo, and therefore could not contain silver chloride, was thoroughly washed, and again tested, and the presence of sulphur proved. A considerable quantity of this residue was treated with nitric acid, and part of it was dissolved and filtered, and to the filtrate was added some hydrochloric acid, when a white, flocculent precipitate was formed, soluble in ammonia—a proof of the existence of silver. That portion insoluble in nitric acid dissolved in aqua regia, and the presence of mercury was proved by stannous chloride.

From these experiments, it is obvious that the generally accepted assumption that the intensified image produced by mercuric chloride and subsequent treatment with sodium sulphate consists of metallic mercury is erroneous; it consists of silver chloride and an undetermined compound of silver, mercury, and sulphur. By treatment with hypo, part of the silver and mercury is dissolved, whilst the rest remains undissolved.

R. E. Chesterman, D.Sc.

Bro. Alfred H. Saunders, P.D. Sec., etc., has been appointed lanternist to the University of Birmingham. Our brother is an expert operator, and for years has been a noted lanternist in the Midlands.—"The Good Templar's Watchword."

EXPOSURE.

[A paper read before the Manchester Amateur Photographic Society, and reprinted from the "Photographic Record."]

THE beginner soon discovers that his success largely depends on the time the sensitive plate is exposed in the camera, or, in other words, how long the lens is uncovered. It is only a few years ago that the wiseacres in the art invariably told the young hand that the only way to acquire this knowledge was by experience—that is, by first making many failures. But of late years the problem has received more attention, and almost complete accuracy can now be attained by following certain first principles. In exposing a plate, it is shut up in a camera, and illuminated through an opening in the lens by light reflected from the object or objects being photographed. We have here four influences which are subject to variation, and a variation in any one affects the length of exposure required. They are: Plate, opening of lens, subject, light; and in any plan of estimating exposure these must be considered. The reason why such a thing as correct exposure is necessary lies in the limitations of the sensitive plate, and it is well to examine in a plain, non-technical way what these limitations are. If a plate is exposed in different parts to increasing amounts of light and then developed, we get, of course, varying densities, as shown on the screen. Now, with every particular plate there is a *minimum* amount of light, below which amount no impression is made on the plate at all, this minimum being marked by a cross on the slide. At the other end of the scale there is always a *maximum* amount of light, beyond which amount any increased exposure does not give a corresponding increase of density on the plate. Now, the object of exposing a plate is that all the varying amounts of light in the subject shall be represented by varying densities in the negative, and for a plate to be correctly exposed the highest light must not make a greater impression on the plate than that marked by a cross on the screen; for if the exposure be above this, both high lights and some of the lighter tones will be represented by equal densities in the negative, and the familiar grey appearance of over-exposure will result. On the other hand, the exposure must be sufficiently long for the darker details of the subject to make some impression on the plate, or the familiar "clear class in shadow" of under-exposure will result. The real quality of the plate depends upon the distance between these crosses. If the distance is great, we have a plate with plenty of backbone or latitude, and a considerable variation can be made in the camera exposure without the high lights or shadow detail getting respectively either above or below the crosses. In a poor quality plate—and it should be noted that the quality has nothing to do with the speed—the crosses are nearer together, and very little variation can be made in the camera exposure without getting over or under-exposure.

Now, the sole object of correct exposure is to get the varying amounts of light reflected from the subject represented on the plate by densities between the crosses, and various plans have been devised for estimating the value of the four varying influences of plate, diaphragm, subject, and light, and from these estimates deducing the exposure to give. The ever-varying light was the influence which first attracted attention, and Vogel, about 1873, drew up a table of rough estimates of the value of light at different hours of the day and at different seasons. The slide gives a condensed idea of this table, which was followed in principle by Scott, Hurter, Driffield, and others. It suffers from the grave disadvantage that any variation from the average light caused by dull weather, clouds, or clear atmosphere has to be allowed for by personal judgment. In 1887 Burton published a rough estimate of exposures for different subjects in bright and dull lights. Burton expressly stated that this table was a rough guide only, and as an accurate classification of subject, it is open to the objection that it really includes the lighting also. Thus, a stone font in the interior of a church would be classified as 100 to 800, whereas if the same font were in the churchyard it could only be classified as "landscape with foreground" as 2. The Vogel (or Scott) light tables were soon combined with Burton's light tables, and with the necessary table of variation for different sizes of diaphragms, and on these combined tables all the existing exposure tables are based, as well as all those slide calculators in which no light test is made. Now, in all these calculators and tables the variation of the light from the average and also the lighting of the subject has to be estimated, and the human eye is notoriously ill adapted for estimating the actinic value of the light. For a good many years actinometers have been used by a few advanced photographers. In these instruments the relative value of the light is given by the time a strip of sensitive paper takes to darken to a standard tint, and, other things being equal, the exposure will always be in proportion to this actinometer time. Since Abney adopted bromide paper instead of chloride paper for actinometers, their readings have been found to be reliable, even when comparing the dim light of an interior with the bright sunshine outside, and the efficiency is still greater since the steadfast paper (which never assumes a red tint in damp weather) was introduced. Although before the year 1890—the year I invented my exposure meter—several attempts had been made to utilize the reading of an actinometer with the aid of slide rules to estimate the exposure, the mistake had been made, as in Ackland's card calculator, of using Burton's subject classification; and, although the out-door light was tested by actinometer, any variation for woods, interiors, etc., became a matter of estimation. In my system, introduced for the first time in 1890, and now followed by thousands using my exposure meter and one other instrument imitating mine, I, test with the actinometer the light actually falling on the subject, and this being done, the lighting need not be considered in classifying the subject. My system, therefore, is essentially different from the older plan, and does not use the same tables.

Of the *four* factors named on the screen, the first three—light, plate, and diaphragm—need only be considered in most cases. It is only when the reflecting capacity of the subject varies largely from the average that subject need be considered. As regards the classification of speed of plate, this is not the time to enter into the vexed question of plate speeds. Suffice it to say that plates even of one brand vary in speed from time to time, that the Hurter and Driffield system of speed-testing is practically the only precise plan in use, and that although several makers mark all their boxes with H. and D. speed numbers, the different makers' numbers have different values, owing to want of uniformity in standard light and developer. For some years I have repeatedly tested all the plates on the market, and publish a speed card, giving the relative speeds for my meter. This is kept in type, and new editions printed frequently. As regards the influence of diaphragm, the camera can be regarded as a room lighted by a window (the opening of the lens), the plate being on the opposite wall to the window. In a room 8ft. long lighted by a window 1ft. square, the opposite wall would receive just the same illumination as in a room 8yds. long lighted by a window 1yd. square. Therefore, when an optician marks his stop *f*8 it has a definite value, whatever the focus or kind of lens. Let us now glance at the use of an actinometer in estimating light variation caused by the interference of surrounding objects. (A number of slides were shown, illustrating this point and showing how the actinometer held so as to test the light actually falling on the subject made allowance for various obstructions shutting out the illuminating sky.) I wish to note that in my exposure system I make no variations in the value of the subject caused by these changes of lighting. In the exposure-table plan, a varia-

tion of at least one to 100 would be required for the subjects illustrated, ranging from landscape to interior. In my system I value all subjects of average colour, whether they are landscapes, buildings, portraits, or interiors, at 100, and it is only when there is exceptional variation in reflecting capacity of subject, as snow scenes, sky, sea, or white objects, that variation need be made on account of subject. (Slides illustrating the different subjects for which a variation in subject value is required were thrown on the screen.) Where the camera has to be racked out for copying near objects or for enlarging, a fifth factor, which I term *f* has to be considered, and here the extra *f* scale in the standard meter becomes useful. In the simpler pattern meters even the subject scale is omitted, and it is presumed that the subject value is 100, as it is in nine cases out of ten. In the tenth case a variation from indicated exposure can easily be made.

CALCULATING WITH SLIDE RULES.

Now let us see the principle by which the variation for plate, diaphragm, and light can be calculated in practice. These three factors, with the final one of exposure, are the smallest number which can be considered in any exposure meter. The means of calculating is always based on the ordinary slide rule, and countless variations can be made on this. (A lever slide illustrating the calculation was shown.) It is easy to devise a bogus simplicity by reducing the number of the scales, but the trouble in using a meter is in hunting out the four values, and I have always thought that it is really most simple to provide a separate scale to each factor. The meter can then be set for the two factors, plate and diaphragm, which may not require alteration that day, and only the figures for light and exposure have to be sought for. Where two scales only are provided, all four values must be hunted out each time. In the dial meter—(an illustration of working this was thrown on the screen)—only the figures actually wanted appear in sight, and the meter remains set for plate and diaphragm. The eye is therefore not confused with a large number of figures.

RELATIVE STANDARDS OF SPEED.

As at different times articles have appeared in the "British Journal Almanac," giving the supposed relations between the speed values in my meter and those in the Wynne meter, I presume that the comparison has some interest. I throw on the screen an illustration of the slide rule calculator which, in conjunction with a separate actinometer, was the first exposure meter issued by Mr. Wynne. It came out in 1893—three years later than mine. Simple numbers are used to express the speed of plate; the standard of speed is identical with that in my meter, and the result of a calculation with the same figures is the same. For example, my standard for a plate speed *l* was that with *f*8 and two seconds actinometer time (best summer light), it would require for an average subject two seconds exposure. The Wynne slide rule, which is an application of the ordinary carpenter's slide rule, gives the same result, the central row of figures serving both for actinometer seconds and for exposure seconds. This identity with my system can be verified by reference to the illustration of the slide rule in the "British Journal Almanac" of 1894, page 820. As Mr. Wynne selected the Manchester Amateur Photographic Society as a medium of relating how *he* worked out the plan of his instrument, I feel bound, also, to record the fact that in a letter dated September 1st, 1892, Mr. Wynne, in ordering a refill for my meter, mentions his having used two previous refills, and winds up: "I find it very useful and reliable." In the subsequent watch-shaped exposure meter issued by Mr. Wynne, he omitted the third row of figures, and without making any changes in his (or, rather, my) standard of calculation, he now called the speed previously called *l* by the name of the *f* value opposite it on the scale, namely *f*8. The corresponding values of Watkins' plate speeds and Wynne's plate speeds can, therefore, always be found opposite each other in the illustration in the almanac I have mentioned.

INTERIOR WORK.

When photographing indoors the length of exposure has long been a difficult problem, which the exposure tables scarcely attempt to solve. The judgment of the eye, too, is apt to be at fault in dealing with feeble lights, and it is in this work that old and experienced photographers have most frankly acknowledged their indebtedness to the actinometer. Practically, however, no one cares to spend the time in testing indoor light before making an exposure; and it was my introduction of the plan of using such a stop in the lens that the actinometer and camera exposure should be equal, which brought the actinometer, or exposure meter into use indoors. With this plan the actinometer is placed in one of the darkest parts of the subject, and the lens uncapped at the same time, and left uncapped until the paper darkens to tint. A quarter tint suitable for this plan is provided with all meters and the new actinometer. With Ilford ordinary and *f*22, the camera exposure will always be the same time as the darkening to quarter tint.

Using rapid plates and modern anastigmat lenses, we sometimes want to use a larger stop than that proper for the quarter tint. The first visible darkening of the sensitive paper is equal to a sixteenth tint, and with a rapid plate of 150 on my scale *f*22 can be used and the camera exposed for just the time which elapses before the paper commences to darken.

PINHOLE WORK.

Good photographs can be taken without a lens, by means of a pinhole aperture, and the exposure for these can be calculated with exactness. I show a few examples. For every distance from plate to pinhole there is a sizehole which gives the best definition. In the little book, "Exposure Notes," I give a table of the right sized sewing needles to make these holes for each distance, and also the diaphragm, which has an area of 60 times the pinhole.

HAND CAMERA WORK.

It does not seem, at first sight, advisable to calculate exposures for snap shots, but I found, working in Switzerland, with a shutter adjustable to slow speeds and a Stigmatic lens opening to *f*6, a great comfort in the little hand-camera calculator screwed to my camera, telling at a glance what shutter speed to use with a particular stop, or vice versa. Here is a scene taken with slow shutter in the dark shadow of pine woods, which I should not have attempted if the actinometer and slide rule had not told me it was feasible. (Other instances of the use of the meter amongst the towns and glaciers of Switzerland were shown, both snap shots and time exposures being developed together by timing only.) I will now give a few illustrations of three-colour work, in all of which I used the actinometer for determining the exposure through the blue screen. In concluding this outline (for much is omitted) of systematic exposure, let me remark that I deal only with the tools of our science, and not with that distinct branch, the artistic use of the tools. A man may use over or under-exposure for artistic effect, but let him not despise the methods providing a definite standard, which he is at liberty to follow or not, as the mood seizes him.

ALFRED WATKINS.

G.E.R. MECHANICS' Institute, Photographic Section.—The following are the awards at the ninth annual exhibition:—Class A: Silver medal, No. 6, J. K. Ayling; bronze, 39, C. S. Bent. B: Silver, 67, T. A. Smith; bronze, 52, A. Woolford. C: Silver, 97, T. R. Bourne; bronze, 92, A. Woolford. D: Silver (withheld); bronze, 115, T. A. Smith. G: Bronze, 153, P. J. Perry. H: Silver, 199, H. W. Bennett, F.R.P.S.; bronze, 177, J. K. Ayling. Lantern Slides.—Class F: Silver medal, No. 149, T. A. Smith; bronze, 137, A. Woolford. I: Silver, 219, H. Hill; bronze, 210, R. W. Harvey. Class E: Silver medal (withheld); bronze, No. 133a, A. Woolford.

REVERSAL OF THE PHOTOGRAPHIC IMAGE AND ITS SUBSEQUENT DEVELOPMENT IN ACTINIC LIGHT.

[A paper read before the Photographic and Micr oscopic Section of the Franklin Institute.]

Prof. Francis E. Nipher, during the past year, presented several communications to the Academy of Science of St. Louis that have renewed the general interest in the subject of sensitive silver salts and their characteristic behaviour to the action of actinic light. The peculiar fact that these silver salts have the property of assuming a certain physical condition that makes them particularly susceptible to the action of reducing agents, and also that an extended exposure to actinic light brings about a reversal of this peculiar physical condition, were facts that had been observed long before Professor Nipher made his interesting communications. The feature of his experiments that was original, and that was all that Professor Nipher claimed to be original, is the possibility of developing these reversed photographic images in actinic light. The statement of this fact, when first made, appeared to be so different to what we were accustomed, in ordinary photography, that it created widespread attention, and caused numerous experiments to be made along the same lines.

Following up a suggestion that was made before the Photographic Section of the Franklin Institute some two months ago, I made several experiments along these same lines. These experiments appeared to me to be interesting, and to some extent also instructive. Professor Nipher, in one of his early communications, states that a photographic plate, even after it had been exposed for weeks to diffused daylight, would still give an image if exposed to the direct spark discharge of an induction coil or a static machine, and subsequently developed, either in the dark room or in bright daylight. To test this statement I allowed several pieces of damaged photographic plates to lay exposed to bring light for ten days or two weeks, and then subjected them to a spark discharge, the resulting electrographs were then developed in bright light, and, in each case, the resulting picture showed the action of the electric spark clearly. In one case, shown here, a coin was placed in the centre of photographic plate and connected with one terminal of the induction coil. In the resulting picture we see plainly the radiations of the spark in all directions. The most interesting part of this particular experiment, however, is the fact that the area immediately under the coin and a very narrow zone around it has been completely reversed, while the spark radiations, with few exceptions, show dark against the fogged background of the plate itself. Following up Professor Nipher's own experiments, I exposed a very sensitive photographic plate under a positive, in this case a dense lantern slide, for five minutes and then developed the same at a window with northern exposure, using an old metol-hydroquinone developer without any further restrainer. The resulting picture makes a presentable lantern slide, and represents fairly the condition of the original positive. To get an idea of the length of time necessary to obtain the best results under similar conditions, I interposed between the plate and positive a piece of heavy black paper. By withdrawing this paper gradually, I was able to make on the same plate exposures of one, two, four, and eight minutes. As will be seen by an inspection of this picture the portion of the plate that has not had any exposure under the positive is entirely opaque; that portion that was exposed for one minute is very dense, but the portions of the picture representing the deepest shadows in the original picture are not entirely reversed. The portion of the plate exposed for two minutes is next in density, and here we have complete reversal of all portions of the picture. The parts that were exposed four and eight minutes respectively, are not nearly as dense and differ but little in their general appearance. This is a feature that should especially be noted, as it appears to me to be evidence of a protective influence of the upper layers of changed silver salts, similar to what we would naturally expect to have had in the plates that had been exposed to diffused daylight for weeks. This experiment was gone over on several occasions, with uniform results. Even in cases where the highest exposures were as long as an hour, or the equivalent of many hours' exposure in a camera, the high lights came out quite clear, barring the general vagueness that we see in all reversed pictures.

A series of exposures made with a camera were, however, of even greater interest to me showing, as they do, the very great range of exposure that is possible with rapid photographic plates under practically the same conditions of illumination and development. The subject was Girard College in bright sunlight at or near mid-day. The first picture is a negative made with an exposure of approximately half a second, using a Beck wide angle lens having a 128 stop. The resulting picture developed with fresh normal metol-hydroquinone developer, came up to its present density in a little over four minutes after being placed in the developing solution, and is, if anything, a little overexposed. The next picture had exactly the same amount of exposure with a 16 stop, giving it approximately eight times the amount of light of the first; the plate developed very much more rapidly, but is still a very fair negative. The next one of the series was exposed for five seconds under exactly the same conditions as the previous one, using the 16 stop, and the result is still a negative, though rather thin; but when we consider that it has had 80 times the light that the first negative had, we will appreciate that the possible range of exposure is really remarkable. The next plate had an exposure of 50 seconds, and shows traces of general fog; you can see, however, that there are distinct traces of reversal; the high lights are completely reversed and almost clear. This plate would probably come somewhere near the so-called zero condition, where the positive and negative conditions of the plate would nearly balance each other, and give as result of this a general fog. Again increasing our exposure, this time to ten minutes, and developing the picture in the dark room, we obtained a completely reversed picture that is rather dense in the shadows on account of the activity of the developer; under these conditions, this plate did not require more than three minutes in the developing solution, and appeared to flash up very rapidly. The next picture was given the same exposure, but developed at an unprotected window having a northern exposure—in fact, the same window from which the plate had been exposed in the camera. This required eight or nine minutes to develop, and the conditions of the development were quite different. When the plate was first taken from the camera there was plainly seen a distinct outline of the picture as a negative. On placing the plate in the developing solution this negative image gradually faded until the plate was perfectly blank, then the edges of the plate that had been protected by the holder began to darken, and following this the positive image gradually but slowly developed, the process requiring at least three times the time that was necessary in the dark room.

Some further experiments were made with a view of testing the action of various reducing agents; the exposure in these cases was 25 minutes, and more or less satisfactory results were obtained by using pyrogallic acid, amidol, eikonogen, metol, metol-hydroquinone, and hydroquinone as the reducing agents. The first four did not give very satisfactory results, as their action appear to be too rapid and rather irregular; the fifth was the developer used in the experiments alluded to above; while the sixth, hydroquinone, was used with and without an alkali, with interesting results. The first picture, which I show you, had the normal amount of alkali, as advised in the

formula given by the manufacturer of the plates that were used. This plate shows up quite clearly and is quite black. The next plate was developed with a developer having but half the amount of alkali, and, as you can see, it has a distinctly brown cast of colour; it was also slower in development, although not markedly so. The third plate was developed without the addition of any alkali, and presents a reddish-brown appearance in colour, though sharp and distinct in all details of the picture. Speculation as to the principles involved in these processes are perhaps out of order, but it appears to me as though the action of light on sensitive silver salts was in the first stage a purely physical one, disarranging the equilibrium of the molecules of the silver salt and making them susceptible to chemical reducing agents; prolonged action brings about a chemical change that produces opaque metallic silver or a silver oxide, and this in turn protects the silver bromide molecules immediately below it from further action of light; the physical change is going on in other portions of the plate, and these in turn are susceptible of reducing by proper chemical agents, while the portion that has been acted on chemically is not. The change brought about by reducing agents is much more intense and opaque than is that produced by light, thus giving us a dark picture against a grey or hazy background. As evidence of this I would say that so far I have not seen any reversed pictures in which the highlights were represented by perfectly clear glass. More evidence that the ultimate action of light is chemical is found in the fact that we may expose a plate under a negative for a sufficient length of time to produce the outlines of the picture distinctly, then fix the resulting plate in hyposulphite solution and still retain the faint outline of the positive, and this in turn may be intensified so as to be distinctly visible. Under proper conditions we would no doubt be able to make photographic negatives in this way without the use of a dark room; that is, by first dissolving out the unchanged silver salts in a fixing bath, and subsequently intensifying the very weak but distinct image remaining on the resulting plate.

M. I. Wilbert.

THE PATENT LAW AMENDMENT BILL.

Professor Sylvanus P. Thompson writes to the "Times" to urge the desirability of embodying in the new Patent Bill a clause to remove an anomaly which exists under the present law. At present, Professor Thompson points out, any man who brings before any of the learned or scientific societies any discovery that he may have made forfeits, unless he has previously filed an application for a patent, all rights to take out such patent." The scientific instinct is to publish and make available for further development at the hands of other scientific men any discovery that may have been made. The learned and scientific societies and the chartered professional bodies form tribunals capable of understanding and criticising advances in knowledge or in its applications that may be brought before them. But the very fact of bringing any invention thus before the view of the persons most competent to appreciate it has, under the present law, the effect of vitiating the validity of any patent which the inventor may subsequently take out. In the Patent Act of 1883 there was inserted a clause giving inventors the privilege of exhibiting an invention at an exhibition without any such forfeiture of the right of subsequently taking out a patent for it. One would have thought that the case of the learned and scientific societies was much stronger, in view of the professional scrutiny and discussion which the presentation of new discoveries evokes at their meetings.

"The inequitable operation of the present law might be illustrated by many cases. When the late Professor Hughes, in 1898, read before the Royal Society a description of that marvellous invention the microphone, he was by that act of publication debarred from securing any patent; while, by the irony of fate, others stepped in and took out patents for special arrangements of two, three, or more microphones, and sold their patents for thousands of pounds. The United States patent law is much more reasonable in this regard; it permits a scientific man to appeal to the proceedings of the learned societies as evidence of his title to have made the invention. Thus, when Principal Oliver Lodge seeks an American patent for the wireless telegraph, he is able to appeal to the proceedings of the Royal Institution or of the British Association to show how, in 1894, he used a coherer to relay the electric waves in the ether to a telegraph instrument. That he then supposed the limit of wireless telegraphy to be a few hundred yards is not to the point. He actually showed wireless telegraphy in operation, and is granted subsequently an American patent for this invention. But the very records which thus establish beyond all cavil his prior rights are, under British law, held to preclude him from having a valid patent; and so a foreigner steps in to reap where the Briton has sown.

"To remedy this very unjust state of things, and to assimilate the British patent law somewhat towards the American, it is now proposed to add a clause to the Bill before Parliament to the effect that—as in the case of exhibitions—the disclosure of an invention before one of the learned or scientific societies by a fellow or member shall not prejudice the right of the inventor to apply for and obtain protection and a valid patent for the same, provided such application be made within two years. Some such provision would place the scientific bodies in a position of much greater dignity than at present they occupy. The existing law virtually excludes from discussion at their meetings precisely those scientific topics in which advance is most imminent. It hampers the early and rapid diffusion of such scientific knowledge as may be new, since it robs the discoverer of all chance of pecuniary reward if, in the interests of scientific progress, he publishes that which he has discovered.

Exhibitions.

THE KODAK COMPETITION.

An exhibition is now being held at the Kodak Company's gallery, 40, Strand, W.C., of the prize-winning photographs and enlargements in the recent competition for prizes amounting in value to £300. Included also is a selection from the 22,000 photographs sent in, the total number of the exhibits being about 3,000.

If any proof were needed that the Kodak system of photography, in the hands of a capable photographer, is capable of pictorial work of the highest excellence, a visit to this exhibition would afford it. It was not a condition of the competition that the entire work of the production of the picture should be done by the exhibitor, so that presumably in many cases the exhibitor's part consisted in selecting the subject and pressing the button, the rest being performed by a professional photographer; but this fact, although it may prevent us from determining the precise amount of credit due to each exhibitor generally, in no way prevents us from recognising the capabilities of the instrument and material.

The competition was divided into three classes: for photographs 3½ by 3½ inches and under, for direct photographs over that size, and for enlargements. The last-named class is distinctly the most interesting, and some of the work included is of great excellence. It is undoubtedly the fact that Kodak film negatives, probably owing to their usual freedom from harsh contrasts, are generally suitable for enlargement. The size of a picture is not, theoretically, to be taken into consideration in appraising its merit, but in a gallery a small picture which requires very close inspection is apt to suffer in comparison with one of greater area, which can be viewed from a convenient distance, and as there is ample scope in bromide paper for variety of treatment, by choice of the surface or tint of the paper, by toning the image, or by modifying the definition by means of a gauze screen or otherwise, the gain in size need not be at the expense of other desirable qualities.

In so large a collection of photographs brought together under such circumstances, that a large proportion should be of the kind best described as lucky snap-shots was inevitable, nevertheless instances are not rare of photographs which show serious intention and pictorial aims. Since the last great exhibition of Kodak work a great improvement is shown in the general get-up of the prints. The ordinary glazed gelatino-chloride print is, of course, the popular fancy, but in the better style of mounting, and often in the adoption of a printing process suitable to the subject, there is evidence of an improvement in taste.

Thirty-five prizes were awarded in each class, varying in value from a cash prize of £15 downwards. The judges were Sir William Abney,

Mr. Craig Annan, and Viscount Maitland. The exhibition is a most interesting one. It is open, free, daily, and those who have the opportunity should not omit to pay it a visit.

THE WOOLWICH PHOTOGRAPHIC SOCIETY.

The Woolwich Photographic Society draws, to a great extent, its membership from the employees of the Arsenal, and the activity in that great manufactory of weapons and materials of offence and defence consequent upon the war, for the past two years, has greatly curtailed the opportunities of those who are employed there of practising the arts of peace such as photography. It is scarcely to be wondered at, therefore, that the seventh annual exhibition, which was held on the 13th, 14th, and 16th inst., at the St. John's Lecture Hall, Wellington Street, Woolwich, did not show that marked advance over its predecessors that we should have desired to record. Making reasonable allowance, however, for circumstances which particularly affect this society, the show was a creditable one, and this in spite of the absence, or unrepresentative character of the work, of several of the members, whose exhibits in former exhibitions have had the effect of greatly raising the average. Thus, Mr. J. Churchill, President of the Society, and J. Borthwick Panting had only one picture each, and W. H. Dawson, whose architectural subjects were interesting in character and well chosen, although they were printed in carbon, had managed to get his prints so wanting in force that their effect was seriously marred. Some of the less known members of the society showed work of promise. W. H. Parker had commendable pictures. G. Tapp and A. Lees evidently possess that feeling for nature which is essential to pictorial work, and, with greater experience in managing their material, should succeed in rising above the average. Douglas English's natural history studies are too well known to require comment. J. E. Brown deserved credit for the technical excellence of his enlargements, and J. Dear, B. G. Bishop, and G. Meinertzhagen also deserve a word of praise.

Following its usual custom, the society offered no medals or other prizes, and it speaks well for the *esprit de corps* of its members, that from year to year they can get together so admirable a collection of pictures, with no other inducement than the desire for the well-being of the society.

A PHOTOGRAPHIC SURVEY OF SURREY.

THE following corespondence on this subject (see Mr. H. D. Gower's letter in this Journal of March 7th) has recently appeared in our contemporary, "The Croydon Advertiser":—

"I hope that Mr. Gower's admirable suggestion as to the inauguration of a photographic survey of Surrey will bear immediate fruit. It is needless to dilate in these days, when the preservation of every sort of printed and pictorial record is beginning to be looked upon as simply an act of civilisation, upon the exceptional interest and value of a photographic panorama of the Surrey of the present moment, its topography, natural history, and sociology. No county is undergoing more rapid transformations, and in no county consequently is the need of such a survey more urgent. The county seems peculiarly adapted to the work of a survey—it is small, it is full of interest, and there must be a very large number of enthusiastic and able photographers within its borders. So far as we are concerned, I feel sure that the Libraries Committee would willingly provide proper storage for the prints in the Reference Library. And in the meantime, the committee will be glad to receive any *permanent* photographs relating to Surrey—scenery, objects of interest, notabilities, or happenings. Nothing is really too trivial in this connection to be worth preservation. May I in particular ask the photographers of Croydon to look over their negatives and send me prints of Croydon persons or things or events? " L. STANLEY JAST.

"Town Hall, Croydon."

"I was very glad to see Mr. H. D. Gower's letter on the above subject, and, backed up as he is by Mr. L. S. Jast in your last issue, it is to be hoped that some useful and permanent records of our beautiful county may be obtained. Good results have already been achieved by at least two counties—*i.e.*, Warwickshire and Worcestershire, and it is a source of gratification to find that Croydon proposes to take the initiative in regard to Surrey. As Mr. Jast truly says, very great and important changes are taking place in many parts of the county, and we all know how rapidly this is going on in the vicinity of Croydon, so that there is no time to be lost in commencing work. Doubtless much material already exists and only wants finding. Your extensively read paper is therefore doing good service in allowing letters to appear on the subject. I believe it is proposed to shortly form a committee to fully consider the matter and to suggest the best methods of dealing with it. Meanwhile, most of the principal towns in Surrey have a photographic society, and these can form a series of nuclei from which to start the survey.

"It should be noted that photographs for this purpose must be accurate presentations of what is seen, and not distorted views: the lens used must not be too long nor too short a focus—about seven or nine-inch would be about right—a scale should be used, and full particulars as to locality, etc., should also be given; but information on these points will no doubt be issued by the committee. It is most likely that other towns, such, for instance, as Guildford, Reigate, Dorking, etc., will wish to have collections of photographs as well as Croydon. In such cases an admirable opportunity would be afforded for an exchange of prints; these prints, by the way, should be *permanent*, and to this end only bromides, carbons, or platinotypes should be used, and *not* silver prints. Another point to notice is that prints such as these, which are more or less of a scientific character, need not be of the class usually called pictures; accuracy is the point to be aimed at. " J. H. BALDOCK.

"St. Leonard's Road, Croydon."

New Apparatus, &c.

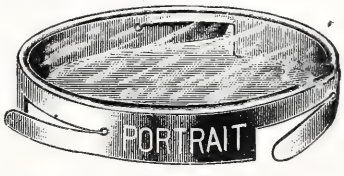
Schering's Cartridge Developers. Wholesale agents: A. & M. Zimmermann, 9 and 10, St. Mary-at-Hill, E.C.

We have received samples of the developers which Messrs. Schering are putting up in the now-popular form of cartridges. The following report of the Board of the Imperial Graphic Experimental Institute of Vienna indicates their characteristics:—

"The cartridges, which consist of cylindrical tubes containing the developing agent, separated from the alkali by a small piece of cotton wool and a wooden plug, are carefully packed and neatly got up. For use, the contents of a cartridge must be dissolved in 4oz. to 5oz. of pure water. The solution was obtained quickly, and our experiments showed that the developer may be favourably compared with freshly-prepared developers, made according to the best formulæ for adurol, hydroquinone, and pyrogallic acid. With the developers procured from Schering's cartiridges, negatives of beautiful colour, great clearness, and fine gradation were obtained. These cartridge developers, on account of their compactness, easy handling, and ready solubility of contents, are specially suitable for travelling photographers and amateurs."

The Aptus Supplementary Lenses. Manufactured by Sharp & Hitchmough, Dale Street, Liverpool.

These lenses are made in various sizes to fit the hoods of rapid rectilinear lenses from 1⅛in. to 2in. in diameter. There are three series. The Tele-photo series, as the name indicates, is to increase the size of the image of distant objects, or practically to lengthen the focus of the lens. In using the attachment the enlargement of the object is about one-third. The Wide-angle series perform precisely the opposite function; the original focus of the lens is shortened, and a greater amount of view is included, so that a lens of ordinary angle is rendered available for such work as photographing interiors. The Portrait series is intended



for use when the extension of the camera bellows is not enough to enable, say a head and shoulders, to be obtained at a given distance from the sitter. It is not to be supposed, of course, that the use of supplementary lenses of any kind can entirely supersede instruments of precision, but the Aptus supplementary lenses are undoubtedly as efficient a substitute as can be devised, and to those who are not fortunate enough to have deep pockets they will prove an inexpensive and very useful addition to the photographic kit.

Vignette and Border Negatives. H. & W. Green, Crown Photo Manufactory, Rotherham.

It is occasionally desirable to print a photograph with a border, and to make a negative for the purpose of printing the border requires both time and ingenuity. On such occasions these negatives should come in useful. The negatives are sold in packets containing seven, assorted in design and size up to ½-plate, and included are the masks and discs necessary for their use. The prints submitted to us as specimens of the results obtained are quite satisfactory, and the method is so simple that the least experienced could hardly fail.

Bromide Toning Outfit. John J. Griffin & Sons, 20-26, Sardinia Street, Lincoln's Inn Fields, W.C.

The outfit consists of two sets of glass tubes containing the necessary chemicals for producing brown or red tones in the one case, or blue or green tones in the other. Each outfit contains sufficient material for making 12oz. of each toning bath, and the solutions may be used over and over again. For making the red and brown toning bath it is necessary to dissolve the contents of the double-ended tube marked "red" in 12oz. of water, then adding the contents of the vial labelled "acid for red." On immersion the print assumes first a brown, then a sepia, and finally a red tone. The time of immersion thus controls the colour. The green and blue bath is mixed in a similar manner, using the corresponding tube and vial, and the prints first become green and finally deep blue. In

the instructions the method is given for obtaining various colours on the same print, so that it is not difficult to obtain a photograph approximately in the colours of Nature. It is claimed that the results are permanent, provided that the print be thoroughly fixed and the hypo completely eliminated. Apart from the use of the toning baths for their intended purpose, an interesting application of them will occur to everyone in performing feats of what is sometimes termed natural magic.

Marion's P.S. Dry Plates. Manufactured and sold by Marion & Co., Ltd., Soho Square, London.

We have received a sample of these dry plates from Messrs. Marion & Co. for trial. The series P.S., for pyro-soda development, is one of extreme rapidity, exceeding that even of the instantaneous series. The sample we have tried bears the H. & D. No. 250, and the rapidity of the plate may be judged by the standard of the "instantaneous," which is given as 120 to 200 H. & D. We timed the exposure at 1-10th second, with lens stopped down to f/32, and in very bright light obtained a fully-exposed street negative full of detail. Another trial, in a room, with the sitter at 10 feet from the window, and the lens at an aperture of f/12.5, gave a fully-exposed portrait with 4 seconds' exposure. The plate is free from any trace of fog, and, considering its rapidity, surprisingly fine in grain. The exposures were calculated with the Hurter & Driffield actinograph, and we feel it a duty to express our warm approval of the reliable manner in which Messrs. Marion & Co. have carried out the system. The P.S. plate will be much appreciated for portraiture in dull weather, and for other purposes where speed is essential.

The Tixit Mountant. Manufactured and sold by the Vanguard Manufacturing Company, Maidenhead.

At first sight, the wickered jar that was deposited on our table one day this week raised a momentary suspicion in our mind that the contents were of a different nature to the reality, viz., Tixit, the Vanguard Company's well-known mountant. The Doulton jar is of one-gallon capacity, with a bayonet-clutch, airtight lid, and the retail price of the jar, mountant, and wicker basket is 10s. 6d., refills of the mountant



costing 7s. 6d. Professional photographers who use large quantities of Tixit will, no doubt, appreciate the opportunity of obtaining it in well-protected bulk; similarly, the system may appeal to dealers retailing small quantities. Tixit, as we know from practical experience, is a reliable preparation for mounting purposes, and we have no hesitation in giving it the heartiest recommendation to our readers.

Kodak Novelties.—Messrs. Kodak, Limited, 43, Clerkenwell Road, E.C., write:—"We take the opportunity of drawing your attention to a new competition we have organised for work upon our sensitised postcards. Full working instructions and a couple of masks are included in each packet of Kodak sensitised postcards. We are now introducing a Kodak which is adapted for stereoscopic pairs of pictures 3½in. by 3½in., or for taking single 3½in. by 3½in. exposures. The new Kodak is thus two cameras in one. As a stereoscopic instrument, it combines the daylight-loading feature with stereoscopic photography in its simplest and most convenient form. The No. 2 Stereo Kodak is of the ever-ready box-pattern, requiring no unfolding or other preparation when a photograph is about to be taken. The shutters are ever-set, and are adapted for giving time and instantaneous exposures. A spirit level is attached to the camera, and a large brilliant finder shows exactly the scope of view. The rapid rectilinear lenses are provided with sets of three stops simultaneously regulated from the outside of the camera. Kodak Film Developing Clips.—These appliances have been introduced by us with a view to facilitating the handling of our film when developing, and they render immersion of the fingers in the developing solutions unnecessary. These clips somewhat resemble the ordinary paper clip, but are much more powerful, and are provided with teeth, which hold the end of the film securely. The developing clips are heavily nickelled, and are thus unaffected by, and do not affect, the photographic fluids. The clips may be left attached while the film is driyng, and thus serve to keep the film flat. Reduction in Price of the Kodak Push Pin.—We have pleasure in announcing that we are now prepared to supply these pins at 6d. per box of twelve. Kodak Glass Plate Cameras (for ¼-plate and 5in. by 4in. pictures).—We are now introducing a series of glass plate cameras. These cameras will shortly be placed upon the market."

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

March	Name of Society.	Subject.
22..	Liverpool Amateur.....	Excursion to Burton. Leader, Dr J. W. Ellis, F.E.S.
24.....	Croydon Natural History	Mr. Rudler's Tenth Lecture.
25.....	Birmingham Photographic.....	*Gum Bichromate Process.* Mr. J. Page-Croft.
25	Croydon Natural History	Zoological.
25.....	Newcastle-on-Tyne.....	*Daguerreotypes.* By Walter Corder, J P.
25.....	Leeds Photographic Society ...	*Oxfordshire, Warwickshire, English Lakes, Yorkshire, &c.* Illustrated with New Lantern Slides. Mr. Godfrey Bingley.
25.....	Thornton Heath Polytechnic...	Demonstration. *Lantern Slide Making.* By H. E. Holland, Esq.
25.....	Stonehouse Camera Club.....	*Carbon Printing.* Mr. S. H. Paynter.
26.....	Southsea Photographic Society	*Lantern Slide Views of the Isle of Wight.* Mr. E. H. Purvis.
26.....	Photographic Club	*A Trip up the Rhine with the South London Society.* Mr. W. F. Slater, F.R.P.S.
26.....	Liverpool Amateur.....	Excursion to Bridgnorth. Leader, Dr. J. W. Ellis, F.E.S.
27.....	Rodley, Farsley, and District...	*Films.* Mr. J. Ross.
27.....	Darwen Photographic	*Pictorial and Decorative Work on Austin-Edwards Films and Warwick Plates.* By Walter D. Welford, Esq., F.R.P.S., London.
27.....	Brentford Photographic	Result of Exhibition and Summer Arrangements.
27.....	Oldham Photographic Society	Lantern Lecture. *What can be done with a Hand Camera* (Goerz). By a Member.
27.....	London and Provincial.....	Lantern Night. *Spain.* Mr. Beckett.
28.....	Borough Polytechnic.....	*Carbon Printing.* Mr. P. C. Cornford.

ROYAL PHOTOGRAPHIC SOCIETY.

March 11th.—Ordinary meeting. Mr. Thomas R. Dallmeyer, president, in the chair.

The president referred to the consent of the Prince and Princess of Wales to become vice-patrons of the Society, to which we alluded in our issue of last week.

A ballot took place, and six candidates were elected members of the Sociey.

The president announced that the council had admitted to affiliation the Farnham Royal Photographic Society and the St. Albans Photographic Society.

The president said that he was sorry to announce that continued indisposition prevented Dr. J. W. Swan from personally attending to receive the silver Progress Medal awarded to him by the council. In directing the secretary to convey the medal to Dr. Swan, the president remarked that his name was too well known to need more than a passing reference to his achievements. The particular service to photography for which the Progress Medal was awarded was the invention of the carbon transfer printing process now known as Autotype. Dr. Swan was an eminent scientific man in other fields: in electricity and chemistry, in collodion, and, further still, in the introduction of the rapid gelatine dry plate upon the market. Photographers must always owe a debt of deep gratitude to Dr. Swan for his various discoveries and experiments which had been so beneficial to photography and to photographers.

Dr. G. Lindsay Johnson, M.A., F.R.C.S., read a paper entitled.

"A Century's Progress in Colour Photography and the Knowledge of Colour Vision."

At the outset he pointed out that it was exactly a century ago that Wedgwood, the father of the potter, gave an account of a method of copying paintings upon glass and of making profiles by the agency of light upon silver nitrate. Dr. Johnson thought that the day should not pass without some notice of this important centenary, inasmuch as the paper laid the foundation of that epoch-marking discovery that has since developed into the science of photography.

Dr. Johnson proceeds to notice the fact that, during the early days of photography, if the observer's eye were placed in a line with the rays reflected from the Daguerreotype photograph, one could frequently detect not only the tints of the face and hands in a portrait, but often the colours of the hair, dress, and ribbons. The phenomenon was not inquired into, however, and with the advent of new processes it was forgotten. Lippmann's discovery of his well-known and beautiful colour process was nothing more than a development of this phenomenon. He was the first, however, to explain the principle upon which the phenomenon hinged, as that of interference of the reflected waves with the impinging waves of light. The practical details of the process were given at length, but we do not repeat them here, Dr. Johnson's paper has its chief interest in that portion wherein he endeavours to prove an analogy between the Lippmann colour process by interference and the phenomena of colour vision. It is generally taught that images of objects are formed on the retina, and there in some way stimulate the rods and cones, producing curents which convey to the mind the form and colour of the objects in question. No mention is made of the choroid, nor does the theory account for the fact that the terminals of

the rods and cones are turned from the source of light. Now, in studying the eyes of animals, Dr. Johnson was struck by the amount of colour at the back of the eye and behind the retina. He assumed that those colours were for some useful purpose, and, as the result of further investigation, came to the conclusion that Lippmann's theory was closely parallel with that of colour vision. In Lippmann's case there was the lens, the dark chamber, and a sensitive surface of silver turned from the lens and in contact with a highly reflecting metallic mirror. In the eye there was the crystalline lens, the dark chamber formed by the opaque coats of the eye, and the sensitive surface formed by the terminals of the rods and cones in the hexagonal layer, also turned surface of the choroid. The reduction of the silver into distinct from the source of light, and also in contact with the brilliant reflecting laminæ or strata in the substance of the gelatine film is analogous to the series of strata formed by the rods and cones under the action of the light. Lippmann's sensitive plate is transparent; so is the retina of the eye, but how far, of course, the resemblance may be sustained by further inquiry is a matter for the future.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

March 13th.—Mr. J. T. French in the chair.

Mr. R. P. Drage passed round a piece of the first film issued to the public. It was made by Warnerke, and was issued in packets of twelve sheets. Warnerke made a great noise about the film, but it never found general favour, perhaps owing to its excessive granularity. It was a gelatine film, supported upon a yellow paper, and finally on a black paper, which also had on its other side a coating of emulsion. The piece passed round had a positive image upon it, and seemed in a good state of preservation.

Mr. A. Mackie said Warnerke's earliest film was a collodio emulsion film, dating back into the seventies, long before the advent of the film now shown, which could not have been previous to 1880.

Mr. A. Green said that it was brought out about 1884 or 1885, and was packed in a tin box.

Mr. S. H. Fry mentioned, as a fact of historical interest, that he remembered a roll film which he believed to be coated upon thin rubber. He recalled the fact that his father had a number which had been exposed in Algeria. It was made in continuous length of no great length, it is true, but the film was the forerunner of the present-day roller-film.

Mr. Drage also showed the earliest bromide paper issued to the public. It was made by Morgan & Kidd.

Mr. Fry thought that present-day bromide paper was no better than it was ten years ago, except in so far as improved methods of working permitted.

Mr. Wilfred Emery passed round the Blair Camera Company's American-made Weno camera. He called attention to the fact that the back could not fall off, as it was released from the inside and could not be moved until the front was opened. He showed several examples of its performances.

Mr. P. R. Salmon showed a few interesting slides of Turkish scenes in and around Constantinople—the Golden Horn, Galata Bridge, etc. He also showed some slides by Mr. Graystone Bird, of Bath, which included landscape and figure subects, fine cloud effects, etc.

Mr. J. W. Hodges contributed an excellent selection, covering Banbury, York, Oxford, Salisbury, etc.; all architectural studies, a branch of work in which he has achieved much success.

A discussion also took place regarding the use of black paper and glycerine as an anti-halation backing for plates, but the use of it as a substitute for caramel was not much favoured.

PHOTOGRAPHIC CLUB.

March 5th.—Mr. Chas. Wallis in the chair.

Mr. Ernest Human demonstrated the Wellington S.C.P. or slow contact paper variously termed gaslight and fireside paper. Made in smooth and glossy grades it is for contact work alone. The treatment of the paper is similar to that required by other papers of the kind. Mr. Human made several prints, and the members also tried their skill. Some particular attention having been drawn to Mr. Human's method of washing prints by supporting them on a plate under the tap, instead of immersing them in water, the discussion very largely turned on that question.

Mr. Mackie said that the method was not good, because only one side of the paper was washed. He thought that the ideal theoretical washing device would be one in which a deep vessel of water was allowed to come to rest, with the print to be washed suspended just beneath the surface of the water. The hypo, being heavier than the water, would sink and leave the print. Of course, practically, the method was impossible to follow.

Mr. Bridge suggested that more prints faded through insufficient fixing than washing, and other speakers urged a double fixing operation to make certain sure.

March 12th.—Mr. J. R. Gotz in the chair.

Being an open evening, the meeting devoted itself to the discussion of matters of general photographic and kindred interest. Some discussion centred in the question of the speed of papers and plates, and its bearing on half-tone rendering. It was pointed out that slow papers, like that demonstrated last week, would not render half-tones and give such good gradation as a more rapid plate. The matter was one not merely of prolonging the exposure of a slow plate until it equalled a short one with a fast plate, but overcoming inherent characteristics of the emulsion.

LEEDS CAMERA CLUB.

On Wednesday, March 12th, a demonstration of Natural Colour Photography, according to the Sanger Shepherd System, was given by Mr. C. B. Howdill, A.R.I.B.A., president.

After briefly detailing the principles of the Sanger Shepherd process, Mr. Howdill showed on the demonstrating table a mosaic square of leaded stained glass in a variety of colours and tints in a vertical position, with a sheet of white tissue paper stretched over one side. Limelight was projected through it from that side, while at the other side was placed the camera—an ordinary camera, with a special back and slide fitted. This slide carries a plate measuring 8in. by 3 1-3in., and in front of this are placed the three colour screens—particular shades of red, green, and blue respectively—one-third of the plate being covered with the red screen, a third with the green, and the remaining portion by the blue. The slide is on the "repeating back" principle, so that three exposures upon different portions of the plate can be made alternately through the same lens. The first (through the red screen) was exposed for five minutes, the middle part of the plate (through the green screen) for 1½ minutes, and the other end of the plate (through the blue screen) received but 30 seconds' exposure, these being the proportions necessary, according to the actinicity of the light, when passed through the respective coloured screens, the plate used being a Cadett s backed "Lightning Spectrum." Stencil ink, Mr. Howdill remarked, by the way, forms an excellent medium for backing plates.

The plate was then removed from the slide and developed for three minutes in Sanger Shepherd's "Universal" Developer, plus 50 per cent. of added water, at 68deg. F., and fixed. On examination it was found to be slightly over-exposed and somewhat thin. Another negative (ready-dried) of the same subject, taken in the same place, under similar conditions, was then printed from. The blue positive was first made from that part of the negative exposed through the red screen, a Cadett lantern plate being exposed to a gas-flame by contact at about a foot distance for four seconds, developed, fixed, and thoroughly well washed. It was then immersed in a bath of potassium ferricyanide, 1oz., to water, 10oz., for a minute; again well washed, and, while still wet, immersed in the "minus red" (blue-green) bath for one minute, slightly rinsed, and plunged in a clean solution of hypo. It immediately assumed a beautiful blue-green colour, the depth of which is unalterable, hence it is often necessary to make several of these blue positives before the correct depth of colour is secured.

A piece of celluloid film coated with bromide of silver emulsion (an ordinary sensitive film), and further sensitised with bichromate salts, had previously been printed through the "green" and "blue" portions of the negative, with the celluloid side against the film side of negative, having received an exposure of about five minutes to dull daylight, until a faint image, as in the platinotype process, was visible; this having been done because exposure to artificial light would necessarily have been too prolonged for the purposes of demonstration. An attempt was first made to develop this film in water at 100deg., but as it was found to be a little refractory it was further raised to 130deg., which dissolved out all the soluble gelatine in the manner well known to all carbon workers. The silver bromide is then dissolved out by the action of hypo and the film well washed. The result is a clear gelatine relief of the image of different thicknesses, according to the varying action of light passing through the negative on the thin celluloid base. That portion of the film printed through the "green" negative was then immersed in pink stain until it had attained sufficient density of colour—which degree can only be ascertained by trial. The film from the "blue" negative was simultaneously stained yellow. The pink and yellow positives can, in ordinary practice, be intensified or reduced in colour by repeated immersions in the dyes or by washing respectively. When dry, the films were superimposed on the blue transparency, the pink being laid on first and the yellow outside. They were roughly adjusted, held together by means of spring clips, and immediately exhibited in the lantern, the result, although not absolutely perfect, creating at first a murmur of surprised admiration, followed by an outburst of applause. A finished, bound-up slide, previously prepared, of the same subject, was then shown, free from any of these minor defects, although the one produced on the spot was by no means a failure.

The demonstrator then exhibited another example of domestic stained glass—a group of fishes, with brilliant green and pink colouring—and a colour slide made therefrom, side by side, and the accuracy of the colour reproduction was warmly commented upon. He also showed on the screen a few slides by the Lumière process, the brilliancy and delicacy of colouring in which was equisite, and, to my way of thinking, even superior to the process demonstrated. He also showed a large number of slides by the Joly and Sanger Shepherd process.—"The Leeds Mercury."

LIVERPOOL AMATEUR PHOTOGRAPHIC SOCIETY.

The following are extracts from the annual report:—The membership roll at the beginning of the year contained 327 names; the number of new members elected during the year amounted to 39; resignation, lapses, and deaths to 49; leaving 317 names in the books at the end of the year. The coffee meetings held on Wednesday afternoons from four to five o'clock have been well patronised, the informal discussions and interchange of ideas which take place, rendering these meetings exceedingly useful as well as being a means of maintaining the social character of the Association. During the summer months the club-rooms and studio have been re-decorated, and your council desire to place on record the valuable assistance rendered by Mr. James Parkinson, in drawing up the specifications for the work and in superintending its performance.

NORTH MIDDLESEX PHOTOGRAPHIC SOCIETY.

MARCH 5TH, 1902.—Mr. Nightingale demonstrated Velox and Carbona papers.

He toned some fully-printed Carbona prints, and also developed some partially printed; the latter gave warm tones of pleasing colour on simple fixation, while the former gave a great range of tones from brown to black, with the acetate and borax bath recommended by the makers.

With regard to Velox, an underprinted proof with prolonged development gives a soft result, while over-printing heightens contrasts, and often presents a mottled appearance in the lighter tones.

CROYDON CAMERA CLUB.

THE twelfth annual meeting of the above Club was held on Wednesday, 12th inst., a large number of members being present. The president (Mr. Hector Maclean, F.R.P.S.) first briefly summarised what had been done in the past year. Thirty ordinary meetings had been held, the average attendances at which were very satisfactory.

The exhibition held during the year, ending January 31st, had proved decidedly successful, a balance of about £5 in favour of the Club being carried forward by the Exhibition Committee. The outings had been, although few, well attended; the first one of the year consisted of forty members, the concluding one was attended by over 100 members and friends. Four "one man" shows of prints were held at the Club rooms during the past winter. The members who successively displayed their works as above were Messrs. W. H. Rogers, L. G. Kough, W. H. Smith, and R. H. Edgar. The displays in question proved interesting, educative, and stimulating.

From the balance-sheet, which the hon. sec. submitted, it appears the Club is in a flourishing condition, a good balance in hand being carried forward. Mr. J. H. Stanley, sen., was appointed treasurer. Two new gentlemen—Messrs. Edgar and Bennett—appear on the council. Hearty votes of thanks were passed to various members, including Messrs. Rogers, Holland, Noaks, Hicks, Watson, Bennett, Smith, Glanville, and Jenkins.

Mr. Isaac then introduced the feature of the evening, which consisted of the presentation of a handsome salver and cigarette-case to the president. In an admirable speech, Mr. Isaac narrated the history of the Club. It started in a very small way, at the instance of and under the guidance of Mr. Maclean, who consented to occupy the position of president until (as he said) a better one could be found. Needless to say, a better one had not been found. The first habitation was a cellar. From thence the Club ascended to a garret; but, though it rose in the air, its financial position did not rise in a corresponding degree. Rent day came round with monotonous frequency, and the Club funds were not always able to meet it. The president supplied the deficiency. Looking back, Mr. Isaac remembered what a struggle the Club had for a bare existence. Hostility was shown from quarters where it might have least been expected, and, in his (Mr. Isaac's) opinion, the final success of the Club was owing to the persistent and untiring energy of Mr. Maclean. Mr. Holland, too, had come to its assistance at a critical juncture, and had rendered yeoman service.

Amidst loud cheers Mr. Isaac then handed Mr. Maclean the salver and cigarette case, the former being inscribed that it was given "as a mark of appreciation and esteem, of the interest taken by him in the Club, as its president, since its formation in 1890." Mr. Maclean, who was evidently taken completely by surprise, feelingly replied on behalf of himself and Mrs. Maclean, to whom a graceful allusion had also been made.

The proceedings terminated with a strong vocal expression that he (Mr. Maclean) was "a jolly good fellow."

Commercial & Legal Intelligence.

THE Austin-Edwards Monthly Film Negative Competition.—The prize camera for the current month has been awarded to Mr. G. H. Brierley, 27, Conduit Road, Bedford, for his negative "Skating on the Ouse."

THE Cadett Plates and Papers.—We have received from Messrs. Cadett & Neall, of Ashtead, Surrey, the latest price lists of their plates and papers, including a leaflet of discounts to the profession, a copy of which will be sent to any professional photographer on application. We gather from the documents before us that Messrs. Cadett & Neall specially cater for the special needs of professional workers, who are invited to apply for particulars and terms of the firm's productions.

WE are informed that the Third Photographic and Optical Trades Exhibition will be held next month, at the Portman Rooms, Baker Street, London, W. It opens on April 11th, and remains open each day from 12 to 10 o'clock p.m., until April 19th. All the novelties for the season will be exhibited, amongst them being a number of photographic apparatus that have never before been shown. The most important firms in the trade have already taken spaces. Arrangements have been made for a series of attractive and interesting entertainments. There will be half-hour lantern lecturettes and demonstrations by well-known names in photographic circles. In addition, the Imperial Orchestra will be in attendance, and will play selections of music in the main hall at intervals during each day. Smoking and refreshment rooms will also be provided, the catering being carried out by the Portman Rooms Company The admission to the exhibition will be 1s., and there will be no extras for any of the entertainments or demonstrations.

RE H. van der Weyde.—The public examination took place on Tuesday of Henry van der Weyde, photographer, Regent Street. The debtor applied to pass on accounts showing gross debts £13,714, of which £12,627 are unsecured, and small available assets, the debtor having property he was unable to value. In examination by Mr. Grey, Official Receiver, the debtor stated that he was an American subject and held the rank of a major during the Civil War. He afterwards came to England, and started as a portrait painter at South Kensington and also employed his time in inventions. He had filed fifty-eight specifications for patents, twenty of which he had completed. One of them was an electric light for photography, and, being unable to sell it, he, with borrowed capital, started as a photographer in Regent Street, which business he carried on practically to the date of the failure. In 1879 he called his creditors together and paid them 2s. 6d. in the £. Asked what had led to his difficulties, the debtor said it was his weakness for inventing. The photographic business always paid. With regard to two of his patents, companies had been formed, but were in liquidation. Eventually he was sued by the landlord of the Regent Street premises for the rent, and was sold up. The examination was concluded.

A NEW Process Firm.—We are pleased to chronicle the establishment of the new firm of Bond and Haslewood, technical photographers and specialists in trichromatic photography, for it was by the advice of the late Mr. Traill Taylor and ourselves that Mr. Bond decided, many years ago, to devote his attention to process photography. After being some years with Messrs. André & Sleigh, Bushey, when Orford Smith, Ltd., St. Albans, one of the foremost firms of chromo-lithographers, opened a department for three-colour half-tone block making, Mr. Bond accepted an engagement with them. Since then he has initiated three-colour work, with the Printing Arts Company (the proprietors of the Orloff printing machine), and other firms. Recently he was engaged by a noted publishing house to obtain three-colour negatives and diapositives for blocks of pictures in the National Gallery, etc. In reference to a monochrome representation of Constable's "Valley Farm," by Mr. Bond, an artist of repute, of the Corot School, remarked it was the most faithful rendering of the picture he had ever seen, and expressed a similar opinion of an original photograph by Mr. Bond, of "Fen Lane, Flatford." We lately had an opportunity of looking over an extensive collection of three-colour half-tone prints turned out by the above firms, the whole of the photographic work of which was carried out by Mr. Bond, and are pleased to testify to the great excellence of the results. We have received from the firm a price list for commercial and orthochromatic photography; also a process list. From their general technical circular we gather they undertake three-colour negatives, continuous or half-tone, from paintings, articles of vertu and commerce, natural colour transparencies and lantern slides, three-colour, half-tone, and line blocks, orthochromatic work, photo-micrographic, architectural, engineering, legal, and publishers' photography. A distinction in price is made between fine art and commercial jobs. Designs or illustrations can be prepared from customers' rough sketches or notes, or faulty originals improved, at a charge varying according to the amount of work required. They have special lines in large blocks for showcards or posters, and also in photo-litho transfers. The works are situated in Priory Park, St. Albans, but fragile parcels may be left at 6, Ludgate Arcade, E.C.

CASSELL & CO., LTD.—The annual general meeting was held on Tuesday, at the Memorial Hall, Farringdon Street. Sir Henry Fowler, M.P., who presided, congratulated the shareholders on the improvement shown in the accounts, and said that the Company's sales had been larger and expenses smaller than in the previous year. The net profit for the twelve months ended December 31st last was £24,370, and the dividends received from trading companies amounted to £991, against £16,309 and £765 respectively in 1900. An interim dividend was paid last September, absorbing £7,217, and the available balance on this occasion was £13,574, as compared with £9,415 at the annual meeting twelve months ago. It was proposed to add £2,500 to the reserve fund, raising it to £25,000, and to pay a final dividend making 5 per cent. for the year, leaving £248 to be carried forward. Having referred to some of the items in the balance-sheet, he said that the board believed that the literary enterprises undertaken during the past year had been appreciated by the public. The more satisfactory position of the Company's affairs was due, in the main, to their general manager and managing director, Sir Wemyss Reid, whose unceasing devotion to the business had impaired his health. In conclusion, he moved the adoption of the report, which was seconded by Mr. R. Turner. Mr. Lee and another shareholder having spoken, the chairman said that at the close of the year the Company owed £53,000, but this had now been paid off with the exception of £7,000 not yet due. On the other hand, the item of debtors was £79,000, which had now been reduced to £20,000. This balance was also not yet due. The 6 per cent. debentures could only be paid off by drawings at the rate of £5,000 a year. It had always been the policy of the company to have a predominant interest in allied companies, and this explained the investments in trading companies. They were largely interested, for example, in the firm doing this Company's colour-work, including the series of pictures which had met with so much approval in the artistic world. Dr. Drysdale inquired whether the falling off in the profit during the past year or two was not attributable to the war. The chairman replied that no doubt that was the case in 1900, but during the past year the adverse effect of the war on the business had not been so great. The report was then adopted. The chairman next proposed the re-election of Sir Wemyss Reid as a member of the board. Mr. E. Bale (a director) seconded the motion, and spoke of the ability and energy with which Sir Wemyss Reid had performed his duties during a trying period. Mr. Lee said that he rose with regret and reluctance, especially after the words which had fallen from the chairman regarding Sir Wemyss Reid's health, to oppose that gentleman's re-election as managing director.

Since his appointment as manager of the Company the value of the shares had fallen to less than one-half of the price which they previously stood at. He had great respect for Sir Wemyss Reid as a literary man, but his management had been unsuccessful. Mr. Easterbrook remarked that he should be pleased to support Sir Wemyss Reid's election as a director, but he considered that other qualifications were wanted for the position of manager. Mr. Turner, speaking as a former managing director, said that Sir Wemyss Reid had had great difficulties to contend against, which did not exist when he himself occupied the position. If the shareholders thought that they would improve the management by electing another gentleman in the place of Sir Wemyss Reid they were making a great mistake. They would never get a better or more enterprising general manager. The chairman pointed out that the resolution was for the election of Sir Wemyss Reid as a director, and added that the question of the management rested with the board. Some years ago it was decided, for many reasons, that the Company's general manager should be also an ordinary director, and to that opinion the board still adhered. On a show of hands being taken, the re-election of Sir Wemyss Reid was agreed to, with four dissentients.—"The Times."

News and Notes.

THE last meeting of the Wolverhampton Photographic Society was devoted to an exhibition of members' lantern slides, some capital examples being shown by the president (Mr. Harold Holcroft), and Messrs. Gale, Turton, Taylor, and Cooke.

PHOTOGRAPHIC Club, Anderton's Hotel, Fleet Street. On Wednesday, March 26th, at 8 p.m., Mr. W. F. Slater will give a lantern lecture on "A Trip up the Rhine." The committee will be pleased to welcome visitors at this or any other of the weekly meetings.

LEICESTER Literary and Philosophical Society.—This Society held its annual exhibition on the 12th inst., when about 100 prints and 180 lantern slides were shown by the members. All officers were re-elected for next season, viz.—Chairman, Mr. H. A. Roechling, C.E.; vice-chairman, Mr. J. Porrill; hon sec., Mr. G. O. Marshall. There was a record attendance, and a very enjoyable evening was spent.

ROYAL Photographic Society —On Tuesday, March 25th, at 8 p.m., at 66, Russell Square, Mr. Charles P. Butler, A.R.C.Sc., will give an address on "The Photographic Investigation of Modern Astrophysical Problems." The Society will also open an exhibition of pictorial photographs by Mr. C. Yarnall Abbott, of Philadelphia, and an introductory address from his pen will be read. The exhibition will remain open daily for six or seven weeks.

AT the meeting of the Newcastle-on-Tyne and Northern Counties' Photographic Association, in the Y.M.C.A. Rooms, on Tuesday, March 11th, Mr. A. B. Gardener gave an address on "Process Plates." On account of the fineness of grain and the ease in getting almost any desired density, these plates are very useful for several purposes, but Mr. Gardener used them in quite a novel way. He had to take some large negatives of the streets of Newcastle during the laying of the new tramlines, and as it was important to get them very clear and of a fair printing density, and the light is not strong enough for instantaneous work during the winter months, he stopped down to f/32, and, using process plates, gave an exposure of half an hour, the very slight blur (owing to the busy traffic) being hardly noticeable. At the conclusion of his lecture Mr. Gardener handed round for inspection several examples of photographs so taken.

LIVERPOOL Amateur Photographic Association.—A large audience assembled on Thursday, March 12th, at the rooms of the above Association, Eberle Street, to hear a lecture by Mr. Grant (manager of the Lumière Company) on the Lumière process of colour photography. Mr. Grant first sketched the history of colour photography, dating its inception to forty years ago, when, at the meeting of the Royal Association, Professor Clerk Maxwell gave an outline of the process as used to-day, viz., the interposition of light filters—blue, green, and red—between the object to be photographed and the plate. Mr. Grant went on to describe in detail the processes used by Messrs. Lumière, giving the various formulæ for the production of the light filters, etc., and at the conclusion showed, by means of the lantern, a considerable number of slides in natural colours taken by the process. The lecture proved exceedingly interesting, and was followed with marked attention. A discussion followed, in which Dr. Buchanan, Mr. F. W. Saxby, and others took part.

ROYAL Institution.—The following are the lecture arrangements at the Royal Institution, after Easter:—Dr. Allan Macfadyen, three lectures on Recent Methods and Results in Biological Inquiry; Professor F. York Powell, three lectures on English Kings and Kingship; Professor Karl Pearson, three lectures on the Laws of Heredity, with Special Reference to Man (the Tyndall Lectures); Professor Dewar, three lectures on the Oxygen Group of Elements; Dr. A. Smith Woodward, three lectures on Recent Geological Discoveries; Mr. M. H. Spielmann, three lectures on Contemporary British Sculpture; Mr. W. H. Cummings, three lectures on British National Song (with musical illustrations); Professor Walter Raleigh, three lectures on Poets and Poetry; and Professor Brander Matthews, three lectures on the Development of the English Drama—(1) The Art of the Dramatist, (2) The Drama of the Middle Ages, (3) The Drama under Elizabeth. „The Friday evening meetings will commence on April 11th, when Professor Dewar will deliver a discourse on Problems of the Atmosphere. Suceeding Friday evening discourses will be delivered by Sir John H. A. Macdonald, Dr. J. Mackenzie Davidson, Sir Robert Ball, Sir Benjamin Baker, Professor A. E. Tutton, and other gentlemen.

New Books.

"Sell's Dictionary of the World's Press." 986 pp. Price, 7s. 6d. London: Published by Sell's Advertising Agency, Limited, 167, Fleet Street, E.C.

The new volume of this useful and readable dictionary contains articles on "The Outlook for Liberal Journalism," Sir Edward Russell writing from a Liberal point of view, and Mr. H. J. Palmer (president of the Institute of Journalists) treating it from a Conservative standpoint. Among the other articles are the following:—Mr. Alexander Paterson's review of two centuries of Daily Journalism; the illustrated article on the Crown Colonies of the Empire, their Governments, education systems, and their industries; the continuation of the article dealing with the Anecdotal History of Journalism, drawn from the current literature for 1900-01. Other contributions include "A Glance at the Comic Papers of the Victorian Era," by J. Farlow Wilson; the year's "Newspaper Happenings," and obituary columns. The lists of papers, the magazine list, the classified lists of trade papers, and the lists of Colonial papers have been brought up to date. The thumb-index gives at once, first the index, then the London papers, the English Provincial papers, the Irish papers, the Scotch and Welsh papers, the magazines, and lastly the Colonial and principal foreign papers. Special space has been devoted to the maps and information connected with the British Dominions beyond the seas. In the work particulars are given of every town throughout the British Empire in which a paper is published, together with particulars of the principal papers themselves. In regard to the papers of the British Isles, the name is given of every town and village in which a paper is published, the market days, distance from London, etc. The total number of papers in the British Isles is now 2,532; of these London is responsible for 554. The number of magazines is 1,562, while there are 209 quarterly reviews of every kind. The "Dictionary" is a painstaking compilation, and we accord it a hearty welcome. Not once, but many times during the year do we dip into its pages, and always with profit and interest.

"The Homeland Handbooks." London: Published by the Homeland Association for the encouragement of Touring in Great Britain, St. Bride's House, 24, Bride Lane, Fleet Street, E.C.

No. 18 of the series of Homeland Handbooks is entitled "Minehead, Porlock, and Dunster: The Seaboard of Exmoor," by C. E. Larter. It contains articles on stag hunting, by Philip Evered; fishing in the district, by C. M. F. Luttrell; fox hunting, by "Peep Out"; hare hunting, by L. E. Bligh; golfing, by the Rev. J. Utten Todd; and a chapter on Cleeve Abbey by Gordon Home. The book, which is illustrated by drawings by Gordon Home, and by photographs by H. M. Lomas and others, is published at 1s. 6d. nett, bound in cloth, with map; or 6d., paper cover, without map. Postage, 2d.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

PHOTO BUTTONS.

To the Editors.

Gentlemen,—We note your reply to "Liverpool," in "Answers to Correspondents," in the last number of the BRITISH JOURNAL OF PHOTOGRAPHY, in which you say that you know of no one in this country who makes photo button machinery. For about six months, ending Christmas last, we advertised that we made, not only buttons and medallions, but also machinery to manufacture same, and we have pleasure in handing you a price list, together with a few specimens. We are just delivering to an enterprising seaside photographer machinery to make three popular sizes in buttons, and we believe our client intends to present each of his sitters with a button or medallion of his or her photo during the summer as a special draw.

In addition to the constructing of special presses and dies for making these little novelties, we also now manufacture our own metal shells and backs for this trade. We send you herewith to illustrate the various processes of manufacture:—

1. A piece of thin sheet steel, from which we cut the blanks.
2. Blank shaped for front shell.
3. First operation in making back.
4. Second operation in making back, with centre cut out, forming the familiar ring.
5. Plain back, used for attaching ribbons when button is made into a badge.
6. The same in gilded metal, with strut back for small-sized medallion.
7. Sample of bromide contact print.
8. Sample of bromide contact print, glazed and cut into disc ready for placing in machine; and, finally, we send you a few samples of the finished articles.

The large medallion sent is also made on the same principle, and you will note the very effective style of the same medallion mounted is one of our new art mounts.—Yours faithfully,

For the Crayon Art Company,

49B, Brecknock Road, London. F. A. VENNING.
March 19th, 1902.

[We are obliged to our correspondents for the interesting specimens. Medallion photography in Coronation year will no doubt be popular, and many of our readers may therefore be glad to know where the necessary machinery and specimens may be obtained.—EDS. B.J.P.]

THE METRIC SYSTEM.

To the Editors.

Gentlemen,—Your correspondent, C. L. Hett, seems to me a little unreasonable. Seeing how uncertain a measure a spoonful is, and that it is not defined by law, it is no wonder that a tablespoonful does not exactly measure an ounce; moreover, all the cheap glass measures I have seen of this sort are furnished with marks blown in them. This cannot be accurately done, either in such measures or in bottles.

But there is another reason why these things might be wrong. Once on a time there was an apothecaries' fluid ounce corresponding to the weight of the same name; but, even before the weight was abandoned, the law defined the fluid ounce as the twentieth part of a pint, and from the definition of a gallon, it followed that the fluid ounce, as now, weighed an avoirdupois ounce. But our law has the peculiarity that it can be defied with impunity, and no doubt the glass blowers and makers of cheap measures ignored, if they ever took the trouble to learn, the law; thus the dimensions of the measures remained unchanged. In France no one is allowed to sell unstamped weights or measures; in England the penalty is for using them in commerce only, and thus the multiplication and diffusion of incorrect articles is facilitated.

If Mr. Hett requires correct weights and measures, he can have his weights examined and, if correct, certified by the local inspector. Glass measures, probably, it would be beyond that officer's power to mark, but I fancy any good chemist (not a photographic dealer) would supply him with measures certified by the Company of Apothecaries (I think), who examine and mark them by a test which differs insensibly from that sanctioned for the inspectors of the Board of Trade.

It is just the confusion inevitable under the present system which renders it desirable to introduce without delay the compulsory use of the metric system alone, and it is very much to be hoped that the law, when changed, will leave no openings for evasion.—I am, gentlemen, yours faithfully, J. F. T.

ON THE NEGLECT OF TRUTH BY PHOTOGRAPHERS.

To the Editors.

Gentlemen,—Reading A. V. Kenah's article "On the Neglect of Truth" in the last issue of your valuable paper, I had pleasure in recognising an old and dear acquaintance of mine, whom the author did me the honour to select as the bad example of the present-day photographer, who, "professing to know all about collodion emulsion and the presence of halogen," was too ignorant to help himself, and in search for increased rapidity asked the author for help, failing to grasp the value of his own evidence. Now, my dear Mr. Kenah, who wrote about truth with a capital T, so I am sure you will not be angry with me if I prove to you how highly I appreciate the educational value of your admirable article, by promptly correcting the character sketch of my friend, trusting that you may in future be more exacting in the choice of your "enfants terribles." You know what the old Romans said: Fiat experimentum in corpore vili; but that is not my friend.

Not only did he spend a fourth of his life in the laboratories of such authorities as Eder, Valenta, Vogel, Hühl, but also graduated with an easy first at aContinental high school, particularly in the science of photo-chemistry.

Apart from his sound theoretical photographic knowledge, he acted for the last two years as demonstrator of collodion emulsion processes, of which he has a firmhold, enabling him to dispense with the kindly-suggested, although highly appreciated, help of the author of the article in question. The experiment, however, Mr. Kenah refers to was, so my friend informs me, one which Mr. Kenah himself suggested, so by no means the answer of the author to the helpless plea of "an advanced process worker."

As Mr. Kenah himself refrains from giving exact date as to the success achieved by his experiments, it is no part of my purpose to investigate any further, but leave it to my friend to register with highest scientific accuracy the results obtained by the suggested absorption of halogen in collodion emulsion.—I am, yours, etc. HENRY O. KLEIN.

9, Upper Brighton Terrace, Surbiton, March 18.

COPYRIGHT.

To the Editors.

Gentlemen,—Mr. Armstrong, in your issue of 14th inst., calls on the Professional Photographers' Association to suggest a course for dealing with such cases as that he quotes from the Glasgow Sheriff's Court. I am not a member of the association, but one of the general public who pay for photographs, but I trust I may be permitted to make a few remarks on the subject. As I understand the law, the negative belongs to the photographer when he takes it to order and supplies prints for payment, but he has no right to use it, except for his customer. It would seem clear, then, that if he sells his business he cannot confer on the purchaser the right (which he himself does not possess) to use the negative as he pleases. The purchaser must be assumed to know the law, and if he pays the seller for rights he does not possess that seems to me his look out.

I have seen some suggestions that it would be well to change this state of affairs and confer on the photographer a complete copyright enabling him to use the negatives as he chooses. I think that such a change would be against the interest of the best men. However much we might be right in trusting to the honour and right feeling of the photographer we employ, we should remember that the rights he has may pass, by no choice of his, into the hands of less scrupulous parties. Possibly the fear of this would deter private persons from sitting. And, in my opinion, the remedy lies in another direction. Let the photographer offer to sell to his customer the negative at a reasonable price, and let this offer be made with the proof prints. At the same time, all disapproved negatives should be destroyed. Few would claim probably the negatives, but all disputes would cease.—I am, etc. J. F. T.

STARCH IN EMULSION.

To the Editors.

Gentlemen,—When, some weeks ago, we had occasion to send over to London one of our staff in quest of some technical matters in connection with proof wanted in a law suit preferred against us, you were very kind in not only letting us have the loan of some books, but also gave us your valued assistance in having an affidavit drawn up, explaining the technical meaning of the word "Proof." We herewith beg to tender our best thanks for assistance rendered to our representative and service shown to ourselves, and shall be glad if you will avail yourself on any future occasion of our readiness to be of use to you in return. By judgment delivered by the Supreme Court of Justice of Germany, at Leipzig, the claim brought forward against us was declared to be void of substance and wholly unfounded, and the Court gave it as their opinion that the patent itself had been delivered for a so-called process, which in itself, in fact, was not susceptible of falling under the protection of any article of the Patent Regulations in this country.—We remain, dear Sirs, very faithfully yours,

NEUE PHOTOGRAPHISCHE GESELLSCHAFT.

Berlin-Steglitz den, Siemensstrasse 27.
March 10th, 1902.

ON TIMING DEVELOPMENT.

To the Editors.

Gentlemen,—We all know something about photography, and we each know something that others do not. If necessity is the mother of invention, then argument is the father of learning. We each try to convince the other, and if one succeeds then the other is the richer. I am glad Mr. Baker has answered my letter on the above subject, and that in a friendly spirit. Too often these friendly bouts end in both sides getting their back up against the wall and calling each other blithering idiots, or words to that effect.

I allow Mr. Baker is right (as I did in my first letter), that, providing the exposure given is correct, *for all parts of the subject*, then timing development is all right. But where it is impossible to have all parts of the plate properly exposed, as in studio work, then timing is not so good as the old method. Studio exposures are generally a question of compromise; we have to rob Peter to pay Paul, as it were. What a lovely subject we have to deal with when fond Mamma brings Angelina and Augustus to have their portraits taken together (to save expense). Angelina in a starched white frock, stiff as cartridge paper, and Augustus in ruby velvet, à la Fauntleroy. What is the correct exposure? Oh, ye great exposure meters, give us the tip! Mr. Baker asks me how I would treat the lady with white dress and black hat, and how I would develop it. I will take the above subject instead, if, with your permission, I may use your space for this purpose. I do not pose as a teacher of photography, and give this, not because I think it the *best* way, but because it is *my* way, which is what Mr. Baker asks.

I would pose my sitters with the girl nearest the light. Why? Take a white dress in a subdued light, and what have you? Marble. Take it in a strong light (careful lighting essential), and you have light and shade even in white. I would pose the boy slightly in advance of the girl, so he did not stand in the slight shadow she casts, and expose. If my sitters kept quite still, I would give nearly enough

for the velvet, but not quite. To develop, I would take normal developer, diluted with four times its bulk of water, and perhaps slightly less bromide, just enough to prevent fog. In this developer the plate would develop fairly even, but remain very thin. When detail was well out, I would wash under tap and make up fresh developer, strong in metol or pyro, as the case might be, plenty of bromide, and only a very little soda, and proceed to build up my lights. Temperature of developer 65F. If I could not give as much exposure as I would wish, and the girl's dress came up much in advance, and looked like getting too dense, I would wash under tap and develop the boy up locally with a camel's-hair brush, and normal developer.

Mr. Baker mentions three plates of subjects quite different, being all developed in on dish by time and good results obtained. I see nothing at all in that, if each had its correct exposure. Had they all been on one plate it would have been marvellous. Is there no such thing as local development? Does more or less bromide, pyro, or ammonia added as development proceeds make no difference? Can nothing be done to improve a negative when it has once started to develop? Is strong and dilute developer one and the same thing in regard to contrast? Cannot we hold one part of a plate up, while we force another? Then all our old time dodges have been time wasted.

H. E. S.

March 12, 1902.

SPIRIT-PHOTOGRAPHY—SPOOF OR HUMBUG?

To the Editors.

Gentlemen,—I have been interested and amused at the remarks which have appeared in your columns lately on the subject. Your old readers may remember the position I took over thirty years ago, and in the early seventies your Journal contains letters on the subject of Spirit-Photography. I have now had over fifty years' constant practice in photography, and during that time I have never seen a form that I could not account for its presence. I may mention the fact that the late Traill Taylor and myself attended our first séance (not photographic), at Mrs. Marshall's, Maida Vale, and this was at the earnest request of Mr. W. H. Harrison. Subsequent to this, I threw out challenges offering sums as high as twenty guineas for test conditions. Sufficient to say they were never accepted. About a couple of years ago I was in correspondence with a West of London photographer, and it was arranged that I was to have a demonstration. It did not come off, as I was on the eve of going abroad. A few weeks before I last left England I called on the said photographer, who did not know me. He at first said, "I could mark my plates," but on my stating other reasonable conditions he point blank refused to have anything more to do with me. I am forgetting to say that he showed me a letter from Mr. Stead making an appointment. I have little doubt this was done as an advertisement, or as a kind of guarantee of genuineness.

I called on Mr. Stead aftewards to hear the result. From what he told me, the séance was not as satisfactory as desired. Mr. Stead mentioned to me that a well-known West-End photographer was continually getting hands on his plates, to the detriment of the negatives. As I know the photographer personally, I got Mr. Stead's permission to call, on the strength of the information. I have not yet taken advantage of it. I have in my possession a negative, taken by a Rotherham photographer, and through the form of a lady an easel is distinctly shown. The photographer in question made his own plates, he used new glass, and he had no easel in his possession. I am pretty well versed in the various modes of producing shams and something more as the columns of the "Medium and Daybreak" can testify. My main object in addressing you is to suggest that a committee of experts should be formed to test the matter, of course, inviting sittings from mediums and others. I will be pleased to add my mite. Apologising for taking up so much of your valuable space, yet methinks the doubt should be for ever settled, I remain, yours truly,

A. L. Henderson.

THE CLIMAX SENSITISED PAPERS.

To the Editors.

Gentlemen,—Although you have previously noticed in your columns our climax sensitised papers, we think you may like to make further mention in regard to them, owing to the fact that we have effected marked improvements in their quality during the last two months. These papers are now made at our new works at East Molesey, under very much improved facilities. By means of an automatic arrangement absolute uniformity in the steam heating is effected. We have also invented a new contrivance by which bubbles, which are so frequently prone to occur when the usual method of floating is employed, are entirely obviated. We have also constructed a damp cellar, and the paper being stored in this for some time before floating almost absolute immunity from blistering results.

We would also draw your attention to the new paper we have introduced, which is our Unpreserved, *i.e.*, paper which is not subjected to any acids. The paper will keep as long as a professional requires—viz., for a week or ten days, and yet it is identical to freshly floated paper on pure silver bath.

We may remark that there is an evident tendency for professional photographers to use albumen paper in increasing quantities for special work.—Yours faithfully,

John J. Griffin and Sons, Ltd.

20-26, Sardinia Street, Lincoln's Inn Fields, London, W.C.
14th March, 1902.

Answers to Correspondents.

*** *All matters intended for the text portion of this* Journal, *including queries, must be addressed to* "The Editors, The British Journal of Photography, 24, *Wellington-street, Strand, London, W.C." Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* Messrs. Henry Greenwood & Co., 24, *Wellington-street, Strand, London, W.C.*

Photographs Registered:—

A. H. Hawke, 352, Stapleton Road, Bristol. *Three photographs of the Meet of the Beaufort Hounds.*

W. Macfarlane, 339A, High Street, Cheltenham. *Photograph of F. W. Phipps.*

W. J. J. Thompson, 2, Worcester Street, Kidderminster. *Photograph of Stourport Bridge.*

J. B. Young, Wellington Street, Ballymena. *Photograph of Rev. R. M. McCheyne Gilmour.*

The Powder Process.—"Amateur," C. Barrett, and C. H.—In reply: There is an article on the process on another page.

Address Wanted.—E. H. would like to know the address of Underwood & Underwood, stereoscopic view publishers?—In reply: Heddon Street, Regent Street, London, W.

Book Wanted.—E. S. writes: "Could you tell me the best book to get on matt printing, and where I could buy one?"—In reply: There is no work devoted exclusively to matt printing. All works on photography treat of printing, and there is practically little or no difference between printing on glossy and matt papers.

Spots on Prints.—"Cameo."—In reply: We have very little doubt the spots are due to the cause you surmise, namely, particles of iron in the water in which the prints were washed prior to toning them, and not to any defect in the paper. Tie several thicknesses of fine flannel, loosely, as a bag, over the tap; that will, no doubt, filter them out, but the flannel must be changed frequently.

Buying Plates.—"Amateur 2" writes: "How can I know, when buying plates from a dealer, whether I get new plates or stale ones?"—In reply: You cannot know without trying them. You have to rely upon the word of the dealer as to how long he may have had them in stock. Of course, they are fresh when he gets them from the makers.

Embossing Prints.—"Herts" asks: "Will you, please, inform me how I can raise up the centres of portraits like those done by some of the professional enamellers?"—In reply: The prints are embossed after they are enamelled in an embossing press. These presses, with suitable dies, are supplied by all the large dealers, and are very simple to use.

Spots on Platinum Prints.—"Anxious" writes: "I herewith enclose a few platinum prints, and I should feel obliged if you could tell me what causes the spots on them. I have seen them before, and have put it down to damp acting on the paper and an intensified negative, but some of the spots appear on prints that have been taken off negatives that have not been intensified."—In reply: We do not think the spots are due to the paper having become damp; they appear rather to be caused by scum on the developing solution, and we have but little doubt that is the source of the trouble.

Glazing P.O.P.—S. Knowles writes: "I have been experimenting with the glazing of P.O.P. prints on looking-glass, but have found they have invariably stuck. I have cleaned the glass with a mixture of benzine and wax, mixed up by a professional who uses it. I am sure the glass was thoroughly clean. Could you tell me the cause of my failure, and how to remedy it?"—In reply: We should say that the trouble arises from the wax not being sufficiently polished off. It should be polished so that the glass seems to be quite clear and, apparently, free from wax. If the prints are alumed after they are fixed they will have less tendency to stick.

Enamels.—Student writes: "Must a special oven be used for burning photographic enamels? The process is one of the subjects in an examination for which I have entered, and I am desirous of doing a few myself. Could you tell me anything I could utilise without incurring much expense?"—In reply: For firing in enamels a muffle furnace is required. A convenient form is that heated by gas. For small enamels a small furnace only is necessary, and they are not very expensive. Suitable ones are supplied by Messrs. Griffin & Sons, Sardinia Street, W.C., Messrs. Fletcher & Son, Warrington, and others.

Formula Wanted.—F. S. writes: "Could you let me have the formula

for 'Beach's Potash Developer'?"—In reply: The formula for Beach's Developer stands thus:—No. 1: Sulphite soda, 4 ounces; warm distilled water, 4 ounces. When cold, add 3½ ounces sulphurous acid water; strongest, 3½ ounces; and pyrogallol, 1 ounce. No. 2: (A) Carbonate of potash, 3 ounces; water, 4 ounces. (B) Sulphite soda, 2 ounces; water, 4 ounces. Dissolve separately, and then mix A and B together. For use, take 1 drachm of No. 1 and 20 minims of No. 2, and make up to 2 ounces with water. The formula we take from the Almanac of 1889.

THE ROYAL ARMS.—"PROGRESSIVE" writes: "Some time ago I photographed a house party, including Royalty. I sent a copy to —— (Royalty), and they received it, and I have their letter thanking me for the copy, in which the writer says he is desired to thank me for the photo sent to the Royal personage. Although I received no order, could I print on my mounts (I don't want to put coat of arms) 'Patronised by H.R.H. ——'?"—In reply: We do not think it would be illegal for you to do what you suggest; but it seems rather a stretch of terms to say that you are patronised by H.R.H. —— simply because a print that was not ordered was accepted by them. If the picture were ordered, or you were commissioned by H.R.H. —— to take it, the case would be somewhat different.

MATT SURFACE BROMIDE PAPER.—"MAX" writes: "I shall be greatly obliged if you will give me, in your JOURNAL, a formula for preparing bromide paper, matt surface, for enlarging upon, or contact printing, with developing solution."—In reply: Whilst we are always pleased to assist our readers, we would suggest that it is very much cheaper to purchase bromide paper than to attempt to make it; still, the following formula should give good results:—A.: Ammonium bromide, 48grs.; gelatine, 30grs.; water, 1oz.; soak for an hour, and heat to 50deg. C. B.: Silver nitrate, 36grs.; distilled water, 1oz.; heat to 50deg. C. Mix the two solutions in the darkroom, and keep at 50deg. for an hour; then allow to set, and stand 12 hours; break up with a silver knife and fork, wash for four hours in running water, drain; then melt, and apply to the paper.

PHOTOGRAPHIC MEDALLIONS.—"A 20 YEARS' OPERATOR" writes: "Will you kindly inform me how to produce, or where I can find, a formula for the production of photographic medallions? To-day's "Express" says, in the article on photography: 'We understand that the King has given a command for the production of 100 medallion portraits of himself. These portraits will be obtained by one of the many photographic reproductions.'"—In reply: There are so many styles of portraits that are called "medallions," and so many different methods of producing them. You say that the article mentions, vaguely, that what the King has ordered "will be obtained by one of the many photographic reproductions"; but we have no idea whatever which will be the method selected. If you could obtain a specimen of the particular one adopted we should then be able to tell you how it was made.

SEPIATYPE PRINTING.—H. R. R. writes: "I am in a bit of a fix about the sepiatype printing-out paper described on p. 803 of Almanac by "B. E. F." I have made the emulsion as carefully as I could, and have succeeded in obtaining a greenish, thickly-opalescent solution. The only mistake I can think of is that I added the ammonia rather too quickly, and in too great a quantity. Can you oblige with the following answers? (1) Can I sensitise ordinary postcards? (2) Must it be done in photographic light, or will lamplight answer? (3) Does the emulsion keep indefinitely?"—In reply: Personally, we have had no practical experience with the process. We should say, however, your failure is due to the cause you suggest, because the author lays great stress on adding the ammonia "drop by drop, with constant stirring and shaking." (1) Yes, if they be of good quality. (2) Lamplight is all that is necessary. (3) We should say that it will not keep indefinitely, but as we have just said, we have had no experience with the process.

DEVELOPMENT.—"FACTOR" writes: "I use for development the Ilford pyro-soda formula, and to obtain soft negatives, full of gradation, suitable for enlargements, to preserve the half-tones and atmosphere, if present, I wish, instead of judging, when development is complete, by opaqueness in the high lights, etc., to work by a Watkins' development factor. Of the Ilford Stock pyro solution I take 1oz., making up to 20oz. with water. For ¼-plates I use 1½oz. of developer. If we call the diluted stock pyro solution (i.e., the 1oz. of it made up to 20oz. with water), our No. 1 Solution, and the sodacarb., etc., the No. 2 Solution, to obtain such a negative as suggested above, please state what proportions of Nos. 1 and 2 I must take to use a Watkins' factor of 6. I know 1gr. pyro (2drs.) and ¼gr. KB_2 (2drs.) to 1oz. H_20 give factor 9 in Watkins' list of developers."—In reply: It is almost impossible to say whether the proportions we give will exactly suit our correspondent's requirements, but the following strength has, we know, given satisfaction with a factor of 6:—Pyro, 1½; bromide, ½gr.; soda, normal per ounce of developer.

OBSTRUCTED LIGHT.—R. C. writes: "Last year I bought a house (freehold) in a road in which all the houses have been built within the last five or six years, in the garden of which I have put up a studio for professional work. Before I commenced to build I submitted plans, etc., to the local authorities, and they were approved of. My next-door neighbour, also a freeholder, objected, and appealed, with one or two others, against the building to the District Council and their surveyor, but they would not entertain the appeal; so, of course, I went on with the building and completed it. Now the man has put up, on his side, a high, ugly, wooded hoarding, that stops off all the available light, except from the top. What proceedings should I take to make him remove it, as the studio is useless as it is?"—In reply: Unfortunately, for you, none will avail. Your neighbour has as perfect a right to put up anything on his premises as you have on yours, and no law will prevent him from doing so. Cannot you come to some amicable arrangement with him to remove the hoarding? If you glaze the studio with glass that cannot be seen through by your sitters, so as to cause him, what he may consider the annoyance?

STUDIO CONSTRUCTION.—"FERNO" writes: "I am adapting an ordinary room, about 16ft. wide, into a studio, and can only have glass on one side of the roof, either facing the east or the west. The room runs north and south, and I am not allowed any glass in the side. Would you kindly say: (1) If this studio will be difficult to work without any glass at the side; (2) which is the best aspect to choose—facing east or west. (3) I have an idea the west light would be far the quicker to work with in the afternoons, but am afraid I would be troubled with the sun getting on the sitters. I propose placing them at the south end, and would like, if possible, not to be troubled with the sun shining on that end. If I left 3ft. of the roof at the south end without glass, would this prevent the sun from getting to the background and sitters? (4) Would you advise the glass side of the room to be painted white, to make up for not having side light?"—In reply: (1) The studio would be somewhat difficult to work, but the trouble is not insurmountable. (2) On the whole, we should be inclined to the western aspect. (3) Yes, until late in the afternoon. (4) Better than white would be to paint the sides of the room a pale blue; there would then be less glare from them when the sun is shining.

FLUORESCENCE.—F. W. D. writes: "Would you be good enough to tell me whether there is any substance which is fluorescent or phosphorescent when either red or yellow rays fall upon it. Will you also explain why, when a piece of yellow glass and a piece of red are superimposed, you get orange through the two? If the red glass only lets red rays through, only the red can come through to the yellow; then, if the yellow only lets yellow rays through, it won't let red; therefore you ought to get black, or, at any rate, nearly so."—In reply: (1) We cannot recall any substance that will fluoresce in the red rays. Possibly, if you could see a copy of "Stokes on Fluorescence," you might find what you want. (2) No red glass will, when combined with yellow, give orange, but a rose-coloured glass will do this, because the red transmits red, orange, and blue; and as a yellow glass passes orange, yellow, and green, the combination must give orange, because this is the only colour common to both. In other words, the red of the red glass cuts off the green of the yellow glass, and leaves orange and yellow; the yellow of the yellow glass cuts out off the blue of the red glass and leaves orange and yellow, and the orange is therefore the most predominant. A glass that passed red only is fairly easy to obtain or make, but one to pass yellow only is almost an impossibility."

*** SPECIAL NOTICE.—GOOD FRIDAY.—*Correspondents and advertisers are requested to note that the* BRITISH JOURNAL OF PHOTOGRAPHY *will be published at nine o'clock a.m. on Thursday next. Advertisements intended for insertion in that issue should therefore reach the Office not later than Tuesday, March 25. Communications relating to editorial and technical matters should be addressed to the Editors, and all business communications to the Publishers, Henry Greenwood & Co., 24, Wellington-street, Strand, London.*

*** NOTICE TO THE TRADE, WHOLESALE AGENTS AND BOOKSELLERS.—*A Contents Bill is issued with each number of the* JOURNAL, *and copies may be had on application to the Publishers.*

*** NOTICE TO ADVERTISERS.—*A Revised Tariff for advertisements in the* JOURNAL *is now in force. Blocks and copy are received subject to the approval of the Publishers, and advertisements are inserted absolutely without condition, expressed or implied as to what appears in the text portion of the paper.*

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*** *The Editor can only be seen by appointment.*
*** *We do not undertake to answer letters by post.*

EX CATHEDRA.

Preserving the Eyesight. For the benefit of retouchers, we may republish the experience of a French writer who accidentally discovered a means of refreshing his eyes when over-fatigued after the strain of continued writing. Whether the plan has any real value or not we are unable to say; we merely repeat his account. He records that one night, while engaged in writing an article, his eyes gave out before he had finished, and he was compelled to stop. Turning from his inchoate manuscript, his eyes accidentally fell upon some scraps of coloured silk that his wife had been using for patchwork. The bright colours seemed to compel his attention for a time, and he then tried to go on again with his work. He found his eyes quite fresh after his few minutes' gazing upon the iridescent heap, and, surprised, he set to work to experiment on this strange effect. After several experiments he surrounded his inkstand with brilliantly-coloured, striped-silk material, so that every time he took a dip of ink his eyes perforce rested upon the gaudily-coloured heap. He found this to bring instant relief. Should this experience prove not to be due to any special idiosyncracy, it may be that some modification of the plan might really be of use to the busy retoucher, the strain upon whose eyes must be very great. The eye is such a sensitive organ that any hint that would tend to the reduction of undue strain would be gladly received by any worker in almost any profession or business.

Washing Prints. At a recent meeting of the Photographic Club a gentleman present mentioned that his method of washing prints was by supporting them on a plate under the tap, instead of immersing them in water. A member present pointed out that the method was not good, inasmuch as only one side of the paper was washed. There is no question that the quicker the hypo, and the hypo-salts of silver, are eliminated from the prints the better it is for their quality and for their permanency; and the more completely they are "fixed" the more quickly can this be effectively accomplished. We some time ago spent a day in a large establishment on the Continent, in which several hundreds of silver prints—on albumen paper—were produced daily. They were mostly of large size, and reproductions of paintings. The washing was quickly, though very efficiently, done. Of course, the toning, fixing, and washing were done towards the close of the day's work, and with regard to the washing it was "all hands to the pump," and all the men who had been engaged in the day's operations took part in it. This was the method employed:—After the prints were taken in batches from the fixing solutions and drained, they were put into a large tank of running water, where the man in charge of it kept them continually turning about; then, after slightly draining, he put them into the next tank, in charge of another man, who in turn passed them on to the next tank, and so on. After this treatment the prints, after again well draining, were taken to another room and placed, face upwards, on wooden frames covered with very open muslin, when a man with a hose, furnished with a fine rose and water at high pressure, played upon them for a few minutes. The prints were then transferred to another frame, this time face downwards, and the operation repeated. The prints were then passed on to other hands for similar treatment. In this way the last traces of the hypo are, as it were, forced out of the paper by the pressure of water brought to play upon the prints. By such means several hundreds of photographs were thoroughly washed in the course of an hour or an hour and a-half, and much more completely than if they had simply been put into running water for several hours.

* * *

The National Physical Laboratory. This country is at last in possession of a National Physical Laboratory. It is true that it is only on a very small scale as compared with those begun in Germany nearly twenty years ago. On that at Bushey House, Teddington, opened by the Prince of Wales one day last week, some nineteen thousand pounds have been expended, while in Berlin the Government has expended over ten times that sum on two similar establishments. For our laboratories the Government have devoted the modest sum of four thousand pounds per annum for their upkeep. The Prince of Wales, how-

ever, announced that the well-known firm of Armstrong, Whitworth, and Co. are prepared to subscribe a thousand pounds to the fund, and he hoped that the example thus set would be followed by others. It is said that technical education is much more fostered by the Government in Germany than it is in this country, and to that is largely due the advance made there in chemical and other manufactures. To an extent this may be the case, but we opine that it is largely supplemented by German business enterprise. Although the first coal-tar colours were made, and made on a large scale, in England, the Germans have now almost, if not quite, the monopoly in them. At one time England stood pre-eminent in the manufacture of optical glass; now Germany has practically supplanted us with kinds which have placed greater possibilities in the hands of opticians. Germany, again, has to a great extent killed the Indian indigo industry by the manufacture of the article synthetically. Some idea of the extent of this manufacture may be judged by the fact that in one factory several thousand hands, including over a hundred chemists, are employed. Turning to photographic subjects, nearly all the albumenised and collodio-chloride paper used in England comes from Germany. All the newer developers have their origin, and are made, in Germany. Our old "pyro," again, is nearly, if not all, now "made in Germany," though at one time the English article was looked upon as being the best obtainable, and so with many other things that might be mentioned. Technical education goes a long way, but it needs be supplemented by good business enterprise, and that no National Physical Laboratories will supply.

* * *

Spurious Fivers. According to the police reports, a large number of spurious five-pound-notes have been put into circulation, and the fabricators and utterers thereof are under lock and key. The counterfeit notes so closely resemble the genuine article that experienced cashiers at the banks are said to have admitted that they have the greatest difficulty in telling the false from the true. Both the engraving and the watermarked paper are splendidly imitated, and the only tangible difference between the counterfeit and the genuine note appears to be a slight difference of weight. But the ordinary man is not in the habit of carrying a chemical balance with him when he goes to business, and he must therefore run the risk of reducing his bank balance by five pounds whenever he accepts one of these promises to pay on demand of the "Old Lady of Threadneedle Street." We are by no means surprised to hear of this attempt to defraud the Bank of England; it was bound to come sooner or later, for the crisp fiver positively invites imitation on the part of the criminally disposed. It is easy enough, by methods known to most photographers, to reproduce as an engraved plate any design in black and white, and that without the help of an engraver at any stage of the process. Then the art of paper-making by hand is by no means difficult to acquire, and as to the watermark, that, too, can be closely imitated by a simple process published twenty years ago by one Woodbury. The plain fact is that the criminal of to-day, thanks to the rage for educating the masses without regard to the positions which they will be called upon to fill later on, is far better equipped for his warfare upon society than ever he was before. The burglar throws aside his ordinary tools, and uses the arc-light, or the oxy-hydrogen blowpipe for getting at the contents of "burglar-proof" safes. In the same way the forger is well acquainted with the resources of photography, and can quickly see his way to reproduce bank notes or other valuable documents. It is a serious question whether the bank authorities would not do well to make an entire change in their designs for notes. A committee composed of chemists, photographers, engravers, paper makers, and printers could between them suggest such safeguards against fraudulent imitation that forgeries of the kind we have now to deplore would cease to be possible. Unless some such plan as this is adopted, imitation notes will be carried to such perfection that the Bank people themselves will not be able to distinguish waifs and strays from their own offspring.

* * *

Kite Photography. The securing of photographs of a birds-eye-view character, from lofty buildings, and from balloons, has had a fascination for many workers. The late Mr. Woodbury designed a special form of camera, which was attached to a balloon about eight feet high, the lens pointing vertically downwards, and the shutter being actuated by electric current sent through wires woven into the cord which held the balloon captive. His idea was to obtain views of the surrounding country for use in military operations. To some extent kites have been tried for this same employment, and it is possible that for such work they may prove more serviceable than balloons, for they offer a less tangible target to the enemy, and even if hit by a bullet no material damage is done. A small hole in a balloon will, on the other hand, form a ready exit for its life-gas, and down it comes to mother earth. Much attention has of late years been centred on kite construction, and many improvements have been adopted. The kite of our boyhood, which has figured after the pattern of Queen Elizabeth's corset, and which had a tiresome habit of turning topsy-turvy and descending upon its head, has almost disappeared even from those conservative places, the toy shops. The approved form of modern kite can be gathered from the account published of the last half-yearly meeting of the Scottish Meteorological Society, when an "observation kite," intended for use in the South Polar regions, was exhibited. This kite is of the box, or Hargreave pattern, the framework being of bamboo, and the measurements approximately seven feet square, by three feet deep. The kite "string" consists of pianoforte wire, of the kind used for deep sea soundings, which has the merit of being both strong and light. Four miles of this wire, wound on a drum, will permit of the kite being raised to an altitude of 15,000 feet. As affording some indication of the lifting power of such a kite, it may be mentioned that a two horse-power oil engine is required to turn the drum when the kite returns to earth. It carries a photographic camera, enclosed in a bamboo frame to protect it from injury should the kite bump the ground. The shutter is worked by a "messenger" sent up the wire when it is desired to make an exposure. This sems to be the weak part of the design, for such a messenger would take a long time to traverse even a mile of wire, and its action must be uncertain. It is, however, difficult to suggest another means of working the shutter without greatly adding to the weight of the line connection. Possibly something of the slow match kind would best solve the difficulty.

* * *

A Copyright Appeal. As will be seen by a report elsewhere in this number of the JOURNAL an important case with regard to penalties for infringement of copyright occupied the attention of the Court of Appeal on Thursday last week before the Master of the Rolls and Lords Justices Romer and Mathew. It will be remembered that in May last Mr. H. W. Nicholls, photographer, formerly of Johannesburg, brought an action against the proprietors of the *Graphic* and the *Golden Penny* to recover damages and penalties for an infringement of copyright. It appeared that the defendants had been granted a licence to reproduce

the photograph in the *Graphic*, stipulating that it should appear in that paper only. The defendants, however, subsequently used the photograph for the *Golden Penny*; hence the action. At the trial it was shown that some 86,000 copies of the paper had been printed. According to the Copyright Act, the maximum penalty is ten pounds per copy. The learned judge, Mr. Justice Wright, awarded the smallest coin of the realm, one farthing per copy, and gave judgment for the sum of £89 11s. 8d. At the same time he said that in his opinion the penalties were out of all proportion to the injury done to the plaintiff. Against this decision the defendants appealed, on the ground that a case had been decided in the Irish courts, which on appeal was upheld in the House of Lords, that the judge was free to assess the amount of damages to be paid for infringement of copyright. Mr. Justice Wright, who tried the case against the proprietors of the *Graphic*, held that he was compelled to award a current coin of the realm, of one value or another. In giving judgment last week, the Master of the Rolls said they must adopt the strict course in this case, and send it back to the learned judge to assess the amount the plaintiff was entitled to get. They had no power to assess the damages themselves, and the decision of the House of Lords was clearly an authority upon which the defendants could ask them to take this course. The order of the court was that the case should be remitted to the learned judge to decide what damages the plaintiff was entitled to recover under the Act. It was intimated in court that the case would probably be taken to the House of Lords, and if it is, the result will be looked forward to with interest by all holders of photographic copyrights. The penalties of some eighty-nine pounds odd may seem large to recover for a copyright picture, when a licence to use it in another instance was granted for a guinea, but it must be borne in mind that penalties are instituted as a punishment for infringement of the laws of the country, and to deter others from infringing them.

* * *

Coronation Incongruities. The coming coronation is looked forward to by all loyal Britons with enthusiasm, and by a large number with a more commercial interest, for they hope that it will in some measure compensate for recent stagnant times. The London photographers should certainly have a busy time, for there will be few among the fashionable folk who are privileged to witness the ceremony who will not wish to have their portraits taken in their coronation costumes, so that the pictures can be handed down to posterity as memorials of their connection with a great historical event. Of course, the bulk of the photographers' clients will be ladies, and most of these will have rich ultra cerulean blood flowing in their aristocratic veins that nothing short of "the blue process" will do their pictures justice. But there will be a few whose vital fluid is of the more ordinary colour, and whose former visits to the photographer's studio have been under far different circumstances. We refer to those ladies of the stage, and chiefly of the music-hall stage, who have been fortunate enough to find partners among our old nobility. These ladies take precedence according to the rank of their husbands, and we shall have therefore the curious spectacle of Miss Highkicker, late of the Frivolity Theatre of Varieties, who is doubtful as to the identity of her grandparents, taking her place, as a matter of right, in front of grand dames who can trace back their ancestors, without a break, to the time of Noah. Perchance the same photographer who takes her portrait in her coronation finery can find among his stock negatives some of the same young lady in costumes which would hardly be in keeping with a sacred edifice like Westminster Abbey. We seem to remember the story of such a risen star, who, after her marriage, treasured up a stage costume as a memento of a former histrionic triumph. She kept it in a cigar box. But times have changed for the new peeress, and a rich dress, with a train long enough for half-a-dozen ordinary dress lengths, compensates, in some degree, for the shortness of material which was such a distinguishing feature of her former apparel. Our late revered Queen did not invite these recent additions to the peerage to her drawing-rooms, but no one can dispute their right to seats in the Abbey to view the coronation ceremony. The old adage says, "Poverty makes strange bedfellows," but poverty is not in it with a coronation in bringing queerly-assorted folk together. The wise photographer will endeavour to entice as many as possible to his studio, and if he should recognise a previous customer in some lady of high degree he will do well to keep a discreet silence as to the past.

UNCONVENTIONAL PORTRAITURE.

THE professional photographer is apt to look with a pitying eye on what he considers the vagaries and eccentricities of the amateur, when that individual ventures to forsake his ordinary run of landscape or architectural work in favour of portraiture. The latter is undeniably the weak point of the average amateur, for which he is on the whole not so much to blame, since he generally lacks the studio and its helpful appurtenances, and is obliged to do the best he can in face of many difficulties. And in spite of, perhaps to some small extent in consequence of, these drawbacks, the amateur occasionally produces portraiture displaying a freshness and individuality that are often of the highest value as hints and suggestions to his professional brethren. The latter are by no means unwilling to learn or to adopt new ideas. The old conservative isolation which drew so sharp a line of demarcation between amateur and professional is fast disappearing, and there seems a striking readiness to adopt the principle of the "clean slate" in other realms than those of politics. The professional is, no one knows it better than himself, terribly handicapped and embarrassed by traditional and antiquated ideals, still insisted on by the general voice of his clients, and an unsympathetic, matter-of-fact, business atmosphere, hardly congenial to original and creative effort. It is but few among the ranks of those who practise portraiture as a means of livelihood who have been able successfully to shake themselves free from all such interference and restraint, and to carry out their work and teach the lesson they have for us, if we will but learn it, in their own fresh and characteristic way. There is no need to mention names. Are they not written in the minds of all lovers of photography, by the memory of portraits that please, not for a moment only, but as the years pass?

And this is where the great value of an intelligent study by the professional of amateur work in portraiture comes in. He is so apt to get into an easy going routine, and to go on mechanically and almost automatically turning out just the same work in the same way. A better antidote to this tendency could hardly be recommended than that just mentioned. And when we speak of the amateur it is not only the first-class, medal-winning variety whose study is advised, but all sorts and conditions of that numerous body. Even in the half-comical efforts of the sheer beginner there is often to be found some germ of truth or useful suggestion that, to one who knows how to successfully carry it out, may be of the greatest value. There seems to be a state of quiescence at present, as far as the

production of unconventional and unhackneyed portraiture is concerned. Both amateur and professional appear to be resting on their oars, either content with what is won or fearful of fresh attempts. The latter, it is true, finds but little encouragement for the new and original among his clients. The public have unfortunately got so used to a certain orthodox type of portrait that they are scarcely satisfied with any attempt to place something different before them, however superior its artistic merits may be. They have become accustomed to certain conventional poses and presentations of themselves, certain ways of lighting, printing, mounting, and so on. It will doubtless take time before they can be brought to appreciate the more beautiful, though less showy, work that so many photographers would like to place before them, if it were only commercially sane and expedient to do so. It must, however, be admitted that if the artist is in some degree justified in his frequent assertion that the mechanical limitations of photography must necessarily prevent it from ever seriously threatening the supremacy of the brush and palette, at least the camera, of late years, has approached perilously and wonderfully near to doing so. And of no branch of photographic work can this more truthfully be said than of portraiture. In the hands of a true lover of his craft and of the humanity he copies, the camera has a power and vividness of rendering the inmost soul and character of the sitter that the artist may well envy, though, fortunately for the latter, it cannot yet hope to rival him in the wonderful realm of colour where his brush now holds unquestioned sway. It is simply courting failure to attempt portraiture in any merely mechanical or technical spirit. Here, more than anywhere, feeling, understanding, and sympathy are needed. There is not only necessary a keen sense and perception of beauty, in feature, form or outline, but a kind of psychological understanding and judgment, which enables us to bring ourselves into harmony with the sitter, to lead out, retain, and transfer to our plate the winning and witching smile, or the look of serious gravity, which are surely and certainly there—the dominant, key expressions of the faces we are dealing with, if only we know how to conjure them forth.

Since the camera has not the power of rendering colour, the photographer is driven to pay more attention to beauty of outline, light and shade, or composition. And it should ever be remembered that Art rises above all mere rules and formulæ, declining to be bound by them, and often obtaining its most striking successes in sheer defiance of their authority. They are necessary though, all the same, and he who would produce satisfactory and creditable work in any branch of pictorial photography should make himself, at the very outset, thoroughly acquainted with them. Only he must not allow himself to be blinded by their weight of authority, or to fancy them infallible. A little bright unconventionality will sometimes give greater pleasure and satisfaction than a more rigid adherence to orthodox laws. There are certain imperious rules, springing from the very nature of photography, that must be taken account of if really satisfactory and creditable work in portraiture is desired. For one thing, the camera will not subordinate the background to anything like the extent an artist would desire. This must be done then by the worker himself. It is perhaps in this respect that the greatest scope for new and original ideas will be found. There are many who think that the painting of backgrounds has been brought to rather too high a pitch of perfection, and that a revulsion in favour of greater simplicity might not be undesirable. On the other hand, plain dark backgrounds, however suitable and effective, are certainly getting rather hackneyed. Surely much more might be made of suitable draped hangings, picturesque carving, and the like, than is done at present. And is there not scope even now for the investigation of fresh methods of lighting, showing some departure from the usual studied roundness and evenness of the average studio portrait? That supreme masterpiece of Nature, the human face, is capable of looking well in an infinite variety of light and shade, as any intelligent study of our great painters will amply prove. There is plenty of room for the introduction of novelty in the way of combination lighting, that is to say, an exposure with partly day and partly artificial light. The ground in this direction has been very little broken up. And we want more *genre* portraiture. How little there is of it! We have really gone back in this direction since the beautiful work done by H. P. Robinson and others in the old days. People fight shy of that sort of thing now; they know the difficulties and the many failures they must face if they undertake it, and prefer cheaper successes. This is not as it should be. If we could only learn once more to take greater pride in one picture, representing months of thought and many fruitless attempts, than in crowded exhibition walls filled with our rapidly-turned-out and ephemeral work, the advance of photography would be quicker. In this class of work the golden rule is Patience, and again Patience. We shall not hit it with one negative, or two, or three. Over and over again must we try, never disheartened, making each effort better than the last; until, finally, the sitter, the surroundings, the attitude, expression and all, are just as the artist of the camera had in his mind at the beginning—and the result, a picture. There are unrivalled possibilities in photographic portraiture. Let us try to make more of them—to make the most of them. Dainty faces and forms are waiting to be caught by our trusty lenses and plates; graceful and unstudied attitudes; the silent poetry and melody of expression. Let us try to break down the stony mechanical barriers of our art, to bring freedom and life and soul into our work, so that instead of being the despised photograph, admired and appreciated for a day or two, and then only tolerated, it may be the picture, the work of art, the thing of beauty, that longer we see the more we love!

PURELY BUSINESS.

[By a Business Man.]

It is a pity that so many professional photographers fail to get more than they do out of their businesses. The great majority are worthy men, who would be willing to work twice as hard as they do if they but had the chance. Not that, perhaps, in the summer time each has sufficient work to fill up his time, but it is because he has to do all of it himself—take the picture, retouch, print, and mount. Most of it, he feels, is detail work that might be very well handed over to an assistant. What he would like would be to have sufficient trade to justify his devoting himself to the most important section—handling the customer. As things are, he is not in a position to keep an assistant; nor does he see much hope in the future. He has been at it, maybe, a dozen or a score of years, and if he has escaped the heavier shadows of discouragement, he feels, at any rate, that he is getting a bit stale in spirit and effort, and is allowing himself to settle down unconsciously with what contentment he may possess to things as they are. Occasionally there is added a touch of philosophical comfort in thanking his natal stars that things are not worse. He can just manage to make both ends meet, any way; many there are who fail to do as much.

The slackness of trade he attributes to several causes—cut prices, excessive competition (and from outsiders, in the shape of tobacco dealers and soap makers), the spread of amateurism, and so on. Having a common-sense idea of the average nature of his professional abilities, he sensibly concludes that the many suggested remedies, the new process, the highly artistic rendering, or what not, that may mean money to a more gifted man, are not for him. Or if his natural capacity be such as to justify him in feeling that, with a little practice, he is quite equal to turning out any class of work, he knows—possibly from experience—that such work could not possibly appeal to his customers. They have not been educated up to its appreciation. He is established in a quiet country town, or in the prosaic suburb of a commercial one, and not in the "west end" of a large city, with its broad margin of moneyed and leisured passers-by. Finally, he cannot afford to try experiments. He is sure of a certain amount of plain work, and his bread and cheese—and that of his wife and children—are immediately dependent upon it. He dare not risk that as a possible stake.

We do not wish to detract in the slightest degree from the value and the money worth, in suitable fields, of new technical departure and the exploitation of the artistic. But there is evident truth and hard common sense in the belief of the average professional, that they are not for him until they have become generally introduced, fairly well known, and his particular public familiar with them. He is not so likely to find a remedy on the professional, as the business, side of his work. Half a dozen new streets, to accommodate the employees of a new glue factory are more to his purpose than half a dozen new discoveries in the scientific and artistic fields of photography. Rather hard from an art point of view, perhaps. But it is not a question of art. Art cannot be got to rule the roost when "cabinets" only fetch eight and six a dozen. It is a matter of business. And as long as we make no comparison with art, but frankly treat the question as a matter of business, there is nothing out of place. The hundreds of thousands of fathers and mothers who look at the photographs of their absent sons and daughters, of young men and maids who look at those of their sweethearts, never give a thought to their art sides. Is there not a higher point of view—that of sentiment and love—to which the most commonplace business can cater? It is in filling such demands as these that nine-tenths of photographs are taken. If a worker, then, is to get out of the rut of depression, he must do so upon business principles pure and simple. He should regard his wares exactly as the grocer and draper regard theirs. It would be better if it were otherwise, and an inducement given to embody artistic excellence at a higher price. But the public that pays is not open to the view. That is, the general public is not; for it is, of course, needless to add that there is a special public with artistic instincts, which will always be ready to pay for their gratification in a photograph. If the photographer regards it as his mission to educate the general public up to the level of this special one, well and good; he is at perfect liberty to do so. It is a most admirable aim, but it will not spell business success. If, on the other hand, he elects for the latter, he must adopt exactly the same means as he clearly sees to mean success in the case of his fellow-tradesmen. Immeasurably so, the two chief of these are advertising and cheapness; they are, indeed, the very essentials of business success to-day. As has been often pointed out in the JOURNAL, it is astonishing, considering the power that his special business gives him in this, how little use is made of it. Special lines have also been pointed out along which profitable exploiting might be made. The field cannot be traversed in detail here, but it must surely be patent to all that not only can originality which will at once arrest desired attention be gained by the use of the camera, but that it can be made to strengthen a hundred-fold the orthodox means of advertising on poster, hand-bill, concert programme, memorandum head, and envelope flap.

Then as to the other great essential of cheapness. The prevailing complaint is of reduction of prices, and all effort made to keep them up. The wisest business effort will run to the reverse course, and into cheapening as much as possible. It would be ridiculous to say that a man would not prefer a guinea to half a guinea for a dozen prints. But the guinea is out of the question, for reasons so powerful as to be hopelessly beyond individual, or collective, control. It is useless trying to fight against the spirit of an age; and the spirit of this age is cheapness. We admit it to be an admirable one when buying, but otherwise when selling. If the photographer goes to the cheapest grocer and the cheapest tailor for his food and his clothing, why—we are now on the purely business basis, be it remembered—should he cavil at the grocer and the tailor going to the cheapest photographer for his likeness—not picture? His effort, instead, as a wise business man, should be to go with the existing order of things, swim with the current, and not against it. If he cannot afford, with his present instruments and methods, to turn out work at the lowest market price, he must adapt them to the dominant conditions so as to be able to, or even go lower—and make a fortune. To take one case in illustration. The time taken in work must be paid for, as a matter of common-sense. It takes some time to print a dozen prints, especially at some times of the year. That time would be immediately reduced to a third if a camera with four lenses were used, that would give four negative figures on one large plate. It would mean a new camera and more expensive plates, that would require greater care and economy in using. But the great gain is that they would cheapen the product. America has spent hundreds of thousands of pounds in laying down new plant to cheapen the production of steel. The result is that they rule the markets at home and abroad, at a lower price than ever before, and at high profits. The same commercial and economic laws apply in exactly the same way in the case of a camera costing but a few pounds. And so in all other directions. The great effort must be to cheapen by every possible means. Whether, at the same time, a higher and more artistic section could be retained is a matter for practical experience. But, certainly, upon the lines pointed out, the business that now gives but a bare return would give a handsome one; and a satisfactory bank balance is something of a set-off to loss of so-called artistic personality. And, after all, is artistic personality shown in ninety-nine-hundredths of the professional photographs that we see? If it is to be, frankly, business, why not the most profitable business?

THE PRESERVATION OF SOLUTION OF MERCURIC CHLORIDE.

[Communicated to the Pharmaceutical Society of Great Britain, at a meeting held in London on Tuesday, March 11, 1902, and reprinted from the Pharmaceutical Journal.]

SOME time ago we were requested by the Council of the Pharmaceutical Society to inquire into the change, if any, which solution of mercuric chloride undergoes according to the nature of the bottle in which it is kept.

The subject, upon consideration, divided itself into the following questions:—

1. Does the solution of mercuric chloride of the British Pharmacopœia undergo any change when kept?

2. To what extent is such change, if any, influenced (*a*) by the nature of the bottle in which the solution is kept; (*b*) by the

nature of the light to which it is exposed; (*c*) by the nature of the solvent?

3. What is the nature of the change, if any?

The question of the presence or absence of ammonium chloride did not receive our attention, partly because it has now been omitted from the official solution, and, for the rest, because it has been sufficiently dealt with by the late Mr. Martindale in the papers cited below.

It is of interest to note the changes through which the solution of mercuric chloride has passed since first it was made official. It was first introduced into the London Pharmacopœia of 1809 as liquor hydrargyri oxymuriatis, the solution containing 8 grains of the salt in a mixture of distilled water, 15 fluid ounces, and rectified spirit, 1 fluid ounce. The next edition of the London Pharmacopœia, issued in 1824, contained the same formula. The solution appeared in the 1836 edition as liquor hydrargyri bichloridi, and contained 10 grains each of mercuric chloride and ammonium chloride per pint of distilled water; the same formula was given in the 1851 edition. The first British Pharmacopœia, which appeared in 1864, omitted the solution altogether, but in the 1867 British Pharmacopœia it again appeared under the name liquor hydrargyri perchloridi, with the same formula as that of the Pharmacopœia Londinensis of 1836. The 1885 British Pharmacopœia repeated this formula, but that of 1898 gave it in an altered form by omitting the ammonium chloride.

At the outset reference was made to the literature of the subject, and two papers by the late Mr. William Martindale were found. In the first paper[1] the solution of the 1868 Pharmacopœia, containing ammonium chloride, was dealt with; the statement occurs that a simple solution (of mercuric chloride) in distilled water is quite stable. In the second paper[2] Mr. Martindale repeated this observation, and pointed out that even in the case of spring waters, containing supercarbonate of lime in solution, the solution is more stable than it is with a preservative, especially one of such a nature as ammonium chloride.

We accordingly, on July 23, 1900, prepared a quantity of solution of mercuric chloride of the official strength, and exposed it under various conditions. The intensity of light was varied by placing some of the bottles selected in a dark cupboard, seldom opened; others in diffused light, such as prevailed in the laboratory provided with frosted windows; and the remainder in a strong light. This was effected by placing the bottles in a window with a south-west aspect, so that they were exposed to a maximum of direct sunlight. Bottles were procured of different colours: viz., ordinary white shop rounds, from Messrs. Maw, Sons, and Co.; ordinary dark blue poison bottles, ordinary "actinic" green poison bottles, and the yellowish-brown (amber) glass bottles commonly used for bottling extract of malt. The character of the water was varied by using distilled water, recently boiled and cooled water, and tap water.

Further variations in the choice of glass will be described later in the paper. The following is a brief account of the results after the solutions had been exposed to various conditions named for nine months: viz., until March 21, 1901:—

INFLUENCE OF THE NATURE AND INTENSITY OF THE LIGHT.

WHITE GLASS BOTTLES.

Amount of deposit, if any, after nine months.

	Distilled Water.	Recently Boiled and Cooled Distilled Water.	Tap Water.
Diffused light ...	Slight	Minute	Copious, white
Strong light	Slight	Slight	Copious, white
Darkness	Minute	None	Minute

[1] Pharmaceutical Journal [2], **11**, 547. [2] Pharmaceutical Journal, [4], **4**, 228.

This table shows the folowing points:—

Distilled Water.—Even after keeping for nine months, that which had been kept in a dark cupboard contained but a minute deposit; that kept in diffused light and in strong light deposited slightly more; but all these solutions were judged to have kept satisfactorily.

Recently Boiled and Cooled Distilled Water.—These solutions kept slightly better, except in strong light, in which the deposit was rather more distinct than it was in the corresponding distilled water experiment.

Tap Water.—These solutions, under the same conditions, gave a copious deposit, except when kept in the dark; in this case only a minute deposit had formed. Bottle of tap water without mercuric chloride were similarly treated, and gave practically no deposit.

These deposits were,as a rule, so minute in quantity that we could find no satisfactory method of comparing them except by pouring the liquids, after well shaking, into thin glass beakers standing on black paper, and judging the relative amounts of deposit formed, the method gives sufficiently satisfactory results, which are, however, only approximate.

It will be seen that in the case of white glass a distilled water solution keeps well in any light, but a tap-water solution must be protected from the light.

BLUE GLASS BOTTLES.

Amount of deposit, if any, after nine months:—

	Distilled Water.	Recently Boiled and Cooled Distilled Water.	Tap Water.
Diffused light ...	Minute	Minute	Copious
Strong light	Slight	Slight	Copious
Darkness	Minute	Fairly copious	Minute

Distilled Water.—The deposit in strong light was rather more than we considered satisfactory. In diffused light or darkness there appears to be but little change in the solutions kept in blue glass bottles.

Recently Boiled and Cooled Distilled Water.—In diffused and strong light thi solution keeps as well as a plain distilled-water solution, but we obtain a fairly copious precipitate in darkness. We are unable to give any reason for this last result.

Tap Water.—The same as with distilled water in darkness, but a copious precipitate in diffused and in strong light.

ACTINIC GREEN GLASS BOTTLES.

Amount of deposit, if any, after nine months:—

	Distilled Water.	Recently Boiled and Cooled Distilled Water.	Tap Water.
Diffused light ...	Minute	None	Copious
Strong light	Slight	Slight	Copious
Darkness	Minute	Fairly copious	Minute

The same remarks apply here as to the blue glass bottles. It is noteworthy that tap water gives practically no precipitate in the dark, whilst in diffused light or sunlight a copious precipitate is formed. In darkness, recently-boiled distilled water again gave a fairly copious deposit.

AMBER GLASS BOTTLES.

Amount of deposit, if any, after nine months:—

	Distilled Water.	Recently Boiled and Cooled Distilled Water.	Tap Water.
Diffused light ...	None	None	Minute
Strong light	None	None	Minute
Darkness	Minute	Minute	Minute

Distilled Water.—In diffused light and strong light free from any deposit; in darkness a minute deposit was obtained.

Recently Boiled and Cooled Distilled Water.—Same as distilled.

Tap Water.—Minute deposit in all. It is remarkable that, even in strong light, tap water gives only a minute deposit with mercuric chloride if the solution is kept in amber bottles.

These experiments agree with the results arrived at by Moeller[1], who recently made a careful inquiry into the influence exercised by bottles of various colours in keeping different solutions. Amongst others, Moeller experimented with a solution of mercuric chloride to which oxalic acid had been added. He found that black, red, orange, and dark yellowish brown glass bottles were most efficient in protecting the mercuric salt from reduction; that brownish-yellow, pure dark green, and dark brownish-green protected well; but that bluish-green, blue, or white afforded little or no protection. In view of the agreement between Moeller's result and our own, we have not thought it necessary to make further investigation into the choice of the colour of glass.

We thought it, however, desirable to ascertain whether there were any differences between white glass bottles of English, German, and French manufacture in their action on mercuric chloride solution. We therefore prepared another solution of mercuric chloride in distilled water on May 9, 1901, and exposed portions in English, German, and French white glass, stoppered bottles, such as would be used by pharmacists, to diffused daylight on the laboratory table, thus reproducing as nearly as we could the conditions that obtain in a pharmacy. At the end of about two months a slight deposit had formed in each, as is shown in the table. Check experiments were also set on, side by side with the others.

COMPARISON OF WHITE GLASS BOTTLES.

Deposit, if any, after about two months:—

	Distilled water with Mercuric Chloride.	Distilled Water alone.
English	Slight.	None.
German	Slight.	None.
French	Slight.	None.

The deposit was much too small to be weighable, and quite insufficient to produce any appreciable reduction in the strength of the solution. As far as the eye could judge, the amount of deposit was the same in each case.

This experiment tends to show that such differences as exist in the manufacture of the various kinds of glass used do not cause any appreciable difference in the change that occurs in solution of mercuric chloride kept in them. It also confirm the previous experiments in showing that a distilled water solution of mercuric chloride, kept in white glass bottles exposed to diffused daylight, only very slowly undergoes change.

NATURE OF THE CHANGE.

The deposit in solutions prepared with distilled water, or recently boiled and cooled distilled water, consists of minute and apparently amorphous white flocks. With the aid of a centrifuge, we collected some of this deposit, and washed it free from the supernatant liquid. Examination under the microscope showed it to consist principally of minute crystals, which turned black when irrigated with solution of potash. We were also able to sublime it on to a cover-slip, and the sublimate gave the same reaction. It, therefore, is mercurous chloride, but the quantity at our disposal was, however, so minute that we were not able to finally determine whether wholly or partly so.

The deposit from tap water is at first similar to that from distilled water, but in tap water large dark ruby or garnet red crystals subsequently form. They appear to be formed in the solution, and to be carried to the surface by minute bubbles of gas. They float on the surface, unless disturbed, when they sink to the bottom. Thümmel[1], who investigated the action of potassium and sodium bicarbonates upon mercuric chloride, found that mercuric oxychloride was precipitated, its composition varying with the conditions of the experiment. By long standing, mercurous chloride containing mercuric oxide was deposited from solutions of mercuric chloride. He also observed, under certain conditions, the slow formation of minute black crystals on the surface of the liquid; these fell gradually to the bottom. Millon[2] assigns to these crystals the composition $4HgO . HgCl_2$, and Thümmel ascribes their formation to the gradual loss of carbon dioxide by which the bicarbonate is converted into carbonate. The disappearance of bicarbonate is followed by a precipitation of mercuric trioxychloride till then held in solution by the bicarbonate; the carbonate formed converts this into mercuric terra-oxychloride of t hecomposition indicated. We have tested these red crystals, and have found them to contain mercury, in the mercuric condition, and chloride; but not carbonate.

To ascertain if the precipitation in tap water was due to bicarbonate contained in it, we added to a distilled-water solution of mercuric chloride sufficient solution of magnesium bicarbonate to represent the quantity of bicarbonate present in tap water: viz., about 16 grains of magnesium bicarbonate per gallon. French white glass bottles were used, and placed, some in diffused light and some in the dark cupboard. The table gives our results after three weeks:—

EFFECT OF MAGNESIUM BICARBONATE ON MERCURIC CHLORIDE SOLUTION.

	Diffused Light.	Darkness.
Mercuric chloride solution with magnesium bicarbonate	Copious white deposit not adhering to the bottle	Copious yellowish-white deposit, adherent to the bottom of the bottle
Magnesium bicarbonate in distilled water without mercuric chloride	Slight flocculent deposit	Slight flocculent deposit

We obtained, therefore, exactly the same precipitation as in the tap-water solution of mercuric chloride. It is interesting to note, also, that subsequently dark red crystals were formed in both solutions of mercuric chloride in distilled water with the bicarbonate. The decomposition between magnesium bicarbonate and mercuric chloride goes on in darkness, as well as in light.

It seemed desirable to try the effect of organic matter on a mercuric chloride solution in distilled water, since possibly traces of organic matter present might bring about a reduction of mercuric to mercurous chloride, just as oxalic acid will. For this purpose 5 C.c. of a 1 per cent. cold aqueous infusion of hay were added to each quart of solution. At the end of three weeks only very slight deposits were observed, as the table shows:—

EFFECT OF ORGANIC MATTER ON A DISTILLED-WATER SOLUTION OF MERCURIC CHLORIDE.

	Diffused Light.	Darkness.
Mercuric chloride solution with organic matter	Slight deposit.	Minute deposit
Distilled water with organic matter, without mercuric chloride	No deposit.	Minute deposit

To each bottle we then added, when cold, 5 C.c. of a 10 per

[1] Ber. d. d. Pharm. Ges., 1900.

[1] Archiv. d. Pharmacie, 1855, p. 918. [2] Comptes rendus, 98, pp. 298 et seq.

cent. hot infusion of hay, but the only effect observed was that the mercuric chloride exercised a preserving influence on the organic matter, the bottles without mercuric chloride showing a larger quantity of green organic deposit than those containing mercuric chloride.

The minute deposit that very slowly forms in distilled water solution of mercuric chloride may possibly be due to the gradual solution of alkali from the glass by the long-continued action of water. It is quite possible that some varieties of glass may yield more alkali than others, but we have not thought it necessary to pursue the investigation further. We have tested five different specimens of white glass bottles, such as the pharmacist would use, and upon the results obtained we base the opinions subsequently expressed in a summary.

The action of light on mercuric chloride solution in glass vessels of different colour may be demonstrated by means of the electric lantern. If the bottles be filled with a solution of mercuric chloride containing, in addition, a reducing substance —*e.g.*, oxalic acid—in the proportion of one part of each substance in sixteen fluid parts, and then exposed to a beam of light from the lantern for a definite time, the effects are readily compared. Thus, after an exposure of three minutes, white glass gave a heavy precipitate, blue or green glass gave a less heavy, though considerable, precipitate, while no perceptible precipitate was obtained in the case of amber glass. These results are in entire accord with our conclusions based on the experiments we have described, which lasted over a long period.

It is of interest to demonstrate the relative values of glass of different colours by passing a beam of light from the lantern through a prism so as to produce the spectrum, and then interposing strips of glass between the prism and the screen. It is seen that the blue portions of the spectrum are not appreciably affected by passing through blue or green glass (obtained from the bottles previously referred to), but that the blue portions are almost entirely cut off by amber glass.

SUMMARY.

We draw the following conclusions from our experiments: (1) That solution of mercuric chloride in distilled water will keep satisfactorily in white, green, or blue bottles for a reasonable length of time if not exposed to direct sunlight. (2) That, even in direct sunlight, it will keep if protected by the use of amber glass; we therefore recommend the use of bottles made of such glass. (3) That the ordinary white glass botles, whether of English, German, or French manufacture, as sold to pharmacists, do not appreciably differ in their action. (4) That the minute deposit gradually formed is partly or wholly mercurous chloride. (5) That mercuric chloride with tap water gives a copious precipitate in blue, green, or white glass bottles; the precipitate will not form, however, in amber bottles or in darkness. (6) That in diffused light amber bottles preserve the solution better than blue, green, or white bottles. (7) That in strong light the amber glass alone is satisfactory. (8) That strong light effects more decomposition than diffused light, especially with tapwater.

Henry George Greenish, F.I.C., Professor of Pharmaceutics to the Pharmaceutical Society of Great Britain,

and

F. A. Upsher Smith, Demonstrator in the Research Laboratories of the Pharmaceutical Society of Great Britain.

Marple and District Photographic Society.—Mr. C. J. Atkinson will lecture upon "Exposure" on Thursday, April 3rd, commencing at eight o'clock, Recreation Club.

According to a contemporary, an animated newspaper will be presented to the Palace Theatre audiences next August, when Mr. Mostyn Pigott, of the "World," will produce the "Revue," a photographic *résumé* of the day's doings. The new form of cinematograph has been invented by Mr. Charles Cochrane.

THE NATIONAL PHYSICAL LABORATORY.

The main features of the National Physical Laboratory which was formally opened last week by the Prince of Wales, are thus officially described:—The basement and ground floor of Bushy House have been transformed into a physical laboratory, while the upper floors form offices and a residence for the director. One wing, containing the original dining-room and library, has been fitted as an electrical and magnetic laboratory. All iron has been, as far as possible, removed from the structure, and, with a view of preventing a stray magnetic field from any currents which may be used, concentric wiring has been employed for all large currents, while the wires for smaller currents have been twisted. In this room will be placed the Lorenz apparatus which the Drapers' Company has recently given to the Laboratory in memory of the distinguished services to science and to education of the late Principal J. V. Jones, F.R.S., of Cardiff. Along with this there will be other apparatus for the absolute measurement of current and of electromotive force. Another wing has been fitted for thermometric work. A special study will be made of high-temperature thermometers, and the laboratory owes to the generosity of Sir A. Noble the means for installing a number of electric ovens for testing thermopiles and other instruments for the measurement of temperature up to 1,000 deg. or 1,200 deg. Centigrade. In a third wing a metallurgical laboratory has been fitted in which to continue the work begun at the Mint by Sir William Roberts-Austen and the Alloys Research Committee. For this purpose apparatus for cutting and polishing sections and further photomicrographical examination has been obtained. The committee has to thank Mr. Stead for his assistance in arranging this. The fourth wing is fitted as a chemical laboratory. In the basement are a number of constant temperature rooms. Sir Andrew Noble's fund, referred to in the last report, has provided a measuring machine, a dividing engine and a comparator, which will be placed in some of the basement rooms. In an adjoining room the resistance measurements of the British Association Committee will be continued, while in another, apparatus for the production of liquid air is being set up. The testing of pressure gauges will form an important branch of the work, and for this a mercury column some fifty feet in height has been erected in one corner of the house. Gas and water have been laid on freely throughout the building—also electricity. A 100-volt circuit is connected to the main dynamo and battery in the power-house, and supplies light. Numerous plug points enable a supply to be taken off for lights for experimental purposes or for small motors. For experimental work a special battery of fifty-five cells has been installed. This is divided into groups of five. Wires run from the switchboard to the various rooms in such a way that one or more of these groups can be switched on to any circuit. Thus voltages between 2 and 110 volts can be obtained as required. The house is heated on the Webster low-pressure system by steam from a Lancashire boiler in the boiler-house at a distance of about 100 yards. The boiler also supplies steam to one of Parson's 60-kilowatt turbo-generators, which is the main source of power. The power-house also contains an 18-h.p. Crossley gas-engine, driving a 12-kilowatt dynamo by T. Parker and Co. This serves as a stand-by and for charging the main battery of fifty-eight chloride cells. The engineering laboratory, a building eighty feet by fifty feet, adjoins the power-house. This is divided into two bays; a shaft, driven by a motor supplied by Mather and Platt, runs along one, and in it will be placed the lathes, drilling machine, planing machine, and other tools. The other bay is for experimental work. It is traversed by a 2-ton crane, and will contain a testing machine and machinery for testing steam-pressure gauges, indicators and such instruments.

With regard to gifts to the Laboratory, it has already been mentioned that the Drapers' Company has undertaken to provide the sum of £700 to meet the cost of a Lorenz apparatus, in memory of the late Principal Viriamu Jones. Messrs. Willans and Robinson are providing apparatus for testing steam-pressure gauges and indicators, while in a number of cases very advantageous terms have been granted to the committee by manufacturers of tools and machinery. Lord Rayleigh, Lord Kelvin, Mrs. Hopkinson, and the Syndics of the Cambridge University Press have presented valuable books. Lady Galton has given a valuable astronomical clock with electric contacts, in memory of the late Sir Douglas Falton. But though much has been done, the laboratory is far from complete. Rather more than £300 has been spent on apparatus, but visitors will notice many gaps before the important problems which lie to hand can be fully grasped. Still, it is now possible to make a start, and to show, by the work done with the means at the disposal of the staff, that the Laboratory is fulfilling a need and that it deserves the support of those who are concerned in facilitating the application of science to industry. The pious benefactor, however, who will put it as regards equipment on a footing comparable with Reichsanstalt is still to seek. In research work it is hoped that the investigations of the Alloys Research Committee may be continued. Much, though not all, of the apparatus required for this has been purchased; a recording pyrometer, however, must be added to the outfit before it is complete. Prof. Barrett's paper

read at the Institution of Electrical Engineers recently showed the importance of the aluminium steels for dynamo and transformer manufactures, and with the kind assistance he then offered it is hoped that a start may soon be made on their investigation. The measurement of wind pressure is of great importance to engineers; with the help of Sir Benjamin Baker, an investigation will be made into this subject. In thermometry, the object will be to arrange for the more systematic and ready measurement of the high temperatures met with in industrial undertakings. As to the commercial testing work which is to be undertaken, the following list will indicate its scope, though until the Laboratory standards have been more thoroughly studied it is hardly possible to do much on a large scale—

Tests of pressure gauges and steam indicators.

Tests of measuring appliances and gauges for use in engineering shops, etc.

Test of screw gauges.

Tests of thermometers for the measurement of high or low temperature, the platinum thermometer, thermopiles, etc.

Photomicrographic tests on metals, steel rails, etc.

Measurement of the insulation resistance and di-electric capacity of insulators.

Measurement of the electrical resistance of conductors.

Tests of capacity and induction and of various forms of electrical measuring apparatus.

Tests on the magnetic properties of iron, etc.

Standardisation of glass vessels, flasks, burettes, etc., used in chemical laboratories and in various industries—*e.g.*, the dairy trade.

Standardisation of weights and scales for laboratory purposes.

Testing of photographic and other lenses.

Among those present at the opening ceremony were:—The Lord Chancellor, Mr. Gerald Balfour, M.P. (President of the Board of Trade), Mr. Akers-Douglas, M.P. (First Commissioner of Works), the Duke of Northumberland, Viscount Esher, Lord Kelvin, F.R.S., Lord Blythswood, Lord Lindley, F.R.S., the Lord Mayor, Mr. W. L. Jackson, M.P., F.R.S., the Right Hon. W. J. Pirrie, Mr. S. E. Spring Rice, C.B., the Master of the Drapers' Company, the Master of the Haberdashers' Company, the Astronomer Royal, Mr. Bigwood, M.P., Mr. Skewes-Cox, M.P., Sir F. Abel, F.R.S., Sir B. Baker, F.R.S., Sir F. Bramwell, F.R.S., Sir J. Crichton Browne, F.R.S., Sir E. Busk, Sir W. Crookes, F.R.S., Sir J. Durston, Sir W. Thiselton Dyer, F.R.S., Sir J. Kirk, F.R.S., Sir J. Hooker, F.R.S., Sir N. Lockyer, F.R.S., Sir G. G. Stokes, F.R.S., Admiral Sir W. J. L. Wharton, F.R.S., Col. Principal Lodge, F.R.S., Professor S. P. Thompson, F.R.S. (president of the Physical Society), Mr. McKinnon Wood, Mr. P. Watts, F.R.S., Mr. C. T. Yerkes, Professor D. S. Capper, Mr. Kempe (treasurer of the Royal Society), Sir M. Foster, M.P., and Dr. Larmor (secretary of the Royal Society), Dr. Thorpe (foreign secretary of the Royal Society), Mr. Hawksley (president of the Institution of Civil Engineers), Mr. Maw (president of the Institution of Mechanical Engineers), Mr. Langdon (president of the Institution of Electrical Engineers), Mr. Levinstein (president of the Society of Chemical Industry), and the following members of the Executive Committee:—Sir F. J. S. Hopwood (Permanent Secretary of the Board of Trade), Captain Creak, R.N., F.R.S., Professor Perry, F.R.S., Sir J. Wolfe-Barry, F.R.S., Sir E. Carbutt, Mr. A. Siemens, Sir William Roberts-Austen, F.R.S., Mr. G. Beilby, Dr. F. Elgar, F.R.S., Professor Clifton, F.R.S., Principal Rücker, F.R.S., and Sir A. Noble, F.R.S.

According to the report given in the "Times," Lord Raleigh said that the idea of a national physical laboratory was not new. It was many years since Dr. Lodge forcibly advocated the establishment of such an institution. In the year 1896, he thought it was, Sir Douglas Galton made it a principal subject of his presidential address before the British Association. He took some pains to inform himself of what was being done in the kindred institutions in Germany, and was very much impressed with the importance of our following in those steps. He thought it was Sir Douglas Galton's address that led to the deputation to the Prime Minister, he was sorry to say as much as five years ago, in which the importance of that work was laid before him, and he presumed it was in consequence of the representation then made that a Treasury Committee was appointed by the Chancellor of the Exchequer, of which he (Lord Rayleigh) had the honour to be the chairman, although the bulk of the work fell upon Professor Rücker. That committee examined witnesses representing both the scientific side and also the industries, of which there were many, depending on scientific discoveries. They visited the German institution and reported finally, strongly, and unanimously in favour of the establishment of such an institution as they celebrated that day. After detailing the circumstances which led to the establishment of the laboratory at Bushy House, Lord Rayleigh said that he considered that Bushy House was an ideal place for a laboratory. There was a good surrounding of ground within which they might do as they pleased without being pulled up to account; but the scale of the building and the works necessary to adapt it for the purposes of a laboratory had sorely tried, he was afraid, the patience of the Treasury, and he thought it was highly probable that that patience would be still further tried in the future. One of the first businesses of the committee that was appointed by the Royal Society to manage the institution was the selection or appointment of a director. That appointment was offered to Mr. Glazebrook. They were well acquainted, not merely with his scientific abilities, but with his business capacities and powers of organising, before he gave up a position of importance and considerable independence in order to take up that work which he felt himself well qualified to do. And now they had the National Physical Laboratory. It was national in the proper sense of the word, and it was the laboratory of the nation. He had been struck, and he dared say many others had been, in reading the life of Pasteur to find how very largely figured in the motives that directed his work the feeling that he was working for the honour and glory of France, and how, when the disasters overtook France in 1870, he felt that he must do all that he could in order to raise France again from that position into which she had fallen. He certainly succeeded in that attempt. Now they had their opportunity. The presence of their Royal Highnesses there that day testified to the sympathy felt in that work by the Royal House. The Treasury—he was going to say for the Treasury—had shown themselves sympathetic. He thought that would hardly do them justice, because he must say that those officials of the Treasury with whom they had been directly concerned had entered most warmly into the idea, and had given it their heartiest support. In this country, as things went, we must not expect the Government to do everything. We must look for assistance from those especially who had made fortunes out of industries which depended upon recent scientific discoveries. (Cheers.) Some little while ago he heard the lamented Bishop Creighton tell an anecdote which he thought it was appropriate to repeat. He was speaking of the president of an American University who had received financial favours from a local financier of wealth, upon whom he called to obtain, if possible, further extensions of that bounty. When he was shown into the room the great man looked up for a moment only from his books and papers, and said, "I have no time to talk to you, but I know what you have come for. There's my cheque-book. Fill it up!" That was the right spirit. They hoped there were others who would allow them to use their cheque-books in a particular manner, by making presentations of machines, or even giving them orders for testing which would bring in useful fees. In that way he though the deficiencies, which were at present considerable, might be filled up. Finally, he might appeal, although he knew it was not necessary to do so, to the workers in the establishment itself, that they each one of them should do all that lay in them to make the work which they had undertaken a success, a credit to the country, and a justification of the name which that institution bore.

The President of the Board of Trade took the opportunity on behalf of the Government department with which he was connected of expressing their cordial wishes for the success of the institution which was being opened that day under circumstances so auspicious. The Board of Trade might, he thought, claim to have been intimately associated with the national laboratory in what he might call its pre-natal days, for the late permanent Secretary of the Board, Sir Courtenay Boyle, was a member of the committee of inquiry appointed to examine into the subject in 1897, and was subsequently to that time a member of the executive and general committees appointed by the Royal Society. He took the keenest interest in the subject, and gave ungrudgingly his share of labour to that which was contributed by the distinguished men whose colleague he was. There was also another bond of union between that institution and the Board of Trade, as a part at least of its work was very similar to that which was entrusted by Parliament to the Board of Trade. To that extent the operations of the two institutions might be said to touch, and even, perhaps, to overlie, and though it sometimes happened that rival institutions were apt to look upon each other with something of an eye of jealousy, on behalf of the laboratories of the Board of Trade he thought he could assure them that no sentiment of that kind animated them in the present instance. He believed it was universally recognised that, within the limits of the statutory duties of the Board, the standards department and the electric standardisation laboratory had performed their work satisfactorily; but they undoubtedly admitted that even within those narrow limits the refinements of modern science called for investigations to which the resources of an ordinary Government department with statutory duties were necessarily unequal, to say nothing of the more varied field lying outside. It would be presumptuous on his part to attempt to address them on the more strictly scientific aspects of the National Physical Laboratory, nor, indeed, was the interest so justly excited by the establishment of that institution one which regarded solely or even principally the strictly scientific side of the institution. What was the nature of that interest? He thought the interest arose from this, that that institution typified what they might fairly regard as one of the most important movements of the present day—he meant the systematic application of science and of scientific methods to the arts of production. Mr. Glazebrook and he were fellow students at Cambridge, and he remembered a story which was current at that time concerning a certain celebrated professor of mathematics. He was engaged in investigating the properties of a peculiar curve, and he published a preliminary paper on those properties and the results of his investigation. Having to bestow his attention upon other

matters he afterwards suspended his investigations on the curve, and in that interval, unluckily as it turned out, a certain inventor had the audacity to apply that curve to a novel invention for a gun-carriage. What was the result? The learned professor was so taken aback at that application of his theory to practice that, instead of resuming the suspended subject of his investigations, he was constrained to give it up in disgust. He thought that story illustrated what had been the attitude of theory towards practice in the past, and he thought it might be very easily matched by the attitude which practice had occasionally taken up towards theory. But that temper was passing away. The union between scientific theory and practice was becoming more and more intimate every day. He was afraid that if this country in the first instance, took the lead in the applications of science to industry, it had of late fallen somewhat behind in the race, but not so far, he trusted, but that it might be possible for us to make up our lost ground. The establishment of that institution was certainly a step in the right direction, and he was sure he was but expressing the sentiment of all there present when he expressed the hope that, although the beginning might be comparatively small, the resources with which that institution started comparatively slender, it nevertheless had before it a future of renown and of utility worthy of the send-off which it was receiving from their Royal Highnesses that day and of the great and important purposes for which it was founded.

The Prince of Wales, in declaring the Laboratory open said: I am glad that my first duty as a Fellow of the Royal Society should be to join with my distinguished brethren in opening this institution, the direction and administration of which have been entrusted to the society by the Government. It is also a great pleasure to assist in the inauguration of what may fairly be called a new departure, for I believe that in the National Physical Laboratory we have almost the first instance of the State taking part in scientific research. The object of the scheme is, I understand, to bring scientific knowledge to bear practically upon our every-day industrial and commercial life, to break down the barrier between theory and practice, to effect a union between science and commerce. This afternoon's ceremony is not merely a meeting of the representatives of an ancient and world-renowned scientific society for the purpose of taking over a new theatre of investigation and research. Is it not more than this? Does it not show in a very practical way that the nation is beginning to recognise that if her commercial supremacy is to be maintained greater facilities must be given for furthering the application of science to commerce and manufacture? In the profession to which I am proud to belong there are, perhaps, special opportunities of gaining a certain insight into the general trade and commerce of the world and of comparing the commercial vitality of the different countries. And certainly abroad one finds an existing impression, which was confirmed by the experience of my recent and interesting colonial tour, that the superior technical and scientific knowledge of our foreign competitors is one reason why our hitherto pre-eminent position in manufactures and commerce is so considerably threatened. As a simple example I may quote the opinion of an expert authority in Australia, that the aniline dyes of Germany had given to a certain class of German-made goods a decided superiority over those of British manufacture. In Germany and America much valuable work has been carried out by the State. In this country the Government have provided these buildings and found machinery for the supply of light, heat, and power. They are at present not inclined to spend more money upon equipping the laboratories. It is therefore to the liberality of the public that we must look not only for money, but for presents in machinery and necessary appliances. Already the institution has benefited in the latter respect by gifts from Sir Andrew Noble, the Drapers' Company, Messrs. Willans and Robinson, Lady Galton, and others. The old-established Kew Observatory now forms part of the laboratory. Important and growing work is carried out in the testing of telescopes, binoculars, sextants, and more particularly, telescopic sights for the Navy. Most of the scientific outfit supplied for the Antarctic expedition was tested at Kew. The laboratory will also supply a want which is much felt for standardising and testing the many other forms of apparatus in daily use, while investigations will be carried out on points of importance to the manufacturer or the merchant from the solution of which valuable results may be expected to accrue. I am particularly pleased to know that it is possible that within the precincts of this laboratory there will be established a work of the utmost importance—namely, a tank after the design of the late Mr. Froude, in which the performance of a ship can be predicted from experiments on a model. At present there is such a tank at Haslar, which is fully occupied in Government work. The Institution of Naval Architects, impressed with the demand for this work, have proposed to raise the sum required to erect the tank and for the necessary appliances. But the funds at present at the disposal of the laboratory will require to be considerably supplemented if they are to undertake this much-needed work. No doubt the working expenses of the tank will ultimately be met by fees. But a difficulty may arise in tiding over the interval which must elapse before such fees are available. I am confident that, through the generosity of the public, the necessary means will be forthcoming to meet these difficulties and to secure that which is almost an essential to the shipbuilding industry of a country possessing the largest mercantile marine in the world. Before such an audience I have not presumed to speak of the value to science of this institution. Though the Navy has given many notable names to scientific theory, it is the practical results which naturally appeal more to the mind of the sailor, and I am sure you will accept this as my excuse for having ventured to make my few remarks upon the future of this institution from merely a utilitarian point of view.

Lord Kelvin hoped that from that institution the alliance between theory and practice would be made close and effective more than ever hitherto, and he thought that the results that might be expected from it, both in their material aspect and from a purely scientific point of view, were so great that we could only now venture to foreshadow them, to think of them in imagination, and to look forward to them. A large part of the work of that institution would be exceedingly minute and accurate measurement of pieces of metal of all sorts, accurate to the millionth of an inch, the measurement of temperature accurate to hundredths or thousandths, or perhaps some would say hundred-thousandths, of a degree. This very minutely, accurate scientific work taxed the resources of science more than perhaps did any other scientific work whatever, for the amount of scientific knowledge and experience and mathematical skill that must be bestowed on that very accurate measurement could only be known perfectly to those who worked at it, or who were fully acquainted with the foundation upon which it rested. It did not, however, strike the popular imagination so much as brilliant discoveries in science. They must remember, however, that some of the most brilliant discoveries had been due to very minute measurements. Newton's discovery of the law of gravitation was due to such very minute observation. His great generalisation was ten years at least under his hand and in his mind. He would not declare the result until he had an extremely minute measurement of the earth's dimensions, much more accurate than had ever been made before, and that proved the keystone to the grand arch, and established for ever the law of universal gravitation.

A SIMPLE METHOD OF ETCHING PICTURES.

[From the "Scientific American."]

THE desire to draw and sketch is an almost universal one. There is a singular delight in the ability to put on paper that which has pleased the eye or caught the fancy. There have been many processes devised for the purpose of aiding the unskilled to gratify this ambition, probably the oldest and most familiar being the transparent sheet of glass, back of which are placed prepared sketches to be traced. There have been other forms of this same idea, some of which are too elaborate to answer the popular demand. The camera has in a great measure filled this rôle, and its immense popularity gives convincing evidence of the desire of the masses to dabble in the picture-making art. But the camera has its drawbacks, principally in that it is not selective, but accurately registers on the sensitive plate all that is within its field of view. The worker with the pencil and brush, on the other hand, exercises great discrimination in the matter, picking out only the telling features of the view and rejecting everything else from the canvas or pad before him. Benjamin Hawley, an artist of Philadelphia, is the inventor of a device which has been recently patented, by which works of art can be produced by anyone without any previous tuition or particular aptitude for handling the pencil. The instrument is called the etchograph. On the top plate of a tripod, a support is carried, comprising a longitudinal bar and a lateral bar. At one end the longitudinal bar carries an adjustable frame to receive a glass plate coated with a transparent film of gelatine or collodion; at the other end, the bar is formed with a slot to receive a holder for a vertically adjustable lens. The lateral bar serves as an arm rest. The tripod having been set up in proper position, the engraver looks through the lens, and sharply focuses the image transmitted through the glass plate by sliding the holder in the slot of the longitudinal bar. The reduced image, being apparently projected on the plate, can then be engraved on the prepared surface of the glass. By this means anyone can make a satisfactory picture without the least knowledge of art or even acquaintance with the use of the pencil; but with the skill which soon comes of practice and observation some very artistic effects can be obtained. For instance, by allowing a small amount of ink to remain on the plate's surface instead of thoroughly cleansing it, and then by a broad sweep here and there with a wad of cotton the print can be given all the appearance of an etching. The method here offered is also of value to the student just beginning his career of art. It teaches him to see, and greatly simplifies the understanding of perspective. That things are seldom what they seem becomes at once evident to the art student when he makes his first endeavours to make a plane reproduction of solid form. For instance, when an oblong box is viewed in perspective, its long side may appear shorter than its short side, and in the drawing of such a box the line representing the short side may actually be shorter than the line representing the long side. To the beginner such appearances are most confusing, and the labour of learning to see is often so tedious that many are discouraged at the outset. It is evident that with the aid of some such device as

this, perspective and form as well are revealed at a glance. Thus it can be made a great help to the beginner. It has received the indorsement of a number of artists for this purpose. The etchograph is also a valuable assistant to the scientist and student, particularly in botany, zoology, or anatomy. With its aid he can reproduce just such parts of the floral specimen as he desires, rejecting all superfluous and confusing details.

Exhibitions.

KIRKCALDY PHOTOGRAPHIC SOCIETY.

THE annual function of this rising Scotch society was opened to the general public last Saturday in their rooms at 196, High Street, Kirkcaldy. The exhibition, which is entirely confined to members, cannot be described otherwise than as an admirable one, highly creditable to the members of the society, and reflecting in the most satisfactory manner on all those who have in any way contributed towards achieving so highly successful a result. The entries number 92 pictures, and 12 sets of lantern slides, each set consisting of six slides. The hanging is as satisfactory as one can wish, and the framing generally of the exhibits has had some care bestowed upon it. The gentlemen who kindly undertook the duties of making the awards in the four classes or sections were Mr. Walter D. Welford, F.R.P.S., of London, and Mr. John Terras, of Markinch, whose son, the late Robert Terras, produced the well-known genre studies, "The Ghost Story," "News of Battle," etc. The judging was therefore in very capable hands, and, in our opinion, leaves nothing to be desired. From the work, the casual onlooker must be struck by the vitality and earnestness of the exhibitors. Mr. Storrer is perhaps the largest exhibitor, and secures the place of honour in the class for enlargements —a particularly large and strong division—for his work entitled "The Birth of a New Day." A general high quality prevails throughout this work. The next place is held by Mrs. Landall for a most pleasing and harmonious work, No. 66, "Norwegian Sailing Boat." The division devoted to lantern slides proves that the society have lantern-slide makers who will yet be heard of. The whole of the 12 sets are of much higher quality than that usually seen at confined shows. The award goes to Mr. W. Lockhart for a set splendid in technique and with some artistic quality. The division for direct prints contains much good work, the winter landscapes of Mr. C. Stewart being of high quality. He scores with a rather fine tree study. Among the work shown, we jotted down that by Mr. H. P. Thomson as being worthy of attention. All the photographic work exhibited by this gentleman is almost of perfect technical quality; it, however, points to a lack of sclective ability, and that seeking in nature of pictorial and pleasing effects which the camera is so much adapted to render. When this worker becomes able to do as well in this direction as he can at present do with the technical side, then he will be a strong man. Dutch scenery represents Mr. S. Stewart to a very large extent. His representations of canal scenes leave little to be desired. The picture which struck us most by this worker is "Fisher Folk—Katwyk," one of a set of four prints in a frame. Framed separately it would command attention anywhere. There are quite a number of others which we would fain mention, but space forbids. Altogether it is a creditable show, and gives abundant evidence of the possibilities of photographic art.

BRENTFORD PHOTOGRAPHIC SOCIETY.

THE fourth annual exhibition of the Brentford Photographic Society, which was held at the Public Baths, Brentford, on the 18th and 19th instant, was a very creditable one to the society. In the members' classes a considerable improvement was shown over the work of last year, and taking into consideration that it is a young and comparatively small society, and that the majority of the members are evidently in the beginner's stage, the proportion of photographs that possessed some feature of interest was a considerable one. The work of Arthur R. Read and Frank H. Read in particular deserved notice for its pictorial feeling, and, with a greater knowledge of how to use their material to the best advantage, which can only be gained by experience, they show promise of coming well to the front. S. E. Bonfellow and F. Mealand also had landscapes of more than average excellence, and the figure studies of Hilton Grundy were good.

The open classes were well supported, a large proportion of the pictures being familiar acquaintances to those who have visited recent exhibitions in the Metropolitan district. The members of the society exhibiting in the open classes, A. R. and F. H. Read, S. E. Bonfellow, and Hilton Grundy, however, fully sustained their own society's reputation. The work of Lieut.-Col. R. W. Shipway deserved notice for its marvellous technical quality; but, unfortunately, although the views were fairly well selected, no attempt had been made to give them a pictorial character. Among the principal exhibitors, in addition to those already named, were G. H. Capper, Graystone Bird, W. T. Marriott, E. W. Taylor, H. O. Isaac, C. Wickison, E. W. Shing, C. M. Wane, Walter Kilbey, F. G. Tryhorn, S. C. Stean, E. W. Burch, and A. T. Ward.

The judges were Messrs. J. H. Gear and J. C. S. Mummery. The prizes in the members' classes were apparatus to a certain value.

THE AWARDS.

Members' Classes.—Class A.—Landscape: F. H. Read. Class B.—Any other subject: Hilton Grundy. Class C.—For members who have not previously taken an award: F. Mealand.

Open Classes.—Class D.—Landscape, etc.: Silver Medal, B. C. Wickison; bronze, E. W. Taylor, and G. H. Capper. Class E.—Portraiture, etc.: Silver medal, Walter Kilbey; bronze, C. M. Wane. Class F.—Architecture, etc.: Silver medal, Walter Kilbey; bronze, F. G. Tryhorn. Class G.—Lantern Slides: Silver medal, H. Wild; bronze, H. O. Isaac.

THE CANTABS' WELCOME TO THE CONVENTION.

[The sentiment, at least, of the annexed lines justifies their reproduction here, as showing the kindly spirit in which the forthcoming meeting of the Convention will be received by its Cambridge hosts.—EDS. B.J.P.]

We welcome the Convention to our ancient classic town,
Long famed for noble buildings of beauty and renown;
Illustrious men as students once dwelt within those walls
That border on the winding Cam the memory now recalls.
We trust distinguished members now in the 'Varsity
Will willingly come forward, like our Sir Robert B.,
Take part in the reception upon the opening day,
And entertain the visitors during their brief stay.
Our kind and worthy President, in his cordial manner free,
Has invited all Conventioners to the Observatory,
To view the apparatus that records the starry sphere,
And enjoy the garden party in the pleasant grounds so near.
We're lucky, too, in this respect, we've got a generous Mayor,
Whose help will not be lacking, and he's sure to do his share,
And meet us in a handsome way, like other Mayors have done;
So I think we may look forward to a week, a record one.
We've arranged for day excursions, and you'll find enough to do
In the photographic way at Ely and Bury too;
For lovers of the picturesque, St. Ives is worth a day,
Its quaint old bridge and river will all your plates repay.
Then there's the views of Cambridge, its colleges, and "Kings,"
The pretty bridges o'er the Cam, and a host of other things.
To go right through the programme would tire you, I'm afraid.
There will be the exhibition connected with the trade,
And many social gatherings, a dinner like that last year,
Some papers read on subjects profound to some, I fear.
So equip yourselves with plates and kit, and "buck up," so to speak,
And come to the Convention next July for a week. TRIPOD.

Cambridge, March 21st, 1902.

A CENSUS OF LONDON PHOTOGRAPHERS.

UNLIKE the method adopted at previous censuses when the occupations of the people of England and Wales were published in one volume and at a late period after the taking of the census, the authorities have created a new departure this time by publishing the occupational results of the census taken on March the 31st of last year in county sections. The first county to appear is that of the administrative county of London, which comprises the City of London, together with the 28 metropolitan boroughs constituted under the Local Government Act of 1899. The figures given showing the number of photographers enumerated within this area are as follows:—

Total number, 2235 males; total number, 703 females.

At the previous census in 1891 the totals were respectively 1,635 and 610, showing increases during the decade of 600 and 93 respectively.

The totals for 1901 are distributed under the following range of ages:—

	10	14	15	20	25	35	45	55	65	75 upwards.
Males	3	31	318	392	651	432	228	128	45	7 2,235
Females	3	9	173	188	206	75	29	17	3	— 703

Turning to the section of the volume assigned to foreigners and their occupations, we find the following foreign element described as photographers within the area under notice:—Russia, 16; Poland (Russian), 4; Sweden, 1; Norway, 3; Denmark, 3; Holland, 1; Belgium, 2; France, 10 and 3 females; Germany, 36 and 1 female; Austria, 9; Hungary, 2; Switzerland, 1; Italy, 10; Servia, 2; Turkey, 2; and America (U.S.), 10 and 1 female.

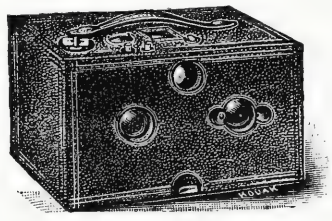
PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

THE following gentlemen were elected members of the association at a meeting of the committee on March 21st:—Banfield, Arthur C., Foulsham and Banfield, 95, Wigmore Street, W. Gower, James Edward, The Studio, 7 and 9, Lammas Street, Carmarthen, South Wales. Illingworth, William, Art Studio, 110, Abington Street, Northampton. Rignall, J. William, Starr and Rignall, 108, Fitzroy Street, Cambridge and City Studio, Ely. Starr, Ralph, Starr and Rignall, 108, Fitzroy Street, Cambridge and City Studio, Ely. Ramell, Frederick Miller, 34, High Street, West End, Sittingbourne. Prodger, Daniel, C. F. Treble, 373, Brixton Road, S.W.

New Apparatus, &c.

The No. 2 Stereo-Kodak. Manufactured and sold by Kodak, Ltd., 43, Clerkenwell Road, London, E.C.

In the instrument before us we see realised an aspiration expressed in these columns a long time ago for a cheap stereoscopic Kodak, and as binocular work for many years has been a pet fad of our own, from which the chilling and enthusiasm-destroying influence of time has failed to detach us, we have examined the No. 2 Stereo-Kodak with more than ordinary interest. When the sliding catch shown at the bottom of the camera is pulled out, the body of the machine is lifted from its shell by means of the top strap. The film is then spooled into position over guide rollers in the usual way, and when the paper is made taut by the slotted receiving-reel, the cardboard flap (which has two circular holes in it) is folded back to the paper, and the body of the camera returned to its outer case. The two holes at the back of the camera show when Nos. 1 and 2 films are axial to their respective lenses and ready for exposure. The No. 2 Stereo-Kodak, it will have been divined, is of the ever-ready box form. There is a large centrally-

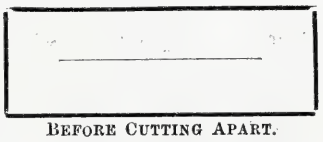


placed finder, and the diaphragmed shutters work between doublet lenses, time and instantaneous exposures being given by applying pressure to protruding pins on the top of the camera, which also carries a spirit-level, an essential adjunct in stereoscopic hand-camera work. A moving metal panel can be used to cover the lens on the left-hand side of the instrument, which thus becomes, at the will of the operator, either a stereoscopic camera taking two 3½in. by 3½in. stereographs, or a monocular camera yielding single 3½in. photographs. The centres of the lenses are set 3½in. apart, and the foci of them are approximately 5in.

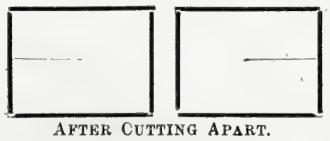
Like all Kodaks, the No. 2 Stereo is ingeniously and neatly constructed, and it retails at the moderate price of £3 10s. In a wide experience of cameras of this class we have found nothing simpler to use. The instrument weights about 2½lb., and measures 8¼in. by 6in. by 5in., so that the utmost possible facilities are given to the amateur photographer for taking up binocular work with the minimum amount of trouble.

From an accompanying pamphlet of thirty-two pages we perceive that Messrs. Kodak not only give full directions for the use of the camera, but also supply special apparatus for developing, trimming, mounting, and viewing the prints. Thus, the Kodak stereographer is distinctly encouraged, after he has "pressed the button" to "do the rest" himself. We extract from the pamphlet some explicit directions for cutting and mounting the prints:—

"When the prints are dry, take each pair and mark with a pencil a light line across the back, from side to side, extending to within, say, 1in. of each side (see diagram). Then trim each pair of prints as follows:—Place the cutting shape centrally on the pair of prints and trim all round the shape. Then place the cutting shape so that the diamond-cut line nearest the right-hand side corresponds exactly with the left-hand edge of the pair of prints, and cut the print down the right-hand side of the cutting shape. This finishes the trimming of one picture. Move the cutting shape so that the diamond-cut line nearest the left-hand side of the shape exactly corresponds with the right-hand edge of the other print, and cut down the left-hand side of the cutting shape. You will now have two square pictures which have then to be mounted on our special mounts. Place the prints exactly in the spaces provided on the mount, using the Kodak photo paste mountant. The prints must be mounted so that the right-hand side of one print and the left-hand side of the other print are adjacent, and the pencil line at the back, instead of being continuous, will show a break in the middle, thus reversing the original position of the pictures. The prints, trimmed and mounted according to the preceding directions, will, when viewed through the stereoscope, show the well-known stereoscopic effect, the views springing into solid relief."



BEFORE CUTTING APART.



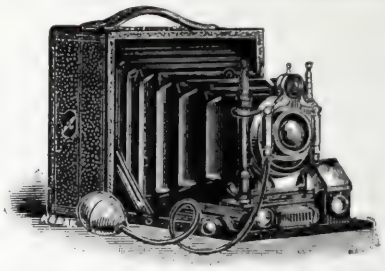
AFTER CUTTING APART.

The No. 2 Stereo-Kodak has all the elements for a successful career amongst amateur photographers, large numbers of whom we hope it will permanently interest in stereoscopic work.

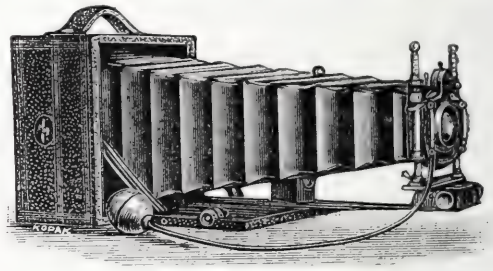
The Glass-Plate Kodak. Manufactured and sold by Kodak, Ltd., 43, Clerkenwell Road, London, W.C.

The essential feature of this, the newest Kodak, is that the hooded focussing-screen at the back of the instrument may be easily removed and a double dark slide containing plates inserted in the focal plane. Thus, for the first time, we believe, a Kodak plate camera, pure and simple, is placed in the hands of photographers. The following specification of particulars will be of interest:—

"The mahogany used in the manufacture of the bodies is waterproofed by a special treatment, which prevents shrinking or swelling, and makes the cameras specially suitable for the tropics. The cameras are suitable for hand or stand use, and are constructed with bodies of



waterproofed mahogany and aluminium covered with fine-grain leather. The cameras are made in two styles, C and D, the difference between the two styles being only in the extension of the bellows. The extension of the D style permits of the use of either front or back combination of the lens separtely, and objects down to 16in. from the lens may be focussed. Both styles are fitted with Bausch & Lomb rapid rectilinear lenses; Bausch & Lomb Unicum shutters; reversible spring backs, removed and re-adjusted with one hand; ground-glass screen, with folding spring shade for focussing, operated with one hand; rising, falling, and sliding fronts, with automatic locking device; double swing from



centre; rack and pinion focussing; socket for tripod screw; brilliant reversible finder; spirit level; non-sagging bellows. The cameras are sold complete with lens, shutter, and one double plate-holder, at the following prices:—No. 3 (4¼in. by 3¼in.), Model C (long extension), £5; No. 3 (4¼in. by 3¼in.), Model D (extra long extension), £5 10s.; No. 4 (5in. by 4in.), Model C (long extension), £5 10s.; No. 4 (5in. by 4in.), Model D (extra long extension), £6."

The quarter-plate camera before us weighs about 3lb., and measures, when closed, 5¾in. by 3¼in. by 3¼in. The double extension gives a focal length of 12in. (approx.), and the doublet lens, of 5in. focus (approx.), is controlled by shutter moving at speeds graduated from ½ to 1-100 of a second. The finder, focussing scale, and spirit are placed close together on the left of the baseboard. Compact, beautifully made, and easy in all its movements, the glass-plate Kodak is a distinctly serviceable and workmanlike instrument.

THE Photographic Club meets weekly, on Wednesdays, at Anderton's Hotel, Fleet Street, at 8 p.m. On April 2nd there will be an "open night," when objects of interest will be discussed.

AT the Röntgen Society's ordinary general meeting on Thursday, April 3rd, 1902, at 20, Hanover Square, a paper on "X-Ray Diagnosis of Renal Calculus," forwarded by Dr. Ch. Leonard, of Philadelphia, will be read.

IT would seem that the Act as to the administration of the law with regard to musical copyright, and its infringement, is in some cases as difficult as it often is in the case of the infringement of photographic copyrights, seeing that many copyright songs are now being hawked about the streets at a penny each, including the music. In a case before the Marlborough Police Court, one day last week, a bookseller was charged with being concerned with another in stealing six sheets of "lithographic-transfer songs," etc. This would be of little interest to our readers, but for some of the remarks of the presiding magistrate, as given in the "Standard's" report of the case. The defendant's council asked "Do you regard this as stealing—if a person buys one of your songs, photographs it, and sells it in cheap form?"—Witness: "Yes; we call it piracy." Mr. Denman pointed out that such an offence as piracy was not recognised, except with regard to certain acts committed on the high seas. Now, we and other photographic journals have hitherto spoken of infringements of photographic and other copyrights as being "piracies," and it has been a very generally-accepted term for them. Turning up the first dictionary that came to hand, we find piracy defined as "The act or crime of robbing on the high seas; an infringement of the law of copyright." Pirate, "A robber on the high seas; one who infringes the law of copyright." So that we find that we and others have not been so very far wrong in describing infringements of copyright pictures as piracies, and we shall continue to do so as occasion may require.

Commercial & Legal Intelligence.

Messrs. Hyde & Co. announce that they have opened premises at 1, Palace Street, Buckingham Palace Road, London, S.W., for the sale of all classes of photographic apparatus and materials, spectacles, eye-glasses, opera-glasses, field-glasses, microscopes, barometers, and other scientific apparatus. An inspection is invited of their stock of hand cameras, which comprises the latest and newest designs for the coming season. Every description of photographic work, enlarging, copying, developing plates and films, and printing from same, lantern-slide making, photo-micrography, etc., can be undertaken.

Nicholls v. Parker and Another.—This case was heard in the Court of Appeal last week. The plaintiff, who was a photographer carrying on business at Johannesburg, sued the defendants, who were the proprietors of a weekly newspaper, known as the "Golden Penny," to recover penalties and damages for infringement of copyright, by publishing in the "Golden Penny" the plaintiff's registered copyright photograph representing "Officers buying Shells as Curios from Kaffir women," and for an injunction. The plaintiff was the registered proprietor of the photograph in question. When the war broke out in 1899 he supplied the defendants, who are the proprietors of the "Graphic," the "Daily Graphic," and the "Golden Penny," with photographs from time to time, and received payment for them. In the present case the plaintiff gave a written license with the photograph in question, under which the defendants were permitted to reproduce it in the "Graphic" only. The photograph, notwithstanding, appeared in the "Golden Penny," owing to the defendants' not noticing the limitation in the licence, and it was in respect of this alleged infringement of his copyright that the action was brought. It appeared that about 86,000 copies of the "Golden Penny" in question were printed, and 82,000 copies were sold. The plaintiff at the trial did not ask for damages, but only for penalties and an injunction. Mr. Justice Wright, following the decisions in "*Ex parte* Beal" (L.R., 3 Q.B., 387) and "Ellis v. Marshall" (11 "The Times" Law Reports, 522), held that he was bound under section 6 of the Fine Arts Copyright Act, 1862, to give some coin of the realm on each of the 86,000 copies printed; and therefore he gave one farthing for each copy, amounting to £89 11s. 8d.; and he gave judgment for the plaintiff for that amount. Since the judgment the Court of Appeal, in "Hildesheimer v. W. & F. Faulkner, Ltd." (1901, 2 Ch., 552), have held that the Court was not bound to give a penalty of at least one farthing for each copy, but might award for all the offences a lump sum, which, if divided by the number of offences, would give for each a fraction less than the least recognised coin of the realm. Mr. Warmington, K.C. (Mr. Marshall-Hall, K.C., Mr. Lawless, and Mr. Temple Franks with him), for the defendants, said that Mr. Justice Wright would not have given so much by way of penalties if he had not felt himself bound to give at least one farthing for each copy printed; and therefore this Court would either now assess the penalties or send the case back to the learned judge to assess them. Mr. J. A. Foote, K.C. (Mr. G. W. Ricketts with him), for the plaintiff, said that he could not distinguish the present case from "Hildesheimer v. W. & F. Faulkner," and he did not, therefore, propose to argue the point in this Court. The plaintiff desired to carry the case to the House of Lords with the object of having the decision in "Hildesheimer v. W. & F. Faulkner" reviewed. He was willing to have the penalties assessed either in this Court or by Mr. Justice Wright. The Court said that the proper course would be to allow the appeal so far as regards the amount of the penalties, and to send the case back to the learned judge to assess the penalties.

The Patent Law Amendment Bill.—Two deputations waited upon Mr. Gerald Balfour at the Board of Trade, on Thursday, March 20th, with reference to the Patent Law Amendment Bill of the Government. The first was from the Chartered Institute of Patent Agents, to urge that the compulsory working in this country of inventions should not be incorporated as proposed by section 2 of the Bill. Mr. Gerald Balfour thanked the deputation for placing their views before him, and said that he would hear what the other deputation had to say before replying. The second deputation represented chambers of commerce, manufacturers, and trade unions, who came to urge the view that the Government Bill does not meet the requirements of the manufacturers or working classes of this country, "inasmuch as it does not subject foreigners to the same obligation of working their patents in this country that Englishmen are under to do abroad on pain of forfeiting their patents." The deputation was introduced by Sir William Houldsworth, M.P. Several members of the deputation having spoken, Mr. Balfour, in reply, undertook to give the changes which they wished to see introduced into the Bill his most careful consideration, with a view to seeing, at all events, how far it might be possible to meet their wishes. The main differences, as he understood them, between the deputation and the Bill were these. First of all, in the place of compulsory licence, the Manchester Chamber of Commerce and those who thought as they did would desire to see compulsory working under a penalty of revocation substituted; and, secondly, they considered that the machinery provided in the Bill for the obtaining of a compulsory licence was too complicated and too elaborate. With regard to the last point, he would certainly consider whether it might not be possible to some extent to simplify it. With regard to the first point—he took it to be the more important point—he was not prepared to express any opinion; but, at the same time, he felt bound to tell them that he saw considerable difficulties in the way. Nevertheless, he would like, so far as possible, to meet what he had recognised was in some instances a very real grievance—namely, a case where a patent had been taken out in this country and in a foreign country, and where it was worked only in the foreign country, and obstacles were deliberately thrown in the way of working it in this country. His impression was that even in its present form the interests of the public referred to in the first sub-section of the second clause implied something very much wider than Mr. Levinstein and Mr. Lawrence had interpreted them as meaning. He would be ready to make that point as clear as anybody could desire. The proposal to substitute the compulsory working subject to the penalty of revocation for compulsory licence was not one, he thought, which had commended itself to the associated chambers of commerce in this country, though, no doubt, there were a great many chambers of commerce in addition to the Manchester Chamber of Commerce which favoured that policy. He would be prepared to go so far as to introduce words into the second clause of the Bill showing clearly that the refusal of a foreign patentee to work his patent in this country would be among the grounds on which an application for a compulsory licence would properly be made. If it was possible for them to come to an agreement upon that basis, so much the better. Meanwhile, he was not prepared to make any definite statement. He would consider the further and more extreme proposal made to him, but he felt bound to say that there were certain difficulties in accepting it; but possibly a compromise might be found possible. If a compromise was found possible, so much the better; if it was not, then, he thought, there was a great deal to be said in favour of a suggestion made by Mr. Roberts—namely, that we should pass the Bill with the first clause only, and leave the subject-matter of the second clause for further discussion, and possibly a further measure in a subsequent session.

Illingworth's £100 Open Carbon Printing Competition.—We append particulars of the prizes in the carbon printing competition organised by Messrs. Thomas Illingworth & Co., of Willesden Junction:—Class A (for small prints) for a set of three prints from same negative, not less than 6in. in length or more than 12in., made by the double transfer process: 1st prize—cash (£7 7s.), and carbon tissues or materials or carbon enlargements to the value of £5 5s., £12 12s.; 2nd prize—carbon tissues or materials or carbon enlargements to the value of £3 3s.; 3rd prize—carbon tissues or materials to the value of £2. Class B (for large prints) for a set of three prints from same negative more than 12in. in length made by the double transfer process: 1st prize—cash (£10 10s.), and carbon tissues or materials or carbon enlargements to the value of £5 5s., £15 15s.; 2nd prize—carbon tissues or materials or carbon enlargements to the value of £5 5s.; 3rd prize—carbon tissues or materials to the value of £2. Class C (for small prints) for a set of three prints from same negative, not less than 6in. in length or more than 12in., made by the single transfer process: 1st prize—cash (£7 7s.), and carbon tissues or materials or carbon enlargements to the value of £5 5s., £12 12s.; 2nd prize—carbon tissues or materials or carbon enlargements to the value of £3 3s.; 3rd prize—carbon tissues or materials to the value of £2. Class D (for large prints) for a set of three prints from same negative more than 12in. in length made by the single transfer process: 1st prize—cash (£10 10s.), and carbon tissues or materials or carbon enlargements to the value of £5 5s., £15 15s.; 2nd prize—carbon tissues or materials or carbon enlargements to the value of £5 5s.; 3rd prize—carbon tissues or materials to value of £2. Class E ("Gravure Tissue") for a set of three prints from same negative not less than 6in. in length made by Illingworth's new "Gravure" process, on the "Gravure Tissue" and supports, a cash prize is offered of £10 10s. Should any of the prizes be won by a professional photographer, Messrs. Illingworth & Co., Ltd., desiring to acknowledge the co-operation of the working printer, will place the additional sum of £2 at the disposal of the professional photographer, for distribution amongst his printers. The following are the conditions of the competition:—(1) The competition is open to professionals and amateurs alike, and a competitor may send any number of sets of prints, in only one class or in every class, but each set must be entered separately. A set of prints is understood to be three prints from one negative, printed on the same colour and on the same supports. (2) All prints to be made on Illingworth's carbon tissues and supports, and each set of prints must be accompanied by the printed entry form, which will be supplied on application. (3) The sets of prints may be in any of Illingworth's colours or supports, and in giving their awards the judges will take into consideration the colour of the tissue selected, and the suitability of the or supports, in relation to the subject of the picture. The regularity of the set—that is, the evenness of printing—will also be considered. (4) All prints to measure not less than 6in. in length, and to be sent in mounted on cardboard. (5) Under the heading "professional photographer is included trade printers, publishers, and all who engage in photography as a business. (6) The carbon materials or enlargements given as prizes may be selected by the winners from Illingworth & Co.'s price-list. (7) The winning prints will become the property of Thomas Illingworth & Co., Ltd, and unsuccessful prints will be returned providing that stamped and addressed labels are enclosed for their return. (8) All prints to be sent not later than June 14th, 1902. (9) If required by the judges, the competitor must submit the negative from which his prints are made, for comparison with the prints. (10) In the event of the prints in any class not being of sufficient merit, the judges reserve the right to withhold any of the prizes; and (11) The judges' decision to be accepted as final.

Books for the Kyrle Society.—Lord Monkswell, writing from 2, Manchester Street, W., to make the annual appeal on behalf of the Kyrle Society for literature, of which it stands urgently in need. Numerous applications are received for books and magazines for hospitals, workhouses, boys' and girls' clubs, parish and village libraries, and many other institutions where pleasant reading does much to brighten the lives of the poor. Even in towns public libraries do not entirely meet the wants of those for whom the society caters, while in country places they are practically non-existent. Lord Monkswell says:—"We will gladly forward a collecting basket, by carrier, to any intending donor within the metropolitan area. The trouble of packing and sending books is thus greatly diminished."

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

April.	Name of Society.	Subject.
1	Rotherham Photographic	Paper by Mr. Leadbeater. (Subject to be announced.)
1	Southampton Camera Club	Lantern Slide Competition. Subject: *Animals.*
2	Maritzburg Camera Club	*Art Principles applied to Photography.* Arnold Cooper.
2	Southport Photographic Society	*Negative Making—a Plea for Selection of Developer to suit Subject.* Griffin & Sons.
2	Edinburgh Photographic	*A Talk on Flexible Films as used in Cameras and Cinematographs.* Illustrated. Thos. Haddow.
2	Southsea Photographic Society	*Here and There with a Hand Camera.* Mr. L. J. Steele.
2	North Middlesex Photographic	Third Lantern Slide Competition.
3	Darwen Photographic	*Demonstration on Photo-Micrography.* By Thomas Roberts Esq.
3	Röntgen Society	Discussion Evening, probably.
3	Richmond Camera Club	Lantern Evening, including *Venice* and Members' Slides.
3	Sunderland Photographic	Lecture by Mr. A. Milburn.
4	Leicester Literary	Lecture. *Negative Making*, with Demonstration. By Demonstrator from Messrs. J. J. Griffin & Sons, London.
4	Bognor Photographic Society	Annual Meeting: Election of Officers. Selection of Prints for Albums, &c.

ROYAL PHOTOGRAPHIC SOCIETY.

March 18th.—Mr. J. J. Vezey in the chair.

At this, the monthly lantern meeting, Mr. A. Barton Kent, F.R.G.S., gave a very interesting chat upon "Pharaohland, or the Nile from Cairo to the Second Cataract." Mr. Kent emphasised very strongly the claim of the camera to be regarded as a third eye. It was remarkable, he pointed out, how much that was interesting to tourists was overlooked because they had no camera with them. The camera seemed to add very greatly to one's power of observation, and the pleasure of travelling was considerably increased. Cairo afforded strangely-mixed scenes of European and Eastern character and life, and the bazaars and mosques were full of attractive details. It appeared that the traveller in Egypt has to accept strange contortions of fact from dragomans and guides as gospel; they stop at nothing, and tell the most unblushing tales. Every visitor to Egypt, of course, takes in the sphinx and pyramids. The largest of the pyramids would just about cover Lincoln's Inn Fields. The history of these and of the sphinx is too long to tell, but Mr. Kent had several interesting views to show, and the few bare facts that he recounted were very welcome. The great rock-hewn temples towards the end of the journey form perhaps the most wondertul examples of the skill of the ancient Egyptian engineers. The solemn grandeur of these stupendous monuments, fashioned out of the live rock, has no equal; nor the labour that tunnelled out the spacious chambers that thread these rocks near Philæ, Karnac, etc. Mr. Barton Kent is a lecturer who has no difficulty in retaining the sympathies of his audience; his remarks are expressed in a clear, explicit, and entertaining way, and his pictures are all that can be desired. There were some 120 people present, and the lantern meetings seem to lose nothing of their popularity.

CAMERA CLUB.

The paper read last week, by Maj.-Gen. J. Waterhouse, on "Historical Notes on Photographic Optics," covered so much ground and dealt in detail with so many important points that it is quite impossible, in the space at our command, to do it justice. Encyclopædic in its construction, but containing much matter that no encyclopædia is able to give, it is eminently adapted for the pages of a volume of that character. This paper will therefore be always a valuable one for reference, gathering together, as it does, little detached fragments of knowledge which are spread over various books and manuscripts of past centuries, and correcting mistakes which have crept into most works on photography, and which have been blindly accepted and copied by subsequent writers.

At the commencement of his discourse, General Waterhouse explained that his remarks would take the form of an expansion of the subject which he had previously brought before the Royal Photographic Society. He had searched many old books and manuscripts at the British Museum and elsewhere, and his great difficulty had been, not in finding material, but in sifting it out and getting at the nucleus of it. One thing seemed quite apparent, and that was that Baptista Porta, the Neapolitan observer of the sixteenth century, who was credited in all the text books with the invention of the camera obscura, could not lay claim to that distinction. He was neither the first to use the camera obscura nor the first to apply a lens to it, although hitherto his claim to the discovery had been accepted without question.

He was inclined to think that the principle of the camera obscura hardly admitted of the term "invention" or "discovery," because the forming of an image through a small aperture was a natural phenomenon which must have made itself evident from the earliest times. Aristotle pondered over it, and many other observers in the early centuries made reference to it, some of them using the device to watch the progress of a solar eclipse. He himself, in the bright Indian sunshine, had frequently noted the images formed through a keyhole in the door of a bungalow. Roger Bacon, in the thirteenth century, was one of those who made of this image formed by a small aperture, to watch an eclipse of sun, and this would be about 300 years before the work of Porta; inde we might look upon this period as being the starting-point of pho graphic optics.

The lecturer then read many interesting extracts from differ sources, which showed how the use of concave mirrors and spheri segments of glass gradually led up to the invention of spectacles, un at the end of the thirteenth century these aids to vision were larg made both in Vienna and Venice. During the fourteenth century th was little advance in optics, but the fifteenth century was remarka for two noteworthy inventions—the camera obscura and the printi press. This century, too, saw the birth of that remarkable gen Leonardo da Vinci, whose wealth of information upon all subjects w most remarkable. Among the diversity of things treated with in h books—which, by the way, are illustrated by very good sketches—h had found a small printing press and an account of nature printing fro leaves. He also describes the camera obscura, and seems to be the fir observer to give a comparison between the eye and that instrumen Leonardo gives a diagram showing the intersection of the rays of ligh and explains the reversal of the image. It is curious, however, tha although he was acquainted with spectacle lenses he makes no mentio of the use of a lens in connection with the camera obscura. It i noteworthy that these things were written of twenty years before Ba tista Porta was born.

Baptista Porta has left us four books, the date of which is 155 The fourth of these contains his camera obscura notes. His first instru ment is used without a lens, but later on he admits the use of a len as a great secret. He also compares the eye to the action of th camera, as did his great predecessor Leonardo da Vinci. It was to b gathered from the lecture generally that it was a common practice i past times for devices to be re-invented, or to be claimed by subsequent observers as their own.

It fell to the lot of Mr. Inwards to open the discussion upon General Waterhouse's able paper, who said that the members of the Club were much indebted to the lecturer for the great amount of research which the compilation of such a paper must have entailed. It would be considered a valuable contribution to photographic literature, and would be esteemed as a work of reference in the Club Journal for all time. There was one point, with regard to early lenses, which he should like to have cleared up, if possible, and that was in connection with the Colossus of Rhodes. This immense statue of Apollo, which was said to have been erected at the port of Rhodes about 300 B.C., is described as being hollow, so that persons could climb into the head and look through the eyes, which were furnished with lenses of such a character that the most distant objects could be plainly seen. Could these lenses have comprised some form of immature telescope? The account appeared in Lempriere's Classical Dictionary. He should also like to know whether the lecturer had, in the course of his researches, come upon any account of photographs being taken by means of the crystalline lens in an animal's eye. The question which arose in his mind was as to whether animals saw precisely as human beings did. He had lately noted a swan in the water making grabs with his beak for food below the surface, and he had noted that the bird aimed with great accuracy. Has the bird some appliance for making allowance for the refracted rays, which one would think would spoil its aim?

Another questioner wished to know whether there was any reliable authority for the story or Archimedes setting fire to the Sicilian fleet by means of concave mirrors. The lecturer was also asked whether he had noted, in one of the Comedies of Aristophanes, a reference to a compromising record on a waxen tablet being erased by the action of a burning-lens?

In his reply, General Waterhouse said that he had failed to find anything definite with reference to the Colossus of Rhodes. Photographs taken with the eyes of animals were on record, and Mr. Spiller, on the occasion of the reading of the general's former paper, in May last, had told him how he had produced a picture with the eye of a bullock. He was, of course, familiar with the old story of Archimedes and the burning mirrors, but as the matter had no connection with the subject of the lecture he had not followed it up. Experiments with very large mirrors were described by many writers, and no doubt there was some foundation for the tradition. With regard to the suggestion that gem engravers in ancient times must have had the use of lenses to aid their sight in such delicate work, he had been assured by modern engravers that it was quite possible to do all such work without the aid of glasses.

After a few remarks by the chairman, the proceedings came to a close with the usual vote of thanks.

BLAIRGOWRIE AND DISTRICT.

At the monthly meeting, on March 18th, Mr. James Richardson presided. The draft syllabus for the season, prepared by the executive, was submitted, and approved. Mr. John B. Maclachlan, vice-president, lectured "On Things in General," in the course of which he spoke in favour of a thorough grounding in technique as the basis of all good photographic work, and advised the careful study of good pictures, with a view to improving the worker's knowledge of composition and the application of it. He specially directed attention to the importance of a satisfactory foreground. Speaking of exposure, he advised that a careful and detailed note be kept of all exposures, as a means, not only of reference, but also of education. He spoke strongly of the worker making himself acquainted with the different printing processes so that he could use the printing process most suitable for the subject. Mounting and framing were also dealt with, when it was pointed out that the work of the frame or mount was to detach the photograph from its surroundings without "killing" the photograph itself.

SOUTHAMPTON CAMERA CLUB.

HE above Club held its fortnightly meeting on Monday evening, the 7th ult., at their headquarters, Philarmonic Hall, Southampton, when he president, Mr. Burrough Hill, occupied the chair. There was an xcellent attendance, the proceedings being graced by the presence of any ladies.

After the usual preliminary business and election of new members, he hon sec., Mr S. G. Kimber, stated that the lecture on Windsor astle recently delivered by Mr. Pitt had resulted in a financial benefit the Club, but regretted that the attendance was by no means so umerous as such an able discourse merited. He wished to propose a ote of thanks to the president for his kindness in placing the hall at he disposal of the Club, and to the lecturer for his generosity in giving he lecture free. Mr. Johnson seconded the proposal, and said that he ould but echo the opinion of many of his friends who had the pleasure f hearing Mr. Pitt. They had all observed that the lecture was of a ost interesting and instructive nature.

The president and Mr. Pitt expressed their pleasure at being accorded he vote of thanks, the former saying it was a pleasure to him to help he Club in any manner he could, Mr. Pitt observing that he felt amply paid on his part by hearing that he had given satisfaction.

The president then introduced Messrs. G. Vivian and W. A. Max-Mills contribute their evening of the winter programme of the Club, which as an illustrated lecture, entitled "Beating the Bounds of Southampton" Mr. Vivian contributed the literary part of the entertainment, whilst the pictorial portion was produced chiefly by Mr. Max-Mills, in most masterly style, which was evidenced by the beautiful and plentiful upply of well selected lantern-slides, a set portraying picturesque parts f our lovely common well deserving the admiration it received. The ecturer observed that the Southampton Common contained very many oints of interest to photographers, of which full advantage was not aken, seekers for pictures often going further afield and faring much orse. He observed that the first description we have of the boundaries f the town is in a grant by King John in 1199, which was confirmed by Henry III. The townsfolk appear, however, to have been dissatisfied ith the area of the town, and so made it larger; and another descripion of the boundaries, which was given in detail by the lecturer, ppeared in 1483. These were the boundaries described by Mr. Vivian, who explained that his title had been chosen from the fact that it was he custom from very early times for the responsible inhabitants to make eriodical perambulation of the boundaries, to satisfy themselves that o tampering with the boundary-stones or landmarks had taken place, r encroachments made.

This journey, which took place in Southampton on Hoch Tuesday, as described as "Beating the Bounds." Some very quaint customs were esorted to during the ceremony, one being the holding of Court Leet t the Cut-thorn at the top of the common, where also the gallows nd stocks were situated. At this court all kinds of public wrongs were nvestigated and the offenders dealt with. Any burgess not attending hese proceedings was fined the sum of one penny. There was, however, sually the attraction of a feast, given by the Sheriff, after the ceremony, t which it is stated that some little excesses were often indulged in. Attention was called to many old landmarks, etc., not the least of which as the only remaining stone conduit near St. Peter's Church, which was nce used to store the water, and was condemned in 1292. Slides showing ections of the old wooden water-mains were shown. Attention was also rawn to the fact that the present Southampton Football-ground is made ver the stream which once formed the boundary of the town. The ecturer conducted his audience gradually round the boundary, from the Cut-thorn, along Burgers (now Burgess) Street, and eastwards to the water's edge, referring to the old Priory at St. Deny's; and then in south-easterly direction to Marine Parade and Cross House, and then long Canute Road to the Platform. The interest in the discourse was well sustained throughout, and was thoroughly appreciated by all who had the pleasure of listening to it. It was suitably enlivened by well-selected lantern-slides at the various stages, most of these, as before mentioned, being contributed by Mr Max-Mills, who also ably manipulated the limelight lantern.

The lecturer wished to tender his best thanks to Mr. Spranger for allowing him access to his premises to obtain photographs in connection with the spring from which the first water-supply of the town was obtained.

In proposing a vote of thanks, the president said that he felt sure he voiced the opinion of the meeting when he said that the lecture was of a most interesting nature, and he hoped that steps would be taken for a repetition of it in the large hall. The vote of thanks was carried by acclamation, and briefly acknowledged by Messrs. Vivian and Max-Mills.

GLASGOW AND WEST OF SCOTLAND AMATEUR PHOTOGRAPHIC ASSOCIATION.

"PHOTOGRAPHING Night Scenes" was the subject of a lecture by Mr. J. S. Oliver before this Society on March 17th.

There was an exceedingly large turn-out of members and friends, and this was nothing more than what might have been expected, for the lecturer may aptly be termed "Scotland's Paul Martin." He has made a name and reputation in the photographing of night street scenes. Visitors to Glasgow's great show at Kelvingrove must have noticed his "Park Gardens by Night," an exquisite study of this particular photographic work. In his introduction, Mr. Oliver expressed his conviction that Glasgow had now a large army of photographic workers who had done something in this line, and followed that up with a vivid, lively, and sprightly description of the scenes on Kelvingroves slopes towards the close of the International (1901) Exhibition, when the illuminations were on and cameras in hundreds were to be seen. Thought there was no great difficulty in this branch, still all of them were not so patent and obvious as one might be inclined to imagine. There were three points that it would be well to look after when photographing street scenes at night, which was the subject his remarks applied specially to. The first was the selection of the subject; this was a point about which it was an utter impossibility to lay down laws, the worker must find out these things for himself, and success would readily be obtained if he exercised his finer feelings. The next matter to have attention was the grouping of the lamps in the scene or view. This was always a matter of difficulty—street lamps were so far apart nowadays. Attention must be given that the lamp lights were not scattered all over the picture, as this tended to distract the spectator's interest. The weather conditions was the other point. He had found that dry evenings did not give so effective pictures as those that might be obtained on a wet night. The reflections added greatly to the composition, and one could not have it too wet. Obviously, the wet weather entailed disadvantages to the worker's person, but the use of an umbrella and an assistant did away with that to some extent. Continuing, he remarked that two methods of working were available; the scene could be taken with one exposure after it was dark, in which case he advised that a cloudy night be selected, as he had experienced some disappointment with any work he had done on "cloudless evenings"—he imagined that this was due to the much greater amount of actinic light present in the heavens then. The other manner of working was simply to make a very short exposure just before it was dark—in the failing twilight—and complete the exposure when the street lamps were lit and the sky dark. He advised the latter method. It was possible to secure moving figures in street scenes by night when working by it, while the first way only gave empty streets, as a rule. It had the disadvantage, however, that the photographer must stand beside his apparatus for a much longer period—which, on a teeming wet night, meant slight discomfort—but the results would be sure to make up for the ease and comfort lost. He himself had wrought by both methods, and when working by the latter the following was his usual procedure:—A close, or entry, or some other place where there was not too much traffic was selected, from which his subject composed well. To this spot he went, say, an hour before dusk, and leisurely set up his stand camera. After carefully focussing and selecting his subject he inserted his double-black, set his instantaneous shutter, and drew the shutter of the dark slide, and then waited for a favourable and pleasing grouping of moving figures, etc. Whenever such occurred he released his shutter so that he might secure the same. It was as well to point out that the shutter was set at such a speed as would produce a much under-exposed negative—it was not at all necessary to give a full exposure—what was wanted was a general impression only. Having done this, the lens was capped, double-back shutter closed, and then the wait for darkness commenced. When the lamps were lit and the sky thorougly overcast, the exposure was completed, the apparatus never having, in the intervening period, been touched or moved. Following on this, the lecturer advised no special make of plates for the work, though a thickly-coated plate should be used, and it was essential that they be backed. Wen using plates of the marked speed of 200 H. & D., a fairly rapid type, though not by an ymeans the most rapid on the market—in conjunction with a stoy of F/11, he had found an exposure of from one to two minutes quite sufficient for views lit by electric arc-lamps. Where the incandescent gas-lighting was in use, the exposure might be prolonged to at least twice that period. These times were what he had found suitable, but workers should experiment for themselves, keeping in mind that it all depends on the quality and quantity of light. Mr. Oliver advised the use of a long-focus lens, and uses a whole-plate lens on his ½-plate outfit. In development, the worker who was only commencing this class of work, usually erred in carrying the development much too far. A thin, soft negative, full of delicate graduation, was what is wanted, and by going on in the same way as you would when developing interlor work the results should be satisfactory. A series of Mr. Oliver's medalled lantern slides of "Glasgow Streets by Night" and "Exhibition Studies" brought the meeting to a close.

CROYDON CAMERA CLUB.

"EXPERIMENTS and Illustrations with the Optical Lantern" formed the subject-matter of an interesting and lucid demonstration by Mr. A. E. Isaac on Wednesday, 19th inst. The lecturer, using the limelight, explained the manipulation of the lantern and the working of the "blow through" and the "mixed chamber" jets, and illustrated the intense heat of the oxy-hydro flame by burning up steel rods and a large iron nail, brilliant corruscations of the molten metal accompanying the operation. By a series of striking examples Mr. Isaac then demonstrated the refraction of a narrow beam of light on its entering a denser medium, the medium used being water, contained in a transparent glass tank. A very pretty experiment showed the beam entering the water from below at a suitable angle, and being totally reflected downwards at the surface, no light escaping into the air above. The differential refraction of white light into its coloured constituents next claimed attention, and by means of solid glass prisms and also a hollow prism containing bi-sulphide of carbon (which possesses a very high refractive index) this was effectively shown. Coloured glasses were next utilised, and by placing various glasses or screens in front of the prism Mr. Isaac showed how different part of the spectrum were cut out or reduced. By this means the safety of glasses used for dark-room illumination and the properties of iso-chromatic screens could be approximately ascertained. Various coloured spectrum rays were next caused to mingle, the combination of an orange-red and a green producing yellow. This would not be the case with a similar admixture of pig-

ments which excite the colour sensation in an entirely different manner, namely, by absorption. A discussion followed, in which the president (Mr. Hector Maclean) and Messrs. Wratten, Edwards, and Salt, amongst others, took part, and a hearty vote of thanks to Mr. Isaac terminated a really enjoyable and instructive evening.

NORTH MIDDLESEX PHOTOGRAPHIC SOCIETY.

MARCH 19TH.—Mr. E. R. Mattocks, on Wednesday, 19th, gave an 'Instruction Lecture" on the "Camera in the Field." The uses of the swing-back and rising-front, etc., were elementarily explained, and a few hints on selection of subject and its treatment were given. On Saturday, 22nd, the annual dinner was held at the Holborn Restaurant. Mr. C. Beadle, president, was in the chair. The certificates won at the annual exhibition in December last were distributed. The feature of the dinner was the menu-card, which, as heretofore, was designed by a member of the Club, and was produced by Mr. Glendinning, the winning picture being reproduced in the design. Among the guests were Mr. Douglas English, Mr. W. Thomas, and others. The musical arrangements were under the control of Mr. Stanley Barnard, who provided a very good entertainment.

DEVONPORT CAMERA CLUB.

MEMBERS of the above club met at the Technical Schools, on Tuesday March 18th, when an illustrated lecture on "Across the Alps with the Camera" was given by Mr. A. C. Townsend, of Birmingham. Mr. H. J. Hissett took the chair, and there was a good attendance. The lecturer dealt with his subject in a very interesting manner, the grandeur of the Swiss scenery being indicated by over 150 splendid pictures of mountain, vale, river, and lake. At the close, Mr. Catford proposed a hearty vote of thanks to Mr. Townsend, which was seconded by Mr. J. T. Trend, who spoke of the excellence of the pictures, which demonstrated what could be done with the camera. He did not think the pictures were enhanced when highly coloured. The chairman supported the vote, which was carried. At the next meeting of the club Mr. H. J. Hissett will be the lecturer.

News and Notes.

YORKSHIRE Photographic Union.—The annual meeting and exhibition of prints will be held in the large hall of the Grammar School, Manningham Lane, Bradford, on Saturday, April 19th, 1902.

MESSRS. DAWBARN & WARD, LTD., entertained their employees and others connected with the company to dinner at the Holborn Restaurant on Saturday, the 22nd inst. Among those present were:—Mr. J. C. Dawbarn (chairman), Mr. and Mrs. Champness, Mr. Percival Marshall, Mr. and Mrs. H. Snowden Ward, Mr. A. E. Ward, Mr. George E. Brown, Mr. W. E. Ward, Miss Biggs, Miss Barnes, Mr. Breeze, Mr. Causton, Mr. and Mrs. Dangerfield, Mr. and Mrs. Danson, Mr. and Mrs. Fricker, Miss Hambrook, Mr. Hore, Miss Hunt, the Misses Maylott, Mr. Peachey, Miss Philcox, Miss Robertson, Mr. Raker, Miss Rogers, Mr. Stewart, and Miss Wilton. The chairman proposed the toast of "The King, Queen, Prince and Princess of Wales, and all the Royal Family." "Our Visitors," proposed by Mr. H. Snowden Ward, and responded to by Mr. Percival Marshall. A capital programme was arranged for the evening, and among those who contributed to the entertainment were Mr. H. Snowden Ward, Mr. A. E. Ward, Miss Hunt, Mrs. Fricker, the Misses Maylott, Mr. Dangerfield, Mr. Danson, Miss Robertson, Mr. Hore, Miss Wilton, and others.

THE Goldsmiths' Institute, New Cross, S.E.—The following are the classes in photography for the quarter commencing April 7th, 1902. The teacher is Mr. W. T. Wilkinson:—Monday afternoons, from 2.30 to 5: A special course of 12 indoor and three out-door practical lessons for ladies only. Monday evenings, from 6.30 to 9: A special course of twelve in-door and three out-door (Saturday afternoons) practical lessons for ladies only. Tuesday afternoons, from 2.30 to 5: A special course of twelve in-door and three out-door practical lessons for gentlemen. Tuesday evenings, from 7.30 to 9.30: A special course of twelve in-door and three out-door (Saturday afternoons) practical lessons for gentlemen. Wednesday afternoons, from 2.30 to 5: An advanced course of twelve practical lessons, for ladies, comprising enlarging on bromide; making enlarged negatives; printing in carbon, platinum, gum bichromate, etc. Thursday afternoons, from 2.30 to 5: An advanced course of twelve practical lessons, for gentlemen, in bromide enlarging; making enlarged negatives; printing in carbon, platinum, gum bichromate, Collotype, etc.

THE Poisons Committee.—This committee, appointed by the Lord President of the Council to inquire into what alterations may be expedient in Schedule A of the Pharmacy Act, 1868, sat at Whitehall on Monday, Tuesday, and Wednesday last week, Sir Herbert Maxwell, M.P., in the chair. There were also present Mr. A. Cross, M.P., Professor T. E. Thorpe, Professor W. A. Tilden, Dr. Stevenson, Mr. W. Hills, Mr. J. H. Harrison, and Mr. E. B. Masham (secretary). The following witnesses were examined:—Mr. R. Bremridge (registrar of the Pharmaceutical Society), Mr. J. Rutherford Hill (assistant-secretary of the Pharmaceutical Society in Edinburgh), Dr. W. L. Muir (of Glasgow), Mr. C. Beck (of Messrs. R. & J. Beck, Ltd.), Mr. R. Le Neve Foster (manager of Messrs. Calvert & Co.), Dr. R. B. Selby (of Wigtownshire), Mr. H. Cannell (horticulturist), Mr. J. Bowen-Jones, and Dr. Voelcker (of the Royal Agricultural Society), and Mr. W. J. Leggett, and Mr. A. W. Lobb (representing patent medicine interests).

THE Measurements of Science.—The eye and the ear have long been regarded as marvels of mechanism, quite the most wonderful things in the world. But compared with the implements of a present-day laboratory, the sensitiveness of all human organs seems gross enough. A photographic plate, coupled with a telescope, will reveal the presence of millions of stars whose light does not affect the retina in the least. The microscope, too, with its revelations of the world of the infinitely small, tells us how crude, after all, is this most delicate of the senses; indeed, we may liken it to a piano where only a single octavo, towards the middle, sounds. From the ultra-violet to the lowest reaches of the spectrum is a range of some nine octaves of light vibrations, of which, save for our new mechanical senses, we should never have been conscious of but one. The ear hears little of what is going on around us. By means of a microphone the tread of a fly sounds like the tramp of cavalry. Our heat sense is very vague; we need a variation of at least one-fifth of a degree on a thermometer to realise any difference in temperature. Professor Langley's little bolometer will note the difference of a millionth of a degree. It is 200,000 times as sensitive as our skin. A galvanometer will flex its finger at the current generated simply by deforming a drop of mercury, of pressing it out from a sphere to the shape of an egg. The amount of work done by a wink of the eye would equal 100 billion of the units marked on the scale of a very delicate instrument. It is at least 10,000 times as sensitive as the eye or the ear. But even this astonishing performance is far surpassed by the exquisitely sensitive coherers, discovered by Professor Branly, of Paris, by which the Hertz waves of wireless telegraphy are caught in their pulsings through space. The range of impressions which we get from lifting an object in the hand seems rather small. An ordinary chemist's balance is about 20,000,000 times as sensitive. It will weigh down to the 200th part of a milligram.—"Harper's Magazine."

THE Chemical Industry and the Patent Laws.—It must be admitted that our patent laws do want reforming—in the direction of making it more difficult to get a patent, so that old processes cannot be patented; of reducing the cost, and also of obliging foreign patentees to work their processes in this country; but to blame the patent laws and the Patent Office because the German dyeware industry is greater than ours is to confuse the issue. Why, it might well be asked, is not the French dyeware industry greater than the German or even than our own? Judging from the remarks made by various speakers and writers, the French patent laws are more favourable to the development of French manufactures than our own, yet the French chemical and dyestuffs industry is not flourishing. Again, the American patent laws are in some respects better than ours, but the American dye manufacturing trade is practically non-existent. It is not the patent laws or the Patent Office that are at fault: there is no distinction of nationality here, and it is just as easy for an English chemist to get an English patent as for a German chemist to get one. But if the English chemist does not come forward there is no wonder that the Patent Office gives a patent to the German chemist who comes along. The fault lies with the English manufacturing chemists, who have failed in times past to see that new developments in chemistry and chemical manufacture are and can only be attained as the result of chemical research. They have not encouraged the English professors of chemistry at our colleges to raise up a class of research chemists; they have failed to retain men like Caro, Martius, Bayer, Witt, and other pioneers of colour chemistry in this country when they had the chance, and have unconcernedly allowed them to go over to Germany and found and develop the great chemical and dye works there. These establishments pay dividends of 20 per cent. to their owners, and do so because they employ research chemists solely to find out new products; and if these spend a year or so in making a discovery, their employers do not mind, for the profits attending a success are large. Indeed, reform of the patent laws is not so pressing a matter as a reform in the way our English chemical manufacturers encourage the training of English research chmists.—"The Textile Mercury."

DEVELOPMENTS in Colouring Matters.—A lecture on "Recent Developments in Colouring Matters derived from Coal Tar Products," which was delivered last Friday at the Royal Institution by the distinguished savant, Professor Otto H. Witt, of Berlin, drew a large audience. A special exhibition of the new aniline and auttracene colour derivatives, together with a complete set of artificial indigo products, had been arranged by the Badische Aniline Company in the library of the institution and excited almost as much interest as the lecture which followed. In that exhibition samples of dyes were shown side by side with dyed stuffs, cottons, woollens, and silks, some of which were greatly admired for the beauty and delicacy of their shades. In commencing his lecture, Professor Witt said that love of colour was innate in human nature, and consequently the intrest taken in everything concerning artificial colouring was general. He traced the progress of the industry, which had lately taken a wider scope, the richness and variety of the artificial colouring obtained from coal tar having become common knowledge. Twenty-five years ago he read a paper on the subject before the Chemical Society of London, and what a revolution had taken place since then! The domain of dyestuffs had grown to an amazing extent. To give an idea of the remarkable results obtained by the industry the lecturer made some beautiful experiments, demonstrating the solubility of crystalloids in water and ether, and the various effects produced, turning colourless liquids red, blue, and green, showing how two solutions change colour, and giving an illustration of the problems of dyeing. Another experiment was that of showing fluorescence in arc light and in a Giessler

tube—blue, scarlet, green, and orange. Continuing, the lecturer said the process of producing dyestuffs was simplicity itself, and the history of the past twenty-five years had been one of triumphant success, and at the present time no less than 3,151,000 different dyestuffs might be produced. He next dwelt on the brilliancy of alizarine, as shown in the exhibition which they had just inspected. Alizarine dyestuffs might be applied to cotton, silk, or wool with equal facility. Finally, he treated of the production of artificial indigo in some detail as carried on by the Badische Company. Referring to the cultivation of the indigo plant in India, he concluded by predicting that the day would come when the indigo plantations would have disappeared; but there was this consolation—that the vast areas vacated would be available for the growing of rice and other foodstuffs.

PHOTOGRAPHING by Electric Headlight.—Some very remarkable specimens of night photography were recently secured on the line of the Colorado Springs and Cripple Creek District Railway—a new Colorado mountain road, and in many respects one of the most interesting railway lines in the world—by Mr. George R. Simmons, of the executive staff of the operating company. The photographs were secured by means of an electric headlight, and were taken in bright moonlight between the hours of nine o'clock in the evening and midnight. A Premo camera was employed, and extra rapid plates were utilised. Perhaps the most interesting feature of the work was found in the length of the time-exposure. The Cripple Creek Railroad, which is only 45 miles in length, probably has, on the basis of total length, the highest average altitude of any railroad now in operation in North America. The altitude ranges at various points from 6,076 feet to 10,000 feet. In planning for the photographic work along the road, it was taken into consideration that at this altitude the rarefied condition of the atmosphere is conducive to more rapid action of the light-waves than would be found at a lower altitude. In securing the negatives of the night scenes, the time of exposure varied from twenty-three to thirty-five minutes, each of the plates being over-exposed. As the result of the demonstration thus afforded, Mr. Simmons believes that even better results may be obtained by reducing the time of exposure to an interval not exceeding fifteen minutes, and possibly limited, in some cases at least, to ten minutes. Still greater interest will centre, however, in still another experiment to be undertaken in the near future by this mountain photographer, namely, an attempt to move the locomotive carrying the camera on a curve of the road, so as to take in the entire field of the lens. This can be done without interfering with the photograph in any way, inasmuch as the changing of the light-rays will change the portion first photographed in darkness and bring into the light an entire new scene, thus covering the entire field. The Cripple Creek Railroad, which, by the way, is designed to afford a short line of communication to the richest gold-mining district on the continent, is admirably adapted for experiments of the character of that last outlined, inasmuch as the entire line is little else than a continual succession of curves, many of them very sharp. It may be noted also that the headlight employed in the photographic work described is the standard locomotive headlight operated by a steam dynamo located just forward of the engine stack.—Waldon Fawcett in "The Scientific American."

PHOTOGRAPHY at the St. Louis Exposition.—Photographers from several cities met in St. Louis recently, at the Strauss Studio, and took definite steps toward inducing the World's Fair to recognise photography as a fine art. Heretofore, expositions, except that at Glasgow last year, have classed photography among the liberal arts, and given it representation only as a commercial exhibit. High-class photographers now insist that the art has advanced so far that the choicest specimens of photography should be classed as works of art, and, in an exposition, should be admitted as a part of the fine arts exhibit. Those attending the meeting on Monday, besides Mr. Strauss and Mr. Godlove, of the Strauss Studio, were S. L. Stein (Milwaukee), Frank Clark (Detroit), I. Benjamin (Cincinnati), H. H. Pierce (Providence), Geo. L. Lawrence (Chicago), Gustav Cramer (St. Louis). Mr. Cramer represents a well-known dry-plate establishment; all the others are prominent photographers, composing committees from the Photographers' Association of America and the Photographers' Association of New England. They were in conference with Col. John A. Ockerson, chief of the liberal arts department of the World's Fair, who will have the photography display under his direction. Some time ago the photographers requested that a separate building be furnished for the display of artistic photographs. This being denied them, they asked for an annex to the fine art building. Now they ask that a room in this building be assigned them for a display of photographs which shall be selected by a jury of artists, not photographers. "This demand," says Lewis Godlove, "is for a salon display of pictorial photography, along art lines, to be separate and wholly distinct from the general photo exhibit. We desire that the commercial photography display, apparatus, materials, etc., to be in the liberal arts building, but that the artistic photos be in the fine arts building. Col. Ockerson was assured that, if this recognition were granted, the advanced workers in photography the world over would co-operate to promote the fair, and they would participate on no other terms. Mr. Strauss has a mass of correspondence from photographic societies all over the world, showing the great interest aroused in the World's Fair. Provided that photography is recognised as a fine art, all these societies will co-operate." Mr. Stein, of Milwaukee, told Col. Ockerson that, in his opinion, if one hundred pictures were accepted by a jury of artists, eighty of them would be by advanced amateur photographers. He made it clear that this is not a movement in the interest of professional photographers, but for the glory of art. Col. Ockerson promised to refer the suggestion of the photographers to the World's Fair management, and that Prof. Halsey C. Ives, director of fine arts, would be consulted.—"St. Louis Post-Dispatch."

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

STEREOSCOPIC PHOTOGRAPHY.

To the Editors.

Gentlemen,—I notice that in this week's Journal our old friend, "Cosmos" takes exception to my putting long distance stereoscopic photography out of action. Theoretically, I presume he is right, and according to that theory any object of which the parallax can be determined can be photographed stereoscopically, but that base line in the same plane would be a puzzler. I think it would be interesting to see a stereoscopic picture in the stereoscope which had been taken with a telephoto lens, the nearest object represented being one mile off. I wonder what the effect would be when viewed by a pair of eyes 2½ inches apart. I will not attempt to say what the length of the base line should be to take such a photograph, nor how it is to be obtained in one plane. Practically, however, the base line provided us by nature, being about 2½ inches long, "I hold the same opinion still," and I think that when we take lenses of six inch focus and separate them by 3¼ inches for the purpose of getting a stereoscopic picture of some object much less than a mile off, we are stretching our base line about as far as we are entitled to in reason.

My letter, from which "Cosmos" takes his quotation, was, however, written with no intention of going into the possible limits of stereoscopic photography, theoretically, but rather taking things as we find them. I have not had the advantage of studying the works "Cosmos" names, I wish I had. I think, however, he is very near the mark when he says that "only a few in the great photographic army probably aspire to the production of long distance stereographs." I have, certainly, no wish to limit the possible range of stereoscopic photography, or to say anything which might discourage anyone from joining that minority, who aspire to the long distance attempt, but from a practical point of view I fear it is limited, as also is our vision.—Yours, etc.,

P. O. P.

[The term "identical plane," as applied to separate exposures in stereoscopic photography, is a perfectly admissible expression, and should not puzzle our correspondent, if we define a plane as a "surface real or imaginary in which, if any two points are taken, the straight line which joins them lies wholly in that surface." With regard to long-distance stereography, has our correspondent never heard of De La Rue's stereo-photograph of the moon?—EDS. B.J.P.]

THE "DAISY" SETS OF PHOTOGRAPHIC CHEMICALS.

To the Editors.

Gentlemen,—In sending you a copy of our wholesale photographic price list for March, we would draw your attention to our latest introductions—viz., the "Daisy" photographic chemical sets. These will be issued for the present in five sets to retail at popular prices, and we think same will meet a want for complete outfits in the direction indicated.

We regret our samples are not yet to hand, and we are therefore unable to submit same for your inspection, but the sets are composed of cartridges usually supplied by us to you from time to time. P.S.—We will have pleasure, in sending, on application, a copy of our price list to any photographic dealer.—Yours truly,

FUERST BROS.

17, Philpot Lane, E.C., London.
March 24th, 1902.

SOME CORRECTIONS.

To the Editors.

Gentlemen,—Although I was taught to write an exceptionally good copper-plate hand when I was a small boy, I regret that age, or laziness, has caused a degeneration, and I am afraid that many a worthy compositor has done everything but bless me and my crabbed fist of late years. From this cause, and also from the fact that I did not receive the proof in time, in consequence of absence from home, a few errors have crept into the note on "The Sulphite Intensifier," which appeared in your issue of last week, on page 228, and I shall be glad if your readers will note them

First column, second paragraph, the equation should read—

$$2Ag + 2HgCl_2 = 2AgCl + Hg_2Cl_2$$

Third paragraph, line 6, read "sulphite," instead of "chloride."

Second column, line 14, read "sulphite," instead of "sulphate."

Second column, second paragraph, line 16, read "a small quantity of mercury," instead of "a small quantity of silver."

Second column, fourth line from end, read "sulphite," instead of "sulphate."

Yours faithfully,

R. E. CHESTERMAN, D.Sc.

ISOCHROMATIC PLATES.

To the Editors.

Gentlemen,—We have had our attention called to an article on "The Choice of a Plate," in THE BRITISH JOURNAL of February 21st, and to certain remarks contained therein respecting isochromatic plates. We must take strong exception to the sweeping character of some of the statements in the article in question, which certainly do not apply to iso plates of our make. As the introducers, and, practically, the only makers, of isochromatic plates at the present time, we fear that the remarks will be applied to iso plates of our make, while it is clear from the general text that the writer's experience has not extended to these. We trust, therefore, you will permit us to point out that his statements are incorrect, or do not apply to our plates. For instance, it is stated that "The isochromatic plate . . . . is by no means an unmixed blessing in the hands of the inexperienced, for at present it is far from perfect, and has many vagaries. First, no plate varies more in its keeping qualities; sometimes it will keep in excellent condition for eighteen months or two years, and at other times not for two months." An obvious inference from this statement is that the iso plate is more uncertain in its general quality than the ordinary, or even if it be taken for granted that neither of them is absolutely perfect yet, the article lays particular stress on the uncertainty of the isochromatic plate. It is also definitely stated that iso plates do not keep as well as ordinary, or, at any rate, that many of them deteriorate to such an extent as to become unreliable within a few weeks. The article goes on to say that iso plates must be developed within less than ten days after exposure or the photographer will court failure, and that they should not be used for touring, although they are useful in the studio and for flower studies, etc., at home. Further, that iso plates are more liable to fog than ordinary when changed under unfavourable conditions; and, finally, that it is wiser to leave them at home.

It is impossible for us to pass over any statements of this kind without remonstrance and unqualified contradiction. We think that your own experience of our iso plates will enable you to confirm us in saying that such statements are absolutely without foundation as applied to those of our make. We challenge the writer of your article to substantiate any one of the statements mentioned as applying to our iso plates, and we defy him to prove that any of our plates made within, say, three years, at least, have deteriorated appreciably up to the present time, provided they have been kept under reasonable conditions. The letter of your correspondent, Mr. Goodwin, who is not personally known to us, in your issue of March 7th, confirms our own experience as to the keeping of iso plates, and here we have at any rate, an impartial statement, absolutely at variance with your article. There are other points in the article referring to iso plates to which we feel tempted to draw attention, and which are so widely different from the experience of users of our plates in all parts of the world, that we cannot think the writer of the article intended his remarks to apply to our plates, although there is nothing in the article which would lead people to suppose otherwise. As you are no doubt aware, our isochromatic plates are used largely by scientific explorers and travellers, from the arctic regions to the tropics, which would not be the case unless they gave every satisfaction as regards keeping quality. We have already sent you prints from negatives which were developed nearly three years after exposure, and although we do not consider this exactly fair treatment for any rapid plates, it is by no means exceptional. In short, it is well known (except as would appear to the writer of the article in your JOURNAL) that one of the chief characteristics of iso and ordinary plates, as made by us, is their excellent keeping quality, for which they have for many years been celebrated.—With compliments, yours truly,

B. J. EDWARDS AND CO., LTD.

Castlebar Works, Ealing Dean, London, W.,
March 22nd, 1902.

[Mr. Goodwin's prints, which are before us, are from negatives made on Edwards' isochromatic plates, that had been kept for months between exposure and development, and the results are excellent. All the more value is to be attached to Mr. Goodwin's evidence in this connection, as we recollect him quite eighteen years ago being one of the first British photographers to recognise the value of isochromatic plates in practical work (see the volume of this journal for 1884). Our own personal experience of the same plates contra-indicates the suggestion that they are necessarily deficient in keeping qualities. We find on reference to our recorded experiments that in the year 1894 we exposed and developed some isochromatic plates that had been in our possession two years, and that clear, sparkling negatives resulted. Again at Easter, 1896, the whole of our exposures were made on Edwards' Isochromatic plates, and some of the negatives (stereoscopic), transparencies from which are before us, were not developed until much later in the year. No deterioration whatsoever of the sensitive layer had occurred. We are happy to bear personal testimony to the fine qualities of the Edwards' isochromatic plates.—EDS. B.J.P.]

A WARNING.

To the Editors.

Gentlemen,—I beg to draw the attention of your several readers that a man, about the age of 35, 6 feet high, sallow complexion and clean shaved, is going about the country, calling on photographers asking for a situation as a canvasser, and states that he has been employed at several large firms, etc. Then, on succeeding, being fit out for the purpose of obtaining orders, he goes straight, and commences, to not only get orders, but draws the money at a very low rate. To achieve this object, he tells the customers it is done to advertise the business of the firm. I am writing for the express reason to inform your readers that I have obtained a warrant for this man's arrest, and the police are of opinion that the above man is wanted at Wigan and elsewhere; therefore, if he turns up at any other firm, it would be to the interest of the trade to bring such a man to justice.

I would ask that any information respecting this man would be thankfully received by the W.R. Police, Court House, Wakefield, or myself.—Yours truly,

H. LEAKE.

The Arcade Studio, Kirkgate, Wakefield.
March 24, 1902.

GLYCIA.

To the Editors.

Gentlemen,—Owing to an unfortunate difficulty having arisen in connection with the registration of the word "Dalux," the name originally chosen for our new P.O.P., we have decided to abandon it. In its stead we shall use the word "Glycia," and the paper will therefore be issued and advertised under the latter name. Perhaps you could kindly notify your readers of this change, and at the same time express our regrets that some inconvenience and confusion may be caused, as some advertisements have already appeared.—Yours faithfully,

JOHN J. GRIFFIN AND SONS, LTD.

20-26, Sardinia Street, Lincoln's Inn Fields, London, W.C.
20th March, 1902.

PHOTOGRAPHING THE AURORA.

To the Editors.

Gentlemen,—In your interesting columns, under "Ex Cathedra," in the BRITISH JOURNAL OF PHOTOGRAPHY you refer to a brief reference I made at the Camera Club recently *re* the photography of the Aurora. During the discussion at the close of my lecture I was not able to recall the reference to the researches I had in mind at the moment, and I take this opportunity of doing so.

In March of last year I wrote a brief abstract for *Nature* with reference to the then new work on photography the Aurora, and I enclose a copy sf the note published in that journal (vol. 637, p. 525). The note was accompanied by an illustration of the Aurora display of February, 1892.

I think that as Herr Bashin has shown that he can obtain photographs of the Aurora with exposure of *less* than *10 seconds*, we can consider that the photography of the Aurora is a *fait accompli*.—Believe me, faithfully yours,

WILLIAM J. S. LOCKYER.

Solar Physics Observatory, South Kensington, London, S.W.,
March 19, 1902.

"The ever-changing form, and the faintness of the Aurora, render this phenomenon a difficult subject to the photographer. Many have been the attempts to secure photographs of what have appeared to be brilliant displays, but the results have shown that little or no action had taken place on the photographic film, in spite of the fact that very rapid plates had been used. Herr Trombolt, who made a special study of the photography of the Aurora, exposed very rapid plates to what he considered bright auroræ, and even with exposures from four to seven minutes secured no trace of them. Later, at Christiana, he was more fortunate, and obtained an impression with an exposure of 8.5 minutes. To advance our knowledge of the changes in form of this phenomenon, it is important that photographs should be secured, if possible, in a few seconds, and not minutes. This seems now to be feasible, judging from an interesting account given in the *Meteorologische Zeitschrift* (Heft. 6, 1900), by Herr O. Baschin. Herren Brendel and Baschin stayed several months, during the winter of 191-2, at Bossekop, in Norwegian Lappland, to study the magnetic elements and the Aurora.

"For the photography of the Aurora they employed an apparatus belonging to Herr O. Jesse, who had used this instrument for photographing luminous night clouds. The objective had a focal length of

210 mm. and 60 mm. aperture; the dimensions of the plates used were 9 by 12 cm., the field photographed covering about 20 to 30 degrees. Schleussner's plates were employed, and, what appears to be the most important desideratum, the plates were stained (with erythrosine) and thus rendered more sensitive to the auroral light. For the first experiments the exposures given were comparatively long, namely, three minutes, but this was found to be excessive; finally seven *seconds* were sufficient to give good results. The reproductions accompanying the account of these researches illustrate the results secured with exposures of one minute and seven seconds respectively. The latter is reproduced here, and shows very clearly the drapery-structure, although even this, according to Herr Baschin, is over-exposed, the structure having a wavery and not a sharp appearance. With such first results as these, there seems no reason why, with plates stained to be most sensitive to the particular colour of the Aurora, and with the most rapid lenses even shorter exposures of a second or less should not be given.

"A step in the right direction has, however, been made, and the time is not far off when it will be as possible to project the ever-changing form of the Aurora upon the screen as it is to exhibit in this way the phenomenon of an eclipse of the sun."—*Nature* (vol. 63, No. 1,639, March 28, 1901, p. 525).

THE PHOTOGRAPHERS' ASSOCIATION OF NEW ENGLAND.

To the Editors.

Gentlemen,—Mr. A. Langfur advised me to write you in relation to a matter that, as president of the above Association, is very much in my thoughts, and (if I mistake not) as you are the president of the Photographers' Association of Great Britain, as well as editor of the British Journal, it may be that we can be of service to each other.

I desire to enter into correspondence with some of the leading art photographers of England, who would probably not be unwilling to exhibit at our next convention in August, which our Association's Executive Committee are desirous of making of more practical value than heretofore. One of the greatest sources of "education" (which is what we are after) comes from the education derived from seeing the work of others, and if we can obtain pictures from good workers abroad, it gives it an international interest. I am willing in turn to lend my efforts towards obtaining good pictures for a like purpose to any other Association, and with this object in view I would be pleased to enter into correspondence with you, if the idea strikes you favourably. Some of the best workmen in the United States are in the New England States, and belong to our Association. Besides these, I am well known to the leaders in the whole country, personally and in correspondence. I will do what I can to secure for your next convention or meeting—if not *too soon*—some pictures for you. Will you in turn assist me by your efforts to getting some for us? I suppose there are some of your members who are in the habit of exhibiting, who would do so here, and if you will give me the address of some of them I would write myself, if you would prefer it to be done in this way? At a future time I will mail you some printed matter that would explain our wishes, etc., that could be mailed to good workers in the United Kingdom. We have a number of members who attend our conventions from Nova Scotia and other parts of Canada.—With thanks in anticipation of your kind and favourable response to my inquiry, etc., believe me, very sincerely yours,

Chas. W. Hearn,
President P.A. of N.E.

Boston, Mass., February 21, 1902.

[We will communicate with our correspondent by post. Meanwhile his letter is of interest as showing the friendly feeling existing between the professional organisations of this country and America.—Eds. B.J.P.]

ON THE NEGLECT OF TRUTH BY PHOTOGRAPHERS.

To the Editors.

Gentlemen,—In reply to Mr. H. O. Klein's criticism on my article—"The Neglect of Truth by Photographers"—it is only necessary for me to tell you that, prior to the publication of his letter, I received a private communication from him to the effect that a second reading of my article convinced him he had made a mistake, and, as evidence of his apology for the wrong he unintentionally did me, sent an express letter to you to stop publication of his first communication. I regret that this arrived too late to be of service.—Yours, etc.,

Arthur V. Kenah.

2, Eliot Hill, Lewisham Hill, Blackheath, S.E.,
March 21st, 1902.

[Mr. Klein's letter withdrawing his communication in our last issue did not reach us until 24 hours after the Journal had gone to press.—Eds. B.J.P.]

PHOTOGRAPHING WOOD ENGRAVINGS.

To the Editors.

Gentlemen,—In photographing coarse wood engravings, especially figure subjects, when such have to be eventually used for projection purposes, or in a somewhat enlarged form, more or less dissatisfaction is felt with the coarseness of the results arising from the texture of the paper and the hard crude outlines of the wood engraving. It is well known that those workers who have had much experience at this kind of work resort to one or other of the various expedients whereby these eyesores are reduced to a minimum, if, indeed, not entirely overcome. Among the different methods employed when copying subjects of this description may be mentioned the employment of ground glass, in the form of a shield, over the face of the engraving. A method which the writer has employed with much success in what may be termed extreme cases, *i.e.*, in dealing with engravings more than ordinarily coarse. Many photographers, who have never tried this dodge, might imagine that the interposing of a sheet of ground glass between the picture and the lens when photographing it would be very liable to introduce an out of focus "smudgy" effect, which would be quite as undesirable as having the picture copied with all its crudeness of outline. Such, however, is not the case in practice, when the operation is gone about properly. Of course, there are different qualities of ground glass, and when selecting a sample for this purpose, only the smoothest possible quality should be chosen. A quality such as was used to form the very best focussing screens in the days of wet collodion, the surface of which is so smooth as to make it difficult to deect the rough from the smooth surface when examining the same by touch in the dark. If the pad of the forefinger can detect the rougher surface by a sense of touch the same may be too coarse. A really fine surface can only be detected by the slight noise the finger makes when passing over the roughened surface in the dark. Anyone having in their possession a sample of such finely ground glass can easily satisfy themselves as to its suitability for work of this description by merely placing it over a coarse example of wood engraving. Very possibly at their first attempt they may discover that by placing the ground surface next the paper but little or no amelioration of the grain or coarseness will be apparent, indeed, if such a fine quality of ground glass be placed in close contact with ordinary printed matter the interposition of the glass will in no degree interfere with the crispness of the definition, for the printed matter will be as easily read through the ground glass as without it. When used in this manner, but little or no amelioration of the crude outlines will be effected, but the moment the unground side of the glass is placed in contact with the paper that moment quite a different effect is produced, for it will at once be seen that a marked improvement has been brought about, and lines that in the original yielded a hard and crude effect become at once softened and blended into one another, as to yield a much more pleasing result in the photograph.

Apart from old-fashioned wood engravings, there are also the more modern coarse-screened half-tone blocks. Anyone who has photographed such for the purpose of making lantern slides will be well aware of the appearance such transparencies present on the screen in contrast to slides produced from direct negatives from nature. It would doubtless be claiming too much to assert that by copying such half-tone pictures through ground glass results equal to those obtained from direct negatives can be produced. Still, there is no doubt that the use of ground glass does improve the results from such subjects where a low grade screen has been employed in making the block. Some workers advocate the employment of films when photographing subjects of this description, for by their use when two negatives of one and the same subject have been taken it is impossible to resort to a method of superimposing the one film over the other in such a manner as will yield a more blended result in printing. Excellent results no doubt have been produced by this method also, but the difficulty of printing from two superimposed film negatives is greater than is the case where a suitable negative is produced direct through the intermediary ground glass. Many workers have a wholesome dread of conducting any operations in printing that require anything in the shape of superimposing one film or sheet of paper over another; and such is not to be wondered at, for the operation is one which, although to an expert printer is quite easily performed, becomes a more serious affair with those devoid of any knowledge as to how properly to set about doing it. When it is borne in mind that thousands upon thousands of pictures are practically printed in this manner by expert litho. printers every day, it will be at once seen that when the *modus operandi* is known all that is needed is close application to turn out perfect results; but very few photographers indeed are possessed of the knowledge, not to speak of the knack, in doing work of this description, and therefore it follows that all operations in photography calling for a specially correct register by superimposition is looked upon as difficult. By resorting to the ground glass dodge in work of this description the operation is greatly simplified. Of the many minor expedients when using ground glass whereby the negatives are made to yield the best results practise will soon teach a novice how to operate. Sometimes it may happen that better results are obtained by keeping the surface of the picture and the glass just slightly separated by interposing a mask of ordinary writing paper outside the picture; at others, the glass is best pressed in absolutely close contact.—I am, yours faithfully,

March 22nd, 1902. An Old Hand.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY, 24, *Wellington-street, Strand, London, W.C.*" *Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

PHOTOGRAPHS REGISTERED:—

G. C. Smith, The Studio, Giffnock, near Glasgow. *Photograph of the late J. Dick, Esq.*
H. Moyse, 34, High Street, Putney. *Photograph of D. Milburn, photograph of J. G. Milburn and photograph of group of eleven of Oxford University Boat Club.*
J. E. Corrie, Itchen Abbas, Alresford, Hampshire, *Photograph of arm chair and photograph of original engraving of Lusores.*
H. Ricketts, 69, Mostyn Street, Llandudno. *Photograph of Dr. J. C. Jones.*
H. Spackman, Pickwick Road, Corsham, Wilts. *Photograph of Corsham Court.*

ADDRESS WANTED.—F. GOOD writes: "Would you kindly inform me who are now the proprietors of Maloni's Flashlight Apparatus, as, possessing a No. 1 Studio Lamp, I wish to renew certain accessories?"—In reply: Mr. Maloni's address is 5, Blenheim Terrace, Leeds.

WATER FOR DEVELOPER.—C. RIDGEWAY asks "if there is any great gain in using distilled water in compounding the developer?"—In reply: No, ordinary tap water answers every purpose, if it be boiled first and then allowed to get cold.

SPECIMENS OF RETOUCHING.—P. Q. R. writes: "Would you be kind enough to give your opinion of the retouching on enclosed photos, and also what wages I should get as a retoucher?"—In reply: The retouching is fairly good, but by no means high-class. We should say, unless you can improve your work, you will only command a moderate salary.

PATENT SPECIFICATIONS.—COL. TURKEWILL writes: "Your Photographic Almanac, 1902. Are any addresses given for the different patents, e.g., where can I get Macleod's No. 11,154 of 1901 (page 943), or Jones' No. 10,428 of 1901 (page 941)?"—In reply: At the Patent Office, Southampton Buildings, Chancery Lane, London; price 8d. each.

REMOVING FILMS.—N. B. writes: "I should be glad to know the best method of taking the film off and cleaning negatives (1) off varnished negatives, (2) off unvarnished ones?"—In reply: (1) Soak them in a strong solution of American potash. (2) Soak them for a few hours in cold water, and then immerse them in hot, when the film will dissolve off freely.

LENS PRICES.—"JORDAN" writes: "What is a fair price to give for the three following lenses, second-hand and in good preservation, vid., 15 by 12 Ross No. 4 Universal, Ross 9 by 7 rapid symmetrical, and a Grubb B3 cabinet head portrait lens?"—In reply: We do not undertake to value second-hand apparatus, but we should say if you give something a little over half the list price the lenses would be cheap.

MOUNTING CARBON PICTURES.—"PIGMENT" writes: "Will you kindly tell me the best mountant to use for mounting large carbon pictures on thick paper so that they will adhere firmly to the mounts? When they are on thick paper, we find great difficulty in getting them to stick."—In reply: There is nothing better than thick starch paste. For large pictures it is best applied with a soft sponge and well rubbed into the paper. If that is done, they will adhere perfectly.

THE POISONS ACT.—H. W. writes: "Can you tell me of any photographic dealer's, not pharmaceutical chemist's, where I can get bichloride of mercury and cyanide of potassium at a moderate price? The local chemists in this neighbourhood charge an exorbitant price for them."—In reply: We cannot, as only pharmaceutical chemists are allowed to sell these things, and we expect you will have to pay the price they like to charge for them, whatever that may be.

VARNISHING.—C. H. C. writes: "In your very kind reply of the 14th ulto. you give the formula of a matt varnish, and say it may be coloured in the usual way. Here is just the point on which we are seeking information. We cannot find any colours that will combine with the varnish. If you can state what kind of colouring matter will combine you will confer an additional favour."—In reply: Most of the coal-tar colours will be found soluble in the varnish. Aurine is a very non-actinic colour, and a little of it goes a long way. Many other colours will answer as well.

STUDIO QUERIES.—"CAMERON" writes: "(1) Can as good work be produced in a studio facing East as in one facing North? (2) Is an East-light studio much more difficult to work? (3) Are there many studios facing East in Britain? (4) Should the glass side of an East-light studio be perfectly vertical? (5) Say a studio faces a blank wall the same height as itself, is 40ft. between the glass and wall too short a distance for good workable light?"—In reply: (1) Yes, certainly. (2) No, except, perhaps, early in the day, if the sun is upon it. (3) Yes, hundreds. (4) Not necessarily, any more than with any other aspect. (5) No, not at all.

FREEDOM OF TRADE.—D. G. T. writes: "(1) I want to know if I can sell chemicals to amateurs? (2) Am I allowed to make up different solutions, such as developing, fixing, and toning solutions, and sell as ready for use, without fear from the chemists and their Society?"—In reply: (1) Yes, provided they are not scheduled in the Poisons Act. (2) Yes, so long as they do not infringe the Poisons Act. Bichloride of mercury, cyanide of potassium, and oxalic acid you must not sell, or solutions containing them; but such things as developing, fixing, and toning solutions you may vend to your heart's content.

COPYRIGHT.—"INQUIRER" writes: Some months back a firm agreed by post to pay me a certain price for a set of photographs to reproduce (I hold the registered copyright). The firm proved to be simply middle-men, forwarding the pictures to an illustrated paper. My account was sent with the prints, and acknowledged; but though I have repeatedly requested payment, have not received it, in spite of their promises. Can I claim from the publishers who used the prints in their paper?"—In reply: Your claim is against those who contracted the debt with you. You have no claim whatever against the illustrated papers that use the photographs. Better sue the parties in the County Court.

LENS QUERY.—"FOCI" writes: "I have been given to understand that if the combinations of a 10 by 8 Dallmeyer rapid rectilinear lens (13m focus) were brought nearer together, they would form a wide-angle lens, likely to cover with small stop a 15 by 12 plate. (1) Is this so? (2) If so, how much shorter should the tube be than the original setting which measures ——?"—In reply: (1) Yes; but a very small stop will be required to obtain a good definition over the field, and much of the best qualities of the lens will be sacrificed. (2) The nearer the lenses are brought together the larger will be the field; but we should advise you not to tamper with the lens at all.

STUDIO BUILDING.—G. Y. writes: "I am erecting a portable studio, size 23ft. long by 12ft. wide, with almost pure North light (shade to the West). Kindly inform me the shade of blinds to use for top and sides; also if you advise the whole of glass to be frosted or tissued, and should the studio be worked at both ends or one only? Can you give me the name and address of firms that supply signs to hang over doors, projecting over the pavement of the street, for advertisement purpose, as I have only a passage to show specimens? Perhaps you could give me a suggestion that would answer better than sign."—In reply: As the studio is nearly due North, there is no necessity to have any of the glass frosted; we should prefer it plain. Pale green or blue would be a suitable colour for the blinds. The studio may be worked at both ends or one end only, as preferred. It may be convenient to work one end in the morning and the other in the afternoon, according to the light. Any local ironmonger will fit up a sign for you.

THE HALF-TONE PROCESS.—C. P. writes: "I want from time to time a quantity of process blocks (size 4 by 3), which have proved rather expensive, and have been thinking of trying the process myself, to save some of the expense, but have been frightened hitherto from reports I have heard of the initial expense. I have ordinary cameras, and I wondered if I could make one of these do, as the mirror arrangement for reversing is not necessary in my case, as what I reproduce are designs which answer just the same if reversed. I bought second-hand also, last week, a 'whirler' and etching tub. Now, can you give me some idea (1) about what expense will it be absolutely necessary to go to (for a beginning) in apparatus? (2) Is it necessary, if I am able to use an ordinary copying camera, to have a special slide for the plate and screen? (3) What particular process would you recommend as the easiest, and the best text-book on the subject? —In reply: (1) Write to Messrs. Penrose & Co., of Farringdon Road, London, E.C., for a price-list; that will give you the prices of all you require. (2) It will be more convenient; indeed, is almost necessary in practice. (3) The usual half-tone process; Verfasser's work on Half-tone Process, price 2s., which may be had through any of the photographic dealers, or booksellers. We should say that it will be better for you to get the blocks made than to learn the process in order to make them for yourself, because there is something to learn before you will be able to produce blocks equal to those turned out by professional block-makers.

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*** *The Editor can only be seen by appointment.*

*** *We do not undertake to answer letters by post.*

EX CATHEDRA.

Dr. Grun's Lens. Since we first drew attention to the great intensity of the lens constructed by Dr. Grün, he appears to have made considerable progress in the quality of its definition. In the February number of *La Photographie Française* some reproductions of photographs taken with a Grün lens at the Theatre Royal, Brighton, are given, and the definition is sufficiently good to bring the pictures within the scope of pictorial photography. One of these photographs, Miss Pattie Brown, was taken by the light of four gas burners in five seconds at *f*1.4, and the result, judging from the half-tone reproduction, is very satisfactory. The aperture, *f*1.4, does not represent the full intensity Dr. Grün has achieved. He writes to our contemporary that he has constructed a cinematograph lens of $2\frac{1}{2}$ inches aperture and $1\frac{1}{4}$ inches focus, which gives the ratio *f*0.5. These are fluid lenses, and subject, of course, to disturbance arising from variations of temperature. Dr. von Hoegh, the inventor of the well-known Goerz lens, intimates that the lens cannot be used if the variation of temperature exceeds 2 degs. C., but this is disputed by Dr. Grün, who thinks the lens may be used without inconvenience between 8 degs. and 25 degs. C.

* * *

Fluid Lenses. The use of fluids in the construction of lenses is a very old idea. Even if we restrict the application to objectives used for photographic purposes, we find that Scott Archer made such a proposal. But a still more interesting reference to the subject has recently been made by Ed. Dolezal in the *Photographische Correspondenz* for this year, page 85, with regard to Porro's instruments for photogrammetric purposes. Porro constructed a lens for making panoramic photographs. The surfaces of the lens were concentric, and the picture was formed upon a concave surface concentric with the lens. The principal difficulty to be surmounted in constructing the lens was the large diameter of the crown element, in comparison with the focus. The glass would have been difficult to obtain, and very expensive. Porro substituted a fluid of suitable optical properties to correct the flint element. The aperture of the lens was 39 m.m. and the focus 10 c.m. The intensity was consequently almost *f*2.5. As Professor Dolezal does not mention what fluid was used, we suppose Porro did not give particulars. Dr. Blair more than a century ago used a solution of hydrochloric acid and chloride of antimony, or sal ammoniac and chloride of mercury, and constructed a telescope of exceptionally large aperture, *f*3. Sir David Brewster also recommended sulphuric acid and oil of cassia for elimination of the secondary spectrum.

* * *

Porro's Panoramic Camera. It may interest some of our readers to learn that Porro, the constructor of the first telephoto objective, published the description of a well-conceived apparatus for photogrammetric, panoramic photography. An illustration of this apparatus is given in the February number of *Photographische Correspondenz*, in the article by Professor Dolezal, to which we have already referred. The camera is drum-shaped, and supported upon a stand with levelling screws. The lens is placed at the axis of the apparatus in the centre of the drum, and the enclosure forming the camera consists of about two-thirds of the drum, the other third being left open for the light to enter the lens. The photographs were made upon paper stretched upon a cylindrical glass support at the focus of the lens, which had a round field. At each end of the cylindrical glass plate were rollers, to carry the film before and after exposure. Three exposures sufficed to complete the circle of the horizon. A small telescope above, supported by an arm revolving upon the axis of the drum, served as finder. A compass was fixed on the top of the drum's axis, and a level upon the arm of the finder. To obviate difficulties arising from expansion and contraction of the film in development, a scale was ruled upon the glass supporting the film, which was thus printed upon the film simultaneously with the landscape. The apparatus is also mentioned in Dr. von Rohr's work upon "The Theory and History of the Photographic Objective." The photographs taken with a camera of this construction are free from distortion.

The Daily Press and Photography. It is a sign of the widespread interest manifested in photography that a leading daily paper should devote one of its columns weekly to photography. Although the writer of the paragraphs to which we refer displays considerable knowledge of the technics of the art, yet there are certain points showing that he is not fully aware of the possibilities within the reach of the amateur, even with apparatus of cheapest type. He tells us that with anything like luck in the weather at Easter the light should be suitable for most outdoor work, except that requiring very rapid exposure. The words are addressed to the holiday-maker, and we will assume that he is provided with a hand camera constructed on lines to suit the pocket of the million. Granted that the light at the end of March is not the brightest of the year, the difference in its strength now and in the month of June is nevertheless so small that very rapid exposure may be given with lenses of but moderate intensity. Let us descend to facts. Between the hours of eleven and one in the day the exposure now should be only one-third longer than in June, and if we assume that the aperture of the lens is merely *f*11.3, a near object may be photographed in 1-50th of a second, if the very sensitive plates now upon the market be used. It says much for the skill and enterprise of our dry plate makers that plates of this extreme sensitiveness should be offered to the public at the popular price of one shilling per dozen quarter plates.

* * *

Artistic Exaggeration. The same writer takes the opportunity to refer to the realistic and impressionist schools of photography, and tells his readers that the school given to a "little artistic fibbing," of the nature of "white lies" that mitigate the acerbities of life, is the one which has always received the support of artists. We feel tempted to print the word "artists" in italics, to emphasise our contempt of this association of art with what is most ignoble in everyday life. It is true that certain defects, which have been inseparable from photography, justify the use of certain means by which a photograph may be brought into greater harmony with nature, and thus enable it to appeal more strongly to our sense of beauty, but their extension to the deliberate perversion of truth should be emphatically discouraged by the photographer. They should be left to the "artist" who would depict a "white lie" to suit his own purpose. The writer crowns his remarks by telling us that optical science may some day provide the idealist photographer with a lens that will pervert perspective to his heart's content, and that there should be a great future for the Ananias camera and the Sapphira lens. If the writer is in quest of such instruments to complete his photographic outfit, we may inform him that optical science can even now provide him with the Ananias lens. The Anamorphot will distort perspective in any direction, and we trust it may satisfy his artistic instinct.

* * *

Colour-Blindness. In the current number of the *Nineteenth Century* there is an interesting article on colour-blindness by Dr. F. W. Edridge-Green, in which he raises the question as to whether the sense of differences in colours may not be a gift of the ages, and it is suggested by the author that our remote ancestors may have been unconscious of all but the most marked contrasts, and that they perhaps even saw everything of a uniform hue, as in a photograph. In a letter to the *Standard* of Friday last, commenting on the article, Mr. Eadweard Muybridge, a gentleman pretty well known in connection with photography, says that his experience has led him to believe that people utterly devoid of the first rudiments of education in art are far more capable of distinguishing variations in colour than of form, or of the shapes of objects on flat surfaces. In support of his opinion, Mr. Muybridge mentions that when living in New Orleans, about the middle of the last century, he noticed that the negroes, some born in America, and some on the West Coast of Africa, employed in unloading the steamers, were quite incapable of distinguishing the differences between the symbols or letters even of the simplest and most distinctive character, unless pointed out to them in each individual case of a bale or barrel being carried ashore. But when dabs of different coloured paints were put upon the packages the difficulty was at once overcome. The negroes were able to distinguish the different colours, but not the forms. Mr. Muybridge also mentions that when residing amongst the Indian tribes of California—a very imperfectly intelligent race—he found that although the ability to distinguish form or shape in a drawing or in a photograph or other monochrome was almost lacking amongst the natives, they experienced no difficulty, however, in correctly assorting pieces of variously-coloured paper into respective parcels. This experience somewhat controverts Dr. Edridge-Green's theory. There is no question that colour-blindness exists to a great extent even amongst artists, and also amongst photographers. Some printers, for example, are quite unable to tone a batch of prints, on the same paper, all to the same colour, and although the tones may differ widely they fail to recognise any difference in them.

* * *

Pictures in Printing Ink. Few of the hundreds of thousands of readers who devour the popular publications of to-day, and cast a wearied eye over the numberless pictures with which such publications abound, reflect that there was a time, which is within the memory of persons now living, when pictorial illustrations in our magazines and journals were seldom employed. The expense of production was the great obstacle, and before an illustration was determined upon the proprietor of the journal, the artist, and the engraver would meet in solemn conclave to discuss its features. If we look back to the beginning of the lately-closed century we find that pictures in periodicals were as scarce as black swans used to be when some of us were struggling through our Latin grammar. And the reason was obvious. The great revival of wood engraving had not yet come, and newspaper illustrations, when they did appear, were engraved on copper plates. And as the operation of printing from such a plate is quite different to that of printing from raised type, the paper had to be run through two different presses, one for the type, and the other for the illustrations. The curious may find in a certain number of the *Times* of the year 1805 a picture executed in this manner, the subject being Nelson's funeral car. Our readers need no reminder that photography has been the "deus ex machina" which has covered the wide world with pictures, and has, at the same time, caused a mighty revolution in the manner of their production. But the first advance must be traced to the revival of the art of wood-engraving, and this came about in the early twenties. The *Observer* gave its readers fair examples of wood cuts occasionally, and other papers, of course, followed suit. In 1842 the *Illustrated London News* appeared, and pictures became comparatively common. It was a long time before the camera came to the aid of the artist, and it came as a friend. It told him that it was no longer necessary to draw direct on to the wood block; the drawing could be made on paper, and its image transferred to the wood, the original design remaining intact as a valuable asset. A few years later, and the photographer took a more aggressive

tone. He showed how he alone could undertake the entire work of picture making, from the original design to the finished block. Moreover, he could execute the work at a price far below that which formerly prevailed. And in this way pictures in printing ink have become as common as fallen leaves in autumn. Some are good, many are indifferent in quality, and many more are utterly bad. Perhaps there may be a revulsion of feeling some day in favour of the superseded wood-cut, but by that time there will be no engravers!

* * *

Early Daguerreotypes of Famous Men. The marvellous popularisation of photography has arrived at so great a pitch that it seems almost impossible of credit that the beginning of the science happened within living memory. What is now an everyday necessity was in its early days a subject of wonder to the public generally, and of surpassing interest to the scientific man, the chemist especially, so much so that it led in many cases to some of the most eminent of the period sitting to be daguerreotyped, some of the results being still in existence. A most valuable sample of this kind has, through the will of the late Mr. Thomas J. F. Heacon, of Newcastle, come into the possession of the Royal Institution. It is a group of two, representing a consultation of Michael Faraday and Professor Daniell, and is of priceless value now. It is to be trusted that proper steps will be taken for the preservation of a portrait of such unique interest. In this connection we may record the steps taken with regard to another daguerreotype of an equally famous chemist—Dalton, the founder of the atomic theory. Three portrait busts were taken of this eminent man on very small plates. One nearly half a century ago was lost sight of entirely; a second was the property of the late Mr. Dancer, the well-known optician of Manchester; and a third was a cherished possession of the late Mr. Dale, of the firm of Roberts, Dale, and Co., of Manchester (one of the first manufacturers of coal-tar dyes in this country). He was a man of great ability, considerable originality, and he, at an early period of his ownership of this valuable relic, felt it desirable to preserve it, if possible, against all injury, mechanical and atmospheric. This he did by sealing it with Canada balsam to a piece of glass of the same size, the whole surface being thus cemented and protected. Where these two portraits now are we are unable to state, but we believe Mr. Dale had an enlarged reproduction of his copy made for presentation to the Chemical Society of Great Britain.

* * *

The Preservation of Daguerreotypes. While discussing this topic, we commend to consideration of the possessor of similar treasures this plan of Mr. Dale's for preserving these fragile specimens of the early stages of photography. A thick sample of balsam should be chosen, and after softening by heating, a portion should be placed upon the centre of the plate, and a gentle heat applied. The covering glass, previously cut to the exact size, also gently heated, must then be dropped carefully upon the little pool of balsam, and the whole allowed to cool under pressure, and left undisturbed for a week or two. The edges can then be bound with paper, after removing the superfluous balsam, and there is every reason to believe that the portrait is virtually a permanent one, saving for mechanical injury. We may append a precaution to these instructions: the fact of the cementation should be recorded upon the back of the metal plate. That this is no unnecessary step will be seen when we state that this particular photograph of Dalton was, after sealing as described, given into the hands of a photographic friend to copy, with every injunction to be careful of such a treasured memento. It was handed to an unskilled assistant to copy, and he, desirous to get the best result, proceeded to remove the glass in the usual manner. Being ignorant of the fact that it was sealed as described, inserted a penknife blade to separate the glass, and—broke it into pieces! Fortunately no further injury was done, and the mischief was remedied by soaking the daguerreotype and the remaining bits of glass in benzol till the balsam dissolved, and the glass fell away. The picture was then resealed as at first. We can vouch to the accuracy of this account, for our advice was sought at the time of the occurrence. We think it well worth while our making this note in view of the possibility of such preserved specimens of early photographic work being similarly entrusted to the copyist. The present generation, as a rule, know nothing of the mode of production of these really beautiful portraits; most of them, indeed, have never even seen one. Hence, while discussing the subject, we may call attention to the fact that the image is most delicate, and must not be touched. The slightest friction will remove it, as a well-known photographer once learnt to his cost. An assistant, re-packing a daguerreotype in its case after copying, and desiring first to make it look clean, gave it a vigorous rubbing with a dry cloth. Naturally the whole of the surface was removed, and the whole picture destroyed.

* * *

Help for Inventors. A correspondent adopting the initials "F.R.C.S." recently addressed a letter to the *Daily Chronicle* pointing out that, although few things are more essential to the well-being of the community than inventions, little or nothing is done to encourage or facilitate them. And he suggests that photography might work a reform in this matter. Being anxious to improve certain apparatus which he uses in his vocation, he recently visited the electrical section of the South Kensington Museum, to see what progress had been made by others in the same field. To his disgust he found that all the exhibits at this national institution were from 20 to 30 years old. In other words, they were almost useless, for electricity has made such rapid strides of late that the novelty of to-day is obsolete to-morrow. This gentleman makes the very reasonable suggestion that if, on account of their expense, models of recent inventions cannot be exhibited, it would be quite feasible to show steroscopic photographs of such contrivances. That such photographs should be on sale, and they would prove so useful to students that they would not long remain in stock. In the early days of the museum, when its temporary galvanised iron buildings earned for it the sobriquet of "Brompton boilers," there was an annexe called "the Patent Museum," in which models were shown. But even then the display was out of date, and although the first railway engine, and other appliances of a far more remote time, were full of interest to the antiquary, they did not appeal to present-day inventors, athirst for information as to more recent doings. After the Patent Museum was demolished a section of the main building was devoted to mechanical models, many of which are worked by compressed air. It is with regard to the ancient character of these devices that the correspondent of the *Daily Chronicle* complains. It would certainly be a mistake to clear them away, for they are a delight to boys, as one may prove any day by visiting the museum; and who can say whether among these juveniles there may not be found some Stephenson or Brunel in embryo? But we think that the suggestion that these models should be supplemented by photographs of more recent date is a very good one. The pictures could

be viewed through the stereoscope by the visitor, and they could also be multiplied for sale and for distribution to other museums. A photograph of a complicated piece of mechanism does not always convey as much information as may be desired, especially if the picture is on a small scale. But if the salient parts of the same machine were separately photographed, the whole design could be made plain. The suggestion is certainly worthy of the attention of those in authority as a valuable aid to inventors and to technical education generally.

* * *

Lightning Vagaries. To throw light upon lightning, except in a strictly figurative sense, would be akin to painting the lily. But if anyone is capable of doing so, the photographer is that man. There is no question that we have learnt more of the varied forms which lightning assumes since the evolution of the dry plate than ever we knew before, and there are many indications that, by a study of lightning photographs, we have at hand the best means of elucidating many problems connected with atmospheric electricity. A streak of lightning is such an evanescent thing that it gives no time for examination or study. Painters, from time immemorial, have been quite unable to describe its form, and have been content to give it a conventional zig-zagged outline which is not a bit like the real thing. From this failure has arisen the expression, "artist's lightning," a term of reproach which is always used with much gusto and a sense of superiority by militant photographers. The photograph gives an actual transcript of the wonderful streak of light, which is sometimes so destructive in its results, that our forefathers could not dissociate it from something hard and solid, hence the old term "thunderbolt." Photographers who possess pictures which throw anything abnormal in the way of a lightning flash, or which give evidence of its destructive effects upon buildings, can aid in a good work by communicating with the Lightning Research Committee, at their headquarters, 9, Conduit Street, London, W. This committee was organised fifteen months ago by the joint action of the Royal Institute of British Architects and the Surveyors' Institution, the object being to collect accurate records of the effect of lightning upon buildings, with a view to ascertain the best means of protecting them from its effects. The scheme is a big one, for it is not confined to Great Britain. In addition to the 200 observers enlisted in the United Kingdom, there are many others in our colonies and in foreign countries who have expressed their willingness to send in reports to the committee of damage by lightning stroke. A special feature of the work is the obtaining, whenever possible, of photographs showing the damage done as soon as practicable after the occurrence. Up to the end of last year the committee had tabulated sixty cases of damage, and it is a remarkable circumstance that no fewer than twelve of them refer to buildings which were furnished with some kind of lightning rod or conductor. It would be idle to assume that one in five of our buildings are so protected, so that the conclusion is irresistible, seeing that this large proportion figures in the returns, that some of these so-called protectors attract the danger which they are supposed to avert. It has often been hinted that some of the rods put up over buildings as lightning arresters are worse than useless, and it is to be hoped that the Research Committee, whose labours are not yet concluded, will once for all thresh out this important matter. We have already shown how photographers may help in a good work which will probably have far-reaching results.

A NOTE ON FAKED OR COMBINATION PHOTOGRAPHS.

In the expression, "faked photographs," we have practically another term for "combination printing" in photography. Authors, however, select the former, possibly because such an expression is more catchy to the eye. Quite recently some interesting articles on this subject have appeared in our illustrated magazines, whilst some cleverly-executed examples of what are termed "faked" photographs have been brought under the public notice, without any explanation of the "modus operandi." The term, "combination printing" in photography is well known to all experienced photographers, and embraces a somewhat wide field of usefulness, for by its means some of the finest results ever produced by means of photography were made. We have only to look at the magnificent pictures from time to time turned out by such workers as the late Adam Diston and H. P. Robinson to form some idea of the value of "combination printing."

In the days of wet collodion the making of a combination negative was a work that took "some doing," but then there were ardent workers who experienced a delight in the difficult operations required. A knowledge of how to manipulate a delicate collodion film, whereby, after removal of a portion of an image, the film was floated off its original support and superimposed on another film carrying a different image, must of necessity appear a very difficult operation to a present-day worker, who has never seen a glass plate coated with collodion. Yet this was actually accomplished by our early enthusiasts in photography. Combination printing, however, does not merely apply to negative work; it has a far wider range in what may be termed positive productions, and may be successfully accomplished by printing on one and the same sheet of sensitized paper from several different negatives. In this form the work does not partake of nearly so much difficulty when gelatine negatives are employed, as was the case years ago in the making of combination negatives. The chief factor in a successful result in combination printing on one sheet of paper, from more than one negative, lies in a knowledge of how best to proceed with the work, and once this knowledge is acquired the operation becomes practically easy to anyone possessed of a reasonable amount of skill in "blocking out" portions of a negative.

Years ago what was termed a masking operation was resorted to by some workers in producing these combination effects. These masks were made by placing an ordinary sheet of printing paper in contact with a negative until the bare outlines only of the picture were visible. The print was then removed from the printing frame, and by means of a scalpel or very sharp penknife the portions of the print were cut at those places which it was desired to print at different times, first by one shield, and then by substituting a second negative. After the partially-printed proof was carefully cut, the pieces were sunned down until they became quite opaque; they were then placed on the exact parts of the negative as masks, and the double printing conducted as usual. After a time, however, a better method of producing these combination pictures was adopted, for it was found that no matter how carefully a printer manipulated his masks and paper, there was a great liability for the production of eyesores in the finished picture by the masks and shields not yielding an absolutely true registration, dampness of the atmosphere being quite sufficient to cause an expansion of the mask to such an extent as to show nasty outlines when the combinations were made in printing. The next step was the substitution of a careful system of blocking out in lieu of the masking opera-

tion. At this stage it may be advisable to state that combination printing is best conducted on what is termed plain salted paper. The reason for this is obvious when it is pointed out that a very great deal can be accomplished by working up the finished print by means of brush and a suitable pigment, and there is no sample of printing paper which lends itself better to this purpose than a fairly rough-surfaced drawing paper, such as Whatman's. One of the points that beginners seem seldom to understand in work of this description is how to shield the first image printed on the paper whilst the second negative is being printed if there be no system of masking employed. The explanation of this is simple. Perhaps by describing a typical case of where two negatives are to be printed on one sheet of paper a better idea of the operation may be gathered.

Take, for instance, a case of a street scene in which it is desired to introduce the figure of some well-known personage, who, of course, was not in the original view. Here we have two negatives, one being a view of the street, the other a view containing a figure of the individual required. The first step is to block out entirely all the background and surroundings, leaving only the figure on, say, No. 1 negative. When this is accomplished the paper is placed in contact with this negative in the usual manner in the printing frame, and when the figure is printed up sufficiently the print is removed from the frame. This print is then taken into a semi-dark room, and by means of a brush charged with water-colour gamboge the entire figure is painted over. When the pigment is dry, the same print is placed in such a position on the other negative as will produce a natural result in the finished picture, and the printing is conducted until all the second negative is also printed up. By this means the gamboge prevents any printing from the second negative on that portion of the first negative represented by the figure, and all that remains to be done is merely to wash away in the water bath prior to toning and fixing the gamboge from the face of the print. It may be here stated that such an application of a water-colour pigment in no way injures the print or interferes with the success of the toning operation. In selecting a pigment for this purpose, gamboge stands among the best to employ.

ESSENTIAL HAND-CAMERA CONDITIONS.

[By a Hand-Camera Worker.]

The photographic season is coming in. Hand-cameras will soon be in full evidence in all kinds of hands, in all sorts of places. What will the results be? Where are the past results? It must be confessed that they do not seem to figure large enough in proportion to the evidence of the number and kind of tools at work. Are amateur photographers so shy that they seek to hide their lights under a bushel? It is not a marked characteristic of the amateur in general. His light may not be a brilliant one, but he is not the man to place a bushel over it. The natural inference is that it lacks brilliancy enough to suit even himself. This is fully borne out by a very large number of amateur results that we have had the opportunity of judging. We have, further, been surprised at their being so poor, considering the high intelligence of those who are responsible for them. The fact of carrying a camera, in itself, stamps a man as above the ordinary level. It indicates tastes more or less educated and refined, and the desire of preserving a record of something useful or agreeable, for further use or pleasure. As a matter of fact, the disappointment arising from the ill-results of first photographic effort is not so much a question of taste and brains as of not realising the very rigid and confined limits of photography. A man may know of these, after a fashion, from a book, but it is only failure in practice that as a rule stamps them so effectually upon the mind, as to form working rules leading to success. The training, however, is so severe, that it often withers good promise in that bud that, with a little kindly care and attention, might in due course develop into brilliant flower and valuable fruit. As it is, it is distinctly discouraging, after making fifty or a hundred exposures during a tour at home or abroad, to find so few successes amongst them, and these evidently more the result of accident than of design. It is easy to correct this in great measure by bearing a few simple rules of practice in mind. But they must be regarded as supreme, and everything invariably subordinated to them, until such skill is gained as may perhaps lead to their modification in special cases.

It is with the hand-camera that we would deal particularly, partly from the fact that its users are the most numerous, and partly because they are handicapped in not possessing the all-important aid of the ground-glass screen. It should be especially remembered that photography is, upon the whole, a foreground art—in the case of the hand-camera, essentially so. However much the tourist may be charmed by the more distant view from the seat at the inn door, he had far better let it be. It will only lead to photographic disappointment. Let him, instead, turn around, and take the inn; or, better, a portion of it—the porch and sign, the seat and table under the walnut tree, or what not. And so on throughout. If he rigidly limit his range to 20ft. or 30ft., he will find what he expects on his plate when developing. This looks simple enough to do, but is not by any means so in practice. Eyes have been evolved through long ages of time for use at a range varying from six inches to six miles, and to accommodate themselves instantly from the one distance to the other. The evolution of the brain has gone on to correspond with that of its sentinels, the eyes. The optical conditions of the mechanical lens are different to those of the eyes, and it requires something of a mental effort to bring the brain into line with its special demands. There is a similar unconscious ignoring of the incidence of light upon the object to be photographed, as in selecting a too distant object or view. In admiring a building or landscape, no thought is given to the position of the sun. Indeed, it may be that the position of, and cloud glories around, the setting sun form important elements in the sense of beauty experienced. But these conditions will not do in a photographic picture. The mechanical consideration will have to be introduced, that the light fall somewhere from over the shoulder.

Carelessness in not holding the camera square, or the temptation to tilt it, so as to scrape in a far corner or outline, must also be avoided. If any worker will but regard these conditions as of first importance, and strictly subordinate all impressions, sentiment, and so on, to them, he will be on the right road to a satisfactory and encouraging result. If he would have a wider range, he must go in for the artist's training, and discard the camera for the pencil or the brush. We do not mean to say, of course, that the simple rules referred to will turn out high-class pictures. There are many other points of importance, but not, we take it, of such vital importance. By regarding those referred to, nine-tenths of the mistakes made by hand-camera workers will be avoided. Stop and exposure are important. But these are not likely to be far wrong at the usual *f*16 and 1-30th of a second of the hand-camera. The working range under such conditions is certainly limited. The carving on a dark cathedral front, for instance, is out of the question. But this, and many other things, are more for the experienced stand-camera worker. In the more strictly technical matter of speed of plates, developing, and

printing, no advice is given, beyond that it will prove most satisfactory, upon the whole, to use a plate of medium rapidity, the simplest developer, and one kind of paper. There is little difference in the quality of the plates of good makers. For all-round snap work, a medium speed is certainly better than the extremes of "slow" or "rapid." The one is too slow, and the other too touchy in development. Any developer will develop plates properly exposed. In the case of the final result—the print—most workers are divided between the silver print and black and white. Either can be readily mastered, but the one that goes the better with the individual taste should be selected, and faithfully held to. If these few simple suggestions be faithfully regarded, there will certainly be fewer disappointments in the course of the summer and autumn of 1902 amongst hand-camera workers.

PHOTOMICROGRAPHS OF GELATINO-BROMIDE FILMS.

A paper read before the Edinburgh Photographic Society.

WHAT is a photomicrograph? A number of people who should know better still use the two terms, microphotograph and photomicrograph, as if they were one and the same. Medical men seem more than others prone to do this. When Mr. Scott Archer, in the fifth decade of last century, introduced collodion as the medium to carry the silver salts, it then became possible to take very small photographs of objects with a microscope, and also to produce enlarged photographs of small objects. It was proposed to term these Alphagraphs and Omegraphs, but Mr. George Shadbolt proposed the terms at present used, viz., microphotographs, to express a very small photograph of a large object, and the term photomicrograph as the name to be used for enlarged photographs of small objects. These two terms were universally adopted, and have been in everyday use since. To enable you to see the form of a photomicrographic camera, and the better to explain it, I have brought one of mine to the meeting, and it is now on the table. This is a photograph of it. In the early days of photomicrography it was almost necessary to have a very long camera, as better results were obtained without the use of an eye-piece in the microscope, as the objectives were not then corrected for the actinic focus. When, however, apochromatic objectives are used, the apparatus need not be of great length, as better results can be obtained by using eye-pieces in the microscope with these objectives than were formerly got without the eye-piece. The apparatus I show you has a base board a little over 30in. long. It is made of yellow pine, 1½in. thick, stained with bichromate of potash, exposed to daylight, and then varnished. I prefer pine to all other woods, as it is lighter, and the board is stiffer than any hard wood of the same size. It can be made of any breadth to suit the size of camera used. The camera in this case is about 1ft. long, and takes 5 by 4, quarter plates, and plates as small as a half-plate cut into six pieces. When using a microscope with eye-pieces, a 12in. camera seems to be quite long enough to give the best results; a single dark slide is used, and the focussing glass is placed in it. When this is replaced by the plate a perfect register is secured. There is an upright thin board in front of the microscope, interposed between it and the source of light. This is of great service to screen stray light from the lamp from the eyes. The camera is made so that it lifts entirely off the base board to enable one's eye to get comfortably at the end of the microscope while adjusting the object. You will notice that the microscope is rigidly attached to a long block of wood screwed to the base-board, through the medium of two strong brass pillars, through which ¼in. bolts pass from beneath the base-board into the prismatic bar forming the body of the microscope. This bar of gun metal is 8in. in length, and has a breadth of 1in. on each face. It thus forms one of the most rigid possible arrangements for carrying the stage and optical tube. Mounting it upon the supplementary block of wood is to give the microscope sufficient height to enable it to be used in comfort for focussing. The stage is a large one with two mechanical motions, that in latitude by diagonal rack and pinion, and that in longitude by a double screw—that is, the screw has two No. 27 threads running at the same time. Much slower stage motions would be an advantage, especially when using high magnifications. The prismatic bar being a fixture, the stage is made to advance and recede from the optical tube by rack and pinion. No sub-stage is used, although I have one fitted, preference being given to a short tube screwed into the stage to carry the various chromatic and achromatic condensers used. The stage is screwed for these condensers by placing a 1in. object glass in the optical tube, and making with a fine point the exact centre shown; the stage plate is then put on the lathe and made to rotate on a chuck in such a way as to keep this mark in the centre of motion. The plate is then cut and screwed to take the sub-stage tube fitting, and no further adjustment is required. The cross arm which carries the optical tube is of the same kind as those made for the last fifty years by Messrs. Powell and Lealand. As this cross head is a fixture, the stage being movable, the connection to be made between the microscope tube and the short tube screwed into the front of the camera is one suggested and used by the late Dr. Messer, and is simply a disc of cardboard cut with a hole to slip on to the microscope tube behind the small flange on the micro tube, and is quite sufficient to prevent stray light entering the camera.

In the apparatus shown the microscope and camera are so adjusted once for all, that the image is projected on the centre of the plate, and no adjustment or collimation is necessary. Supposing, now, the apparatus has been made in every respect well and truly, yet there is one thing in connection with it that requires the most extreme care and attention, that is, the fine adjustment of the microscope. A large proportion of the Continental microscopes have their fine adjustment screws equal to .5 mm., that is, a little over 50 to the inch. Reicherts, of Vienna, has .3 mm., or nearly 85 to the inch, while Zeiss until recently had a screw of slightly over 100 to the inch, or .25 mm. The London opticians have rarely exceeded 150 to the inch. In the expensive photomicrographic apparatus made by Messrs. Swift, under the instructions of Mr. A. Pringle, one of your former members, they say: "The milled head of the fine adjustment screw is divided into 100 parts, and as one whole turn raises or depresses the optical tube 1-100 of an in., an extremely delicate motion is rendered possible." All these screw motions are far too rapid for photomicrography. So much was this seen to be the case, that Zeiss has recently devised a means, by using an endless screw working into the head of their 100-to-the-inch fine adjustment, that they are enabled to get a slow motion equal in a whole turn to over 600 to the inch. The only miscroscope made in London, or this country, having a really good and slow motion is that of Messrs. Watson's Edinburgh students' microscope. It has a screw of 70 threads to the inch, and the motion of this screw is reduced by a lever of the first order, used in the proportion of 4½ to 1, so that one turn of the button is equal to 315 to the inch. This microscope was made in 1888, to my order, and the first half dozen made were bought by me. I also gave the microscope its distinctive name. The microscope you see on the table had until quite lately—about October last—a fine adjustment screw of 65 to the inch, and as the lever on the arm works in the proportion of 11.6 to 1, one whole turn of the button was the 1-750th of an inch. I had been using this for a number

of years back. In October last I made on my hand-lathe a screw of 100 threads to the inch, and fitted one on this instrument, and now one whole turn is equal to 1-1160 of an inch. No one who has used a microscope fitted with one of the rapid screws I have mentioned has any notion of the comfort there is in using the fine adjustment on this instrument. Every movement of the optical tube in photomicrography is so delicate that one has sometimes, with high powers, to use a difference of focus of anything from 20,000 to the 50,000 of an inch; and this delicacy cannot be got, except with such a very slow motion as I have described. In two of my microscopes in daily use one has 580 and the other 800 to the inch. The first was made by me about 20 years ago. As to the objectives to be used. Many years ago it was sometimes customary to place a spectacle lens of positive focus behind the objective to correct it for the actinic focus. This, however, may be regarded as a bad plan to follow. A prominent instance of this is of the great Lick telescope, the object glass of which is 30in. in diameter. When it is used for photography they place a lens 33in. in diameter in front of the objective, which shortens the focus 6ft., but the photographic corrector, as it is termed, is so bad that they have to cut down the aperture of the whole optical system to 8in. Another method used was to endeavour to find the actinic focus for each objective by slightly shortening the camera extension after the object was formed visually. This method also was unsatisfactory. You will remember that last session you had a paper on photography, as used by medical men, in which the author of the paper said, answering to the report, that when a lens was not achromatic, this method was used. Now, I am not aware that a lens not achromatic has ever been used for photomicrography. Indeed, I doubt very much whether a non-achromatic lens could be so used. At the present day there are notably four varieties of micro objectives which require mention. The first of these are those which are used without any medium being interposed between the lens and the cover glass of the object, and are termed "dry" lens. The second are those where a drop of water is placed between the lens and the cover glass, and are termed water immersion lenses. The third are those in which a drop of cedar-wood oil is placed between the lens and the cover glass; and the fourth are those where oil is used in the same way, but the connections being of a more perfect character, they are termed apochromatic objectives. Now, it was found that when water or oil was placed in front of the objective, what is termed the angular aperture of the objective was at once reduced in proportion to the refractive index of the water or oil used. Professor Abbé, of Jena, therefore devised a method of stating the aperture by what he termed its numerical value, which meant multiplying the sine of half the angle by the refractive index of the medium or immersion fluid used. As the sine of 90deg, or half a semicircle, is 1, a dry objective having that numerical aperture, if it were possible to make one, would have an angular aperture of 180deg., or a semicircle—an impossible thing. Dry lenses are, therefore, usually restricted to a numerical aperture of .95, equal to 140deg. A water immersion glass is also usually restricted to 140deg., or a numerical aperture of 1.25; while if you take an oil immersion, one of 140deg., the numerical aperture of such a glass is 1.43. The result is between dry, water immersion, and oil immersion, that, taking the dry lens aperture at 1, the immersion glasses transmit an extra amount of light just in proportion in each case to their own refractive indices, that is, in the proportion of 1 to 1.33 for water, and 1.52 for oil; the latter thus giving one-half more light than a dry lens. The chief feature in the apochromatic lenses is this, that their chromatic dispersion, taken along with the compensation eye-pieces, has been better corrected, and they give much purer images, and almost entirely free from colour. Professor Abbé has pushed the numerical aperture of one of these lenses 1-10, or 2.5 mm. to 1.6, and we have been told by Dr. Czapski, who has charge of that department at Jena, that they could go further in that direction if a sufficiently good mounting medium, with a higher refractive index, could be found. This objective is priced at £40. I shall show you later a copy of a photograph taken by it. I may mention that many of the lower powers of the microscope at the present day photograph with extreme sharpness when used without an eye-piece. Leitz's No. 7, in my possession, is one. I have one of Zeiss's small AA's, of 27 mm. focus, which is an excellent glass for photomicrography.

Objection has been taken by many to this glass, because they say it has an extremely round field. My glass has an exceptionally flat field, but, then, it was the first of its kind sent to this country, to the late Mr. Adolphe Schultz, of Glasgow, the reason being it has a much larger mount than those of more recent make. I asked the Jena people why they had shortened the mounts of the new one. They said the long mount was objected to on the Continent, where the microscopes had little screw to carry a long mount. I have a complete set of the compensation eye-pieces, from No. 2 to No. 18, and five apochromatics, so that the apparatus, you see, is sufficiently long for all magnifications. The next point to mention is that of the illumination of the object. It might be thought that transmitting sufficient light through such small lenses as those of high-power micro object glasses, to produce good negatives with sufficient printing density would be a difficult matter. It is not so, however; the difficulty arrives in very many cases in so modifying the amount of light as to render good results possible. With the lower powers of the microscope we have too much light, even with an ordinary paraffin lamp with a ½in. wick. With such a lamp and a 75 mm. object glass by Zeiss, I required for transmitted light to interpose between such a light and the object a piece of ground glass, both for the purpose of spreading the light and retaining its intensity. Other powers require, of course, varying exposure. With a Zeiss BB. or the 8 mm. apochromatic, when using polarised light with the prisms crossed, the exposure with such a lamp would require a quarter of an hour. For the higher powers of the microscope, I have always used magnesium ribbon as the illuminant. Sir Henry Roscoe, in his "Spectrum Analysis," says that it contains, when burning, more of the purple and violet rays than any other light; while Professor Ames, of the John Hopkins University, states, in "Astronomy and Astro-Physics for 1894," that the light from burning magnesium more nearly resembles sunlight than any other artificial light known. If that be so, it must be the best for photomicrography; the use of it is so easy. You will see that I have upon the apparatus shown, in addition to a brass rod to support the lamp, another rod so fixed upon a plate at its base as to swivel round. The top of this rod covers about an inch of 3-11 brass tube, and when the rod is turned round, it is so arranged that the small tube shall be exactly in the optical axis of the microscope. This is carefully done, once for all, with the aid of the back combination of a 3in. object glass, which has a very long focus. If I now wish to photograph, say, potato starch, with the crossed prisms, after the object has been adjusted and focussed by means of the lamp, the lamp is turned aside, and the tube for the ribbon turned into position, the magnesium ribbon is pulled through and ignited, and by burning about 5in. a well exposed negative is obtained. Instead of fifteen minutes being required with the lamp, half as many seconds suffice with the ribbon to produce the same, or even a better, result. So also when photographing a slide of sand, with the 75mm. object glass, an

ordinary 3 by 1 slide is rubbed over two or three times with the corner of a piece of virgin wax; then the slide is gently heated over a flame until the wax melts. The sand is sprinkled over the melted wax, to which it adheres, and when cool it is placed on the stage of the microscope with a piece of dead black paper behind it, and by burning about 6in. of magnesium ribbon about 10in. or 1ft. away, a dense negative is obtained. Many use the limelight, but that illumination is both expensive and requires cumbrous apparatus to produce it, while the results obtained are no whit better than with magnesium. I noticed that it was used as far back as 1864 for this purpose. When required to be held in the hand, I use always a small piece, about 2in. long, of brass tube, through which the ribbon is passed by the hand, so that any length of it may be used. When the light reaches the end of the tube it, of course, goes out. This simple device is the invention of my friend, Mr. A. D. Richardson, of the Royal Botanic Garden, and a former member of this society. I have brought to the meeting less than a dozen transparencies made from my negatives, and one from a print, which will be shown on the screen, but it may be convenient, shortly, to explain them now. The first four are from slides of sand photographed with Zeiss 75mm., one being from sand from the desert near Cairo, and the second from singing sand from the island of Eigg. These two were made to illustrate a paper by Mr. J. G. Goodchild, F.R.S., on desert conditions in Britain, and photo-mechanical prints from them were printed to illustrate his paper in the "Transactions" of the Edinburgh Geological Society, and in that of Glasgow. The third is sand from the new Imperial Dock at Leith, while the fourth is sand from an egg-boiler sand-glass. The latter was made to show how very inapplicable the sand from the first three was to be used for sand-glasses, an opinion to the effect that desert sand was so used having been given by an expert in geology. The next two slides are from negatives taken with Zeiss's C lens, to show that the lungs in the bronchial pneumonia of a cow are quite open and free, while in the lungs from a cow with pleuro the air cells are full of matter. These were made to settle this question, which was in dispute between the two veterinary colleges here. The next slide is potato starch under polarised light. The next two are from slides of *Navicula rhomboides*, taken with my dry 4mm. Zeiss aprochromatic. This particular valve measured the 1-150th of an inch in length, and both the longitudinal and transverse lines are beautifully shown; there are not less than 60,000 to the inch. The next is a portion of one of these valves, taken with my 2.5mm., water immersion, by Zeiss.

The next slide is a copy from a mechanical print of a negative taken by Dr. Von Zettnow, of Berlin, of *Amphipleura pellucida*, with the 1.6N.A. lens formerly mentioned. This diatom contains at least 90,000 lines to the inch, and is the finest natural object known to microscopists. Until this object glass was made, the thing could not be done. Dr. Von Zettnow has succeeded admirably in rendering this most difficult object. Many others have tried it, but his undoubtedly is the best. Very few of these 1.6 lenses have been made. One was sent to Dr. Van Heurck, of Amsterdam, but his photograph, although good, is inferior in every respect to Dr Von Zettnow's. One was sent as a present to the Royal Microscopical Society of London. A committee was appointed to test the lens, but they utterly failed to do anything with it, and thinking it was the fault of the lens, they sent it to Jena to be put right. They were told there was nothing wrong with it; the failure was entirely owing to their want of skill in using it. I could show you many more slides, but they are endless; what I show you are those taken with the lowest powers of the microscope and those with the highest. It is sometimes assumed that medical objects are the most difficult to photograph; that, however, is very far from being the case. Sir William Turner stated, at the Medical Conference, last year, that bacilli measured in diameter 25,000 to the inch, while Klein states that micrococci measure 50,000 to the inch. The finest of these, you will see, are only about half as fine as the lines on *Amphipleura pellucida*, and as they are usually stained black, they are easy objects to photograph. I wish to add, further, that the apparatus you now see and the others I use—for I have other two—were made with my own hands. Now, as to the gelatino-bromide films. I am an original member of the British Astronomical Association. When the Association were making arrangements to visit Vadsoe, to observe the eclipse there, a discussion arose as to whether they should use collodion plates or gelatino-bromide ones to photograph the eclipse. Some asserted that collodion had a finer grain than gelatino-bromide plates. To ascertain if the microscope would show anything as to this, I made a number of negatives, both from old collodion plates and from recent gelatine ones. To account for the increased speed of the gelatine plates, you must, I think, take into account the circumstances under which the two kinds of plates are made. In making a collodion plate, the first thing to be done was to make the plate as nearly chemically clean as possible. I worked collodion for a long time myself, so that I am not speaking without experience. The best way of cleaning it was by using the solution devised by the late Mr. Carey Lea, a solution of bichromate of potash with a small quantity of sulphuric acid in it. Washed with this, the grease, if any, was removed when dried with a clean cloth; it was then held in a plate-holder, and polished with a piece of clean chamois leather. There is a better way of obtaining a chemically clean surface than this, which I use when preparing a telescope camera for silvering, but Carey Lea's was quite sufficient. After cleaning, the plate was held by the edges, if of small size, and a pool of collodion poured on its centre. The plate was slightly tilted, to make the collodion flow to all the four corners, and after the collodion was slightly set the plate was placed on a glass flat rod termed a dipper, and placed in the nitrate of silver bath containing 40 grains of silver to the ounce, where it remained for a very short space—from a minute to two minutes. It was then taken out and placed in the dark slide, and was ready for exposure. All this, of course, was done in the dark room. You will see from this, that the collodion being set, the silver did not to any extent enter the film, but remained on the surface. With gelatine plates, on the other hand, the silver is incorporated with the film and permeates it thoroughly. It would seem from this that that may be an explanation for the increased rapidity of gelatino-bromide plates. When making negatives for the transparencies, I thought it would be proper for me to measure the size of the grains of silver, both in collodion and in gelatine plates. This I did in many plates, and found that, both with collodion and gelatine, the size of the grains were probably the same. The largest grains measured 1-9,000th of an inch in diameter, while the smallest measured 1-19,000th. The same thing occurred in Mr. Carey Lea's allotropic silver, which Mr. Bashford showed and explained to you many years ago. When I showed the transparencies I am to throw on the screen to our Photographic Club some years ago, I happened to use the term "molecule of silver." I was, however, sharply called to order by Dr. Drinkwater, the chemist, for this, and hence I term them grains. I noticed when you had a paper from an assistant at the Blackford Hill Observatory, last September, he termed the silver grains molecules of silver. I shall now show you about a dozen transparencies made from both collodion and gelatine nega-

tives. I need not here specify the names of the makers of the plates. You will see, however, that in every one of the ordinary plates the silver grains are in a more scattered form, and the granulation is finer. The more rapid the plate is made the grains run into groups or bunches, in some cases resembling the spicula we find on natural objects in micro slides. You will,* I do not doubt, conclude, after seeing these slides, that the advice given by makers of plates to use always an ordinary plate whenever possible is an excellent one. For astronomical photography, especially for negatives, where afterwards delicate measurements require to be made, I should say a slow ordinary plate is an essential requisite. The use of gelatine plates became general, I think, some time about 1879-80. It was a good many years after this before, however, they were used to any extent in astronomical work. I think it is to Sir David Gill, the present astronomer at the Cape, that the work in astronomical photography is largely due. He showed, one evening, at the Royal Society here, some of his work, and among others a transparency from his wonderful negative of Eta Argus. The space covered by the plate was only eight times the size of the full moon, or four square degrees, and on it could be counted 200,000 stars. An enlarged copy of this negative is hanging in the outer room of the Royal Society here, and I feel sure if any of you would like to see it the librarian and his assistant would be pleased to let you see it. When astronomers first began to use the camera they were a little vague with their expressions. You find them constantly using the term, "the angular aperture of the camera," and other expressions, showing that their acquaintance with the art was only beginning. In Miss Agnes Clerk's "System of the stars," she has a chapter on astronomical photography, and in it she says: "The new plates" (that is, gelatine ones) "were, however, first used for astronomical purposes by Dr. Huggins in 1876. Since they are five times more sensitive dry than wet, exposures with them can be indefinitely prolonged." The book is dated 1890. Observe the deduction. It is because they are five times more sensitive dry than wet that exposures may be indefinitely prolonged. A very good paragraph on the use of rapid plates is to be found by the Editor of the "British Journal Almanac" in this year's edition. The gist of it is that whenever small plates are to be enlarged, a slow plate, where the silver is in a minute state of division, is by far the best to use. When Dr. Readman read his paper to you, two years ago, on "Development," he happened to refer to the developer going down through the film. I was struck with this, and at once proceeded to measure the thickness of an ordinary Ilford film, which may be taken as a representative one. I had some difficulty in getting a clean-cut edge, as however sharp the knife used was, there was always a tear. I found, however, after a number of trials, that the film measured about the 1-500th of an inch in thickness, that is to say, 500 of them placed like the leaves in a book would measure an inch across. Now, when you consider that the largest grains of silver are only the 1-9,000th of an inch in diameter, this means that nearly 20 of them could be placed the one on the top of the other in the thickness of such a film; while of the smallest one, only the 1-19,000th of an inch, nearly 40 of them could be so placed. There is a paper by the Director of the Lick Observatory in "Astronomy and Astro-Physics," for, I think, 1893, in which he states that the silver grains as measured by him were two in the 1-10,000th of an inch. Of the largest ones, that is just twice the size of my measurements, which I have no reason to think were wrong. His object in making the statement was to show that in the enlargements of the Lick photos of the moon, which were being made on a large scale by Professor Weinek, two of these grains, which, according to him, were 1-5,000th of an inch each, would just cover one of the small craterlets of the moon in the enlarged copy. This, if it does anything, shows clearly the necessity for using plates with the finest grain in astronomical work.

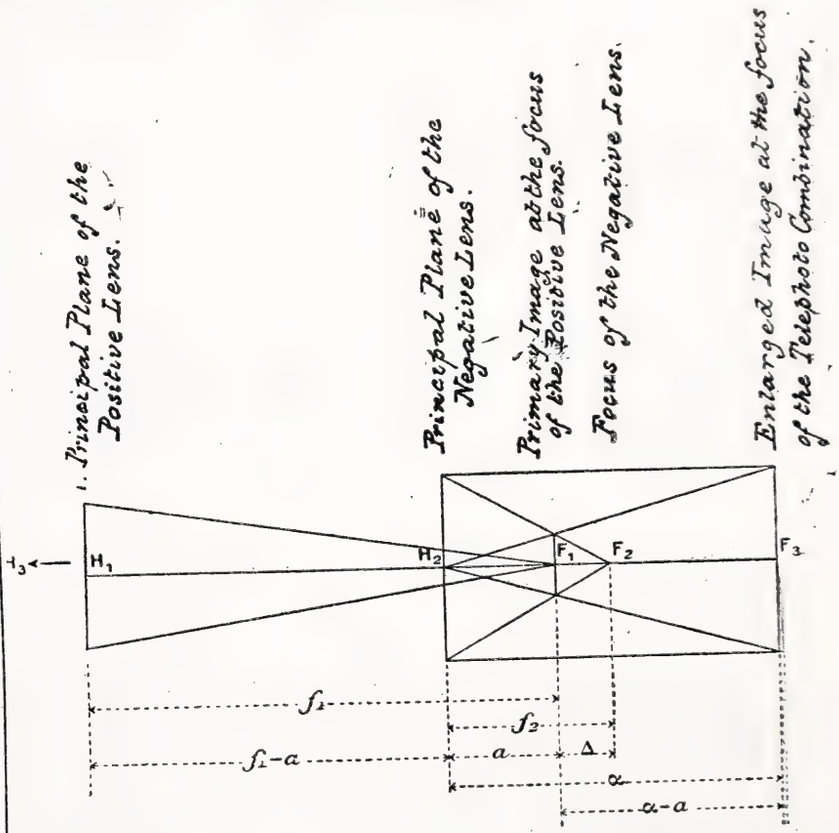
W. Forgan.

* The negatives were taken with a Zeiss 4 mm. dry objective; the field of view or diameter of the object included, with the glass and a No. 4 compensation eyepiece, is 1-55th of an inch. Only about half of this, however, is seen in the transparencies, or 1-110th of an inch at the distance of the lantern from the screen. The magnification on the screen will be about 20,000 times. The slides undoubtedly show that the grains of silver are of the same size both in collodion and gelatine films.

THE TELEPHOTO LENS AND ITS MEASUREMENTS.

[A paper read before the Société Française de Photographie.]

The problem we propose to solve is the length of a telephoto lens and the position of the enlarged image, varying with the degree of magnification, or, in other words, the different extensions of the telephoto lens itself and the camera upon which it is fixed.



Let us take the following factors:—

f_1, focus of the positive lens.

f_2, focus of the negative lens (or eye-piece of telescope).

f_3, focus of the telephoto combination.

a, distance of object for the negative lens, or measure of its introduction within the cone of rays parallel to the optical axis.

α, distance of image from the negative lens.

V, enlargement.

e, separation between the nodal planes of the positive and negative lenses.

Δ, the optical interval, or the distance between the focal points of the positive and the negative lenses: the $a + f^1 - f^2$ of Dallmeyer (B. J. P., 1893, p. 477). See also Dr. A. Steinheil: Ueber Fernphotographie. Phot. Corr., 1892, p. 483. (B. J. P., 1901, p. 407.)

The following relations are at our service:—

I. The evident ratio of $\frac{\alpha}{a} = V$, and likewise of $\frac{f}{f_1} = V$.

II. The well-known fundamental formula :—

$$\frac{1}{a} - \frac{1}{\alpha} = \frac{1}{f_2}$$

Starting from this point, by introducing the values of the first equation to the second, we get the following new values :—

$$\text{I.} \quad a = \left(\frac{V-1}{V}\right) f_2;$$

$$\text{II.} \quad \alpha = (V-1)\, f_2;$$

$$\text{III.} \quad \alpha - a = \left(\frac{V-1}{V}\right)^2$$

$$\text{IV.} \quad \Delta = f_2 - a = \frac{f_2}{V};$$

or, since $V = \frac{f}{f_1}$,

$$\Delta = \frac{f_1 f_2}{f};$$

or, again, in another manner, by substituting the optical interval Δ for the factors I. and III. :—

$$\text{I.} \quad a = (V-1)\,\Delta$$

$$\text{II.} \quad \alpha = V(V-1)\,\Delta$$

$$\text{III.} \quad \alpha - a = a(V-1) = (V-1)^2\Delta$$

To demonstrate this, let $f_1 = 126$ *mm.*, $f_2 = 45$ *mm.*, and $V = 3$ times, we find that :—

$$\Delta = 15 \text{ mm.}$$
$$a = 30 \text{ mm.}$$
$$\alpha = 90 \text{ mm.}$$
$$\alpha - a = 60 \text{ mm.}$$

The proportions of this example are observed in the diagram.

Greater magnification, that is to say a larger V, is obtained by bringing the two components determined by f_1 and f_2, into closer proximity. Their focal points F_1 and F_2 are nearer to each other and the interval Δ is less. Taking the same example with enlargement, $V = 10$ times, Δ is found to be

$$\frac{f^2}{10} = 4{\cdot}5 \text{ mm.}$$

The extent to which the two components have been brought closer together, by increasing the enlargement from 3 to 10 times is therefore :—

$$\tfrac{1}{3} f_2 - \tfrac{1}{10} f^2,$$

which is equal to 10·5 mm. for $f_2 = 45$ mm. In this way it is easy to calculate a table showing the difference of separation between the positive and negative lenses of a telephoto combination, for various degrees of enlargement :—

		mm.		mm.
Enlargement	3 times,	$\Delta_3 = 15{\cdot}—$	starting point	0·—
,,	4 ,,	$\Delta_4 = 11{\cdot}25$	telephoto system shortened by	3·75
,,	5 ,,	$\Delta_5 = 9{\cdot}—$	,,	6·—
,,	6 ,,	$\Delta_6 = 7{\cdot}5$	,,	7·5
,,	7 ,,	$\Delta_7 = 6{\cdot}4$	,,	8·6
,,	8 ,,	$\Delta_8 = 5{\cdot}6$	,,	9·4
,,	10 ,,	$\Delta_{10} = 4{\cdot}5$	,,	10·5

This scale is true of the negative lens, whatever the distance of the focus of the positive lens may be, with which it is combined.

We have thus ascertained the position of the negative component, and we have now to determine the displacement of point F_3, which varies with the enlargement V.

A second table may be calculated for the different positions of F_3 as the centre of the final image, in various degrees of enlargement, or, in other words, we can calculate the extension of the camera carrying the telephoto combination. The displacement of the image point F_3' which is at one extremity of the distance α, beginning at H_2, is also variable. It may be ascertained from the focus for infinity, F_1, of the positive component. We will therefore calculate the value of $\alpha - a$ for the degrees of enlargement $V = 3$, 4, 5, &c., up to 10. (See the article by the same author :—"Du Teleobjectif," Supplement of the Bulletin de la Société française de Photographie, 1896 ; Mémoires et Documents du Laboratoire d'essais de la Société française de Photographie, vol. i, p. 207.)

The following table is calculated for the example already given, taking the F_1 as the measuring point, and therefore = 0 :—

			mm.
Enlargement	$V = 3$ times	$(\alpha - a)_3 = (V-1)^2\Delta =$	60·—
,,	4 ,,	$(\alpha - a)_4 = (V-1)^2\Delta =$	101·25
,,	5 ,,	$(\alpha - a)_5 = (V-1)^2\Delta =$	144·—
,,	6 ,,	$(\alpha - a)_6 = (V-1)^2\Delta =$	187·50
,,	7 ,,	$(\alpha - a)_7 = (V-1)^2\Delta =$	231·—
,,	8 ,,	$(\alpha - a)_8 = (V-1)^2\Delta =$	275·60
,,	10 ,,	$(\alpha - a)_{10} = (V-1)^2\Delta =$	364·50

An alteration in the focal distance of the positive component also has no influence upon these values, since they depend upon the focus of the negative lens $f_2 = 45$ mm.

The separation of the two components, which, in a measure, is the ideal length, $H_1 H_2$ of the tube connecting them, does not, therefore, determine the enlargement and the extension of camera. It is decided by the separation of their focal points. The length of the tube is deduced from this for the desired purpose, and it depends upon the focal length of the positive component. Taking the focal length of the negative lens as determined, let us note the point within it where the focus of the positive component would fall, and how much extends beyond it. This portion is the Δ. If it is one-third of the length, the enlargement is 3 times, or if it is one-tenth, the enlargement is 10 times.

We may also infer that the intervals forming the scale of enlargement remain the same, when the focus of the primary image is not coincident with the principal focus of the positive lens, that is to say, when the object is not distant, but close. The entire scale is merely placed further back upon the optical axis, by the extent to which the primary image is situate beyond the principal focus.

First table : Showing in millimetres the requisite adjustment of the separation between the positive and negative lenses in the case of various telephoto attachments in general use, the necessary adjustment for a magnification of five times being taken as basis and reckoned as O.

Focus of Negative Lens. mm	Times of Enlargement. 3	4	5	6	7	8	10
							mm
−27	+3,60	+1 35	0	−0,90	−1,54	−2,02	−2,70
40	5,33	2,00	0	1 33	2,29	3,00	4,00
42	5,60	2,10	0	1,40	2,40	3,15	4,20
44	5 86	2,20	0	1,47	2,51	3,30	4,40
45	6,00	2,25	0	1,50	2,37	3,38	4,50
50	6,67	2,50	0	1,67	2,86	3.75	5,00
58	7,73	2,90	0	1,93	3 31	4,35	5,80
60	8,00	3,00	0	2,00	3,43	4,50	6,00
65	8,67	3,25	0	2,17	3 71	4,88	6,50
67,5	9,00	3,38	0	2,25	3 86	5,06	6,75
68,7	9,16	3,44	0	2,29	3,89	5,15	6,87
70	9,33	3,50	0	2,33	4,00	5,25	7,00
75	10 00	3,75	0	2,50	4,29	5,63	7,50
78,8	10,51	3 94	0	2,63	4,50	5,91	7,88
80	10,67	4,00	0	2,67	4,58	6,00	8,00
85	11,33	4,25	0	2,83	4,86	6 38	8,50
90	12,00	4,50	0	3,00	5,14	6,75	9,00
95	12,67	4,75	0	3,17	5,43	7 13	9,50
100	13,33	5,00	0	3,33	5,71	7,50	10,00
120	16,00	6,00	0	4,00	6 86	9,00	12,00
125	16,67	6,25	0	4,17	7,14	9 37	12,50
135	18,00	6,75	0	4.50	7,71	10,12	13,50
150	20,00	7,50	0	5,00	8 57	11,25	15,00
200	26,67	10,00	0	6,67	11,42	15,00	20,00

S cond table : Showing in millimetres the distance between the primary image and the enlarged image in the case of various telephoto attachments in general use. The extension of camera for correct focus is obtained by adding to the measurements, given in the table,

the distance in millimetres between the primary image, situate at the focus of the positive lens, and the front of the camera:—

Focus of Negative Lens. mm	Times of Enlargement. 3	4	5	6	7	8	10 mm
27	36	61	83	113	139	165	219
40	53	90	128	167	206	245	324
42	56	95	134	175	216	258	340
44	59	99	141	184	227	270	356
45	60	101	144	138	231	276	365
50	67	113	160	209	257	306	405
58	77	122	186	242	299	355	472
60	80	135	192	250	309	368	486
65	87	146	208	271	335	399	527
67,5	90	151	216	282	347	414	548
68,7	92	154	219	286	353	421	556
70	93	158	224	292	360	429	567
75	100	169	240	314	386	459	608
78,8	105	177	252	328	405	483	638
80	106	180	256	333	411	490	648
85	113	191	272	354	437	521	689
90	120	203	288	375	462	551	730
95	127	214	304	396	488	582	770
100	133	225	320	417	514	613	810
120	160	270	384	500	617	735	972
125	167	281	400	521	643	766	1013
135	180	304	432	563	693	827	1095
150	200	337	480	750	771	918	1215
200	267	450	640	833	1029	1225	1620

MAX LOEHR. (C. A. Steinheil Sons, Paris.)

THE WORK OF THE NEW COUNCIL OF THE ROYAL PHOTOGRAPHIC SOCIETY.

[Reprinted from the Society's JOURNAL for March.]

THE Council have decided that a *résumé* of their proceedings shall be published in the JOURNAL, in order that the members may be more fully informed upon the Society's affairs. The policy of the Council is one of greater efficiency. In carrying out this policy, the Council will be guided by due considerations of the Society's finances, and every care will be taken to keep expenditure within the bounds of expectant income. It is hoped, in view of the steps that the Council have taken, that every member will use his best endeavours to increase the membership, that he will strive to identify himself more closely with the Society's work, and that he will help to acquire for it that position in the world which the Royal Photographic Society of Great Britain should occupy. One of the first duties of the Council has been to appoint a number of committees to which it may look for advice upon the many important questions that require attention at once or in the immediate future. It was laid down at the outset as essential that the members of alll committees should be properly qualified for the work they would have to perform. The Council considered that the realization of this ideal would be greatly assisted by the adoption of the new principle of drawing upon the general body of the members for a certain proportion of the members of committees. It has therefore been decided that all committees of Council shall consist of five members, three of whom shall be members of Council and two non-members of Council, and it is hoped that the members will receive this information as an intimation that their co-operation with the Council in the business of the Society will be very cordially welcomed. In recent years a desire has been frequently expressed that the Society's house should be opened in the evenings, in order to meet the requirements of those members who may be unable to exercise their privileges during the daytime. The Council have thoroughly considered the matter, both from the point of view of a desire to do all that is possible for the members and that of the ultimate good to the Society. It is considered that the funds of the Society warrant them in resolving that the house be kept open continuously every day, excepting Sundays and public holidays, from 10 a.m. to 10 p.m., until the end of their term of office, *i.e.*, February, 1903. Effect will be given to this resolution as soon as the House Committee have completed the necessary arrangements. The dark rooms are being overhauled, and the installation of an enlarging lantern is in hand. The preparation of a museum and exhibition rooms for the display of the Society's permanent collection, apparatus, historical and technical photographs, is also proceeding. It will be of interest to many members, also, to know that a dressing-room for their convenience will shortly be made available.

THE NEW COMMITTEES.

The Council have also considered the Society's position in the light of the special resolutions which were passed on February 11th, and confirmed on March 11th. These resolutions so amended the articles of association as to throw upon the Council the duty of deciding between the appointment of an honorary or a paid secretary, and an honorary or a paid editor of the JOURNAL. The Council have decided, after a careful examination of the matter and of the financial position of the Society, to exercise their power of appointing a paid secretary and librarian, and they have to announce that they have bestowed the appointment upon Mr. A. W. W. Bartlett, who has been for some years in the Society's service, and, during the past three years, its assistant secretary. The Council have given the same careful consideration to the question of the appointment of the Editor of the JOURNAL, and have decided to leave the JOURNAL in the hands of an honorary editor, as before. The following re-appointments have been made: Honorary Solicitor, Mr. Francis Ince; Honorary Editor, Sir W. de W. Abney, K.C.B. The vacancy caused by the re-appointment of Mr. Ince has been filled by the election of Mr. Benjamin Gay Wilkinson as an ordinary member of Council. The Council have come to the conclusion that the best interests of the Society will be served by the publication of several items of information that have hitherto been inaccessible to the members at large, and in virtue of this decision, the composition of all committees, and the various standing orders and resolutions that may be passed for the guidance of the Council, will be published in the JOURNAL. The Council have pleasure in notifying the members that they have secured promises of the services of the undermentioned gentlemen upon the respective committees. The House Committee, which will be entrusted with the general management of the house, including the dark rooms, enlarging room, house exhibitions, etc., is composed as follows: Dr. E. C. Fincham, Mr. S. Herbert Fry, Mr. Thomas K. Grant, Mr. J. C. S. Mummery, and Mr. John Sterry. The Fellowship Admissions Committee, to which is entrusted the duty of examining the applications of candidates for fellowship, is composed of the following fellows of the Society: Mr. C. H. Bothamley, Mr. W. L. Colls, Dr. P. H. Emerson, Mr. Andrew Pringle, and Mr. William Taylor. The Lectures Committee is an innovation. It is entrusted with the duty of providing for the Society's programme, and it consists of the following: Mr. Douglas English, Professor Raphael Meldola, Professor W. C. Unwin, and Sir H. Trueman Wood. The Finance Committee will advise upon the Society's finance, and is composed of the following: Mr. Frank Bishop, Mr. Leslie E. Clift, Mr. E. B. Knobel, Mr. C. H. Oakden, and Mr. John Sterry. The Journal Committee has the care of all matters concerning the JOURNAL and its publication, and is composed of Mr. Leslie E. Clift, Mr. Douglas English, Mr. A. Haddon, Dr. G. Lindsay Johnson, and Dr. E. W. Prevost. The Lantern Committee will provide for the lantern meeting programme, and will conduct these meetings. It is composed of Mr. R. R. Beard, Mr. T. E. Freshwater, Mr. Ernest Marriage, and Mr. Wilson Noble.

THE STANDING ORDERS.

The following standing orders have been adopted:—

(1) The Council shall meet on the first Tuesday in every

month during the session, and at such other times as the President may determine. Three times per annum, on the occasion of the meeting of the Fellowship Admissions Committee, the Council shall meet at 8 p.m., in order that the report of that Committee, which will meet at 5 p.m., may be presented. A *résumé* of the Council's proceedings, their standing orders, and the composition of their committees shall be published in the JOURNAL.

(2) Every member of Council shall be supplied annually with a copy of all instructions (other than the printed articles of association of the Society) that have been passed for the guidance of the Council.

(3) The Council shall vote only upon such questions as may be specifically set forth in the agenda accompanying the notice of meeting, excepting the following items, which shall be held to be sufficiently indicated by the term "general business," viz.: (*a*) The reading of the minutes of the previous meeting; (*b*) the passing of the nominations of candidates for membership and applications for affiliation; (*c*) the receiving of presents; (*d*) the passing of accounts for payment; and (*e*) the reading of letters. It shall be in order to propose that any matter is urgent, and if four-fifths of those present vote in favour of urgency, that matter shall be considered in the same way as if due notice had been given.

(4) The election of honorary fellows shall be conducted in the following manner: Notice of a proposal shall be given on the agenda accompanying the notice calling the meeting of Council at which such proposal is to be made. The proposal, if duly seconded, shall be discussed at such meeting, and the voting shall take place at the meeting of Council next following that at which the proposal has been made. Absent members of Council may vote in writing, but the nominee shall not be elected unless three-fourths or a greater proportion of the total of members of Council present and those voting in writing vote in favour of the election. Honorary fellows shall be asked to present their portraits to the Society's collection.

(5) Applications for the fellowship will be received only from ordinary members of the Society. Such applications shall be considered by a Committee of Council, composed exclusively of fellows of the Society, who shall meet three times per annum, and report concisely upon the applications received. The report of the Committee shall be presented at one Council meeting and discussed, and shall be voted upon without discussion at the Council meeting next following. No candidate shall be admitted to the fellowship unless two-thirds, or a greater proportion, of those members of Council present vote, by show of hands, in favour of the election. The names of candidates admitted to the fellowship shall be announced and printed in the JOURNAL, together with a statement of the number of applications disposed of by the Council. Notice of the meeting of the Fellowship Admissions Committee shall be published in the JOURNAL and the technical Press, with a statement of the bases of qualification. Applications shall be made upon the form provided for the purpose, and candidates will be required to submit a statement of their qualifications in relation to one or more of the following heads: (*a*) Important contributions to photographic knowledge, in theory, practice, or invention; (*b*) the production of notable work in pure photography or in the arts and sciences kindred thereto; (*c*) work done in disseminating photographic knowledge; and (*d*) any public service tending to the advancement of photography. Candidates are asked to specify subjects upon which they will be prepared, if desired, to write a thesis. They should furnish the names of one or more members of the Society to whom they are personally known. Students who may become candidates for the fellowship must show, to the satisfaction of the Council, that they have received a suitable general education, and that they have a good knowledge of photography in general, or a fair knowledge of the general subject, and a special knowledge or experience in one or more of its branches. As to general education, the Council suggest the following examinations: The matriculation, preliminary, or entrance examinations of the various universities and colleges, the Oxford and Cambridge local examinations, and the higher examinations of the College of Preceptors. In photography and allied subjects, the Council suggest the examination of the City and Guilds Institute in photography, especially the honours stage (which will be regarded as the chief recommendation for admission), the examinations in chemistry, physics, drawing, painting, and other allied subjects held by the Department of Science and Art and the various educational bodies. A certificate, under the seal of the Society, will be issued to all candidates who may be admitted to the fellowship.

(6) The Council shall consider annually the award of one silver Progress Medal. The Progress Medal may be awarded in recognition of any invention, research, or publication which, in the opinion of the Council, shall have resulted in any important advance in the scientific or artistic development of photography. The award shall be conducted in the following manner: (*a*) At their November meeting the Council shall receive the names of nominees, duly proposed and seconded, and the nominators shall hand in a written statement of the special work for consideration; (*b*) at their December meeting the Council shall discuss the work of the nominees as set forth in the proposals, and shall ballot out the names until only one remain; (*c*) at their January meeting the Council shall, without discussion, vote openly upon the question of the award. Absent members may vote in writing, but the medal shall not be awarded unless two-thirds, or a larger proportion, of the recorded votes are in favour of its bestowal. Recipients of the Progress Medal shall be asked to present their portraits to the Society's collection. These regulations, with the names of those who have received the medal and a statement of the reasons for the award, shall be published annually in the October number of the JOURNAL.

(7) Committees of Council shall be composed of five members, three of whom shall be members of Council and two non-members of Council. The President shall be a member, *ex officio*, of all committees. The Editor of the JOURNAL shall be a member, *ex officio*, of the Journal Committee. The committees' reports shall, nothing preventing, be circulated amongst the members of Council prior to the meeting at which they are presented.

(8) The election of the exhibition judges by the members shall be conducted on the same lines and at the same time as is the election of the officers and Council. The judges' expenses shall be paid by the Society, the maximum allowance being the railway fare and two guineas for hotel expenses, if residence in London be necessary.

(9) The judges to be elected for the exhibition in the year 1903 shall be members, *ex officio*, of the Selecting and Hanging Committees.

(10) The Selecting and Hanging Committee in the pictorial and technical sections of the exhibition to be held in the year 1903 shall be composed each of nine members, six of whom shall be elected by the Society and three by the Council. The election of the six members by the Society shall be conducted on the same lines and at the same time as the election of the officers and Council.

(11) Lecturers and readers of papers and addresses shall be informed that the Society requires first publication of their communications, unless special exception be made by the Council. The travelling expenses of invited lecturers shall be defrayed by the Society.

THE third Photographic and Optical Exhibition, at Portman Rooms, Baker Street, W., opens on Friday, April 11th, and closes on Saturday, April 19th. We are informed that the rooms will be filled with a display of apparatus. Some sixty firms will be represented, many of whom will have something quite new to interest the visitor. At one of the stalls will be displayed a new daylight-loading system of flat-film photography. As at previous exhibitions, a room will be set aside for entertainments and half-hour illustrated lectures and demonstrations. Dr. W. Hampson, M.A., will lecture each evening at 8.30 upon Liquid Air, and will perform the experiments of producing oxygen, freezing mercury, chloroform, ether, etc. Mr. T. C. Hepworth will give demonstrations in X-rays each evening, and will also during the exhibition lecture on enlarging, hand-camera work, modern illustration methods, colour photography, the Transvaal war and photography, photography with the microscope, and picture-making by photography. The lectures will be illustrated with the aid of the optical lantern. Mr. W. F. Slater is also down for "Snapshots on the Continent," which lecture will be delivered on Monday, the 14th inst., at 9.30. The Imperial Orchestra will play every afternoon from 3 o clock to 6, and in the evening from 7 to 10. Particulars of other attractions will be found in the official programme, which will be issued on the opening day of the exhibition.

ABOUT PHOTOGRAPHIC POSTCARDS.

[Reprinted from the Bromide Monthly for March.]

PICTURE postcards have attained such an amount of favour that the products of the half-tone worker and lithographer, that we see also in this country, are insufficient to satisfy the public. The Rotograph Company, therefore, make a private postcard prepared on one side with the regular printed matter and sensitized on the other to give the photographer an opportunity to let his artistic tastes run rampant, and in this manner better and more artistic results are attained than could ever be gotten by mechanical processes. It also gives a great field to the professional photographer to turn the postcard into a "money-getter," and the apparent side line will, when properly pushed, soon take up his whole attention. The scope is so great that I will only attempt to give a few examples. For portrait work of any kind, from the few extra cards that the customer will order from his negatives after the regular order has been delivered, and a postal sample is shown as "the very latest out," to the hundreds that the theatrical or political party can always use, for view work of any kind, business premises, interiors, factories, groups, picnics, anything and everything: there is no end to the use they can be put to.

The manipulation of Rotograph postcards is simple. They are regular bromides and have the great advantage of all Rotograph papers, and that is latitude in developing. First of all, the negatives must be prepared for printing by placing a "cut out" over the subject of red or orange paper. The opening must be over the subject, the solid paper covering the rest of the negative so as to make it print white; then before going into the dark room it is best to mark the size of the postcard on the paper covering the negative, so that they all have the same margin, and because it is a help, as it enables one to make the changes more rapidly after each exposure. The prints are, of course, printed by contact in a regular printing frame. Where there is only one negative to be printed it can be done in day or artificial light. The latter light is preferable. In either case, I should advise one or more thicknesses of tissue paper pasted over the printing frame to diffuse and soften the light, the colour of the paper to be determined according to the printing value of the negative—a light yellow for flat negatives ,a blue and a white paper for contrasting ones. The daylight exposure would have to be an extraordinarily short one (hardly a second), therefore artificial light is best, with from two to eight seconds exposure, according to the light used. Where there are a number of postcards to be made from several negatives it is best to fix up a little plant, simple and inexpensive, nevertheless time-saving and practical. A rack to hold twelve printing frames should be placed opposite and parallel to the light used, the light to be diffused as before mentioned, this time by covering a frame, say about 30ins. by 40ins., with two thicknesses of white tissue paper or any translucent paper or cloth. After every exposure, which is best counted out loud, so as to secure uniformity, the light can be shut off or covered, and in this way a lot of cards can be printed in a short time. For taking the cards out of the printing frame I should advise the manipulator to always keep those of one kind together and develop them in a lot, so as to secure uniform results. This is especially meant for a beginner.

For developing, three trays or dishes are needed—one for plain water, one for the developer, and one for the hypo. bath. The prints are first placed in the plain water, so as to soak them thoroughly and prevent any air-bubbles in developing. From thence they are to be taken one by one and placed in the developer. There should be plenty of it in the dish, just as in toning a batch of prints, so that a dozen or more can be handled with ease. As soon as developed they can be put direct into the hypo. bath, care being taken again not to have any air-bubbles, as they would cause brown spots. Use one hand to dip the cards in the hypo., and turn them over several times, and the other hand to move them in the developer. After thoroughly fixing and washing the cards, we pass to the drying of same. The best method is to lay them face down on a clean, white sheet of cloth, and when about half dry turn them over on the other side and let them lay in this way until nearly dry. Then they should be placed one on top of the other, with a clean piece of muslin between each one, and either weighted down or put into a copying press.

My favourite developer is:—32oz. of water, 66grs. of metol, 60ozs. of sulphite of soda, 254 grs. of hydroquinone, 80 grs. of bromide of potassium, 3 grs. of carbonate of potassium. Use one part to four parts of water. Hypo. must be acid.

PROFESSIONAL Photographers' Association.—The members' meeting of the Association will be held at the Royal Photographic Society, 66, Russell Square, London, W.C., this evening, Friday, April 4th, at 8 o'clock. Business: Discussion on fire insurance rates. (Members are requested to bring with them particulars of their present policies.) The Professional Photographers' Association's action on copyright matters.

THE PHOTOGRAPHIC TRADE ASSOCIATION.

THE following circular has been issued to members:—

March 18th, 1902.

THE ANNUAL GENERAL MEETING.

At a meeting of the Executive of the Association, held on the 31st ult., it was decided that the Annual General Meeting should be held on Thursday, April 17th. The annual dinner of the Association will take place on the evening of the same day. In order to make the necessary arrangements, applications for tickets should be made to the secretary, at the above address, not later than Saturday, March 29th. Tickets, 7s. 6d. each. It is hoped that you will endeavour to keep open this date in order to be present at the meetings, as your Executive are anxious to have them as representative as possible.

AMALGAMATION OF WHOLESALERS.

With reference to the last paragraph in our circular letter of January 18th, you will be interested to hear that a combination of some of the wholesale photographic trade, who are members of the Association, and whose names are given below, has resulted in the formation of a company, entitled—"The Alliance Roll Film Camera Company, Limited." The firms will combine their joint experience in the introduction of roll film cameras and films. Their specialities will be put on the market by the individual firms introducing them, but will be obtainable from any of the other members. It will at once be seen what an enormous advantage it will be to the dealer to have the combined experience of the leading members of the wholesale trade in the approval and production of roll film cameras, etc., suitable to meet the competition and the requirements of the market. Barclay and Sons, Limited; Busch Camera Co.; W. Butcher and Sons; Jonathan Fallowfield; G. Houghton and Son; Marion and Co., Limited; F. Newbery and Sons; John Sanger and Son; W. Sutton and Sons; C. Tyler and England Brothers, Limited. Other wholesale firms are also expected to join.

Exhibitions.

GLASGOW CAMERA CLUB.

THIS exhibition, which was opened on Tuesday evening, March 24th, in the rooms of the club at the Religious Institution Rooms, 200, Buchanan Street, Glasgow, shows that the members (it is entirely a members' show) have considerable versatility, if the spectator is to judge from the wide range of subjects that have fallen to their cameras. Though the number of exhibits on the walls this year shows a decrease on the number of last year, still there is a remarkably high standard of excellence and an evidence that the members have a vitality seldom seen among the contributions of so limited a circle. The mounting of the exhibits point to a considerable amount of taste and artistic skill, and, besides being a step in the right direction, shows that there is a unmistakable upward tendency. The gentleman at whose hands the pictures received distinction was Mr. H. T. Redwood, of Glasgow, and generally his awards seem to be satisfactory. In the first class, which was for any subject half-plate size and under, the work entitled, "Low Tide," by Mr. Alex. H. Duncan, is fortunate enough to win the premier prize—a silver medal. Its dignified treatment is splendid, while it is of technical excellence. "Waiting for the Tide," by Robert Gray, conveys the sentiment of its title well; it is typical in composition, and thoroughly effective. "Veritas" for "The Haunt of the Kingfisher" is commended—an altogether charming production. The next class is also for any subject, larger than half-plate size. This section contains quite a number of splendid examples of what photography can do in the hands of a person who has artistic feeling.

W. Crosbie's "Spring" is a most effective and admirable work, and has a nice airy feeling about it. To this Mr. Redwood awarded the silver medal. President Gray comes closely after the winner with his river piece, "Evening on the River," a colour print, which owes much to the beautiful colour and its happy grouping and arrangement of line. Commendation was given to Mr. A. H. Duncan for "Banks of Allan Water." He also sends a dainty and happy composition, entitled "Fintry Bay." Miss Davies' work should be noticed; it is of a high order, and shows a fine sense of composition. The outing class was not taken advantage of as it should, and contained only nine entries. Mr. T. Walker is awarded the bronze medal for "Silver Birches, Cadder Woods." This is an excellently-composed work, slightly over-printed, perhaps. "A spring Woodland" by the same worker is an unconventional treatment. "Under Easy Sail," by James Gray, is second, and pleased us much.

The "Novices"—those who had never won a prize—did not show

up anything uncommonly, and the bronze medal goes to J. Duncan Leslie for a fair portrait, "My New Hat." There are quite a number of architectural works in this class, the best of which is "Rood Screen, Glasgow Cathedral." "The Blackadder Crypts" are rather overdone, and are not to be compared with Andrew Walker's well-known medalled picture of this subject. Lantern slides were a superior lot. The 19 sets that were forward did not contain one "duffer." A silver medal was awarded to Robert Gray's exquisite floral studies. His "Chrysanthemums" well merit this. R. L. Collins takes the bronze for a superior lot of landscape views, while T. S. Muir's set was commended. Messrs. Walker, McIntyre, Gray, and Douglas show good work.

EXHIBITION BY C. YARNALL ABBOTT.

The Royal Photographic Society is now holding an exhibition of the works of Mr. C. Yarnall Abbott, of Philadelphia, U.S.A., at 66, Russell Square, W.C. A short address by Mr. Abbott was read at the opening on Tuesday evening, the 2th ult. The pictures are unframed, but, neither individually nor as a whole, do they suffer on that account. They are tastefully mounted on boards of various tints, and of ample proportions, and this simple form of presentation is perhaps the ideal one for the effective display of photographs of the kind under the circumstances. In the admirably-written lines in which Mr. Abbott indicated his idea and his aims he enunciated the principle that a photograph to be a picture must possess something more than mere technical perfection; that it must be permeated by a spirit which cannot be defined in words, but which can be recognised or felt by those who know how to seek for its presence. We are paraphrasing, not quoting, the words. With this, of course, we are in cordial agreement, and it requires but a brief survey of Mr. Abbott's work to perceive that throughout his aim has been to infuse into his productions that touch of human sympathy which may be present when an intellect exercises the power and the control, but which is necessarily absent in the result of a machine. In this consistent endeavour, though naturally he is not always successful, his example deserves our thanks. If the position of photography as a means of artistic expression is to become established, it will be by the efforts of those who, like Mr. Abbott, place their ideal high, even to a height unattainable in our present state of knowledge, but who, further, are not above the plodding work necessary to discover methods of making the means at our disposal sufficient to attain the desired end.

But in avoiding Scylla, Mr. Abbott falls into Charybdis. The average photographer, even when his intention is to produce a pictorial photograph, usually fails in the spirit, though technically his work may be excellent. Mr. Abbott, on the other hand, appears to disregard technical photography altogether. Indeed, it seems clear that he not only fails to realise the importance of good technique, but entirely underestimates its difficulty. The following lines from his address indicate this:—"With the well nigh perfect apparatus of to-day, technical proficiency is within the reach of every photographer." "Owing to the ease with which an accurate photograph may now be obtained of almost any subject," etc. Our views with regard to the ease with which an accurate photograph may be obtained are totally at variance with those of Mr. Abbott. That what is usually termed a "good technical negative" may be made easily we admit, but an accurate photograph—that is one which accurately suggests the visual impression of the view or object itself—is quite another matter. It is because the "good technical negative" does not produce accurate photographs that it is the object of so much derision. To produce accurate photographs requires much study and much skill, much study of nature and natural objects, such as every painter has to undergo to gain the power of analysing visual impressions, and much photographic skill to approximate chemical to visual effects. We are at one with Mr. Abbott that even an accurate photograph requires something more than its mere technical perfection to make it a picture. Nevertheless, feeling is not the only good quality a picture should possess, and we take it that correct or approximately correct rendering of gradation or true tone value, to put it another way, is as essential in the art sense as it is to accurate photography, and that to violate nature by transgressing natural laws in a way which is palpable to the least observant is no less an offence against art than it is against truth. In much of his work Mr. Abbott freely transgresses thus. His favourite methods seem to be either to merge his intermediate tones as much as possible into the highest and lowest, so that the lights and shadows are equally without any indication of form or texture, or to flatten the whole to the extent that the subject is without drawing or texture and differentiation of planes or atmosphere. An example of the last-named method is entitled "a study," a nude female figure. It requires close examination to discover that the figure stands in a rivulet, the banks of which are just knee high. The effect, that of a figure with amputated legs standing on the stumps, is quite revolting. In another case, a nude figure lying on the grass, but for the head and arms which indicate what it is, might be a collapsed balloon, for the body, but for the outline, is an almost shapeless mass of white. The defect is particularly unfortunate in this case, for the surroundings of the figure are managed with great skill.

We might easily refer to many examples of failure entirely due to want of sufficiently accurate photography and to others in which the same want is barely atoned for by compensating good qualities. We do not, however, wish it to be understood that we found nothing that we could unreservedly praise. There are many little studies quite admirable, and when Mr. Abbott contents himself with simple treatment of his subject he is usually successful. His children and portraits generally are acceptable, and even among his most aspiring attempts where his prevailing faults are most pronounced there are works which command respect and even admiration.

Like many others whose ambition it is to gain a reputation in pictorial photography, Mr. Abbott has allowed the unfounded reproach that photography is purely mechanical to eat into his soul, and in endeavouring to avoid its common defects has also avoided availing himself of its advantages. That is not the way to raise photography. Like other methods of expression, photography has its limitations, but many of what are sometimes considered limitations disappear in the hands of an expert, for they are really difficulties, and not limitations. We shall watch with interest Mr. Abbott's photographic career. He is earnest and enthusiastic, and this exhibition amply testifies to his good intentions. With these qualifications and persevering study of the capabilities and management of his medium, about which he has much to learn, his chances of distinction are great. We will conclude by quoting an aphorism from his address, the study of which we commend no less to himself than to other aspirants to fame in pictorial photography:—"Let us beware of the insiduous facility of the regular thing, but let us also take heed lest we fall into the opposite extreme of being 'different' at all hazards. Neither eccentricity nor even diffusion of focus will alone ever make a picture."

New Books.

"The Imperial Handbook, 1902." Published by the Imperial Dry Plate Company, Cricklewood, London, N.W.

The contents of the "Imperial Handbook," which has firmly established itself as a welcome visitor in the spring, are, as usual, varied and interesting, and of a nature to assist the photographer in his practical work. The developing formulæ are given in the English and metric systems, and there is included a table showing the time required for development of correctly-exposed plates with the Imperial developers. "Success with Snap Shots," is a collection of hints, illustrated, by photographers who have made instantaneous work a special study. "Latitude in Exposure: What it is, and how to make use of it," is an illustrated exposition of the subject, which leads to the practical conclusion that "we may avail ourselves of a latitude of fully fifteen to one with Imperial special rapid plates, and by a very simple modification of ordinary development obtain results which are practically the same. In other words, you must cut your coat according to your cloth—i.e., adjust your development according to exposure." Examples of portraiture by two masters of the work, Mr. W. Crooke and Mr. W. Gill, make two full-page illustrations; and there are articles on "Development by Factors"; "Imperial Plates at the Front," by H. C. Shelley; and "About Imperial Plates." Preliminary particulars are given of the Imperial Photographic Competition, over £500 in cash prizes being offered. The "Imperial Handbook" is readable and instructive from cover to cover, and as it is obtainable gratis, every reader of this notice would do well to secure a copy of it.

"The Photographic Dealer's Annual." Edited by A. C. Brookes. 96 pp. Price 1s. London: Published by Marshall & Brookes, Harp Alley, Farringdon Street, London.

Bound in a stiff paper cover and evincing distinct improvement in the editing, the present volume of this annual is a great advance upon former issues. There are articles on "Modern Photographic Lenses," by Dr. C. V. Drysdale; "Magnalium for Photographic Purposes" by "Foreman"; "A Photographic Dealer's Workshop," by Mr. A. W. Marshall; "Practical Hints for Colouring Lantern Slides," by Mr. W. Green; and "Profit-sharing and Co-partnership," by Mr. J. Bingham Wise. The miscellaneous information is copious and well-chosen, and there are also many half-tone illustrations. Especial value attaches to the list of trade addresses, and a capital feature is a list of trade marks registered in 1901. The editor, in his preface, hopes "that something useful will be found" in the pages of his Annual "for every member of the trade." This hope will probably not pass unrewarded, for the book is an extremely serviceable and interesting compilation. It is issued to the trade only.

"Urlin, the Harper; and Other Song" is the title of one of the Vigo Cabinet Series published by Mr. Elkin Mathews, of Vigo Street, London,

W. The author of the poems is Mr. Wilfred Wilson Gibson, one of the sons of our esteemed friend, Mr. J. Pattison Gibson, of Hexham. Some of the verses have seen previous publication in the "Saturday Review," "The Spectator," and "The Outlook," and we have been pleased to see the little volume receive kindly notice in the press. The following, perhaps, shows the author at his best:—

SONG.

As one who plucks a blossom in the dark,
And knowing not the wonder of its hue,
Drinks in the ecstacy of scent and dew;
So I, in ancient dreams, was glad of you.

But now the rising sun has lit the flame,
The blue and gold and scarlet of your pride;
While all men seek your garden, far and wide,
I, hungering, in the wilderness abide.

Yet, when the colour of your life shall fade,
And all the petals of your splendour fall,
When time has shaken down the golden wall,
May I not find you lonely after all?

Mr. Gibson seems to us to have the true poetic instinct, and we wish him success in the attractive if difficult field of work he has chosen for himself.

"Traité de Chimie Photographique." By L. Mathet. Paris: Charles Mendel, 118 and 118bis, Rue d'Assas.

We have received a copy of the second edition of Mons. L. Mathet's "Treatise on Photographic Chemistry,' a work that was first placed before the public some ten years ago. The book has been brought well up to date, and is one of the best of its kind that we have seen. The first volume gives an outline of chemical science, with special reference to photography, a description of the methods of analysis, and a theoretical review of the various photographic processes. The second volume is a study of the various products used in photography, and it might preferably be looked upon as a dictionary of photographic chemistry. Each substance is reviewed in a very complete manner, the formula, atomic weight, synonyms, specific gravity, solubility, and chemical and physical properties being given. The mode of preparation, the characteristic reactions, and photographic uses of the substance are also described. It is a work that should prove to be of great use to French photographers, and we can warmly commend it to those of our readers who may wish to have a very comprehensive work on photographic chemistry in the French language.

Patent News.

THE following particulars are specially drawn for the BRITISH JOURNAL OF PHOTOGRAPHY by Messrs. Hughes and Young, Patent Agents, 55 and 56, Chancery Lane, London, W.C., who will give advice and assistance free to our readers on all patent matters:—

PATENT APPLICATIONS.—No. 5,843.—Charles Thomas Bilbin and Millie Yates, 1, Laura Villa, Welsh Walk, Oswestry. "An improved support for focussing clothes and screens for photographic and other lenses, re Patent, No. 15,693, August 1st, 1899.

No. 5,863.—George Nicholas Stone, 43, Pellatt Grove, Wood Green. "An improved shutter for photographic purposes."

No. 5,884.—Henri Perrin, Lincoln's Inn Fields. "Improvement in processes for producing enamelled polychrome photographs and artistic stained glass and other like decorations."

No. 5,985.—John Henry Hill Duncan and Frederick Gowenlock, Lincoln's Inn Fields. "Improvements in photographic apparatus."

No. 5,986.—John Henry Hill Duncan and Frederick Gowenlock. "Improvements in apparatus for developing and fixing photographic plates and films."

No. 6,040.—John Daniel Cross, 1, Ice Street, Blackburn. "Improvements in hand cameras."

No. 6,237.—Moses Joy, Lodewyk Jan Rutger Holst, and Frederick Schmid, 130, Fulton Street, New York. "Improvements in photographic cameras."

No. 6,279.—John Dumaresq, 28, Rosoman Street, Clerkenwell. "Improvements in ferrotype dry plate photographic apparatus."

No. 6,355.—Henry John Hodgson, St. Peter's, Exmouth. "Improvements relating to supports for picture and photographic frames."

PATENTS ILLUSTRATED.—No. 20,932.—Photography.—Patentee: P. Rudolph and O. Nathan, both of Carl Zeiss-Strasse, Jena, Saxe-Weimar, Germany. Roller slides; shutters; cameras.

Relates to mechanism by which a roller slide and shutter are actuated simultaneously or separately. For separately setting the shutter, which is of the focal-plane safety-blind type; the handle is turned clockwise. The segmental toothed wheel fixed on the crank axis actuates first the pinion, thus winding up the safety blind, and then the pinion, winding up the main blind of the shutter.

No. 20,933.—Photography.—Patentee: E. Donitz, Carl Zeiss-Strasse, Jena, Saxe-Weimar. Shutters.

Relates to double slide or blind shutters, which can be set with safety, the exposure aperture of which can be adjusted in breadth, and which can be used for rapid or time exposures. The shutter is at rest after an exposure, the lens aperture being covered by the slide, and the stud on the slide resting on the stop.

No. 21,034.—Photography.—Patentee: F. W. Suter, 66, Berners Street, Oxford Street, W. Printing.

A vessel supported on trunnions is partially filled with water or other liquid. An aperture in the upper part is covered by an elastic diaphragm, between which and a glass plate the paper and negative are placed, the plate being carried by a double wall of the vessel. The vessel is then gradually tilted, so that the diaphragm is gradually pressed against the paper by the flow of the liquid, close contact between the paper and negative commencing at the bottom and proceeding upwards to force out air from between them.

New Apparatus, &c.

The Cornerpiece. Manufactured and sold by W. Tylar, 41, High Street, Aston, Birmingham.

Suspended in the corner of a room, this bracket photograph-holder makes a pleasing piece of domestic decoration. It is constructed of solid hardwood moulding, and the two backs of the frame, which are kept in position by small turn-buttons, are easily removed, so that the photographs may be changed from time to time. Upon the level top a small



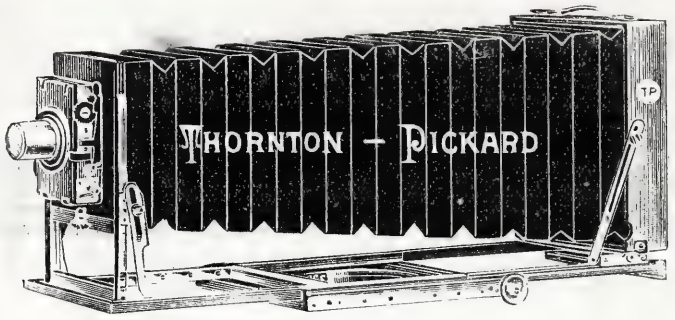
article of bric-a-brac can be safely placed. The cornerpiece, when not in use, may be folded up. It retails at 4s., and is well worth the money. The idea is neatly carried out, and Mr. Tylar, whose fertility of resource in catering for an insatiable photographic appetite always excites our admiration, is to be congratulated upon a happy inspiration in introducing to us a cheap and effective means for the decorative utilisation of photographs.

Messrs. Ferd. Anthony Horle & Co., of 8, St. John's Lane, E.C., are introducing a series of albums which appeals to the large class of photographers that nowadays makes contact prints from small negatives. The books, which are tastefully designed and bound, and with ornamental lettering on the covers, take slip-in Brownie, Pocket Kodak, Folding Pocket Kodak, and Little Nipper photographs. The albums are excellent value, and answer their purpose so admirably that, when filled with photographs, one need have no hesitation in handing them for inspection to one's discriminating friends. The same firm have placed before us a series of parchment envelopes for mounted photographs—Moire, Butterfly, and Aurentum. These are exceedingly elegant, and lend additional charm to cabinet portraits that are inserted in them. Messrs. Horle's albums and envelopes should be popular. A special illustrated list of them is issued for the use of the trade.

The Thornton Pickard Hand and Stand Cameras. Manufactured and sold by the Thornton Pickard Manufacturing Company, Altrincham, Cheshire.

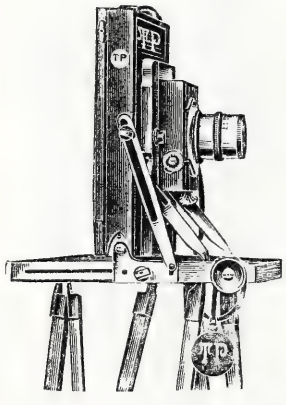
A few weeks since we drew attention to the new series of roll-film hand cameras that have been brought to the attention of photographers by the Altrincham house; and the object of the present notice is to append a supplementary reference to two stand cameras, which meet

the special needs of many workers. The first is the Triple-Extension Ruby, shown in the larger of the illustrations hereto. In the half-plate



size this admits of an extension of 22 inches—a very great convenience in many respects, and especially now that telephotography is becoming so popular. The extra extension is obtained by racking the bellows out at the back of the camera, with the obvious result that an even balance is given to the instrument. The milled-head screw controlling this movement, it will be seen, is fitted to the left-hand side of the camera. Beautifully finished in parts, and as a whole, the Triple-Extension Ruby has all the features and movements of the well-known Standard pattern. We were much impressed by the lightness, elegance, and ease in working of the specimen camera submitted to us. The time has not yet come when the sedate delights and meditative calmness of stand camera photography are wholly replaced by hand-camera work, and to those whose inclinations lead them to the taking of subjects where a comparatively great focal length of lens is required, the Triple-Extension Ruby makes a powerful appeal.

The second of the illustrations shows the camera which is given in the Thornton Pickard "Imperial" complete outfit. It is a strongly-made instrument, embodying a swing back, rising and falling front, swing front, long extension, reversing back, rack and pinion, turntable, and plumb indicator. The set is completed by a doublet lens with iris diaphragms, three-fold stand, a time and instantaneous shutter, and



a dark slide. The quarter-plate set sells for £3 10s., and the half-plate £4 4s., and we have only to say that, judging by the camera which was placed before us for examination, the outfits are extraordinarily good value for the money. To those whose pockets are none too well lined, and who, therefore, cannot indulge in the highest class of cameras, lenses, and accessories, we strongly recommend the Thornton Pickard "Imperial" outfits as perfectly good investments.

The Bantam Pocket Camera. Manufactured and sold by the Birmingham Photographic Company, Limited, Criterion Works, Stratford, near Birmingham.

Taking 2½in. by 2in. plates in sheaths, the body of this little camera is in metal, and measures about 4in. by 3in. by 2in. The shutter gives the lens a working aperture of f/16, is ever-set, and allows of time and instantaneous exposures. The camera has two sunk finders. Changing is effected by the movement of a button on the top of the camera, in which the plate-filled sheaths are placed singly. The camera retails at 5s., and should be popular with the junior members of photographic families. Some excellent photographs taken in the Bantam have been submitted to us, amply attesting that it is capable of producing good negatives. A remarkably cheap addendum to the camera is the developing and printing outfit, for which the small charge of 5s. is made. This consists of plates, developer, toner and fixer, dark-room lamp, three celluloid dishes, printing frame, fixing salt, draining rack, printing paper, and slip-in mounts. A small book of instructions is also issued. The outfit is exceedingly good value, and thus, at the small outlay of 10s., a complete pocket photographic set is available. The camera is made in Britain.

THE Curtis Optical and Photo Company have removed to larger and more central premises, 65, Dawson Street, Dublin.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

April	Name of Society.	Subject.
7	Glasgow and West of Scotland	Technical Meeting. *Estimating Exposure.* Lecturer, Mr. Wm. Goodwin.
7	Oxford Camera Club	Demonstration of *Colour Photography.* Miss Acland and Mr. Minn.
7	Croydon Natural History	Mr. Rudler's First Lecture. 7 45 p m.
8	Newcastle-on-Tyne	*Trimming, Mounting, and Framing.* By J. Fitzgibbon Forde.
8	Thornton Heath Polytechnic	Lantern Night.
8	Stonehouse Camera Club	Elementary. *Mounting and Finishing Prints.* Mr. Stickland.
8	Croydon Natural History	Geological.
8	Birmingham Photographic	A Lantern Lecture on *My Experiences with the Imperial Yeomanry in South Africa, under Lord Methuen.* Mr. E. D. Taylor.
9	Leeds Photographic Society	*Cairo to the First Cataract.* Illustrated with Lantern Slides. (Yorkshire Photographic Union Lecture.) Mr. Percy Sheard.
9	Southsea Photographic Society	*Toning Processes.* Mr. F. J. Mortimer.
9	North Middlesex Photographic	Technical Meeting.
9	Croydon Camera Club	The Hand Cameras of 1902.
10	Rodley, Farsley, and District	*Field Work.*
10	Richmond Camera Club	Paper by Mr. E. Morgan.
10	Woolwich Photographic	*Focal Plane Work.* Walter Kilbey.
10	Sunderland Photographic	Annual Exhibition.
11	West London Photographic	*Three-colour Photography.* A. C. Beard.
11	Croydon Natural History	Photographic. Exhibition of Photography. Prize Slides.

ROYAL PHOTOGRAPHIC SOCIETY.

MARCH 25th.—Mr. A. Haddon in the chair.

The chairman formally opened an exhibition of between seventy and eighty photographs by Mr. C. Yarnall Abbott, of Philadelphia, and an address was, in his absence, read by the secretary. Mr. Abbott said that photography had been to him simply a more or less satisfactory means of artistic expression, but in any event one with which he had succeeded better than the brush. With all due regard for technique, he gave it, however, but the usual second place in matters of the kind. Criticism of the sort of work he showed ought, he held, to be along pictorial lines, and lines more stringent than those applied to the judging of a painting, because of the ease with which accurate photographs were to be obtained. It must be good in the pictorial qualities of composition, tone, balance, and the like, and, whether portrait or landscape, possess something more than a surface likeness of the subject. Mr. Abbott has striven to impart, in fact, to his photographs that something which embodies the difference between the picture and the chromo-lithograph of the shops. The photographs will be on view daily from 10 to 4, and may be seen by non-members on presentation of visiting card.

Mr. Charles P. Butler, A.R.C.Sc., gave an interesting discourse upon the photographic investigation of astrophysical problems. His remarks attached to a very large number of slides, which were described as they appeared upon the screen. The component parts of the spectroscope and the method of setting up and using it in astronomical research were explained, and followed by a statement of the directions in which it had been the means of adding to our knowledge of the heavenly bodies. The work of several eclipse expeditions was also described, and the results in many cases were shown. The erection of the temporary observing stations was generally entrusted to the naval volunteers, who are usually delegated by the Government to assist, and the pictures of these good fellows engaged in the work and in practice, those of the camp and the roughly-erected observatories, threw an interesting light upon the work that Government institutions the world over are carrying on in this field. Mr. Butler also spoke of his own investigations into the career of Nova Persei, its recent appearance and subsequent behaviour, and showed several photographs of the region of the heavens in which it appeared, before and after its appearance.

PHOTOGRAPHIC CLUB.

MARCH 19TH.—Mr. A. Mackie in the chair.

Mr. Quincey showed and described his Quincey patent portable dark-room or developing chamber. It takes the form of a vulcanite vessel, let into the bottom of which is a red glass window, and into the lid an eye-piece with an opaque shutter. The plate is removed from the dark slide or magazine with the aid of a changing bag, and inserted in the developing chamber. The developer is introduced through a tube at the lower end when held vertically. The plate is covered with developer by bringing the apparatus to the horizontal position, and the progress of development is watched by applying one eye to the eye-piece, opening the shutter, and looking through the plate against a lamp. A number of plates were developed in the apparatus, and its use was fully explained.

MARCH 26TH.—Mr. Alex. Bell in the chair.

Mr. W. F. Slater gave a description of one of his conducted tours up the Rhine, and showed a large number of slides, taken by members of the parties. Taking the Great Eastern Railway Company's route via Harwich and Rotterdam, the night was spent on the sea, and an early landing was made for breakfast. Skipping the intervening country, Mr. Slater at once commenced the tour of Germany's noted river, showing views of Cologne, Bonn, Coblenz, Bingen, etc., and the innumerable places of historical or pictorial interest that swarm upon its banks. Some excellent photographic work was done by the party amongst the Rhine villages, and altogether the lecture and slides formed an interesting insight into the life and landscape of the Rhineland, and was duly appreciated.

CROYDON CAMERA CLUB.

THE usual Easter excursion was held on Good Friday, when a party of 25 members, personally conducted by the president, journeyed down to Amberley. Some of the party proceeded in charge of Mr. Hicks to depict the more picturesque parts of Amberley village, including the church and the remains of the castle. Thence a move was made to Bury, where lunch was taken. In the afternoon the route was through Arundel Park to Arundel. There the castle, lake, and river kept all busy for some time. The other section followed the devious reaches of the Arun down to Arundel, which was reached about four o'clock, the scenery met with having yielded a large number of promising subjects. High tea was partaken of by the reunited party at the Bridge House Hotel at 5.30, a well-served repast being forthcoming. During the day nearly 400 plates and films were exposed. A silver medal will be awarded for the best picture taken on this excursion.

Commercial & Legal Intelligence.

MESSRS. R. & R. BULL, Victoria Street, Ashbourne, write:—"We shall feel obliged if you will kindly state in your columns that, having acquired the photographic business lately carried on by Mr. J. L. Hart, we have opened a dark room for the use of amateurs, and that all kinds of photographic requisites will be kept in stock. We might mention that Ashbourne is the nearest town to Dovedale."

REDUCTION of Prices of Warwick Films.—The Warwick Trading Company, Limited, 4 and 5, Warwick Court, High Holborn, W.C., write:—"On and after April 1st, film subjects listed in our catalogue will be sold by us at the following net prices: All Warwick films, one guinea (21s.) per 50ft. approximate lengths (about 5d. per foot) net. All star trick films, 35s. net, per length of about 65ft.; longer lengths in proportion.

THE Royal Arms.—Many tradesmen from motives of loyalty and for purposes of advertisement display the Royal Arms on shop fronts, trade labels, paper bags, and in other ways. The Solicitor-General was recently asked by Mr. Knowles to say whether when tradesmen do this "without words implying that they make such assumption by authority," steps would be taken to make it clear that such persons are free from liability. The reply given was that any person using the Royal Arms without authority in connection with his business is liable to penalties if he so uses them as to lead the public to believe that he is carrying on his business by or under the authority of His Majesty, of any of the Royal Family, or of any Government department. Whether the Royal Arms are so used in any particular case is a question of fact to be determined if proceedings are taken. The Government see no necessity for any alteration of the law.—"Pharmaceutical Journal."

"GLYCIA."—Messrs. J. J. Griffin & Sons, Ltd., of 20-26, Sardinia Street, Lincoln's Inn Fields, W.C., write:—"We have much pleasure in informing you that we have now placed on the market a new P.O.P. manufactured at our own works, which will be sold under the trade-mark of 'Glycia.' The main feature of the paper—that it gives increased contrast—is sufficient justification for its introduction. We believe that there exists a demand, more especially among amateurs, for a paper which will give a result which is tantamount to a moderate intensification of the negative. A very large proportion of the negatives produced by amateurs invariably tend to thinness, due to over-exposure, under development and other causes. A call, therefore, has been made for more body and life in the prints. This, by a method entirely new in emulsion making, we are able to guarantee in vigorous 'Glycia,' giving contrast without hardness. We would particularly point out that this vigorous effect is produced by the extra sensitiveness and richness in the shadows, and there is no tendency whatever to chalkiness in the high lights. Prints on vigorous 'Glycia' are full of sharp detail, the shadows rich, and the whole print bright and plucky. It is very frequently an advantage to be able to use borax, owing to the facility with which this chemical can be obtained. We are glad to say that the borax bath can be used as well as the sulphocyanide for toning 'Glycia,' and the results produced with it are extremely attractive, the toning proceeding evenly and quickly. The paper can also be toned in the combined toning and fixing solutions, and it can also be used for developing out with metol and pyro. The prices of the paper are exactly the same as the regular P.O.P. now on the market, and it is being supplied in sixpenny and shilling packets, the former being put up for all the small popular cameras, such as the Brownie, Little Nipper, etc. We can supply to any of your correspondents a sample ¼-plate size post free for 2d."

CRANKS.—Probably there never was a man who had an idea which was a short time in advance of the age who was not unkindly dubbed "crank." How often is the term applied to the inventor who is struggling with his conception and the construction thereof, and how many times must the expressed opinion of his lack of sanity discourage the man who is honestly, earnestly striving to bring forth a new and useful device or expound a new discovery! Yet patent lawyers and business men are often the first to so stigmatise the inventor who comes to them for help. There is a man in the Patent Office to-day who is still working for 1,500 dols. a year because he called Bell a crank and refused to buy at a nominal price telephone stock which to-day would make him a multi-millionaire. Edison was a crank, Tesla was a crank, Marconi was a crank, and a long list of men, headed by Santos-Dumont, Langley, and Maxim, are called cranks to-day, because they are fighting their way to the conquest of the air through difficulty and discouragement from the masses, who say, ignorantly enough, that because it has never been done, it can never be done. The president of a well-known chemical concern of New York said recently, in instructing his lawyer:—"If any fellow comes to you and claims to have a chemical process which is an improvement on any of our specialities, don't let him get away for want of a few dollars. No matter if he is drunk and in rags, find out what he knows and help him along if there is any chance of his making an improvement. He may be the undiscovered genius with a million-dollar prize in his head." Moreover, it is reported that this course has resulted in the saving of many dollars. Of course, there are a hundred useless ideas presented for overy one which is of value, but the one usually pays for all the rest, with a little over for "vedvet." It was the great thinker and philosopher, Herbert Spencer, who said: "The vital knowledge which underlies our whole existence is a knowledge that has got itself taught in nooks and corners, while the ordained agencies for teaching have been mumbling little else but dead formulas." And no sounder doctrine ever found print. The real knowledge, the real discovery, the real invention which is epoch-making and world-valuable, is not found in books, but in "nooks and corners," and the crank who to-day ferrets out from its hiding place a pearl of Nature's hidden knowledge is the great man of to-morrow. Long live the crank! May his wheels revolve none the less steadily for his unwelcome name and the ridicule aimed at his head, and may the world at large come, in the fullness of time, to recognise that all which it cannot understand is not necessarily nonsense, and that the impossible of the Now is the ordinary of the Future.—"The American Inventor."

News and Notes.

THE Zoological Photo Club, devoted to bird and animal photography, has vacancies for members. Subscription 2s. 6d. Secretary, Charles Louis Hett, Springfield, Brigg.

MESSRS. J. J. GRIFFIN & SONS, of 20-26, Sardinia Street, Lincoln's Inn Fields, London, W.C., write:—"We have the pleasure to enclose you herewith copies of recent lists emanating from our process department. We think that possibly some of your readers may be interested to know that we supply every requisite for photo-process work and photo engraving."

"THE Carbon Process" was the subject of an interesting lecture delivered before Devonport Camera Club last week by Mr. H. J. Hissett, president. Mr. J. T. Trend, who presided, spoke of the remarkable success which Mr. Hissett had achieved in connection with the carbon process. The lecturer having remarked that the process was one of the least expensive that he knew, gave a demonstration and explained the principles of the process, the method of exposing the tissue and development, and offered some useful hints. Mr. Hissett was heartily thanked.

A PRESERVATIVE for Albumen.—A paragraph in the "Photographisches Chronik" draws attention to the use of chloral hydrate as a preservative for albumen. The writer points out that many of the difficulties attending the use of albumen in photographic processes arise from its decomposition, and that the fading of albumen prints is more probably due to paper coated with offensive-smelling material, than to imperfect elimination of hyposulphite of soda. One gramme of chloral hydrate is sufficient to preserve 500 c.c. of fluid albumen, and paper coated with albumen preserved in this way will give prints of perfect purity in the high lights. The only difficulty to guard against is the use of ammonia, or other strong alkalis, which would decompose the chloral hydrate and form formic acid and chloroform.

THE "Lega Navale" states that some interesting experiments have been made recently by the controllers of naval construction at Spezia with the inventions of Messrs. Russo and Laurenti for "submarine vision." Although referred to under the single name of clepsoscope, they are really two distinct instruments. The one, which was the first invented, gives an exact view in a closed chamber of all that is to be seen round about a submarine to any one who may apply his eye to a small eye-piece looking into the chamber. The later invention gives the same image much enlarged and visible to both eyes at once at some distance from the chamber. This second invention is approved by all who have seen it, and is considered as the true solution of the great problem of guiding and navigating the submarines. It is evident that it can also be used in fortifications on land, where it is an advantage to

obtain a view of the surrounding country and objects without the observer himself being seen.

A Photographic Survey of Surrey.—On Tuesday evening, March 25th, a meeting was held in the Town Hall, Croydon, Surrey, to consider the question of the above, the meeting, consisting of members of the libraries committee, the librarian, and also members of the following societies: the Croydon Camera Club, the South Norwood Photographic Society, the Footpaths Preservation Society, the Selbourne Society, and the various sections of the Croydon Natural History and Scientific Society composing the geological, zoological, photographic, and museum committees. The appended resolutions, to the following effect, were carried:—(1) That the meeting forms itself into a provisional committee for establishing a Photographic Survey of Surrey, with the power to add to its number. (2) That the various societies and other persons within the county be informed by circular of the objects aimed at, and societies be invited to send delegates to the committee, with a view of electing a council and officers, to proceed with the work of the survey. (3) That pending the meeting of the above delegates with the committee, Mr. W. Whitaker, F.R.S., F.G.S., act as chairman, Mr. H. D. Gower act as hon. secretary, and Mr. S. Just as hon. curator, and that these gentlemen prepare and forward the circular above referred to. (4) That pending the proposed meeting, either the chairman, hon. secretary, or hon. curator be authorised to invite the co-operation, as members of the provisional committee, of any gentlemen interested in the objects of the proposed survey.

The Chemical Society.—The annual general meeting of the Chemical Society was held on Wednesday, March 27th, when the president, officers, and council were elected for the ensuing year. The president (Professor Emerson Reynolds), after reviewing the state of the society at the present time, delivered an address, the subject of which was the periodic classification of the elements. In the evening a dinner was given by the officers and council to Professor van 't Hoff, of Berlin, who had come over to England to deliver the Raoult memorial lecture. The president of the society was in the chair, and among those present were Lord Kelvin, Sir William Huggins, Principal Rucker, Professor Dewar, Professor Witt, Dr. Thorpe, Dr. Gladstone, Dr. Perkin, Dr. Johnstone Stoney, Professor H. E. Armstrong, Professor Meldola, Professor W. Ramsay, Professor J. M. Thomson, Professor Tilden, Professor Smithells, Dr. Horace Brown, Mr. C. V. Boys, and Major P. A. MacMahon. After the toast of "The King" had been proposed by the president, that of "Professor van 't Hoff" was given by Lord Kelvin, who referred to him as the founder of modern physical chemistry. Lord Kelvin said that as a physicist, if so he might call himself, he had for 50 years taught his students that chemistry and physics were one; nay more, that chemistry was a branch of natural philosophy. He did not say this in any boastful or vain-glorious spirit, but as a sober, logical division of science. There were two reasons why he had not himself taught chemistry; one was that there was no time, and the other that he did not know enough. He was reminded by the sight of Sir William Huggins of the alliance between dynamics, astronomy, and chemistry, for the president of the Royal Society had done great things to correlate astronomy and chemistry. Sixty years ago chemical atoms were thought of as objects infinitely small; now they were told that they were things of real magnitude, and a hydrogen atom, so far from being indivisible, had at least 500 parts, and in fact was a cluster having as many parts as a galaxy of stars. He then referred to Professor van 't Hoff's brilliant application of the principles of thermo-dynamics to explain the observed phenomena of solution, as developed by Raoult and van 't Hoff himself, and to the latter's extension of investigations to the case of solvents other than water. In replying to the toast, Professor van 't Hoff expressed his thanks for what Lord Kelvin had said. He agreed with him on the whole that chemistry was a branch of physics, but with the restriction that it formed the largest branch of all. He was glad to be among the members of the London Chemical Society, not only because it was the oldest chemical society in the world, but also because it was the first to honour him with honorary membership, for which he had never before had the opportunity of thanking it personally. He concluded by proposing the toast of the society. Subsequently, in the course of the Raoult Lecture, Professor van 't Hoff began by giving some biographical details of his subject. Francois Marie Raoult, he said, was born at Tourne, Departement du Nord, on May 10th, 1830, and after holding appointments in Rheims and Sens, became Professor of Chemistry at Grenoble in 1867, retaining that position until his death in April, 1901. His scientific career might be divided into three distinct periods—physical, chemical, and physico-chemical. As a typical research in the first period Professor van 't Hoff mentioned his work on the heat of chemical action as distinct from that of electrical action in cells of the Daniell type. His chemical work included various investigations, many having an origin in technical inquiries. But the researches which made his name famous as a scientific investigator were the establishment by experiment of a definite connection between the lowering of the freezing point of a dissolved substance and its molecular weight, and further of a similar connection between the molecular weight of a dissolved substance and the change in boiling point (vapour pressure) of the liquid in which it was dissolved. This led to the important generalization of the lecturer that the osmotic pressure of a dissolved substance bore a definite relationship to the pressure it would exert if it were in a state of vapour—a theory which had been of immense service in elucidating the nature of solutions, and had also led to the theory now widely accepted as to the existence in dilute salt solutions of the ions of the dissolved substance. As a man, he was characterised by tenacity of purpose and a keen eye for detail as well as for the broader issues, with conviction that the last word must rest with experiment.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

POTASSIUM AMMONIUM CHROMATE.

To the Editors.

Gentlemen,—Referring to the notes in your issue of March 21st on "Potassium Ammonium Chromate," we may mention that a "tabloid" preparation of this salt was issued by us about eighteen months ago, and was described in the 1901 edition of "Wellcome's Photographic Exposure Record," published in November, 1900. It was designed to provide those who wished to make a few carbon prints at irregular intervals with a convenient means of preparing a reliable sensitising solution.—Yours very respectfully,

Burroughs Wellcome and Co.

Snow Hill Buildings, London, E.C.,
March 25th, 1902.

RESTRICTIONS ON THE SALE OF POISONS.

To the Editors.

Gentlemen,—Last week you published the names of the committee appointed by the President of the Council to inquire into what alterations may be expedient in Schedule A of the Pharmacy Act of 1868, and who are now deliberating on the subject. It is a little curious to note, at times, how ignorant some coroners seem to be with regard to the sale of poisons. At an inquest held at Liverpool on Saturday last on the body of a man who had committed suicide by drinking carbolic acid, the coroner is reported to have expressed the hope that something would soon be done to restrict the sale of carbolic acid. Now, the sale of this most useful disinfectant was, by an order in Council last year restricted to pharmaceutical chemists. What further restrictions are required if the chemists fulfil the conditions prescribed in its sale? Possibly, however, the learned coroner was ignorant of the fact that carbolic acid had been scheduled in the list of poisons, or he would not have made the remark he is reported to have made.—I am, yours, etc.,

Non-Pharmacist.

April 1st, 1902.

ANCIENT CUSTOMS AND THEIR RECORD.

To the Editors.

Gentlemen,—Nearly every town in England, and many villages, have certain ancient customs that are still maintained, while others have died out, and no indelible record of them left. The City of London still has some, one of which is that on Good Friday twenty-one old women are each on a certain gravestone in the little churchyard of St. Bartholomew the Great, Smithfield, presented with a new sixpence, and afterwards with a hot cross bun. The sixpences have to be picked up from the gravestone by the old ladies, who then have to walk over the stone. We read that Sir Benjamin Stone, who has done so much in recording by photography the past and passing, was there with his camera, so that we may be assured that this very ancient custom is duly recorded for the benefit of future generations. By the way, this little church of St. Bartholomew the Great seems to be but little known to Londoners, yet it is the oldest church in the City, and it escaped the Great Fire of London. Until quite recenlty a portion of it was used as a blacksmith's forge. The church, which is always open to the public, is well worth a visit, and there is in the interior plenty of work for the archæological photographer. Some of the tablets in the church are in memory of people who died of the "Great Plague of London."—I am, yours, etc.,

F. S. A.

March 29th, 1902.

THE AGFA DEVELOPERS.

To the Editors.

Gentlemen,—We beg to enclose a copy of the "Booklet on Modern Developers" (revised edition, 1902). This has been brought up to date, and we have some 30,000 copies, or more if necessary, ready for free distribution through the dealers. We shall be obliged if you can find space to give this little book a notice in the column of your esteemed journal with an intimation that dealers can have a supply free on application.—Thanking you in anticipation, we are, dear sirs, yours faithfully,

Chas. Zimmermann and Co.

9 and 10, St. Mary-at-Hill, London, E.C.
April 1st, 1902.

AMIDOL.

To the Editors.

Gentlemen,—I am enclosing an article for your journal, provided it meets with the approval of your experimentary operator. I am also sending you two specimens in confirmation of my essay (under separate cover).

Your Almanac is a wonderful 1s. 3d. worth, and is eagerly looked for here by all the army of cameraists. He must be a very poor specimen who cannot get a feed of some sort from the perusal of such a well-compiled heap of photo information. The illustrations also are an inspiration.

Trusting my effort may do someone some good, I am yours faithfully, H. BILLENS.

Portrait Studio, The Square,
Palmerston, N., N.Z., 18.2.1902.

Poor little despised Amidol! While page after page is devoted to most others, this steam hammer has but two allusions made to it in the whole almanac. As if he was of no consequence whatever, or just a toy for the little "Brownies" to experiment and waste their time on. Now I am going to take pity on the little chap, because I have found him quite a David, capable of knocking any of the other giants over. He has been one of my best friends for seven years, and has enabled me to produce as good negatives and bromides as an- of the best men in the colony. Stains the fingers? Does he? Well, so does nitrate of silver and iodine. Care will prevent that. At any rate, if any young lady would not have me because my nails were a little stained in the ordinary course of duty, why she would be quite welcome to the other chap with the clean fingers. For seven years "I have used no other." I left off experimenting as soon as I found out such a reliable and never-go-wrong developer. I cannot tell the number of hours or plates I have saved during that time in developing plates, of snapshot, studio, and copying, also bromide enlargements ad lib.

I do not expect the grey heads of the profession to take this in, but I am giving the explosive bullet formulæ—as I use it, in case there may be any hungry amateurs in the world, who have a little amidol on the shelf that they have given up in despair. Here it is:—

Amidol, 60 grains; meto. bisulp. potash, 60 grains; bromide potass, 20 grains; saturated solution sulphite soda, 10ozs. This is the formulæ for high-class bromides, snapshot and copying, but for those who like more delicate negatives, as for studio work, 3ozs more water will be an advantage. The quantity given will develop two dozen 15 x 12 bromides. In cool weather and winter time the same proportion of amidol and the sulphite solution only give magnificent negatives. It is as well that the exposures be normal or under-exposed.

Please mark the following in bromide work:—Soak as usual after exposure. When nearly up to full strength lift the print out of the dish and place at once in the fixing bath, otherwise it is apt to over-develop. This developer gives pure whites and blacks with good negatives. It is a one-solution developer. The amidol dissolves at once. No acid bath is required, and no staining of any kind ever ensues. It is at its best freshly mixed, but will keep as long as other mixed developers. It is very easy to keep a saturated solution of sulphite always on hand. If you have no mortar, pound up the bromide and meta between a piece of strong brown paper.

STEREOSCOPIC PHOTOGRAPHY

To the Editors.

Gentlemen,—I read with interest your able article of March 21st on long-distance stereo-photography, redressing a slight error made by your correspondent, P.O.P., 28th Feb. Indeed, lenses of long focus can be used in stereo work, but in order to secure the desired sensations of solidity, it is essential to augment proportionately to length of focus the distance between the lenses taking the two images, namely, the base line of the triangle. This also applies to lenses of short focus, when subjects of long distance are to be photographed stereoscopically. By this mail, under separate cover, I forward half a dozen of my stereos, amongst which please to find two views of the Berner Alps as taken from Murren over the Lauterbrunnen Valley, by means of a small hand camera, with Zeiss's lenses, 4½in. focus. No. 2 slide was taken in the usual way, the two images exposed simultaneously by the distance between the two lenses being 4in. from centre to centre. You will perceive this gives hardly any effect of solidity in the scope. No. 1 slide is taken from about the same spot, on same subject, but the two images in succession, with a distance between the two lenses or two exposures of not less than 150 feet.

The huge dark rock in the foreground of the image, called the Schw. Mönch, is distant from the place at Murren from where the stereo was taken about 1¾ English miles, measured as the crow flies. The summit of the "Jungfrau" is distant about 4 miles, the lower part of the Giesen Glacier about 2½ miles, the summit of the "Mönch" 5½ miles, and the Juggi glacier 3½ miles off. This slide, with its exaggerated distance between the two lenses, or rather, places of exposure, does certainly not render the effect of the mountains which the looker-on sees from Murren. It is intended to give an ideal view of the "Jungfrau," such one as no one ever saw, but as a person might see from Murren, supposing his eyes were distant 150 feet the one from the other. The successive planes or rocks and mountains are, however, fully appreciable in this manner. On the other hand, the greatness of the Alps appears considerably reduced. This apparent reduction in size takes place in all the views I have taken with exaggerated distance between the two spots of exposure. The two stereograms of the illuminations of the "Palais de l'Electricité," and fountains at the Paris Exhibition, 1900, were taken at 9.30 p.m. with f9 and 90 seconds exposure.—I am, gentlemen, faithfully yours, VICTOR SELB.

42, Rue des Drapiers, Bruxelles,
March 25th, 1902.

[We have to thank Mons. Selb for the specimen stereographs, which bear out his description of them. The Paris Exposition views are strikingly good examples of photography at night; and the representation of the crystal globe that was shown inside the Exhibition building is one of the most delightful stereos we have seen. Mons. Selb's stereoscopic work is, of its kind, superb.—EDS. B.J.P.]

To the Editors.

Gentlemen,—With reference to the note to P O P 's letter in your issue of the 28th March, I would ask to be permitted to say that I have seen stereoscopic pictures both of the sun and moon taken about the same time, and both (if I mistake not) by Dr. De la Rue, and they fully answered the purpose for which they were made. They made evident to anyone that the bodies were not flat, but solid, and nearly spherical; but they gave no idea either of the size or distance of these bodies. The appearance was that of models at a short distance, and that is quite in accordance with theory.

It is quite possible to take pictures of an object a mile off with points of view exceeding the distance between the eyes. If viewed with lenses of the same focal length as those in the camera they will give the impression of being models at a reduced distance; if the focal distance of the lenses in the stereoscope be less the objects will be correspondingly enlarged.

When the distance of the points of view (distance of the lenses in the two positions) is but very slightly in excess of the natural distance between the eyes the want of truth in the appearance will not be prominent, but it exists nevertheless.

Each lens will produce just such a picture as would be seen by an eye placed at its centre, and the result must be as if the object were seen by a giant whose eyes were at the distance of the two points of view; the result of superposing the two pictures would be as if seen by the giant; or, as reducing all things in the same proportion would make no difference, as though we were looking at a model at a reduced distance.—I am, gentlemen, yours faithfully,

J. F. T.

"SE NON E VERO."

To the Editors.

Gentlemen,—I notice in your issue of February 7th a letter from a correspo dent enclosing a paragraph from the "People," in which a dried fruit firm advertised for original drawings, and where a neat little rejoinder was sent purporting to be from the pen of Mr. Phil May.

I enclose a cutting from last Friday's "Morning Leader," where the same story appears, with the same reply, only it is attributed to another man, Sir Philip Burne-Jones.

Which of these two artists is the hero?—I am yours,

J. W. RIGNALL.

City Studio, Ely, Cambs, March 25th.

"A STORY OF SIR P. BURNE-JONES.

"Sir Philip Burne-Jones, who was over-shadowed during his visit to New York by the simultaneous presence of Prince Henry of Prussia, has nevertheless contributed a fairly good anecdote for society gossip. It appears that the painter, before leaving for Washington, received a circular letter from a firm engaged in the sale of dried fruit. The circular invited him to compete for a prize which would be given for the best design to be used in advertising the company's wares. Only one prize, it was stated, would be awarded, and all unsuccessful drawings were to become the property of the firm.

"A NEAT REPLY.

"The circular for a moment took the titled Briton's breath away. Then he sat down and wrote the following letter:

'Manager Dried Fruit Company.

'Dear Sir,—I am offering a prize of 50 cents for the best specimen

of dried fruit, and should be glad if you will take part in the competition. Twelve dozen boxes of each kind of fruit should be sent for examination, and all fruit that is not adjudged worthy of the prize will remain the property of the undersigned. It is also required that the charges on the fruit so forwarded be paid by the sender.—Yours very truly,

"P. BURNE-JONES.'"

[In reply: Probably neither artist is the hero. The fill up matter of the half-penny London news sheets should not be taken too seriously. To quote a celebrated description of it, "It is written by office boys for office boys."—EDS. B.J.P.]

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY, 24, *Wellington-street, Strand, London, W.C.*" *Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

PHOTOGRAPH REGISTERED:—

E. W. H. Rutley, 117a, High Street, Croydon. *Photograph of Miss May Frederika.*

ZERO.—The name of the firm is unknown to us.

COPYRIGHT.—Send our publishers three prints, and one-and-sevenpence, and they will effect registration for you.

A. LUNDSTROM.—Hardly a matter for our correspondence columns, although we sympathise with you in your difficulty.

PHOTOGRAPHIC BUREAU.—"ADDRESS" writes: "Will you be so good as to tell me the address of a photographic bureau where they get you a re-engagement?"—In reply: We know of no such bureau.

BLACK TONES.—G. PAGE.—The print sent is a platinotype, and we cannot tell you how to get the same colour on glossy P.O.P. You may obtain a very similar one, if you employ a matt bromide paper. Try that, if you cannot get on with the platinotype process.

BOOK WANTED.—PETER MURPHY writes: "Will you kindly inform me what is the cost of 'Experimental Science,' by George M. Hopkins; also where it can be bought? You refer to it in JOURNAL of February 21st, 1902, page 143."—In reply: The book is published by Munn & Co., New York, price $4.

THE "MITA" LIGHT.—F. W. D. writes: "I read in your JOURNAL that there is a new form of incandescent lamp, called the 'Mita' light. Would you tell me where I could get this lamp, also if there is any danger in it?"—In reply: The lamp may be had from Dr. A. Hesekiel & Co., Berlin. The inventor claims that it is quite safe.

L. E. C.—Qualitatively, there is little or nothing to choose between them. Under very favourable conditions of light and subject—seaside photography, for example—instantaneous results might be obtained: you must remember that with such a combination you are working with a small aperture.

SPOILT PLATES.—H. H. G. says: "I have got over half-a-gross of plates left over from last year, and I find that, through being stored in an attic that was evidently not dry, they have become mouldy on the film. Can you tell me how I can use them, as it will be a loss if I cannot?"—In reply: We cannot, as the plates have become ruined by the mould, and are consequently useless.

FLASHLIGHT COMPOUND.—H. A. AYLWARD writes: "Could you kindly inform me if the following mixture would be in any way dangerous to mix, viz., explosive by coming in contact:—Suet, 1¾oz.; magnesium powder, 5oz.; barium nitrate, 7½oz.; flower of sulphur, 1oz.?"—In reply: The mixture is not so dangerous to compound as some; but we should recommend its being done carefully on a sheet of cardboard with a bone spatula—certainly not in a mortar.

LENS QUERY.—"SCOTT" says: "I recently came across a lens marked as per sketch. Diameter of lens, 2½in.; aperture of largest stop, 2¼in. Excellent condition. Could you please say who maker is, and probable value?"—In reply: Although we are familiar with the marking, we cannot say who is the actual maker of the lens, except that it is of French manufacture. Its value is about the same as that of any of the old-fashioned French portrait lenses.

PREMIUM.—"'FAIR WEATHER' would be glad to know what would be a fair premium to expect with an apprentice, to teach him thoroughly all branches in photography, in a second-class trade house."—In reply: This is a subject we can scarcely give an opinion upon. The premium with an apprentice in a "second-class trade house" should be very small, but much will depend upon the wages the apprentice is to receive during the apprenticeship.

BOOK WANTED, ETC.—R. O. writes: "My son has a wish to try amateur photography. I have presented him with a small camera. Would you kindly inform me where I could get a really good instruction book for beginners; also what chemicals, etc., are required?"—In reply: Abney's "Instruction in Photography," price 3s. 6d., is a good work. But probably such a book as the Ilford Manual, price 1s., would answer your son's immediate requirements. From the work you will see what chemicals are required.

LENS FOR ENLARGING.—GEO. BRIGHT writes: "I have a lot of negatives, 3¼ by 3¼, sent by a friend in India, some of which I should like to make enlargements from on bromide paper. Will you please tell me the best lens to use for the purpose, and also the largest size I can produce with it?"—In reply: The most convenient lens to use for the purpose would be a ¼-plate portrait lens. With that the enlargement may be made of any size, governed only by the length of the room, or the extension of the camera, if an enlarging camera be employed.

BOOK WANTED.—C. EMERY writes: "Could you give me particulars as to where I could obtain the book you mentioned a few weeks back in connection with the Woodburytype process? I think the title of the book was 'Experimental Science.' Do you think that the process could be worked successfully in the ordinary business?—I mean to supply people with a dozen cabinets."—In reply: The book is entitled "Experimental Science," and is published by Munn & Co., New York, price $4. On a small scale, it is doubtful if the Woodbury process would be commercially successful.

SILVER STAINS.—E. GRAY writes: "Kindly advise the best and safest way to remove old silver stains from an amateur's negative."—In reply: Some silver stains cannot be successfully removed, and you do not say how the amateur caused them. Presumably they arise from damp paper or an imperfectly fixed or washed negative. Try this:—Make an alcoholic tincture of iodine, about the colour of brown sherry, by dissolving a few grains of iodine in the spirit. Rub this on the negative with a pledget of cottonwool until the stains appear white; then immerse in a solution of hyposulphite of soda.

A LICENSING QUESTION.—PHOTO 16 writes: "I shall be pleased if you will advise me on the following:—I am canvassing operator, and for the purpose of inducing people to visit our studio, make occasional rounds and receive appointments from people, on which occasion I sell coupons, which amount is credited at time of sitting. Is it necessary for me to provide myself with a licence or not, as I have been advised to get one?"—In reply: We should say that a licence is not required. You are not hawking goods for sale, but simply canvassing for orders to be executed at the studio.

STUDIO BUILDING.—T. U. B. works in studio with south-west light; sun all day; glass stippled with white paint; dark blue (almost black) and white blinds used; interior painted grey or dirty white. "Do you think blinds are right colour, also interior, as I get a lot of reflection and on very bright, sunny days get pictures without contrast?"—In reply: We should say the blinds are the right colour if judiciously used. It is probable that the reflections are largely due to the light colour in which the interior of the studio is painted. A couple of light wooden screens, covered with tracing cloth, and sliding along the roof, will further modify the sunlight in the room when necessary.

WATER RATE.—H. & Co write. "For some years we have done our printing at a private house in the suburbs, and only paid the water rate according to the assessment of the house. Last week an inspector called to see the fittings, and seeing the water being used for the washing of the prints, he said that we should have in future to pay for it by meter. Since then we have had a formal notice from the company to the same effect. Can they compel us to pay for it in that way, as it will make a great difference to us? —In reply: As the water is used for trade purposes, the company are quite within their rights in enforcing its supply by meter. You may well congratulate yourselves on so long escaping this system of payment.

WAGES QUESTION.—"ANXIOUS" writes: "I took over a situation as printer and toner at a salary of £1 per week. At the end of three days I was told by my employer that I was not competent at taking the quantity of printing he usually had on hand. He refused to give me a week's notice or a week's money in lieu of notice. Could I claim the above?"—In reply: We are doubtful if you can claim more than the three days' salary, because the employer says you are incompetent, and it is possible that he might be able to establish that, and that you were wasting his material, in the County Court, if he were sued. On the other hand, if you can prove to the satisfaction of the Court that you are a competent printer and toner you may be able to recover the full week's wages and for a week in lieu of notice.

*** NOTICE TO ADVERTISERS.—*A Revised Tariff for advertisements in the* JOURNAL *is now in force. Blocks and copy are received subject to the approval of the Publishers, and advertisements are inserted absolutely without condition, expressed or implied as to what appears in the text portion of the paper.*

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*** *The Editor can only be seen by appointment.*

*** *We do not undertake to answer letters by post.*

EX CATHEDRA.

Rapid Plates. In drawing attention last week to the misleading statements concerning photography, which so frequently appear in the daily Press, we referred to the extreme sensitiveness of modern dry plates, and the short exposures which may be given with safety at this season of the year. There can be no doubt that the perfection of the dry-plate of to-day places at the disposal of the photographer the means of working under very unfavourable conditions. Whether it be the professional photographer, who has to photograph children in dull weather, or the amateur of slender means, who is debarred from the choice of expensive apparatus, the rapid plate comes to the rescue. Two circumstances induce us to return to the subject. The "Photographische Mittheilungen" publishes a short article on instantaneous photography, and whilst insisting on a good lens, a rapid shutter and good light for very rapid work, no mention is made of the plate. Perhaps the need for the latter was thought too evident to require attention, yet its use makes the ordinary rectilinear lens efficient for most purposes, and, given a lens of still larger aperture, the photographer becomes less dependent upon the quality of the light. The other fact which brings us back to the topic is the receipt from Messrs. Marion of an excellent instantaneous photograph taken recently upon one of their plates of the new P S series, of the rapidity of 250 H and D. The exposure for this photograph was 1-70 of a second at f-22, which is equivalent to less than 1-500 of a second for the full aperture of an ordinary rectilinear, f-8. The scene is evidently in the neighbourhood of North London, and a tradesman's cart and a boy in dark clothes stand in the foreground. Although the exposure appears to have been cut down as much as possible, the black buttons upon the boy's dark coat are visible, and the brightness and detail of the print are exceptionally good.

* * *

Three-Colour Photography. The readers of the "Atelier des Photographen" are this month the recipients of one of the most effective three-colour prints we have seen for some time. The photograph was taken by the Editor of the paper, Dr. A. Miethe, and represents an out-door portrait of more than ordinary interest, as it seems to clearly indicate that three-colour work is at the command of the professional photographer under suitable conditions. The photograph is that of a young lady sitting in a wicker chair, shading herself with a red parasol. The green background formed by the grass and fuzzy foliage presents a delightful contrast to the red sunshade and the charming play of colour upon the girl's face and white blouse. The following information is given by Dr. Miethe concerning the photograph. The exposures were made upon a panchromatic plate made by Perutz, of Munich, according to a formula supplied by Dr. Miethe. The total exposure in bright light was about 5½ seconds, being 1 second for the blue screen, 1½ seconds for the green screen, and 3 seconds for the red screen. The camera was of special construction for three-colour work, but small and portable. The plates were prepared by Schelter and Giesecke, of Leipsic, and printed by F. Richter, of Leipsic. The three exposures were made in succession upon one plate. In the "Zeitschrift für Reproductionstechnik" some further information concerning Dr. Miethe's procedure is given. The sensitiveness of the panchromatic plate for the red zone of the spectrum to line D is about 1.25 of that of the zone situate between the D line and wave length 535, whilst the zone between wave length 535 and the extreme visible violet is about 0.1, taking green as unity. The light filters, made by Dr. Miethe for portraits in the open, are adusted for red, green and blue with relative exposures of 2.5 : 2 : 1. The adjustment of the exposures for the different screens is of great importance, and to facilitate this, Dr. Miethe has constructed a photometer with three scales, each giving a range of light intensities ranging from 1 to 16. Tint No. 10 of the blue is taken as the standard. Three small plates are placed in the photometer and exposed behind the coloured screens to daylight reflected from a card, for a few seconds. The plates are developed, and the opacities which agree with No. 10 of the blue give the clue to the correct relative

exposures for each of the three colours. Although the print to which we refer is a three-colour process print, we feel sure that portraits, landscapes, and similar photographs, produced in such a manner, would prove immensely popular.

* * *

Astronomical and Meteorological Stereoscopy. The value of stereoscopic photography has for some time been recognised as a means for the detection of spurious bank notes, and the application of the principle to radiography has proved of enormous benefit in surgical practice. Its application, however, to meteorological and astronomical work is, we believe, comparatively novel. We must not forget, of course, the stereograph of the moon taken by De la Rue, but, with the exception of this, no attempt has been made to seriously apply stereoscopy to the study of the stars, except by Professor Wolf, of Heidelberg, last year. It is now proposed by M. Hamy to take photographs of a given region of the sky on dates sufficiently far apart, and then to utilise the negatives thus taken as stereographs, when it would be at once easy to recognise the shift of any star. This method would also entirely obviate any doubt as to existence or otherwise of a faint nebula, and would preclude any confusion arising from an accidental fault in the sensitive film. It is proposed also to apply this method to the study of cometary and spectroscopic astronomy, whilst for lunar examination small portions of the lunar surface would be stereoscopically examined. Professor Wolf of Heidelberg has been using this last year what is called a "stereocomparateur," by means of which two negatives may be stereoscopically and microscopically compared, and by means of which he has been able to prove that the stars, when photographed with objectives of short focus, have a measurable parallax, and, further, in the constellation Berenice there are more than a thousand nebulosities; he has also been able to obtain a stereograph of Saturn which distinctly shows one of its satellites in front of and the others behind the planet. The application of stereoscopy to meteorology is valuable in that, with sufficiently long base, it is possible to obtain stereographs of the clouds, and readily recognise the different strata that compose them; it is also suggested that it would be of value in the study of lightning. It is interesting to note the increasing application of various branches of photography to the different sciences, and there is no doubt that as time advances so may we expect to find its still wider application.

* * *

Direct-Colour Photographs. Whilst the indirect processes of colour photography are making rapid progress, the direct methods seem to remain outside the range of practical work. P. Hanneke refers to the various methods of direct pigmentary photography. He points out that they may be divided into two classes, those which depend upon silver sub-chloride assuming the colour of the light rays to which it is exposed, as in the case of exposure under a coloured transparency, and those which depend upon the bleaching or organic dyes when exposed to light of a given nature. It is claimed that the first experimenters in the former process were Seebeck, in 1810, and Poitevin, in 1865. E. Vallot is said to have been the first to experiment in the latter process, in 1896. Verres work, in the silver sub-chloride process, excited much attention. His results were obtained with colour sensitive collodion emulsion exposed under coloured transparencies. Dr. Eder, in the "Jahrbuch" for 1891, pronounced the photographs to be comparatively well fixed and capable of exposure to light, without appreciable change, for some days. Vallot's experiments with organic dyes seem to have been over-shadowed by Röntgen's discovery, which was made known about the same time. The blue, red and yellow dyes used by Vallot were Cyanin, Curcuma, and Chinolin. The colours transmitted by the transparency bleached those dyes by which they were not absorbed, and thus produced a print in colours. In Eder's Jahrbuch for 1897 the following formula by Vallot is given:—Analine purple, 0.4 grammes; Victoria blue, 0.4 grammes; Curcuma, 20 grammes. Dissolve each in 100 c.c. of alcohol, then mix, and sensitise the gelatinised paper by flotation. Messrs. Lumière experimented with the process, and found it gave fairly satisfactory results, but the printing was slow, and the colours could not be fixed. Wiener drew attention to the fact that fugitive colours might be fixed upon fibrous materials by the use of salts of copper. Still more recently Dr. Neuhaus and Karl Worel have experimented in the same direction. We recently gave some account of Dr. Neuhaus' experiments, but even these do not give promise of more than a printing process, so far as can be judged from what has been published concerning them. Hannecke very truly remarks that we are still a long way from the ideal photographic process. The principles of direct colour photography may easily be understood by all, and the process may seem simple to those who are unacquainted with the chemical action of light, chemistry, and the technics of dyestuffs, but every experimenter in colour photography knows how great are the difficulties which must be surmounted before the problem is satisfactorily solved.

* * *

Snow Crystals. Some of the most beautiful objects to be found in Nature's storehouse are to be seen in the crystalline flakes which falling snow occasionally exhibits. Within a comparatively recent period the only record we had of the delicate tracery of these exquisite shapes was from the facile pencil of some observer who had studied them and committed their shapes to paper. Probably the most familiar set of these pictures is that to be seen in the well-known "Forms of Water," by Tyndall, and these he owed to the courtesy of Mr. J. Caistor. When engravings only of these beautiful geometric forms are seen by those who have never observed them in Nature (though to do so is very easy when the occasion serves), a suspicion is apt to arise that the imagination has, to some extent, been drawn upon; but when a photograph can be shown, incredulity necessarily gives way. Some few years ago we alluded to the microscopical arrangement for obtaining such photographs, designed by a Scandinavian scientist, but the most complete and beautiful series ever obtained by photographic agency is one by Mr. W. A. Bentley, of Jericho, Vermont, U.S.A., a number of illustrations of which appear in the "States Monthly Weather Review," some of them being reproduced in a recent number of "Nature." Readers of Tyndall's work may remember he speaks of these snow crystals forming in still air, but Mr. Bentley's experience is rather the reverse, for he classifies his illustrations according to the atmospheric conditions at the time, and many of them have accompanied storms of various degrees of force and with wind from varying directions. Thus "Nature" remarks:—"It is also highly desirable that observations be made to ascertain why the more perfect crystals are more common in the western portions of storms, and also why certain portions produce certain types." We may say we have often observed these crystalline forms of snow in our own country. Nearly always when the snowfall assumes the type that may be called fine and powdery if the flakes be re-

ceived upon one's coat sleeve, will the beautiful geometrical forms be noticeable. We are very much inclined to think that these varied hexagonal shapes have been utilised in decorative art, and we have it as a fact, on the authority of an esteemed correspondent, that another variety of snow crystallisation—in this instance, the fern-like forms on a frozen window-pane—have been made use of for a design upon a damask tablecloth. It is rather late in the season to refer to frost pictures, though it is apropos to the subject of ice crystals just referred to; but we may say that whenever such a nature-decorated window-pane is attempted to be photographed it is a great help to put a dark background behind it, the fern forms being then visible by oblique illumination, which renders them far more brilliant and effectively photographed.

* * *

Red Light for Smallpox. Dr. Finsen, the discoverer of the arc-light cure for lupus—which has proved to be so efficient at the London and other hospitals—advocated ten years ago a method of treating small-pox, which, for some unknown reason, has never yet been put to actual test in this country, although it has been practised with signal success in other lands. The treatment is of the most simple kind, and consists in handling the patient as if he were a photographic dry plate. That is to say, the light entering the room where he lies is carefully filtered through red medium, so that no actinic rays can reach him. A writer in *Chambers's Journal*, commenting upon this method of treating small-pox, remarks, "Simple though it be, its efficiency can no longer be doubted, for in no single case where it has been tried—and it has been tried in hundreds of cases—has the patient died; in no single case has the patient had the disease severely, nor has it disfigured him. This is a point on which Continental doctors are all agreed." It was long ago discovered that, in cases of small-pox, access of light was distressing to the patient, and so the custom arose of keeping him in darkness. But this caused mental depression, and the remedy was voted worse than the disease. Dr. Finsen found by experiment that if the light were deprived of its chemically active rays by being filtered through a red medium, the patient greatly benefited, without any counteracting disadvantages. Curiously enough, the remedy is by no means a new one. It was practised in the thirteenth century, when one John Gaddesden, a physician, attended a son of Edward I. who was suffering from small-pox, and, as part of his treatment, wrapped his royal patient in red cloth, and placed him in a bed with scarlet hangings. As neither red glass nor ruby medium was procurable at that date, the good doctor could not shut out all white light, but he did his best with the materials available. We are not, however, told whether the prince benefited or not by the course pursued. It is also on record that certain Italian doctors used, in the past, to prescribe this red light treatment for those suffering from small-pox. But they had to give up the practice, for they were denounced by the church on the score, we may presume, that red light was suggestive of a reflection from the infernal regions. Our doctors would run no risk of such an insinuation in these more tolerant times, and Dr. Finsen's remedy should be tried, and tried without delay. Unfortunately there is ample opportunity for the experiment, more than fifteen hundred small-pox patients being at the present moment in the hospital ships on the lower Thames. It would be easy enough to fit the small windows of one of these vessels with ruby screens, and it would then become evident if the high opinion of this red light treatment which is held on the Continent is justified by results. The undoubted success of the lupus cure should secure for Dr. Finsen a fair trial of his method of combating another terrible form of human malady.

* * *

Electric Light Dangers. The use of the electric light in photographic studios and reception rooms is now so general that it is as well that those who employ it should be warned against certain dangers attending its use which, possibly, they do not suspect. We are not now referring to the arc-light, but to the innocent-looking glow lamps which are used in all kinds of positions, and very often as much for decorative effect as for the purpose of illumination. When the Savoy Theatre changed its old lamps for new ones—it was, we believe, the first theatre to adopt electricity—the late Mr. D'Oyley Carte gave a demonstration on the stage to convince his patrons of the safety of the glow lamp. He purposely broke one lamp after another to show that the white-hot filament immediately became inert and harmless. This widely-published experiment gave the public confidence in the new lamps, and they naturally, but erroneously, assumed that the glow lamp, like the glow worm, represented a source of light destitute of heat. Many years have elapsed since this public demonstration, and the glow lamp has become so common that people know more about its little ways than they knew then. It probably represents the safest mode of artificial illumination known, provided that its fittings and wiring are faultless, and that the glass bulbs are kept from too near an approach to inflammable substances. We remember one occasion upon which a photographic visitor to an hotel tied a red silk handkerchief round the glow lamp which he found in his bedroom, so as to improvise a non-actinic lantern by which to change his plates. A strong smell of burning quickly apprised him that something was wrong, and in less than three minutes that handkerchief was charred through beyond redemption. A writer in *Cassier's Magazine* usefully calls attention to fire risks of a similar nature, as evidenced by experiments carried out with an ordinary 16 candle-power glow lamp. A lamp of this type, which was allowed to rest against a vertically placed white pine board, made a distinct brown mark on the wood at the end of four hours. A piece of varnished oak similarly placed with regard to the lamp was blistered in three minutes, and blackened in a quarter of an hour. With a lamp encased in two thicknesses of muslin, the material was scorched in one minute, gave off smoke in three minutes, and with access of air burst into flames. If a lamp is laid on inflammable material the action seems to be more intense, owing, it is supposed, to the weight of the glass. A newspaper was in this way charred in three minutes, and ignited in forty-five. A lamp immersed in half-a-pint of water caused that water to boil within an hour. Cotton-wool wrapped round a lamp behaved like the silk handkerchief already adverted to; it first scorched, and subsequently became ignited. Celluloid will deflagrate in less than five minutes after contact with a lamp bulb. Any of these experiments can be repeated without difficulty by those who have the current laid on to their premises, and we have no doubt at all that the results will be the same, provided that lamps of the same power are employed. The lesson to be learnt from them is obvious; each lamp should be well isolated from all draperies and other inflammable articles.

* * *

Becquerel Rays. We prefer to retain this title for those mysterious radiations or emanations, particulars with regard to recent discoveries in connection

with which we have from time to time communicated to our readers, for the earliest possible investigations in regard to actinic radiations from dark substances are connected with this eminent name. A week or two ago Professor Henry Becquerel lectured at the Royal Institution before a brilliant audience on the theme of these invisible radiations, his discourse being, in fact, a sort of official announcement in this country of the marvellous discoveries comparatively recently made by him in conjunction with Mons. and Madame Curie. What they have discovered, in fact, is that a mass of uranium possesses the property of giving off radiations of some sort,which act in many respects similarly to the Röntgen rays, they being capable, for example, of producing a skiagraph of bones through the flesh, and so forth. Madame Curie was led to conclude that the mysterious power might more probably lie in some hitherto unknown substance, associated with that element, and eventually she discovered two new elements, one of which, from its possessing this radiation power, has been named radium, and the other, in honour of the lady, who is a Pole —Polonium. One of the most remarkable properties of these bodies is that they appear to realise the dream of perpetual motion, for their photograph-producing power seems to remain indefinitely attached to them. The Curies are not the only investigators in this still mysterious field, and we would direct the attention of our readers who are interested in the subject—and what photographer can fail to be,—to a paper in the April journal of the Chemical Society,* in which Mr. J. E. Rutherford Macdonald, Professor of Physics, and Mr. Frederick Toddy, B.A. (Oxon), Demonstrator in Chemistry, Mc Gill University, Montreal, give an account of their investigations of the radiations from Thorium. It is impossible in these pages to give the paper in extenso, but we may briefly state the nature of the radiations, the investigations upon which are described fully in the journal referred to. "It was shown by one of us that the compounds of thorium, besides being radio-active in the same sense as the uranium, also continuously emit into the surrounding atmosphere under ordinary conditions something which, whatever its real nature may be, behaves in all respects like a radio-active gas. This 'emanation,' as it has been named, is the source of rays which, like the Röntgen and uranium rays, and the ordinary well-known type of thorium radiation, will darken a photographic plate, but is sharply distinguished from them by the following considerations: It can be moved from the neighbourhood of the thorium compound by a current of air passing over it, or even by the process of ordinary gaseous diffusion, and transported long distances, so that the characteristic photographic and ionisation effects appear in the air far away from the original source of radio-activity. The Röntgen and uranium rays, as is well known, travel in straight lines from their source, and any object opaque to them, interspersed in their path, will sharply screen the space behind. But in the case of the thorium and radiation there is no such screening effect." The paper goes on to show that "one of the most striking properties of this thorium radiation is its power of exciting radio-activity on all surfaces with which it comes into contact." We have quoted sufficient to show the marvellous properties of these new powers, and we feel assured that as the investigations proceed their purely photographic interest will greatly increase.

Peterborough was visited by the South London Photographic Society during the Easter holidays, fine weather and good leadership combining to make the trip most enjoyable for the 13 members and friends who took part in it.

* Journal of the Chemical Society, vol. lxxxi., p. 321 et seq.

CAMERAS FOR USE ON THE CYCLE.

The beginning of a new season invariably finds us in the position of being able to chronicle some improvements in that class of camera to which reference has already been made in a recent issue—the camera, that is to say, which is designed for the use of the occasional amateur and the man who cycles. It would almost appear that in the matter of hand cameras and apparatus of the class designed, for use with a shutter, and built on the small scale, ingenuity could hardly go further. The changing mechanism of such cameras is, for the most part, very efficient and reliable; the lenses also, even of those whose price ranges at or about the sum of a guinea, are, if one is not hypercritical, quite satisfactory, inasmuch as they cover well and give good definition, besides being rapid enough for all average purposes. Fault has been invariably found with the shutter supplied with such cameras, which until quite recently was incapable of giving an exposure between a tenth of a second, and time. We handled a series of new cameras recently, and found all the shutters designed to work from, approximately, one second—a vast improvement. When to this is added a simple system of bringing into position, by turning a screw, a series of magnifiers whereby objects at close quarters can be sharply delineated, and merely hinting at higher finish and a lighter construction of camera body, it is clear that our apparatus makers have not lain fallow during the dull season, nor have they remained unappreciative of the criticism which we, *inter alia*, have made from time to time, and as experience dictated.

The practice of combining photography with the cycle is one of those particularly good ideas more honoured in the breach than in the observance—even by photographers who are cyclists. The reason is, we think, not difficult to find, and it is that the camera is, as at present mainly constructed, so much a separate part of one's cycling paraphernalia, that it requires more than ordinary enthusiasm on the part of the rider to ensure its accompanying him oftener than upon very occasional runs. The class of camera and how to carry it are matters which require solution every day of a new season; in all such cases personal experience counts for a great deal. Considerations of weight and bulk are all-important. The tendency of all cycle makers is towards a short, compact frame and narrow tread; therefore an old and favourite position on and behind the handle bar is now no longer available as a place whereon to hang a camera. One of our most successful seasons, judging by the total of negatives, was one during which a leather case was kept, *permanently attached* to the handle-bar of machine; the camera, a Kodak, loaded with film, was dropped in preparatory to a run, and was ready for use as occasion arose. The idea of carrying the camera in this way was to make it as much a part of the cycling outfit as the tool-bag or the cape. Even though upon the way no view presented itself worth the delay and trouble of an exposure, no inconvenience resulted, the presence of the camera did not interfere with one's enjoyment of the ride, the weight was hardly noticeable, the case could be locked and left with the machine, and there was always the comfortable feeling that if something good turned up in the way of a picture, the apparatus was ready for use. Unfortunately for the uniformly successful results of the system, the roads were not always of the best, vibration at times was excessive—sufficient upon one occasion to cause the film to unroll itself into the body of the camera; at least, that was the charitable explanation of the catastrophe. Plates and films are alike liable to disarrangement under the excessive vibratory strain, and the element of uncertainty which, after one or two experiences of this

kind, is thus let in is so destructive of one's peace of mind that sooner or later the camera is discarded.

Cameras are frequently carried long distances upon a "Turner" carrier, which fits behind the saddle and over the back wheel—and presumably with fairly satisfactory results; this is a capital place for the camera body (of course, with all these fittings, etc., on the back wheel forks, it is not advisable to think too much about punctures!), but the *slides and contents* are liable to come to grief, cracked plates are by no means a rarity, and, as usual, it is the most important negative which suffers. By pumping the tyres hard we guard against punctures, but increase the tendency to jolt and jump on the part of the machine. The position is all right for the *camera*, but the slides ought to be packed in another place; the difficulty is, where? Now, many readers, old cyclists, will remember the bulky and ponderous old lamps of the eighties. The lamp bracket would be a capital place on which to suspend in a spring carrier similarly to the ordinary lamp the slides or a small camera; the weight would not probably exceed that of one of the old lamps referred to, and the lamp itself might be, as it frequently is, placed lower down on the front fork. The carrier made by Messrs. Beck is designed to reduce vibration to a minimum, but is in rather a prominent position as at present arranged; it would look better lower down, and attached to the steering pillar. Magazine cameras and others may be conveniently carried on the back of the rider for short distances. One advantage of this method is that you can *feel* that all is right with the "works," sudden jerks being avoided, but when riding over a railway crossing one occasionally hears and feels an ominous click which suggests the falling of a plate out of its turn; this may be only imagination, but it is disconcerting, and often leads to trouble. After all, the ideal camera for cycling is the one which is made to fold into such small compass that it will go into the pocket. The cycling coat is, or should be, loose and roomy as regards pocket accommodation. It would be, of course, expecting too much of the average cyclo-photographer to suggest that he should leave his cigar case at home to make way for his camera, or to subject it to the same vibratory influence which is often considered good enough for the apparatus; but, as a matter of fact, it is easy enough to arrange for a bag (a large tool bag) into which most of the small oddments which find their way into the pockets may be placed. It is quite clear that somewhere on the person of the rider is the safest place for the apparatus, the slides or the film-holder at the least. If a folding camera is chosen, the bulk is not greatly beyond that of a well-filled cigar case, and with the mind set at ease by the knowledge that the camera is safe, the rider has the more time and inclination to look out for subjects. Naturally a film-holder would be the best arrangement as regards the sensitive material carried, though slides carrying films are small and thin, take up little room, and may often be divided amongst one's friends. In any case, room can easily be found in the pockets for at least one spare spool.

It is easy to make a mistake upon the matter of size of picture; in most cases a picture measuring three inches in its widest part is large enough for enlargement to modest dimensions, and if the intentions of the worker run in the direction of possible lecture sets, the small picture is within limits the better, and easier to work. When photographing therefore *en cycle*, and with a view to lantern work, cameras might very well be chosen of a size smaller than they usually are. Although complimentary remarks have been made above regarding the ingenuity displayed by our apparatus makers, it would appear that many of them still err on the side of strength and bulk. Stability is requisite, of course, but in order to take a picture which shall measure three inches square, is it really necessary to provide a box of a capacity equal to two hundred and fifty cubic inches? A folding camera reduces this to about twenty-eight—which is a vast difference. There is one possible objection to carrying the camera on the person, and this is if the weather be warm, and rain comes on, the cape thrown over the shoulders, and the ride continued, as well may happen when on tour, and it is necessary to get on, the camera is very soon subject to the baneful influences of a hot steam bath. Knowing the sensitiveness of film to, not only light, but *warmth and damp*, one would not reasonably expect a spoolful of exposures to turn out so brilliantly in the developer as they otherwise might do. The objection, it may be remarked, is put forward simply because such a condition once prevailed in our own experience, and might easily occur in the future.

In the matter of selection of a camera for use in the hand and for the special purpose above referred to, a word may be put in with regard to the lenses sometimes supplied with them. The beginner and amateur are often tempted with the apparatus fitted with a rectilinear lens; the camera looks very neat and serviceable, there is a focussing movement, and diaphragms a very taking set, and cheap—apparently. But it is well to know and remember that a lens may be a rectilinear, and still be far from rapid, also that it may be merely a periscopic lens of no more value than the single lens of the cheaper camera, and possibly not so useful all round. We have handled such a camera, and found the lens as stated, with the full aperture barely *f*20. This is a long way off the rapid standard. Such a lens may very properly be put down, from the purely beginner's point of view, as practically useless. It is advisable to purchase from makers of standing therefore, or to have a clear specification or warranty that it is, if a rectilinear, a double achromatic combination, and with a speed value of at least *f*8. Such lenses are plentiful, and not necessarily expensive. When working with hand cameras, a spirit-level is almost a *sine quâ non*; this is particularly so when working with rectilinear lenses, with which class of lens, by the way, some extraordinary examples of distortion may be got. This leads us to another matter, that of tripods. The failures met with by many young workers are often the result of under-exposure, and this as often as not by reason of the selection in unsuitable light of objects close in. The case of the cyclo-photographer is often this—that he rides merrily on through sunshine with mind intent on the dozen or so of views which he knows are to be had; arrived at his destination, the sun disappears behind some clouds, only to reappear at long intervals. Obviously *snapshotting* is a risky business under such conditions, but if the camera can be steadied in any way so that an exposure of half a second or so can be given without the possibility of movement during the same, it is not necessary to return without some fair results. The new slow-moving shutters to which reference has been made will ensure that a full exposure is possible under all conditions of light—but the camera must be steady meanwhile. A method of supporting the camera suitable for most purposes out of doors is one which we used and described a few years ago; it is the employment of a small metal camera holder which is screwed to the handle-bar; it has a ball and socket joint and a few inches of rise and fall. A light bamboo rod is supplied with it (for this is now a marketable commodity), one end of which is attached to the steering head of cycle; the other end is dropped to the ground, and serves as a fixed support to

the machine while the camera is adjusted and levelled on its support. The arrangement is simple and easy to use, adds little weight, and is not in the way, requiring no particular trouble in fastening or in its adjustment. Such a contrivance is a great improvement upon the ordinary tripod, which, if made of the required lightness and attenuated dimensions, has to be strapped on to some part of the cycle (where, if it does not work loose, it will be in the way), and, worst of all, it will be costly, and probably far from steady when erected.

Briefly then the camera for the cyclist is a folding one carrying rollable film or cut celluloid films in thin slides, the lens to work at *f*8 at least (if there is any stopping down required, the user should do it), shutter working from a slow movement, apart from time, equal to about a second, the camera to be fitted with one or two circular spirit-levels. Valuable accessories are the tripod arrangement described and something which may be used as a portable dark chamber, viz., a changing bag. Cyclists will all agree that the paraphernalia to be carried on the "bike" should be kept within the most reasonable limits, and with regard to a *changing bag* there is no reason whatever why, when the waterproof cycling cape is already a part of the outfit, and contains within itself all the elements of the article required, this should not be utilised, and made to do duty. Every hand camerist should be so thoroughly conversant with the internal arrangements of his apparatus that he can, in the dark, and by the sense of touch only, remedy any slight defects, or, at the least, change his plates. This is not really so difficult as it appears to be, only requiring a little method and careful attention; at all events, it is worth the trial, and the accomplishment may be useful at some unlooked-for moment. We have personally distinct memories of certain stables, dim lobbies, and badly-lighted coffee rooms where, aided by a cycling cape and a bit of string, advantage has been taken of exceptional weather, and negatives secured which otherwise would have been lost by lack of opportunity. Finally, it must be said that magnifiers have proved of great service to the amateur and the worker whose means are limited, and it is probable that the next improvement will be a "telephoto" attachment which will prove another "string to his bow," and at a price equally as moderate as that of the "magnifier." Truly the hand-camerist is well catered for!

Leicester Literary and Philosophical Society, Section for Photography.—A lecture was given by Mr. D. A. Nightingale last week on "Negative Making; a plea for Selection of Developer to suit the Subject." This closes by far the most successful season this society has experienced.

A Correction.—On the 7th February we published an account of Dr. Eugen Englisch's experiments concerning the over-exposure of bromide dry plates, and the periodic recurrence of darker bands in the descending series of gradations. By a printer's error the weight of the metre of magnesium ribbon was given as 63 grammes instead of .63 gramme. Mr. A. Levy pointed out this mistake in the letter which we published on the 21st February, and by desire of Dr. Englisch, to whom we express our regret, we again draw the attention of our readers to the fact.

The Cantor Lectures at the Society of Arts.—Professor R. T. Glazebrook will deliver a course of four lectures on "Glass for Optical Instruments," commencing on Monday, April 14th. The meetings commence at 8 p.m. Lecture I.—April 14th.—Optical images, their nature and formation; reflexion and refraction; prisms and lenses; conditions required; spherical aberration; astigmatism; focal lines; chromatic aberration; achromatism; distortion; the refracting substance; glass and its manufacture up to 1882. Lecture II.—April 21st.—The microscope; simple theory; conditions of problem; direct refraction; spherical aberration and its correction; chromatic aberration and its correction; secondary and tertiary spectra; the dispersive constants of glass; modern glass. Lecture III.—April 28th.—The photographic lens; simple theory; conditions of problem; oblique refraction; astigmatism; coma; chromatic aberration; distortion; dispersive power and refraction; modern glass. Lecture IV.—May 5th.—The telescopic objective; conditions of problem; photographic objective; telephoto lens; materials other than glass; line of future advance; modern glass-making; tests of optical glass; nomenclature.

STEPS: FROM A BUSINESS POINT OF VIEW.

Houses with steps leading up to their front doors are healthier than those without. If statistics were collected in each case, and compared, it would be found that there is not only less illness, but also that spirits are higher, and life longer, in the former than the latter. The retort might certainly be made that it is naturally the healthiest who would have the margin of strength necessary to climb the steps and the hill-sides upon which high-perched houses are found. Still the fact remains, let cause and effect arrange themselves as they may. The same applies to the photographer in his town studio, necessarily high placed to catch light. He is better off than workers in other directions on the street level. The consideration should add somewhat to the measure of his philosophic content. At the same time, it must be admitted that, in general, steps, or even a step, are not regarded as an advantage in business premises. On the contrary, every effort is made to do away with them People were either stronger in past days to mount steps, or there was more individuality about the shopkeeper and his wares that overbore their disadvantages. The forces that have planed down business individuality to the present-day orthodox level have also planed down the steps—or at least reduced them to as little appreciable a grade as possible. In the country it is in many cases possible for the photographer to be in line with his fellow tradesmen in doing away with steps. The studio can be in the open garden, with a pleasant flower-bordered and aromatic pathway leading to it. But they are the exception, and it is to the general run of town studios at the heads of staircases that we would refer. The necessary steps are a business drawback to all customers, especially so to weak and to stout people. On the face of it, it seems a condition of things that must be accepted as irremediable. When looked more closely at, however, the problem is not so hopeless. The actual height of the studio cannot be altered, but its apparent height to a hesitating customer looking up the staircase can. Now, most people will be ready to admit, as the result of their every-day experience, that there are stairs and stairs. One flight is attractive, and the other is not. They would prefer going up and down the one twice over to going up the other once. In what does the superior attraction lie? Being intent upon practical hints that can be carried out without any great expense, we must leave important structural considerations out of the question. Otherwise, we might point out that the most important high qualities are shallow steps and frequent broad landings.

As existing premises cannot be taken down and re-built for the sake of the studio at the top, we must accept the staircase as it is, and as being of the ordinary type. In the first place, it is eminently important to have plenty of light falling upon it. If an additional window can be got for the purpose, it will pay well to get it. Where impossible, existing light should be given the best possible chance, by light and airy paper or paint. Most staircases have a window at the top, the centre panes filled up, as a rule, with orthodox transparencies of mediæval scenes, or saints, and the smaller side panes glazed with deep blue or red. Too much light is absorbed, and what passes through is of the wrong colour. The scheme being to produce a light and an airy effect, and so a cheerful acquiescence in the step-mounting in the mind of the customer, everything should fall in with it. The saint's true place is in a church window; the mediæval scene or group in that of the ancient country seat. Both are out of place in a window at the head of a commercial staircase. Transparent positives of local scenes might with advantage be substituted by the photographer himself. They will more readily claim the interest of the climber, and tend to make him forget the steps. They might, in addition, be made

to add to business, for many customers have windows in their own houses looking out upon adjoining roofs and tiles. The borders of red and blue glass should also be taken out, and replaced with canary-coloured. This gives a much cheerier light, and produces in dull weather a sunshiny effect. Having admitted as much light as possible, it should not be allowed to disclose dust and dirt.

It may seem unnecessary to call attention to such a fact, but all who have to do with stairs know well the attraction they have for dirt, and how difficult it is to keep them clean. Many, if not most, of the customers are ladies, and, naturally, dressed in their best for the occasion. The disagreeable dread of soiled skirts should not be added to the inherent drawbacks of the stairs. Not the least of these drawbacks to timid and elderly folks is the dread of slipping and falling. To overcome this, mat-surfaced indiarubber treads to the stairs would give the confidence of a secure foothold. A hand-rail would add to it in a firm hand-grip; not the usual banister rail, so broad and highly polished as to be of more ornament than use, but one that can be easily and effectively gripped. The brass tubes, 2in. or so in diameter, fitted at the sides of companion-ways in ships, are very suitable for the purpose, having doubtless been evolved as the best under the difficult conditions of step-mounting and descending upon the yielding foundation of the sea. It may appear a bit far-fetched to go so far, but it depends upon the point of view. That of the alert young man about to confidently descend a flight of steps is different from that of the portly matron with a skirt and a couple of children to attend to as well, or of the heavy-weight of the opposite sex, who has not seen his boots when walking for the past ten years. Yet both the last have money to spend in photographs, probably more than the smart young man. Then there are such things as rheumatism, sciatica, anæmia, and so on, afflicting those whose avoirdupois is normal. All would welcome firm and secure hand and footholds. As it must be a long staircase—as well as a lane—that has no turning, and in the former a landing at it, it should be made as far as possible an agreeable break. A vase of fresh flowers or a case of ferns is very grateful; so is a pretty picture, or, better still, the offered comfort of a chair. Finally, and as the most important point of all, it is most advisable to go up and down, wherever possible, with the customer. A little cheerful conversation, with a light apology, suitably introduced, for the stairs, mentioning their inevitability, and why, in town studios, will reduce the length and steepness of any staircase. The attention will be appreciated, the aid of an arm to an elderly man or woman, or a hand to a child, still more so. Indeed, there are so many possibilities in this direction that we are almost inclined to say that a man gifted with common-sense, and the saving touch of a slight courtliness of manner to appropriately carry off the practical expression of a kindly disposition, might find a flight of stairs not a detriment, but a powerful aid, to business.

Astronomical Photographs.—Professor E. C. Pickering announces that he has received from a friend a gift of $20,000 (£4,000)) for the benefit of the Harvard College Observatory. It is proposed to expend about one-half of this fund in extending the present building in which the astronomical photographs are kept, so as to provide for the adequate storing of this collection with its probable increase for many years. These photographs furnish a history of the entire stellar universe for the last twelve years, and is not duplicated elsewhere. A portion of the remainder of the gift will be used at once to provide for the study of objects of interest on the photographs, as hitherto only those of special importance have been examined.—"Nature."

Royal Photographic Society.—On Tuesday, April 15th, Mr. S. Aitken, F.R.G.S., will lecture upon "The first ascent of Mount St. Elias," and show slides by Signor Vittorio Sella. On Tuesday, April 22nd, Dr. T. Charters White will read a paper upon "Photomicrography," and show slides. The meetings commence at 8 p.m. Members may introduce two visitors. The exhibition of photographs by Mr. C. Yarnall Abbott, of Philadelphia, is now open daily from 10 to 4 at the society's house.

INCIDENTS OF DEVELOPMENT.

I do not think photographers, as a rule, give much thought to the chemical actions which ensue when a developer is brought into action upon a gelatino-bromide plate. Even those amateurs who have studied chemistry are apt to be somewhat appalled by the enormity and complexity of the empirical formulæ of the complex organic bodies, the substitution compounds and derivations and their many-sided actions. The pictorial worker can, perhaps, afford to trust to the developers prepared for him, and let their chemical relations go; but the technical photographer should try to follow what takes place.

The action of light upon the plate is a reduction process, we say; then the action of the developer is a continuation of this. There is, first, a rapid oxidation and a liberation of nascent hydrogen. We get hydrobromic acid formed and free silver precipitated in the film, and after fixing we have purely silver, and the silver bromide is gone, practically.

The Determination of Developing Power by Ferments on the Polyphenols.

Some time ago there was shown a new method by which we might test the relative positions of the substituents in aromatic compounds and test them also as to their developing powers.

In connection with this it is interesting to note the actions of some of the ferments, as the polyphenols and their derivatives.

Bertrand in 1894 published a paper upon oxidases or soluble oxidising ferments. His view was that the ferments, as Lacasse suggested, might be used as a test for the developing powers of the polyphenols.

We know that hydroquinone, Pyrocatechin, and resorcin are isomeric, and although hydroquinone is a powerful, and Pyrocatechin a fairly powerful developer, resorcin fails to lay its claim to that property.

If one of these strongly oxidising ferments, then, be brought into a vessel containing quinol and closed there, it is found after a while that all the free oxygen has been absorbed. In the case of quinol and resorcin:—

C_6H_4 OH (1), OH (4) — 32 *cc* of O absorbed in 4 hours. Paramidophenol.

C_6H_4 OH (1), OH (2) — 17·4 *cc* of O absorbed in 4 hours. Orthodiphenol.

C_6H_4 OH (1), OH (3) — $\frac{16}{10}$ *cc* of O absorbed in 15 hours. Metamidophenol.

Then, again, with phloroglucin no oxidation took place, though with pyro, its isomer, there was oxidation:—

C_6H_3 OH (1), OH (3), OH (5) — Phloroglucin.

C_6H_3 OH (1), OH (2), OH (3) — Pyrogallic acid.

But not only do we get oxidation here, but M. Bertrand shows that we may test by replacing the hydroxyl by amidogen. Thus:—

C_6H_4 NH_2 (1), OH (4) — (Oxidation.) Paramidophenol.

C_6H_4 NH_2 (1), OH (0) — (Scarcely any.) Metamidophenol.

C_6H_4 NH_2 (1), NH_2 (3) — (Scarcely any.) Metaphenylene diamine.

C_6H_4 NH_2 (1), NH_2 (4) — (Oxidation.) Paraphenylene diamine

The formulæ are a little confusing to follow, but the chemical student will, no doubt, see the drift of the experiments.

To the investigations of Andressen and Lumière Bros. we

are now indebted for much light thrown on the organic developers of aromatic series, and it is they who have evolved for us the law that all disubstitution products of the benzene series containing two hydroxyls, or two amido groups, or one HO and one NH_2 are developers, provided these groups stand either in the ortho or para positions with relation to each other. Thus we have methyl-o-amidophenol (ortol), methyl-p-amidophenol (A's metol), and the homologous kresol compound (Hauff's metol).

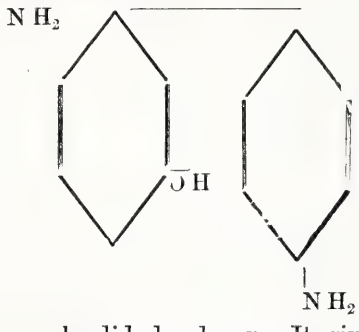
Diphenyl.

Then we have a remarkable developing agent not too well known amongst pictorial workers—diphenyl, or diamidodioxy-diphenyl. It was found after a while, in the course of phenolic substitutions and derivations, that ethyl ethers of the benzonaphthols or oxyazobenzene are converted into semidene on subjection to reducing processes, and acid reduction of the other bodies converts them into diphenyl bases, of which the developing agent in question is one, that is, by the acid reduction of the acetic acid-tester of oxyazobenzene, the acetyl group being split off, forming hydrazobenzene. Roughly, thus:—

$$N_2 \begin{matrix} C_6H_4OC_2H_3O_2 \\ C_6H_5 \end{matrix} + H_4 = \begin{matrix} NH-C_6H_4OH \\ NH-C_6H_5 \end{matrix}$$

$$\begin{matrix} NH-C_6H_4OH \\ NH-C_6H_5 \end{matrix} = \begin{cases} NH_2-C_6H_3OH \\ NH_2-C_6H_4 \end{cases}$$

or by the graphic formula:—



Diphenyl is a splendid developer. It gives clear negatives, with plenty of density, and allows a good deal of latitude—in fact, so much so that it is especially a suitable re-agent for over-exposed plates. It is particularly free from fog, and gives a beautiful range of gradation and decided softness. One part of the developer should be used with about twenty parts of water, and for over or under exposure more or less water accordingly.

FREDERICK GRAVES.

PORTRAITS FOR THE STEREOSCOPE.

THERE is no question that the stereoscope is again coming into favour, and no greater proof of that is needed than the number of new stereoscopic cameras that are being put upon the market just now. When the instrument was all the rage and at the time when, according to a then popular advertisement, there was "no home without a stereoscope," a considerable business was done in stereoscopic portraits. Many of your older readers will remember the very beautiful stereoscopic portraits by the daguerreotype process produced by the late Messrs. Claude, T. R. Williams, Kilburn, Mayall, and others, in London, and by other photographers in most of the large cities. The glass positive process was also largely used for stereoscopic portraits, and very excellent they were; for it must be borne in mind that the positive process as worked by skilful photographers in the fifties was quite a different class of picture from what is produced by the process at the present time. Indeed, both the positive process and the Daguerreotype were better suited for stereoscopic portraiture than were the paper pictures of that period, the slightly albumenised paper of the time being very granular. With the rising popularity of stereoscopic pictures of landscapes, there is very little doubt but that they will become equally popular for portraiture, if portraitists will only give attention to the subject.

APPARATUS FOR STEREOSCOPIC PORTRAITURE.

No special apparatus is necessary beyond what is to be found in most studios. Those portraitists who are not familiar with stereoscopic photography will do well to study the subject before they begin taking stereoscopic portraits, or they may not succeed in producing pleasing pictures. One point is the stereoscopic angle—the distance apart from which the two pictures are taken. For landscapes, the distance at which the two lenses are apart varies from 2⅜in. to 3in. But if such a separation be adopted for portraits, it will be much too great for the pictures to be satisfactory—the relief will be too much to be natural. The separation of the lenses should not exceed 2½in., or less than that if the camera is approached near the sitter. For small sizes, in the studio, portrait lenses are usually employed, and if we take a pair of these we shall find a difficulty in fitting them on the front of the camera with their centres only 2½in. apart. Let us take, say, a pair of what are known as "No. 1 carte" lenses, or their equivalent, "quarter-plate" lenses; we shall find the glasses to be from 1⅝in. to 2in. in diameter, and, with the setting and flanges, about 3¼in. Now it is manifest that in these circumstances the centres cannot be arranged sufficiently close together. It is true that a-quarter of an inch or so may be cut from each of the flanges to get the lenses nearer together, but that is not enough. Hence, we must employ lenses with smaller diameter, and that means, with those of the portrait type, shorter focus, which is very undesirable.

We may, it is true, employ lenses of the "R. R.," or those of the newer types, but, for studio work, they do not find, for the smaller sizes, much favour amongst professional photographers. We have just referred to the very beautiful stereoscopic Daguerreotypes that used to be taken in the days of yore, and, we may mention, they were mostly taken with a single-lens camera—the camera being moved laterally (between the two exposures) the necessary distance to secure a natural effect when the pictures were viewed in the instrument. In this way the two pictures can be taken any distance, however short apart, whatever the diameter of the lens, or its focal length, may be. A very simple way to take stereoscopic portraits with one lens is to fit it on a half-plate camera, with a sliding front and a diaphragm in its centre; then, when the first picture has been taken, to slide the front forward the desired distance, which may be regulated by a stop-piece, and then make the second exposure. It may be urged that by the use of a single-lens camera there would be the risk of movement of the sitter between the two exposures, but with the present rapid plates that is very remote. In the old days, when the exposure ranged from fifteen seconds upwards—often very much upwards—little difficulty was met with from this source. With the present plates it may be reckoned as next to *nil*. Anyhow, I would strongly advise such portraitists as are looking out for novelties to introduce in their businesses to give attention to portraits for the stereoscope, as I am sanguine that they will eventually be in demand.

J. R. HOPWOOD.

FULHAM Public Libraries.—Free Lectures.—The Public Libraries Committee has arranged for the following lectures to be delivered at the Town Hall, Walham Green, on Tuesday evenings during April, 1902. Each lecture will commence at 8.30 p.m. and will last about one hour. April 15th, "A Reading From Dickens," by Mr. C. Stuart-Barker. April 22nd, "Photography in Natural Colours," by Mr. J. W. Hinchley, A.R.S.M. (with lantern illustrations). April 29th, "Goldsmith," by Mr. E. Avern. Admission is free.

THE LIMITS OF VISION.

Has the power and range of human vision changed at all with the lapse of years? (asks "The English Mechanic"). Do we, as the result of long training, see further and clearer than did our first ancestors upon the earth, or has the power and penetration of our sight deteriorated, as have certain other of our bodily attributes, in the modified conditions of modern civilisation? The question is a not uninteresting one—albeit hard or well-nigh impossible to answer. Curiously enough also, what evidence can be adduced in the matter, from history and tradition, appears strangely contradictory and variable. Thus, according to Humboldt, the Arabs of olden days were accustomed to regard as a test of good vision the small attendant star hard by the middle star in the tail of the Great Bear, known sometimes as "Jack by the Middle Horse," in allusion to the local name conferred on the constellation of "Charles's Wain." The Arab title of this tiny star is "Saidak," or the test. Nowadays, however, no one of average sight has any difficulty whatever in distinguishing it, from whence the hasty conclusion might be gathered that we have fair proof that the power of human vision has become augmented. On the other hand, it is, of course, equally possible that it is the brightness of the star, or its distance from its companion, which has increased within historic times rather than range of vision, and this argument is borne out in several ways. The discovery and recognising as a planet, centuries before the Christian era, of Mercury, which, being never far from the sun, must always have been a difficult object, especially for systematic observation, proves the astronomers of early days to have been fully as keen-sighted as their modern descendants. Again, to those who know exactly where to look for it, and are familiar with its appearance in a telescope, the famous nebula in Andromeda is just fairly visible with the naked eye; nevertheless the ancients were well acquainted with it hundreds of years before the telescope had been invented. A much more remarkable fact, however, having bearing on the subject of human vision is connected with ancient observations of the planet Saturn. The rings of this body, as is well known, are to be distinguished only through a fairly powerful telescope, and are far beyond the range of the unaided eye under all present existing circumstances. In the ancient Chaldæan mythology the planet Saturn was associated with the deity Asshur or Nisroch, and it is, to say the least, a most remarkable and strange coincidence that in Assyrian sculpture this god is represented by the figure of a man encircled by a ring. It is hard indeed to escape the conclusion that by some means the Chaldæans were aware of the peculiarity which distinguishes Saturn from all other planets; and, although it is certainly possible that 4,000 years ago the ring system was more visible than now, it is equally certain that unusually keen eyesight must have been necessary to perceive it, even in the clear skies of Chaldæa.

Naturally, the clearness of the atmosphere is the greatest factor in the case of long-range vision, and it is in the purer skies of other climes, or upon very rare occasions in our own land when exceptional weather conditions have prevailed, that instances of phenomenal far-seeing have occurred. Humboldt assures us that mountain air in certain regions under the Equator is so transparent that in the province of Quito the white cloak of a horseman has been distinguished with the naked eye at a distance of 89,664ft., or very little short of 17 miles. Again, on the American prairies, it is said that the packed cumulus clouds of distant thunderstorms, brooding over the plain, may be sometimes seen on the horizon 200 miles away. Such long shots do not come our way in misty England, and it is only what we might expect to find that it is in the pure air aloft, and from the imposing height of a high-flying balloon that English records of naked-eye vision have been obtained. Possibly one of the best and most comprehensive views ever witnessed on these islands was enjoyed by Mr. Glaisher, the aëronaut, when riding some four miles high over London. On this occasion, the observer could see not only the whole coast line of England to south and east, distinguishing clearly the towns in Thanet, Brighton, Dover, and Deal, but Ipswich was also in view, and even the sea beyond Yarmouth, distant nearly 120 miles away. Another history of a "far sight" seen in England, though equally true, must be referred to a different category. In the year 1798, on the afternoon of a summer's day, hundreds of people hurried down the beach at Hastings to witness before them the whole opposite coast of France, from Calais to Dieppe, clearly defined, and apparently but a few miles to sea. The cliffs and shores on which they gazed in astonishment were certainly there, and yet, on the other hand, they were as certainly invisible. Thirty miles of sea separate Hastings from the nearest point of the French coast, and owing to the convexity of the earth, the foreign shore must be wholly invisible. The explanation of this seeming contradiction is, of course, that it was a case of mirage, rarely indeed visible in our own land, though often met with in desert country or in the Arctic regions.

It is a matter of general observation that our atmosphere becomes more transparent when charged with moisture, much as a piece of paper becomes more transparent by being wetted. Far-seeing is therefore more common in unsettled weather, and this fact is borne out in the familiar saying of "The farther the sight the closer the rain." Another well-known effect of moisture-laden atmosphere is the way in which distant lights may be reflected in the sky from the watery particles in suspension to very considerable distances. On certain occasions the glare of the furnaces in the Black Country may be most plainly discerned in the night sky fully 50 miles away. The shimmer of the North Foreland Lighthouse can sometimes be easily traced at twenty-five miles distance, and when so seen, the night watchmen round the coast prophesy stormy weather. In like manner, the inhabitants of Chiswick, Berkhampstead, and other towns round London regard it as a bad forecast when the reflected lights of the Metropolis are much in evidence on the horizon. In proof that reflected light may be visible at almost any distance, it is only necessary to point to the outer members of the Solar System whence the light of the sun is returned us from thousands of millions of miles away. In like manner great spaces of country have been covered by the heliograph. In the Waziri Expedition of 1881 communication was maintained across an interval of seventy miles, and it is stated that on an occasion when the signalling light was thrown upwards upon the clouds, messages have been read over as much as one hundred and ninety miles of country. How far the powers of human vision may be increased by optical aid is a question yet to be decided. Mechanical improvements have lately made practicable the manufacture and mounting of giant telescope glasses, the mere making of which was formerly considered an engineering impossibility, and as far as actual handiwork is concerned, there seems no reason why lenses considerably larger than the largest in present use should not presently be turned out. The limits in the direction of the making and using of large telescopes are really physical ones which no amount of human skill is likely to surmount. For the grinding of large lenses, glass of a proportionate thickness must necessarily be employed, and with the increased thickness of glass comes naturally the increased absorption through it of the light, so that presently what is gained in one direction is lost in another. This difficulty of absorption is of course obviated when the giant lens is replaced by the giant mirror. Yet a worse difficulty remains, for which it seems impossible to conceive a remedy. The wider these giant eyes looking out into space the clearer and less disturbed must be the atmosphere through which they peer. Already the purest air of the prairies and mountain heights have been found scarcely good enough to employ to full advantage the great glasses now in use. Here, at least, we find a very real and impassable limit.

CHEMISTS AND THE SALE OF POISONS.

According to our contemporary, "The Pharmaceutical Journal," a long discussion took place on the Sale of Poisons at the last meeting of the Edinburgh District Chemists' Trade Association.

Mr. Boa said they had recently heard a good deal about the sale of poisons, and he was inclined to think that they were sometimes in danger of doing things which were prejudicial to their own interests. The Legislature had put upon them the responsibility of the sale of poisons. They were, therefore, charged with a certain duty to the public. In the first place, they had the sole right to sell poisons. In the second place, they had a duty to sell poisons in such a way as to secure the safety of the public. In the third place, he did not think they had a right to put any unnecessary restrictions on the public receiving such poisons as they wished. They had no right to refuse to supply, say, one pennyworth of laudanum or chloroform. They ought to assume that the person who asked for the poison was sane, unless there was some obvious evidence that there was some-

thing wrong. The object of the poison regulations was to see that poisons were sent out in such a way as to prevent any disastrous results in their use. They were not justified in refusing to supply. They were, in a sense, like a hotel-keeper, who was licensed to sell liquor, and must supply it on demand. There was a tendency sometimes, he thought, to make unnecessary objections in the selling of poisons required for remedial purposes, or for use in the arts. The consequence was that there was apt to be on the part of the public a demand for greater facilities. They should always remember that the object of the regulations was the safety of the public, and not mere restriction of sale. The public, or at least a large proportion of them, were now much more highly educated, and a plan that worked well enough twenty years ago was often entirely out of date. For example, a person applies to a chemist, say, for perchloride of mercury. If the person is unknown, the chemist cannot sell. But an effort should be made in such cases to make it easy for persons to get what was wanted. It was not right merely to turn them away by saying the law did not allow one to sell to a stranger. They might be able to get someone to introduce them if a little trouble were taken. Unless that was done, persons who had been in the habit of being supplied without difficulty where they were known, who really wanted the poison for a legitimate purpose, were apt to be aggrieved, and begin to want facilities for being supplied elsewhere. They would see what attitude he thought they should take up in regard to poison regulations. There were other points on which he thought they should be careful. He referred to the use of the poison bottle. He had seen laudanum sent out in a poison bottle, and bearing a glaring red label. He thought that was wrong, and did away with the main object of the poison bottle, as well as the red label, which was to emphasise the difference between internal and external remedies. Many of these practices were, of course, adopted from fear of coroners, who very frequently treated chemists in a very unjust manner. He thought that when those individuals offended in that way, as they often did, the Pharmaceutical Society should call them to book. He thought it was the duty of the society to protect its members against the unjust aspersions that were sometimes cast upon them in this connection.

Mr. Henry said he agreed with Mr. Boa. They had delegated to them the selling of poisons, and it was right that they should supply them, and there should be no excuse for anyone wishing to go elsewhere. Mr. R. L. Hendry said if, say, a young lady asked for one drachm of corrosive sublimate, would they be justified in supplying it? Several members said certainly, if she was known to him. Mr. Forret said he agreed with Mr. Boa. He did not think they were entitled to refuse to sell under ordinary circumstances. They were the legal sellers of poisons, and if applied to were bound to supply what was wanted, unless, of course, there was some obvious reason to the contrary, if the purchaser was uncertain as to how the poison was to be used, or in the case of children. He very frequently sold perchloride of mercury, both to professional and amateur photographers. Mr. Bowman asked what kind of bottle should be used when two ounces of laudanum was ordered with directions to take twenty drops as a dose, and also directions to put a tablespoonful in a poultice. Mr. Boa said he thought in such cases two bottles should be used, one labelled "twenty drops for a dose," the other, which might be a poison bottle, labelled, "A teaspoonful to be added to the poultice." Mr. Forrest said that was an example of a very dangerous form of prescribing, which they sometimes came across. Mr. Brown, West Calder, said he had recently had a case in which three ounces of laudanum had been prescribed for a woman to be used for external application to a bad leg. It was put in a poison bottle, and labelled laudanum in the usual way. The woman brought it back, and said there must be something wrong, because the wrong dose was on the label. It was the ordinary laudanum label that had been used, with the dose twenty-five drops printed on it, and she had been told to use a much larger quantity for the external application. Mr. Blenkiron said it was a common thing for dentists to order one ounce of laudanum to be used as a mouth-wash. Did the regulations require that that should be put in a poison bottle? This question gave rise to considerable discussion, in which a very clear difference of opinion was revealed as to whether a mouth-wash could be spoken of as an application for external use. Some maintained that it must be regarded as an internal application, while others maintained that internal applications were those only which passed into the stomach. The point was left undecided. The general opinion was that the laudanum should be sent out in a plain bottle.

Mr. Brown said he would like to ask a question about the sale of arsenic for use in sheep dipping. Farmers very frequently strongly objected to having it coloured. He would like to know if it could be sold uncoloured in large quantities. Farmers complained because it was proposed to colour it, and declared that they could get it elsewhere uncoloured. Several members said it could be sold in quantities of not less than 10 lbs. without colour. It was pointed out, however, that that concession only applied when the arsenic was "Not for use in agriculture," and that, therefore, it must always be coloured when sold for sheep dipping. The chairman and Mr. Macpherson argued that sheep dipping did not come within the meaning of the word "agriculture." An interesting debate took place on this point. It was argued that though, strictly speaking, the rearing of sheep was not agriculture, it must be intended to include that in the Arsenic Act, 1851. That Act was intended chiefly to regulate the supply of arsenic for sheep dipping purposes, and it must be assumed that the Legislature had the purpose in view when passing the Act. It was pointed out that if agriculture did not include sheep dipping then that would have a very far-reaching effect on the application of the recent order scheduling liquid preparations of carbolic acid. Many preparations of carbolic acid were sold for use in the treatment of animals on farms, and if that did not come within the words "agricultural purposes," they would all be poisons, which could only be sold by registered chemists, and must be labelled poison. In the discussion, the order scheduling carbolic acid was strongly condemned as entirely illogical and absurd. The looseness of its provisions in regard to the sale of so deadly a poison as carbolic acid was contrasted with the stringent regulations governing the sale of arsenic.

Mr. MacPherson said he agreed with Mr. Boa. They should avoid unnecessarily restricting the sale of poisons. They should be guided by the Act, and its provisions and regulations should be liberally construed Unless there was some distinct objection it was but right that they should supply any poison that was required by the public. In regard to articles in Part I. of the Schedule they should be sold in strict conformity with the conditions imposed. There had been many illustrations of the dangers attending a loose observance of these precautions. The case of Dr. Lamson was one in point. He was supplied with aconitine across the counter merely on his own representation that he was a medical man. It was a large firm who supplied him; had it been a smaller man he would probably have been severely handled by the coroner. With regard to the poison regulations generally, there were many points on which they were rather puzzling, and he thought they very much required to be overhauled by some competent person. But so long as they remained, they should be complied with. For instance, they might sell laudanum itself in a plain bottle; but if they made a lotion containing a small quantity of laudanum in water, they must put it in a poison bottle and mark it not to be taken. Then, in the case of carbolic acid, they might send out the 90 per cent. liquefied carbolic acid in a plain bottle; but if they sent out a carbolic lotion with more than 3 per cent., it must be in a poison bottle and marked not to be taken. Pure carbolic acid did not even require to be labelled poison. He thought all that was most absurd, and should be rectified. Mr. Boa spoke about not putting obstacles in the way of educated people, but they could not legislate exclusively for educated people. One law must apply to all. The ignorant and prejudiced comments of coroners, who were often very bumptious, was a sore point, and did much injury unjustly to chemists and druggists. He was not sure if the Council could do much. Perhaps a timely letter from Mr. Bremridge now and again might do good by way of restraint.

Mr. Hill said three points had been made clear in the discussion. In the first place, it was the duty of legally authorised poison sellers to keep a stock of such poisons as were required by the public in the district in which they were located. He did not think they were bound to sell these poisons to all who applied. That was left to their discretion as trained sellers. But if they refused to stock any of them the public would seek to get their wants supplied in some other way. In the second place, there was room for taking particular care that in all cases the existing provisions of Section 17 were carefully attended to. He referred more particularly to the supplying of articles coming under the restrictions of Part I. of the Poison Schedule. In the third place, it had come out very clearly in their discussion that the moment they began to apply practically the mechanical restrictions on the sale of poisons embodied in the clauses of an Act of Parliament or in regulations passed pursuant to the Act they landed in difficulties, impracticabilities, and absurdities. He was convinced that it was utterly impossible to lay down, in any Act of Parlament, the detailed conditions that must be applied to all sales of substances deemed to be poisons. The attempt to do so frustrated the very purpose of such precautions, and made them ridiculous. All experience proved this to be so. The true and only efficient line of policy was to make certain that the persons entrusted with the distribution of poisons to the public, for any purpose whatsoever, were duly trained, and possessed a competent practical knowledge. All merely mechanical restrictions should be reduced to a minimum, and the sale carefully restricted to the properly qualified persons. Each trained seller should be left to exercise his own judgment and discretion as to the best precautions to be adopted in each particular case. Experience had shown that that was the only real way of avoiding difficulties and securing the safety of the public. It was also the only safe way in which needless interference with the adequate supply of public wants in the matter of poisons could be obviated. There was a natural tendency to think that imposing statutory mechanical restrictions was a safeguard against accident, but experience proved that that was an entire mistake. The proper education of the authorised seller was the only true safeguard. In any attempt to overhaul the existing

regulations this point should be kept steadily in view. No more mechanical restrictions should be introduced. The existence of the present ones was a standing obstacle to the extension of the efficiency of the poison schedule.

PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

At the general meeting held at 66, Russell Square, on Friday, April 4th, Mr. Thomas Bedding, F.R.P.S., occupied the chair.

The hon. sec. read letters received from Messrs. W. Crooke, F. A. Bridge, Lambert Weston, and others who were unable to attend.

The chairman said that on the card calling the meeting there were two subjects set down for discussion: (1) Fire insurance rates and (2) the relationship of this Association towards copyright and the Copyright Union.

Fire Insurance.

The assistant secretary, Mr. E. W. Simmons, having read letters that he had received from several members, specifying the rates they were paying, Mr. R. Lang Sims followed with an account of negotiations he had carried on with the Sun, Phœnix, Guardian, and the State fire offices. In all the letters he had received from them the fact was pointed out that it was difficult to quote a general standard rate because of the different circumstances in which each studio might be situated. Some had businesses of a risky character underneath, while others did not, and so forth. There was a tendency, however, to offer special terms. Mr. Sims said that the Guardian office, with which he insured, had quoted a lower rate than that he was then paying. The Sun office, which was first approached, said that it was impracticable to quote an uniform rate that would be acceptable in all cases, as the degree of hazard varied so considerably. They had to assess each case on its own merits. The Phœnix office was prepared to quote 3s. per cent. to firms of good standing, subject to the buildings being of first-class construction and free from any surrounding hazard affecting the rate. They reserved the right, however, to decline individual cases. The suggestion was also made that the business of members of the P.P.A. should be transacted through the Association's secretary, or other officer, who would be regarded as an agent, and receive the usual commission. The Guardian office wrote that if a large proportion of the members insured with them they would accept such insurances, subject to the absence of any internal hazard greater than that of photography, at 3s. per cent. minimum. They could not quote a hard and fast rule, however. Here, also, it was suggested that the business should come through the Association's official, who would be regarded as an agent of the company. The State office promised careful consideration to each case, and a quotation as low as possible in accordance with the risk. It was suggested that an agent should be nominated by the Association, to receive commission on the business done. Mr. Sims thought that on the basis of these letters the Association would be able to report something definite at no distant date.

Mr. Alfred Ellis (hon. sec.), said he had gone into the matter of fire insurance when moving into his present premises, and after some trouble got the matter divided into three sections. The building itself, and, in case of fire, the rent and rates, were insured, at 2s. 6d. per cent. The plate-glass windows, show-cases, etc., at 4s. 6d. per cent. The furniture, fittings, stock, lenses, cameras, and, practically, all movable plant, was also insured at 4s. 6d. per cent. The negatives were insured at 5s. per cent., but no claim on any one negative could exceed two guineas. He had great difficulty in getting the offices to take this negative risk at all, but when they found that his books were kept by accountants, who could prove the earning value of every negative in the place, they accepted the insurance at once. This was a very important point. Unless a man were in a position to refer to some reliable authority as to the value of the negatives from a money-earning point of view, he would have great difficulty in getting them insured at anything above sixpence or a shilling a-piece. The best way, perhaps, in which to proceed was to go to a good agent and let him worry round for quotations from various offices. The office he insured in was the Commercial Union, and the negative insurance was based on the value of re-orders.

Mr. Martin Jacolette urged the keeping of separate books for re-orders, so that the insurance might be based upon a proper estimation of value. He insured in the Royal office at 5s. per cent., an all round rate, covering negatives as well, but giving him only £1 as the maximum recoverable in respect of a single negative. It struck him that the offices were only feeling round, judging by the differences in the rates that had been quoted. He thought that with Mr. Sims's information some uniformity might be arranged in regard to the rates.

Mr. Hallier said he insured fifteen years ago in the London and Lancashire office, at just under 4s. per cent., covering negatives as well; but no one negative could recover more than 1s. The quotation was an old one, and one to which he had given little attention. He thought, however, that the question of fire insurance rates deserved inquiry.

Mr. William Grove said he paid 7s. 6d. per cent. for the same block in which Mr. Elliott paid 10s. 6d. per cent. He had tried to get a reduction of the rate, but unsuccessfully. The office was the Commercial Union, and a limit of £2 2s. was placed upon any one negative.

Mr. Ellis said that he insured negatives on a seven years' average of earning life. Thus negatives older than seven years drop out of the estimate, although, if destroyed, of course, compensation could be claimed.

Mr. H. J. Dalby said he had policies in the Royal, Guardian, and Kent offices. In the Kent he insured £925 for £1 3s. 3d., £500 for 15s. in the Guardian, and in the Royal at 3s. 6d. per cent. It seemed to him that his premiums were at least as low as any offered to Mr. Sims, and he therefore thought that, while they appeared to be magnanimous, they were nothing of the kind.

The chairman said that here the question of the premises came in. Their situation, of course, influenced the rate.

Mr. Dalby, continuing, said that it was impossible to expect an uniform rate for studios. For instance, a factory might be insured at a certain high rate. Now, if a studio were built on the top of the factory, the rates would be equally high. Everything depended on locality and surrounding hazards. He went on the principle of putting one office against another, and commended the suggestion to others.

It was eventually agreed that the committee should be asked to codify the information received, and to act as they might consider desirable in the circumstances. It was also agreed that members should consider themselves invited to supply particulars of their own policies to the committee.

The P.P.A. and the P.C.U.

The chairman raised the question of the position of the association with regard to copyright and the Copyright Union. He said, that in the course of the association's short career, the committee had received a number of inquiries from members upon copyright matters. Some of the inquiries had been answered direct, and some had been referred to the Copyright Union. It had been felt by some members of the committee that the association was perfectly competent to answer the questions that had been addressed to the committee, to give advice and information on the subject of copyright, but at the same time it was recognised that there was in existence the well-established, worthy, and useful body, known as the Photographic Copyright Union, which, for the last seven years, had done good work in defending the copyright interests of photographers. The general feeling was that while the executive of the association did not wish in any way to clash with the Copyright Union or to interfere with the very substantial and useful position which it had won for itself and occupied now, yet as the principal body, representing professional photographers in Great Britain and Ireland, the association should not be altogether inert in regard to these matters of copyright. The committee, therefore, sought some expression of opinion from the members for their guidance in taking up the exact position to be occupied. The question was, whether the P.P.A. should or should not act as a source of information on matters of copyright, or whether it should seek to co-operate with or become affiliated to the Copyright Union.

Mr. Lang Sims said that the Copyright Union had expressed sympathy with the movement which had produced the Professional Photographers' Association, and disclaimed any antagonism.

Mr. H. Walter Barnett thought the P.P.A. should regard is as a duty to support the Copyright Union, in the same way as it should support the Royal Photographic Society.

Mr. Jacolette said that a great deal was due to the Copyright Union for the valuable work they had done. There was no reason why they should be antagonistic, and he favoured some form of harmonious co-operation or affiliation, which, he hoped, might some day result in the Copyright Union being absorbed by the P.P.A.

Mr. Alfred Ellis foresaw the time when, if the association took up the duty of advising upon copyright matters, the work of the secretary would be very considerably increased. Speaking for himself, he worked for the same object on the Copyright Union Committee, and he did not wish to do the same thing over twice. There were, however, many simple questions on copyright which could be dealt with by the association, but he thought that if the party seeking information were a member of the Copyright Union he should go there for his answer. Of course, the association could not take up any legal action on copyright matters; it was too expensive. His idea was to advise a member of the association, but go no further. In conclusion, he urged members always to write direct to the secretary, and not the solicitor, unless as a matter of business. The practice was an inconvenient one, and he could not forward letters to the solicitor, as he had been asked, without instructions from the committee.

It was agreed that the committee should be asked to consider the suggested issue of a certificate of membership to members of the association.

A vote of thanks to the Royal Photographic Society closed the meeting.

Professional Photographers' Association.—At the committee meeting held on Friday, April 4th, the following gentlemen were elected members of the Association:—Messrs. J. H. Napier (Messrs. Edwards and Co.), 7, Upton Lane, Forest Gate, E., and Robert William Simmons, 26, Dominick Street, Galway, Ireland.

THE PHOTOGRAPHIC EXHIBIT AT ST. LOUIS WORLD'S FAIR, 1903.

[For the appended copies of correspondence on the above subject we are indebted to Mr. J. C. Strauss.

St. Louis, U.S.A.,
January 29, 1902.

Dear Sir,—I would be very glad to see you at your earliest convenience in regard to a photographic exhibit. Some correspondence with you relating to same has been handed to me, and I will be glad to have you call so that we can talk the matter over.—Thanking you for the interest you have taken in this phase of the Exposition, I am, yours very truly,

(Signed) J. A. OCKERSON,
Chief of Department.

Mr. J. C. Strauss,
City.

St. Louis, U.S.A.,
February 6, 1902.

Col. Ockerson.

My Dear Sir,—Yours relative to photographic exhibit for our World's Fair duly received. The committee appointed by the Photographic Association of America has done considerable work among the foremost photographers, not only of this country, but also of Europe, and particularly in Great Britain. Great interest has been aroused, as is demonstrated by the mass of correspondence in my possession, but it will be utterly useless to endeavour to obtain any displays from the recognised leaders in our work, the world over, if their productions are to be regarded only as mechanical products or of mechanical processes. They are willing to subject their exhibits to the critical judgment of competent artists (not photographers). There should be a division of photographic displays; one, of the commercial side, including apparatus, materials, processes, etc., the other the Art side. The two are wholly distinct. This subject is too important and too big for a letter. If you would find it convenient to step in my studio, we could go over the matter very carefully, and I could give you evidence of the work done to advertise our Fair among photographers.—I remain, yours very truly,

(Signed.) J. C. STRAUSS.

St. Louis, U.S.A.,
February 8, 1902.

Mr. J. C. Strauss,
3,514, Franklin Avenue,
City.

Dear Sir,—Your communication relating to photographic exhibit has been received and read with much interest. I shall take an early opportunity to call and talk the matter over with you. Until then, I beg to remain, very truly yours,

(Signed) J. A. OCKERSON,
Chief, Department of Liberal Arts.

St. Louis, U.S.A.,
February 26, 1902.

Col. Ockerson,

My Dear Sir,—In my first letter to Governor Francis, with reference to our World's Fair Photographic Exhibit, I claimed that the plan suggested by me would arouse interest in every part of the civilised globe. Here's another document in evidence, on the prophecy made by me. This letter came to-day all the way from Australia. Do you think the members of any craft (other than photographers), residents of the South Pacific, have any direct knowledge of the St. Louis World's Fair? Or have announced an interest in its exhibits? Or have taken official action with reference to same? Will you be in the City towards end of coming week? It is quite possible a number of prominent photgraphers may be in St. Louis about March 8th to 10th, and I would be pleased to arrange a conference with you.—I remain, yours very truly,

(Signed.) J. C. STRAUSS.

Enclosure, letter from South Australia Photographic Society, Adelaide, New South Wales.

St. Louis,
March 19, 1902.

Col. John A Ockerson,
Chief, Liberal Arts.

My Dear Sir,—"It is a fair cry" from the American Institute of the City of New York to the Camera Club of Nelson, New Zealand, but the prayer from both is for the recognition of photography. Certainly, a communication from American Institute is entitled to consideration from those in charge of classification of our World's Fair. Some of the most successful and instructive photographic salons ever held have been within its halls and under the auspices of the Institute. It was one of the first of the prominent organisations to reorganise and encourage the development of the Art element in camera work. Among its active members are some of the most advanced and justly-famed amateur photographers. But none of these people, whether they are in New York or in far away New Zealand, will be represented at St. Louis in 1903, unless you can arrange to place their productions in the Art Building. Please place these documents with others submitted.—Yours very truly,

(Signed.) J. C. STRAUSS.

Enclosure, letters from American Institute, New York, Camera Club Nelson, New Zealand.

St. Louis, U.S.A.,
March 20, 1902.

Mr. J. C. Strauss,
3,514, Franklin Avenue,
City.

Dear Sir,—Yours of the 19th, relating to photography, with enclosures from American Institute of the City of New York and your New Zealand correspondence, has been received and carefully considered. I hope you will appreciate the fact, that, personally, I will be very glad to meet the wishes of the photographic fraternity. I doubt, however, if anything can be done that will change the decision already made to leave all phases of photographic work in the Department of Liberal Arts. As soon as the matter takes definite shape as to what will or will not be done, I will promptly inform you. In the meantime, I thank you for the interest you are taking in the matter, and trust that I may have your co-operation throughout.—Very truly yours,

(Signed) J. A. OCKERSON,
Chief, Department of Liberal Arts.

St. Louis, U.S.A.,
March 31, 1902.

Mr. J. C. Strauss,
3,514, Franklin Avenue,
City.

My Dear Sir,—In thinking over the situation as to photography, it occurs to me that the photographers are taking entirely the wrong stand in their claim of "photography in the Fine Arts Building or nothing." Now, in the first place, as I understand it, photographers wanted to flock entirely to themselves and put up a building of their own, at their own expense, in which should be housed everything pertaining to the photographic profession. It was not then considered out of place for the artistic photographer to touch elbows with so-called commercial branch of photography. Why should it be more so if housed in a group of the Liberal Arts Building? Under existing conditions, would it not be best for the photographers to take the ground, that they will prove themselves equal to the emergency, and will not be smothered out, but will club together and will prepare a place in the Liberal Arts Building for their art work that will establish, beyond a doubt, their claim to a high position as a fine art? Get up something that will make the Fine Arts Department "green with envy." By this means you can establish your position before the world and set the question as to your rights for ever at rest. Your art is evidently still in a transition state. You are making giant strides towards greater perfection every day, and no man can yet say where the end will be. It strikes me that it would be very undignified and unworthy of your exalted profession to stay out of the Exposition because you cannot get all you want. That it would be far better to raise a fund to fix up a gem of a place in the Liberal Arts Building according to your own ideas and plans, and fill it with pictures that will challenge the skill and the admiration of the old school artists who hold that fine art is confined exclusively to work done with the brush and the chisel. Challenge them in this way to measure lances with you, and I am confident that in the end you will be more than glad that you did not yield to the first impulse to hold aloof. To this very laudable end I pledge you all the assistance in my power. Trusting that you and your associates will come to see this matter in the light set forth in the above lines, I beg to remain, yours very sincerely,

(Signed) J. A. OCKERSON,
Chief, Department of Liberal Arts.

St. Louis,
March 22, 1902.

Col. John A. Ockerson,
Chief of Departments Liberal Arts,
City.

My Dear Sir,—I am indeed pleased to receive your letter of the 21st inst., because it evidences a decided interest in the photographic display, and it is gratifying to know that you regard an artistic exhibit one to be desired. However, the premise on which your argument is based is in error as to some points of fact. The subject of the proper representation of Art in Photography at our World's Fair was first suggested in a letter written by me, last July, to Governor Francis. The essential points in the plan outlined by me were:—

"Have a pavilion devoted exclusively to pictures produced by

photography, provided same give evidence of artistic feeling. The display of pictures should be along Salon lines, that is to say, only such should be exhibited as are considered worthy by a competent committee of artists, not photographers. No distinction to be made between amateurs and professionals."

You will see that the request made last July, and it was encouragingly received by Governor Francis, was identical with that now made, except that some months later the executive committee of the Exposition rejected the "separate pavilion" idea on the ground of cost, and we have since substituted "Art Building for Art Photography." At no time did the association of America, or any other body of photographers, offer to pay for the pavilion. The entire letter to Governor Francis was published in the "Globe Democrat," of July 16, 1901. I wish to call your attention to some of the statements therein made by me:—"In recent years portraiture by photography has successfully invaded Art realms and commanded recognition by Art critics, as far above and beyond the mechanical in processes and in results." That this was and is true is proven by the actions, to which your attention has been diected, of the Boston Museum of Fine Arts, Pennsylvania Academy of Fine Arts, Department of Fine Arts, Glasgow Exposition, American Institute, New York City, Art Institute of Chicago, "International Studio" (periodical), "Brush and Pencil" (periodical), and by the further fact, that at the photographic salons, held in London, New York, Philadelphia, Chicago, and San Francisco, "old school artists" (to quote your words), who formerly contended "that fine art is confined exclusively to work done with the brush and the chisel," were the judges to decide which photographic productions were entitled to Salon honours, because of "distinct evidence of individual artistic feeling and execution." You will concede that there is an immense distinction between photographers clubbing together, fitting up a section in the Liberal Arts Building, proclaiming themselves and their work as the "real thing" in Art, and the other condition:—The recognition and the heralding forth to the world, by the Louisiana Purchase Exposition, the greatest of all World's Fairs, that photography is a fine art. This recognition is what we are striving for. Let this be granted, and I am quite confident photographers would willingly spend money to make the setting for their display worthy of the Fair and fine art surroundings. There is one more point, in the letter to the Governor to which I will direct your attention:—

> "The clerical and detail work of giving this feature the widest, most general publicity, would be conducted by the photographers of this country. Through their efforts, and that of photographic periodicals, the St. Louis World's Fair would become advertised in every town of any consequence on the globe, and gain the enthusiastic support of more individuals (amateur photographers) than would result from any other contemplated display. The universality of the camera has caused nearly every person in the more enlightened countries to have a lively interest in photographic productions."

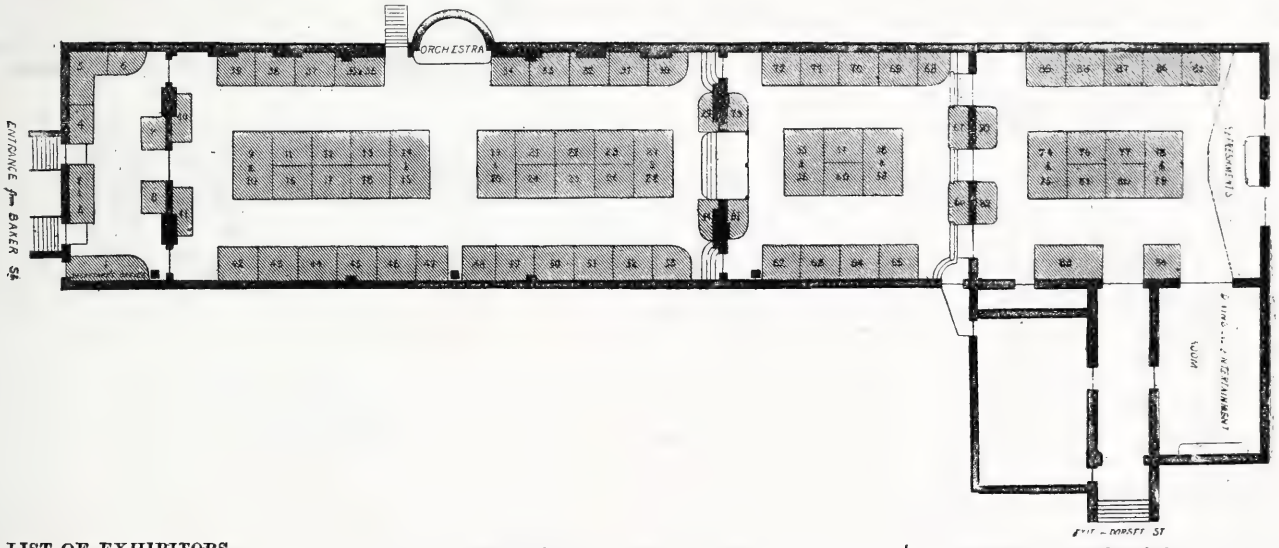
Much of this has already been proven true, as documents submitted to you attest, and all my predictions will be realised if photography is recognised as an art. So, with the kindest of sentiments for you personally, and appreciating your efforts in this matter, I must still contend that the only decision which will command the enthusiastic support and co-operation of the advanced camera workers, is the acquiescence in the demand, "Art Building for Art Photography."—Yours cordially,

(Signed.) J. C. STRAUSS.

Exhibitions.

THE PHOTOGRAPHIC AND OPTICAL TRADES EXHIBITION.

WE append the plan, with lists of names, of the stalls at this Exhibition, which opens to-day, Friday, April 11, at the Portman Rooms, Baker-street, London, W., and continues so for the following week:—



LIST OF EXHIBITORS.

1. The Secretary's Office
2 and 3. Kamm & Co.
4, 5, and 6. Seabrook Bros. & Co.
7. The Bayer Co., Ltd.
8. Theobald & Co.
9 and 10. R. & J. Beck.
11 and 12. Marion & Co.
13. J. Ashford
14 and 15. Thornton Pickard Manufacturing Co.
16. Staley & Co.
17 and 18. D. A. Lowthime
19 and 20. W. Butcher & Sons
21 and 22. David Allan
23. Iliffe & Son
24, 25, and 26. Houghton & Son
27 and 28. H. F. Purser
29. Aerograph Co.
30. Spratt Bros.
31. Burroughs Wellcome & Co.
32. A. C. Jackson
33. J. E. Lockyer
34. F. H. Taylor & Sons
35, 36, and 37. Columbia Optical and Camera Co.
38. Marion & Co.
39. Johnson & Sons
39A. Albu & Sons
40. Chas. Zimmerman & Co.
41. C. P. Goerz
41A. Rogers & Webster
42. Dawbarn & Ward, Ltd.
43 and 44. Chas. Tyler and England Bros., Ltd.
45. W. D. Welford
46. Rotary Photographic Co.
47. H. W. Cox
48 and 49. J. Levi & Co.
50. Hazell, Watson, & Viney
51. T. P. Bethell
52 and 53. O. Sichel & Co.
54. Brooks-Watson Daylight Camera Co., Ltd.
55 and 56. Benetfink & Co.
58 and 59. Gaumont & Co.
62. O. Scholzig
63. Rosenberg & Co.
64. C. T. Mayer
65. Thomas & Co., Ltd.
69. Clement & Gilmer (London)
71. A. & M. Zimmerman
72. J. Lizars
74 and 75. G. Culver, Ltd.
77. Marshall & Brookes
80. Anglo-American Co.
83. J. J. Griffin & Sons, Ltd.
86. Gee & Watson
87. C. Harrison
88. Lambert, Matthews, & Augte. Romanet
89. Watson & Sons

PAISLEY.

THE sixteenth annual exhibition of the members of the Photographic Section (formerly the Paisley Photographic Society) of the Paisley Philosophical Institution was opened in the Observatory Hall, 28, Oakshaw Street, Paisley, last Tuesday, and will remain open till Saturday, April 12. Admission is free, and the large attendance of visitors shows the widespread interest now being taken in photography by the general public. The number of works shown is slightly less than that on the walls last year, but this shortage is accounted for by the absence of the loan collection, a feature at previous exhibitions. This absence does not in any way detract from the undoubtedly high standard of the work. Quite a number of large works are forward this year, proving that the magnificent enlarging lantern of James Coats., Esq., of Ferguslie, has not been idle. The general verdict of even the most casual spectator cannot be otherwise than that the exhibition is of a highly successful character, and reflects credit on everyone who has in the least way contributed towards it. It must also be a revelation to many as to the capabilities of the camera in the produc-

tion of pictures, when it is used by one who is in sympathy with nature. The Rev. John Crouch, the enthusiastic president, in declaring the exhibition open, criticised the Paisley Corporation's action in proposing to charge for the electric lighting had the exhibition been held in the Museum Hall as formerly. The following is the complete list of awards:—

Class A1.—Photographs (any subject or process; size, whole plate and above): (1) Robert Milne, (2) David Ure, (3) William Hutchison.

Class AB.—Photographs (any subject or process; size, half-plate and under): (1) Robert E. Glasgow.

Class B.—Novice Class (any subject or process): (1) David Carmichael; (2) Robert E. Glasgow.

Class C.—Hand Camera Work: (1) David Ure, (2) William Hutchison.

Class D1.—Set of Six Photographs taken at Glasgow 1901 International Exhibition: (1) Robert Milne.

Class D2.—Six Slides of Photographs taken at Glasgow 1901 International Exhibition: (1) William Hutchison.

Class E.—Lantern Slides (in sets of six) any subject: (1) David Ure, (2) T. H. Taylor.

Class F.—Photographs previously shown, whether winners or not: (1) Robert Milne.

The gentlemen who kindly undertook the duties of making the awards were Messrs. Cameron Todd, and Archibald Watson of the Glasgow and West of Scotland Amateur Photographic Association. Might we suggest that in future competitions the awards be made to individual prints and not to sets, as has been done? This would, we are sure, encourage the members to give every print the attention it should have, and obviously help towards a still higher standard of work.

New Books.

Round About Grantown. By J. W. Batchan. Thirty-two pages; price 6d. Published by the author, at Stanley Lodge, Ravensbourne Park, Catford, S.E.

This is an illustrated description of one of the health resorts of the Scottish Highlands. "Situated on a plateau at an elevation of some 750 feet above sea level, surrounded on all sides by health-giving pine forests, and the mighty Grampian Range in the immediate neighbourhood, it has one of the driest atmospheres in the Highlands, the rainfall being considerably less than that of Deeside." The views and portraits in the book are the work of the author, a well-known professional photographer, and they stamp him as an extremely able master of his work. Tourists from this side of the Tweed should "ear mark" the brochure for consultation when the lassitude of late summer induces aspirations after "mountain, moor, and loch." We note that Mr. Batchan has recently commenced business at Catford in technical photography, negative making, lantern-slide work, printing and enlarging. To quote from the preface to "Round About Grantown": "I undertake all kinds of photographic commissions, including portraiture, landscape work, enlargements, etc. The growing importance of photo-mechanical process work has induced me to add this branch to my business, and the blocks illustrating this work, which are exclusively produced in my own studios, from my own photographs, will serve as specimens of work done in this department. Photographic copies of these originals in various sizes, as also of many other views of places of interest in Strathspey, may be had." Mr. Batchan's great and obvious abilities in portrait, landscape, and group photography should assure him a career in the Metropolis, and we hope to hear of his success.

Mawson's Catalogues. Gratis. Published by Mawson and Swan, 11 and 15, Mosley Street, Newcastle-on-Tyne.

The abridged price-list of photographic apparatus and material issued by the well-known north-country house extends to over a hundred pages. It forms an excellent purchasing guide for amateur and professional photographers, to whom the high reputation enjoyed by Messrs. Mawson and Swan should be a guarantee that the requisites issued by them for practical work with the camera are good and reliable. A little pocket note-book for recording exposures should be found serviceable for jotting down the essential data that should be available before development is commenced. A third of the series gives developing formulæ, useful hints and notes, and instructions for the production of transparencies. It has eight half-tone illustrations. The following exposure table for use with Messrs. Mawson's plates is given:—

"Mawson's	'Lantern'	1
,,	Photo-Mech	1
,,	Half-Tone	8
,,	Ortho. B	15
,,	Ortho. A	45
,,	Castle	20
,,	Electric	40
Mawson		60

"With regard to the orthochromatic, the increase of exposure with the yellow screen must necessarily vary with the character of the subject and the screen, but about 30 times the exposure required without a screen may be taken as an average." This batch of Mawson literature is obtainable free on application. It is full of "pointers" to photographers of all sorts and conditions.

A New Catalogue. Published by the Thornton-Pickard Manufacturing Company, Altrincham, Cheshire.

The twelve beautiful half-tone illustrations from negatives made with the justly-renowned Thornton-Pickard apparatus are alone worth the postcard, in return for which the company undertake to send the applicant a copy of their spring catalogue. This is an effectively bound and well printed book of 60 pages, relating to the company's apparatus, many specimens of which have lately been reviewed in these pages. As a catalogue of special productions in cameras and their appurtenances the book before us has peculiar claims on the attention of would-be converts to the charms of photography; whilst old stagers are equally sure to appreciate it. We extract the following terse and informative hints on instantaneous photography:—"Successful instantaneous photography is easy and simple if a little care and judgment is used in observing the necessary points that apply to this kind of work. The most essential conditions are: Good light; a rapid plate; a shutter having a high co-efficiency; as full an exposure as the movement of the subject will allow; a suitable lens; slow development with a very dilute developer when the plate is much under-exposed. For instantaneous subjects as long an exposure should be given as the subject will allow. This depends on the rate of motion and the distance from the camera, both of which affect the movement of the image on the plate during the moment of exposure. To find the exposure required for a moving object. This may be obtained simply as follows: The distance of the object from the camera, measured in inches, must be divided by the number of yards per hour at which the object is travelling multiplied by the focus of the lens in inches. The result will be the fraction of a second, which is the longest allowable exposure that does not show movement in the resulting picture. Putting this into a simple formula, we get

$$\text{Exposure In fractions of a second.} = \frac{\text{Distance of object from Camera in inches.}}{\text{Yards per hour} \times \text{focus of lens in inches.}}$$

For example: Suppose the object is 50 feet from the Camera and the focus of lens 6 in., while the movement of the object is at the rate of 12 miles per hour, we get

$$\text{Exposure} \frac{50\text{ (feet)} \times 12\text{ (reduced to inches}}{12\text{ (miles)} \times 1{,}760\text{ (yds. in a mile)} \times 6\text{ (ins. focus).}} = \frac{600}{126720} = \frac{1}{211}$$ of a second (about)

This does not allow for movement of limbs, etc., which are always more rapid than that of the object itself, and a shorter exposure will be necessary in consequence; on the other hand, if the object is not moving broadside to the camera a longer exposure is allowable. Below is given a table showing the correct exposure that should be given for various moving objects. The table is made out for a distance from the camera 100 times that of the focus of the lens: that is, for a 6in.-focus lens at 50ft., a 7in. at 58ft., an 8in. at 67ft., a 9in. at 75ft., or 12in. at 100ft.:—

	Towards the Camera. Secs.		At right angles to the Camera. Secs.
Man walking slowly, street scenes...	1-15	...	1-45
Cattle grazing	1-15	...	1-45
Boating	1-20	...	1-60
Man walking, children playing, etc.	1-40	...	1-120
Pony and trap, trotting	1-100	...	1-300
Cycling, ordinary	1-100	...	1-300
Man, running a race, and jumping...	1-150	...	1-450
Cycle racing	1-200	...	1-600
Horse galloping	1-200	...	1-600

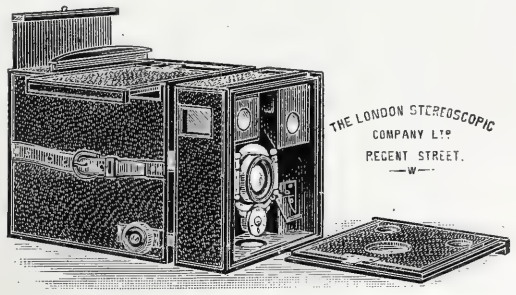
"If the object is twice the distance, the length of allowable exposure is doubled, and vice versa."

International Congress of Applied Chemistry.—We ("Chemical News") wish to draw the attention of our readers to the fact that the Fifth International Congress of Applied Chemistry will take place at Berlin during the Whitsuntide Holidays in 1903, under the presidency of Dr. Clemens Winkler. The House of the Imperial Parliament (Reichstag) has been placed at the disposal of the Congress, and Geheimrath Professor Otto N. Witt has been nominated president of the Organising Committee; Dr. Bottinger, member of the German Parliament, acting as treasurer. A fund of about £3,000 has already been collected by voluntary subscriptions from societies and private individuals towards the expenses of the Congress. The object of these congresses is to further the interests of "applied chemistry" in the widest sense of the words. They embrace both industrial and analytical chemistry; in the latter department one of the chief objects is to enable chemists to decide on standard methods for the testing and assaying all kinds of chemical products and raw materials, and to bring about international agreements for the employment of the selected processes. Much useful work has already been effected in this direction at the former congresses held in Paris, Brussels, Vienna, and again in Paris. Great interest has been taken in these meetings by different Continental Governments, and an official representation may be expected on the part of some of them on the forthcoming occasion. The absence of many English chemists on previous occasions has been much remarked, although this probably arose from the congresses not being better known. It would seem to be greatly to the advantage of English science that this nation should be well represented at Berlin. Probably the best commencement would be for some of the leading chemists to form a committee for carrying out the preparatory work needed to enable this country to take its rightful place among the nations who will be represented at Berlin next year. We should think that the selection of such a committee would fall well within the scope of the British Association, and it is to be hoped that under the auspices of so eminent a chemist as Professor Dewar, the president, a representative committee with this object will enter into existence during the Belfast meeting.

New Apparatus, &c.

A New Cut Film Hand Camera. Sold by the London Stereoscopic Company, 106 and 108, Regent Street, W.

The camera before us measures, when closed, 8in. by 4¾in. by 5in., and weighs not much more than 2½lb. It is both portable and light, and on these counts should be appreciated by photographers. Covered in black leather and strongly made, it is carried by a small strap. A milled-head screw at the side of the instrument controls the focussing movement, a graduated scale (also at the side) indicating (in feet) the distances. The front is raised by a sliding movement, thus giving access to the lens diaphragm (iris) and shutter for the purpose of setting. The shutter release is actuated by a pin at the left-hand side of the camera. The Company's "Black Band" lens and the Unicum shutter are fitted to it.



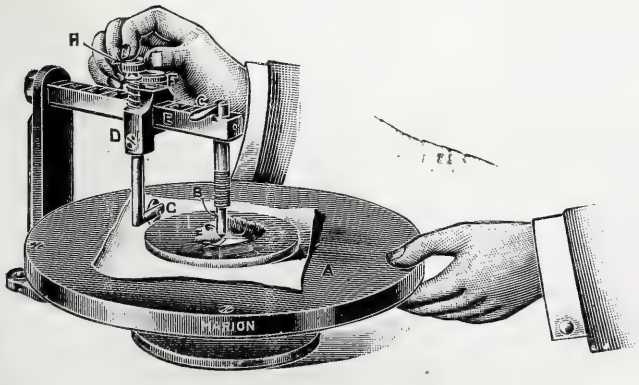
The principal features of the camera are the changing system and the employment of cut films. Twenty-four of the latter, with thin metal caps on the top of each, are placed in the magazine. The changing is effected by drawing out the septum shown on the top of the camera, the exposed film being deposited in an upper chamber. An indicator at the side shows the number of exposures that have been made. The movement in our hands worked with success and certainty. The exposed films may be removed without interfering with those not exposed, as the septum cuts off all light. The camera has two finders. It strikes us, from an examination, as being a useful type of instrument for those with whom cut films are desiderata, whilst the simplicity of the changing movement is one of its strongest recommendations.

New Dark-Room Safe Lights. Sold by A. W. Penrose and Co., 109, Farringdon Road, London, E.C.

Messrs. Penrose have submitted to us small specimens of new red and green glasses for dark-room illumination, of which they also furnish the following descriptive notes:—"Known as Rheinlander's Light Filters, they are constructed on a new principle, and have the great advantage that they are much safer for the extremely rapid colour sensitive plates which are now being used. These glasses have been spectroscopically tested, and are quite monochromatic. Whilst being safe, they also pass a good volume of light, enabling the work of development to be done in comfort. You will observe that one of the glasses is of a red tint, and is suitable for all classes of dry plate work except plates which are sensitive to red. In this case it is necessary to use our green safe light, which we find is excellently suited for working with such plates as Lumière's B Series, and especially for working with plates sensitised with cyanine. These glasses can be made any reasonable size, and are regularly supplied in 10 by 8 size at the following prices:—Red glass, 5s.; green glass, 10s."

A Circular Print Trimmer. Sold by Marion and Co., Ltd., Soho Square, W.C.

This machine cuts circle prints of any size up to 8in. in diameter, giving a clean edge and a true outline. It will be seen that the whole of the print is visible during trimming. The following are the official instructions for use:—



"The print is laid on the table A, upon which is placed a circular piece of glass, a little smaller than the required size of print, with its centre marked. The part which is desired to be the centre of the picture is placed underneath the rod B, which is released by C allowing the pressure of the spring to come into contact with the glass disc, thus pressing and holding the print firmly on the table. The cutter D is then fixed at the required radius from the centre by the scale marked on E, and fixed by the milled screw F, the necessary pressure being applied to the cutting-wheel G by placing the finger on the brass head H, to which it is attached. The table is then revolved with the left hand. The pressure required on the cutting-wheel can be made heavy or light at will by regulating the brass-headed screw upon which the finger is placed."

Well and strongly made in metal the trimmer may be attached by a screw to a bench or work table. In a practical trial we found it easy to work, and to the photographic printer it should prove a useful piece of apparatus for the expeditious production of the increasingly-popular circular print in large numbers.

New Mounts.—Manufactured and sold by Charles Tyler and England Bros., Limited, 79, Copenhagen Street, Caledonian Road, King's Cross, London, W.

In sending us samples of their latest mounts for amateur and professional photographers, Messrs. Tyler and England Bros. remark:—"In this new series of plate-sunk mounts, with and without paste down, with matte surface, we think we have a line which will meet a want which has often been expressed by artistic photographers, and in the series of Dudley mounts, in panel and circles, is a style of professional mount which we think to be somewhat of a new departure. In submitting you samples of our Daffodil, Recherche, Saxon, Raffael, and Brooklyn, we think we have also hit upon rather a novel series of amateur mounts, not being of the usual florid style."

No branch of photography has witnessed such revolutionary advances of late times as the production of supports for the finished print. Twenty years ago one rarely saw anything for small work but the time-honoured g.b.e., the plain cream-coloured cabinet, or c.d.v., and their congeners. We have changed all that with a vengeance. Shape, design, tint, and size in indescribable variety distinguish the modern mount, and the eye need never tire of monotony.

The selection placed before us by Messrs. Tyler is too large to enumerate in detail. It must suffice to say that quietness of tint and tastefulness of design and shape characterise these mounts throughout. Perhaps we can best show our appreciation of them by using them for our own photographs. We want nothing better for the purpose.

Commercial & Legal Intelligence.

H. J. Whitlock and Sons, Ltd.—The above-named company has been registered with a capital of £15,000 in £5 shares. The objects of the Company are to acquire the business of photographers as now carried on by H. J. Whitlock and H. J. Whitlock, jun., at 11, New Street, and 201, Broad Street, Birmingham, and by A. Whitlock as Whitlock Brothers at Darlington Street, Wolverhampton, and, generally to deal in photographs, photographic and artists' materials and apparatus, frames and cases for photographs, pictures, engravings, objects of art, and fancy stationery. No initial public issue. Table A mainly applies. The directors are H. J. A. and H. J. Whitlock, jun. Qualification, £500. Remuneration not specified.

Compagnie American Biograph Francaise, Limited.—The above-named company has been registered with a capital of £30,000, in £1 shares. The objects of the company are to adopt an agreement with the Biograph and Mutoscope Company for France, Limited (old company), and M. Devenish, the liquidator thereof, for the acquisition of the undertaking of the said old company, to acquire and turn to account any patents relating to mutoscope or similar apparatus; as manufacturers of tablets, diaphragms, motors, batteries, generators; as electricians and electrical engineers, etc. No initial public issue. The directors are to be elected by the subscribers. Qualification £100. Remuneration £300 per annum, divisible. Registered office, 15, Walbrook.

Action for Damages, etc., for Wrongful Dismissal Against a Colombo Photographer.—Mr. F. R. Dias delivered judgment in the District Court of Colombo, on March 17th, in the case in which Mr. E. A. Ginder sued Mr. A. W. Endree for the recovery of damages by reason of wrongful dismissal, and balance of wages and passage money due. Mr. Dias states the facts:—Plaintiff, he says, came out on the 19th of April, 1901, as an assistant to the firm of Mr. A. W. Andree, and on the 16th September he was summarily dismissed. He now claims R500 damages, R270 balance of passage money, and R90 balance of wages. The defendant justified the dismissal by saying that the plaintiff was utterly incompetent and unfit; that the original contract on which the plaintiff came out was rescinded on the 31st July, on the defendant's agreeing to procure a cheap passage for the plaintiff. Defendant also counter-claims R98.75, which he says was the value of various frames delivered to the plaintiff. Mr. Dias finds that the evidence fails to sustain these statements of the defence, which are, he says, wickedly false and unjustifiable. In support of his contention the defendant produced a few pictures taken by the plaintiff soon after his arrival here, when he was unfamiliar with local conditions, but has carefully suppressed the many good pictures he since took. Plaintiff, Mr. Dias finds, is a fully qualified and successful operator. It was a cruel thing for the defendant, after casting adrift in a strange land a young man rising in his profession, to have instructed his proctor to place on record such false and libellous pleas as he has done. Fortunately the defendant's counsel, in fairness, withdrew all these pleas of incompetence and neglect, or the Judge states that he would have been prepared to give much higher damages. The only questions left are:—

Was the contract rescinded and was the plaintiff guilty of gross negligence? On both he finds negatively—there was no rescission of the contract. The defendant was anxious to send the plaintiff back, and the plaintiff was anxious to go, and they agreed to certain terms which the defendant failed to keep, and the original contract is therefore in force. The fact was that the defendant intended to extend his business, and got out another assistant named Spizewski to set up a branch at one of the hotels, but the negotiations failed, and the defendant was left with two assistants on his hands while he needed only one, and he therefore tried to get rid of the plaintiff, who was himself willing to go, as his health had suffered and he had reason to suspect bad feeling towards himself. As to the negligence, Mr. Dias finds that the sole instance quoted does not amount to anything of the kind, the omission being due to causes beyond the plaintiff's control. The defendant, however, eagerly seized upon it as a convenient excuse to get rid of the plaintiff cheaply. The dismissal was, Mr. Dias holds, wholly wrongful and unjustifiable, and he gives judgment for the plaintiff in full entering decree for R862.50, and dismissing the defendant's claim in reconvention for the value of some old useless frames, which he had presented to the plaintiff and for which he now claimed R98.75.—"The Times of Ceylon."

Edison and the Mutoscope in Court.—The decision which was handed down in the United States Circuit Court of Appeals on March 10th, by Judge Wallace, probably marks the termination of a bitter strife that has been waged by Mr. Thomas A. Edison against rival makers of moving-picture apparatus. Mr. Edison was one of the first to secure patents on a chronophotographic apparatus. When other manufacturers of similar devices entered the field, a series of legal battles began in which Mr. Edison uniformly triumphed. For years he has received royalties from companies which are said to amount to many thousands a year. The last alleged infringer of the Edison patents to be attacked was the American Mutoscope Company. A decision was first rendered in favour of Mr. Edison in the United States Circuit Court. But the opinion now handed down by Judge Wallace on appeal reverses the decision of the lower court, and declares not only that the American Mutoscope Company has not infringed the Edison patent, but even that Edison invented no new combination worthy of a patent. What Edison claimed was the use of a continuous film upon which the moving object was photographed. In order to refute the claims of Edison to priority of invention, the court dwelt long and learnedly on the history of chronophotography, and pointed out that as far back as 1864 a Frenchman named Du Cos had invented a moving picture machine very much like Edison's. A similar apparatus was patented in this country in 1866 by Le Prince. The Court said:—"It is obvious that Mr. Edison was not the pioneer in the large sense of the term, or the more limited sense in which he would have been if he had also invented the film. He was not the inventor of the film. He was not the first inventor of apparatus capable of producing single negatives taken from practically a single point of view in single line sequence upon a film like his and embodying the same general means of rotating drums and shutters for bringing the sensitised surface across the lens and exposing successive portions of it in rapid succession. Du Cos anticipated him in this, notwithstanding he did not use the film. Neither was he the first inventor of apparatus capable of producing suitable negatives and embodying means for passing a sensitised surface across a single lens camera at a high rate of speed and with an intermittent motion, and for exposing successive portions of the surface during the periods of rest. The predecessors of Edison invented apparatus; no new principle was to be discovered, and essentially no new form of machine invented in order to make the improved photographic materials available for that purpose. The early inventors had felt the need of such material, but in the absence of its supply had either contented themselves with such measure of practical success as was possible or had allowed their plans to remain on paper. Undoubtedly, Mr. Edison, by utilising this film (not, however, his invention) and perfecting the first apparatus for using it, met the conditions necessary for commercial success. This, however, did not entitle him under the patent laws to a monopoly of all camera apparatus capable of using the film."—"The Scientific American."

Royal Institution.—A general monthly meeting of the members of the Royal Institution was held on Monday afternoon, the 7th inst., Sir James Crichton-Browne, treasurer and vice-president, in the chair. Mr. W. A. Bailey, Mr. J. M. Barr, Mr. C. W. Darley, Mr. W. E. L. Gaine, Mr. Carl Hentschel, Mr. J. C. Inglis, Mr. G. Northcroft, Mr. H. C. Plimmer, Mr. F. E. Robertson, and Mr. G. A. Wilson were elected members. The special thanks of the members were returned to Dr. Francis Elgar, F.R.S., for a donation of £50 to the Fund for the Promotion of Experimental Research at Low Temperatures.

At the Cardiff and County Horticultural Society's Fourteenth Annual Show, on July 23rd and 24th, 1902, there will be a section devoted to photography. The following are the classes and prizes:—(1) For the best photograph of plants, flowers, or shrubs, in pots or in the open; first prize £1 1s.; second prize 10s. 6d. (2) For the best photograph of arrangements of flowers or plants in vases, table decorations, button-holes, and cut flowers; merit, natural grace; first prize £1 1s., second prize 10s. 6d. (3) For the best photograph of fruit or vegetables, or fruit and vegetables; first prize £1 1s., second prize 10s. 6d. (4) For the best enlargement covering any of the subjects in above classes; the mount of the photograph not to exceed 14in. by 18in.; first prize £1 1s., second prize 10s. 6d. For further particulars apply to Dr. De Vere Hunt, hon. sec., Westbourne Crescent, Cardiff.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

April.	Name of Society.	Subject.
12	Liverpool Amateur	Excursion to Hall-road. Leader, Mr. F. Anyon.
12	Camera Club	Ramble—Barum Churches. 2.30.
14	Southampton Camera Club	*Amateur Photographer* Prize Slides.
14	Glasgow and West of Scotland	Annual Lecturette Competition.
14	Croydon Natural History	Mr. Rudler's Second Lecture.
15	Croydon Natural History	Ordinary Meeting.
15	Melbourne Working Men's Col.	Discussion: *Photographic Lenses.*
15	Birmingham Photographic	Demonstration. *The Development and Manipulation of Carbon Tissue.* Mr. Bernard Moore.
16	Southport Photographic Society	*Orthochromatic Photography.* G. Cross.
16	Southsea Photographic Society	*Agra and Delhi.* Mr. L. Donaldson.
16	North Middlesex Photographic	*Hand Camera Work.* R. Child Bayley, F.R.P.S.
16	Croydon Camera Club	*What Amateurs should read.* The President.
17	Richmond Camera Club	*Bees and Bee-keeping.* Mr. E. Oetzmann.
17	Darwen Photographi	Print Album Competition.
17	Sunderland Photographic	*Architectural Photography.* By Mr. J. H. Avery.
18	Croydon Natural History	Photographic *Ozotype Process Affiliation* Lecture.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

March 20th.—Mr. P. Everitt in the chair.

Mr. A. Haddon gave an address on the principles upon which

A Sensitive Galvanometer

was constructed. Galvanometers were not articles of every-day photographic utility, but they had been used in the study of photography many times; and, as far back as the days when Becquerel began his photographic investigations, he used a galvanometer for the study of the action of light on silver that had been treated with the halogens. He took two plates of silver, as nearly identical as possible, and submitted them to the action of iodine, bromine, or chlorine. They were then immersed in a solution of common salt, and connected by wires to a galvanometer. No deflection was obtained, however, until light was allowed to fall on one of the plates, the other being in darkness, and then the needle of the galvanometer was at once deflected. General Waterhouse used the galvanometer in order to obtain the direction of the current during development, and he found that, when he used thiosinamine, the image was reversed, and so also was the direction of the current. A galvanometer was a combination of one or more magnets and a coil of wire, the coil of wire to be traversed by the electric current. There were two classes of galvanometer, one in which the magnet is suspended and moveable and the coil of wire fixed; or the reverse, a magnet fixed, and the coil of wire movable. He would assume that none present knew anything about the galvanometer, and therefore he would explain in the first place a few simple properties of a magnet. A magnet was a body which had the power to take up a definite direction, and which, if disturbed from its position of rest, would return to it when released. A magnet had the power of attracting only a few things, which were called magnetic substances. Iron and its modifications, nickel, cobalt, and manganese, are magnetic substances of different degrees. The magnet also had the power, when brought near to another suspended freely upon a pivot, so as to move in a horizontal plane, of attracting one end and repelling the other. This fact was demonstrated as applying to both ends of the magnet. Now why does this magnet (shown) take up a certain direction? Because the earth itself functions as a huge magnet. At the north of the earth there must be a magnetic pole which attracts one and repels the other pole of this suspended magnet, and at the south of the earth a pole that repels the first pole and attracts the second pole of the magnet. Now we come to a difficulty. Are we to call the pole pointing north a south or a north pole? Some speak of the north-pointing pole as north-seeking and the other as south-seeking. Airy thought it would be better to do away with all names that involved terms of north and south, and to speak of red and blue poles. The red end points to the north and the blue end to the south. Next it must be remembered that a magnet always tries to take up a position in which it conveys a maximum number of lines of force. The magnetic axis of the magnet is a straight line joining its two poles. The field of a magnet is the space surrounding it in which its influence is felt. Theoretically this field extends to infinity. An examination of a magnet discloses many interesting facts. Taking a large magnet, we will pass round it another smaller magnet. At different points it takes up different positions. At the blue end of the large magnet the red end of the small magnet is seen to be attracted, and the blue end repelled. At the other (red) end of the large magnet the blue end of the small one is attracted and the red repelled. Mr. Haddon sketched on the board some of the positions that the small magnet would take up in relation to the large magnet, but he said that it was clearly too tedious a job to map out the lines of force in that way. A very simple way was that adopted by Faraday. He found that when iron filings were placed within the field of a magnet they became each converted into a magnet by induction. This conversion of magnetic substances into magnets by virtue of their position was very interesting. Mr. Haddon then placed a magnet beneath a piece of cardboard and sprinkled over

the card some iron filings. Now by gently tapping the card the filings are seen to take up a very curious position. The for mof the magnet under the card is reproduced by the disposition of the filings, which also arrange themselves in positions showing the lines of force or the magnet. Mr. Haddon passed round some sheets of sensitised paper which had been used instead of the cardboard and afterwards exposed to light. The filings were reproduced as white spaces upon the paper, which formed a permanent record of the lines of forces. Here is a magnet. Under the table there is an accumulator, from which proceed these wires. "The current is cut off and you will see that when I bring the wire near to the suspended magnetic needle there is no action. But if I switch on the current, and again bring the wire over the needle, there is a deflection in a certain direction. If now I place the wire under the magnetic needle it is deflected in the other direction. Now if I take more of this wire and make a coil of it, and place within it the needle again, the deflection is much greater than that produced by the single wire. A galvanometer is thus shown to consist of a simple combination of insulated wire and a magnet or magnets. By increasing the number of turns of wire we have seen that the sensitiveness of the needle is much increased. Expressed in another way, an increase in the number of turns of wire enables one to diminish the strength of current necessary for a certain degree of deflection. There is a limit to this, however. As the coil of wire is increased so is its diameter, and as one gets the successive turns further away from the needle so is the effect on the needle diminished. The influence of the current in the wire upon the magnet varies inversely, as the square of the distance."

By increasing the number of turns of wire round a magnet we have already seen that the sensitiveness of the needle is increased, but only to a limit, because in time the outer turns have less and less effect in producing deflection until it is useless to continue them. Now comes a difficulty if we want to still further increase the sensitiveness of the galvanometer. The method usually followed was to employ two magnets instead of one, the two being rigidly attached one to the other with their poles pointing in opposite directions. The wire should be wound round one magnet at a time, the first in an opposite direction to the second. The effect of the earth upon the galvanometer is thus reduced to a hundredth or a thousandth of what it would be upon one magnet, and the sensitiveness is extreme. Kelvin's galvanometer was the most sensitive form. He substituted for a pointer having bulk or mass a weightless pointer in the form of a beam of light. The magnet was half an inch long, and was fixed on the back of a little mirror, which receives and reflects a beam of light upon a suitable receiving surface, and thus indicates the strength of the current passing through it. This method brings about a great reduction in the mass to be moved by the electric current—something like a few grains in fact—and so we have a very sensitive instrument. In 1867 the first cable was laid between Europe and America, and in consequence of the coarse receiving-instruments and the bad insulation, it required a very strong current. To sink and protect the cable there was a covering of iron wire. Electricity is as lazy as it can be, and is possessed of a faculty that leads it back home by the shortest possible route. The bad insulation and consequent leakage necessitated the cells required to work the cable to be increased from five to about fifty; but it was hopeless to go on, and £1,000,000 worth of material was soon lying useless at the bottom of the sea. A new cable was prepared and laid, and so good was it that a cell composed of a silver thimble and a piece of zinc was sufficient to supply the necessary current for a message. The reflecting mirror had been for many years used as a receiver for these cable messages. Its drawback was that a clerk had to be continually on the watch in a darkened room to read the movements of the spot of light and interpret the message sent from the other end; but later a permanent recording instrument was substituted. Mr. Haddon drew attention to a very sensitive galvanometer, constructed by himself very cheaply on the lines laid down. By means of a silver and bronze coin, separated by a piece of paper dipped in some ale, as his battery, and the necessary connecting wires, he showed how the needle was deflected and the movement multiplied by a mirror reflection on to a board. The apparatus and the chat were much appreciated, and a vote of thanks was passed to Mr. Haddon for his trouble.

CAMERA CLUB.

[Reprinted from the Club Journal for March.]

On Thursday, the 20th March, the statutory meeting of the Camera Club Company, Limited, was held at the club house. Mr. A. R. Price presided. The directors' report stated that the total number of shares allotted was 4,143, of which 418 were allotted as fully paid-up as part of the consideration for the property of the Camera Club Company in liquidation purchased by the company, 2,985 were allotted as fully-paid up in cash, and upon each of the remaining shares the sum of 5s. had been paid in cash. The total amount of cash received by the company in respect of shares was £1,507 10s. The preliminary expenses were estimated at £65. The chairman added that the board had paid off the debentures, and had made arrangements for the early payment of the amount payable to those members of the old company who were to be paid off in cash. They had come to the conclusion that the arrangement made after the dismissal of the last steward was not a success, and had recently engaged a new steward and rearranged the club staff, thus affecting a change which they hoped would add considerably to the comfort of members. He explained that during several months the work of the club had been carried on under great difficulties, the directors feeling that they could not consistently with their duty incur any expenditure beyond what was absolutely necessary while the success of the reconstruction scheme was in suspense, and that this suspense had only been determined by a large cheque which was received towards the end of February last He then called upon the Rev. Charles E. Few to move the resolution of which he had given notice. This resolution in its original form ran thus:—"That the collective action of the retiring board of directors of the Camera Club not having proved wholly satisfactory, it is desirable that the board to be elected be strengthened by the introduction of other members." Mr. Few spoke to his resolution, which was seconded by Mr. Ferrero. After considerable discussion the motion was, by consent of the meeting, withdrawn, and the members present proceeded to the election of directors and other officers, with the following result:—Directors: Sir William de W. Abney, Messrs. R. G. Adamson, J. W. Cadett, R. W. Craigie, E. Cromack, A. Deed, L. Edwards, and F. V. Finnis, the Rev. R. N. Fitzpatrick, Messrs. S. G. Gamble, and J. W. Gordon, Col. R. Holbeche, Messrs. H. Thomson Lyon, P. E. Marshall, A. R. Price, and G. Powell, the Earl of Rosse, Messrs. W. S. Routledge, E. Sanger-Shepherd, and Major-General Waterhouse.

Hon. secretary: Mr. G. A. T. Middleton.

Hon. Editor of the Club Journal: Mr. J. W. Gordon.

The appointment of a librarian was left in the hands of the committee.

CROYDON CAMERA CLUB.

"The 'V.B.' Process."

On Wednesday, 2nd inst., the president gave an interesting address and demonstration before a large gathering of the members upon the "V.B." (or vandyke brown) printing process, which is associated with the name of its inventor, Mr. A. E. Mallandain. The procedure, as described by Mr. Maclean, was one of extreme simplicity. Once the printing is done, there are absolutely no puzzling manipulations which require either experience or judgment. Briefly put, what is needful is:—(1) Print out until a ghost image is seen; (2) rinse in running water for ten minutes, or give four changes of water; (3) immerse washed print for one minute in a one per cent. solution of hypo; (4) wash two hours in running water. The print may then, if desired, be blotted off and dried by heat. On placing print in washing water it turns yellow, and may somewhat lose in apparent density. In the hypo the print should turn a little darker and stronger in the shadows, etc. After removal from the last washing water the print should not look dark enough nor brown enough. When the print is dry it should turn about 60 per cent. stronger, and therefore darker, than when taken from the washing water. Amongst the advantages peculiar to the paper claimed were:—Firstly, it is but half the price of other printing processes (3d. per dozen sheets ¼-plate); secondly, it was a very serviceable process for use with over-exposed negatives in which there is full detail with some slight veiling of shadows; thirdly, very delightful effects are obtainable by slightly under-printing and then colouring the print with ordinary water-colours, Mr. Maclean, in connection with this last point, stated that the well-known water-colour painter, Carl Haag, was accustomed to complete his subject in a monochrome done with vandyke brown, and then proceed to glaze it over with colour. Several examples of "V.B." prints which had been coloured were shown, and received much approval, especially some post-cards, which at a first sight might easily have been taken for water-colour drawings. A number of ordinary examples were exhibited in illustration of Mr. Maclean's remarks, and about a dozen printed subjects were developed, fixed, rinsed, and dried during the evening, including prints made by Messrs. Rogers, W. H. Smith, and the lecturer. In the subsequent discussion Mr. W. H. Smith stated that if too strong contrasts were obtained, by printing under green glass the result would be softer. Yellow glass would still more soften the print. In case of over-printing he suggested as a possible remedy that a short first washing should be given, thus allowing the hypo to reduce the print. Mr. Rogers had found that a "continuing" action took place where a print was kept for a day or two before developing. The result seemed to be that the excessive whiteness of the half-tones was counteracted. A vote of thanks to Mr. Maclean was adopted by acclamation.

SOUTHSEA PHOTOGRAPHIC SOCIETY.

A pleasant evening was spent by the members and friends of the Southsea Photographic Society, at their rooms, Pembroke Road, on Wednesday evening, April 2nd. The president, Mr. Lewis, occupied the chair, and Colonel Barrington Baker conducted them on a cruise in his steam yacht among the fiords of Norway. The yacht, the Hirondelle, was about 64 tons, and carried no professional hands, all the way everything being done by the Colonel and his friends, navigating, engineering, cooking, and even stoking. The cruise was made via the Zuyder Zee, Bergen, and Kiel, and Colonel Barrington Baker's description of the various places touched at on the way, together with the beautiful lantern slides, exhibited by Mr. H. E. Purvis, gave one a clear idea of the beauty and romance of the Norwegian Fiords. Graphic is the only word fit to describe the Colonel's utterances. He wasted no time in turning high-sounding sentences, but spoke directly to the point. To hear him describe the wonders of a mirage, the exciting escapes from storms, and other interesting episodes, was to have a clear mind-picture left with you, instead of a blurred, foggy, coloured sketch, as happens in some lectures. Beautiful photographs, often taken after eleven at night; whales, seals, waterfalls, mouths of rivers, glaciers, icefields, and rocks polished brown by the snow, seen on the way, made the discourse most interesting, while the lecturer's reminiscences of such affairs as disputes with harbour masters, and of being stoned out of a port to the tune of the Transvaal Anthem, created a deal of diversion. At the close the chairman offered the lecturer the thanks of the audience, and Colonel Baker having suitably responded, the meeting terminated.

NORTH MIDDLESEX PHOTOGRAPHIC SOCIETY.

April 2nd.—The monthly landern-slide competition took place, and some very good slides were sent in. Mr. A. G. Lawson was adjudged the winner, with a slide entitled "The forge."

The prints from the outing to Whips Cross were shown, and Mr. Glendenning and Mr. Mummery were placed first and second. In the general competition Mr. Wall took first place and Mr. Mattocks second.

MARPLE AND DISTRICT PHOTOGRAPHIC SOCIETY.

On Thursday evening, the 3rd inst., Mr. C. P. Atkinson, the president, read a paper upon "Exposure." He stated what he considered to be the chief factors in a correct exposure, viz., class of subject, light value, distance, speed of plate, and diaphragm. He explained the mathematical formulæ for calculating focal distances, and the time relativity of lens stops, and he strongly advised the use of a good exposure meter, his own experience proving that such an instrument was reliable for judging the actinic property of light, and that the prime cost was soon recovered by the saving of plates, and by a nearer uniformity and an improved quality in negatives.

LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

April 4th.—The annual Easter excursion of this society this year was to Bridgnorth, Salop. A party of nineteen members left Birkenhead by the 4.20 p.m. train on Thursday, arriving at Bridgnorth soon after 8 o'clock. The party made the Crown Hotel its headquarters where one and all were made extremely comfortable. On Good Friday the following places were visited:—Apley Hall, Allscot, Stocton, Norton, Madeley-Colbrook, Brozeley, Buildwas Abbey, Ironbridge, Linley Old Church, and Astley Abbot's Priory.

On Saturday Wenlock Abbey was the scene of operations, and a good deal of very beautiful photographic work was done here, the members, without exception, being delighted with it. On the Sunday to Quatford, Qualt, Alixley, Arley and its castle, along the banks of the Severn, to Bewdley, and from there driving back to Bridgnorth. On Easter Monday the places selected were Wirfield. where some very charming landscapes were discovered, and a lot of good work done. Leaving Wirfield the drive was continued to Ludstone Hall, where the party were very cordially received by the owner, who very kindly personally conducted the members through the interesting old hall. The next places visited were Claverly, Wooton, and again through Quatford, and home. On Tuesday work was done in and around Bridgnorth. The party returned to Liverpool by the 4 o'clock train, thus ending one of the most delightful outings in the history of the society. The trip was under the leadership of Dr. J. W. Ellis, F.E.S. The number of plates exposed was 785. The excursion was especially favoured by the "Clerk of the Weather," good weather being essential on such occasions.

SOUTHAMPTON CAMERA CLUB.

On Tuesday evening, the 1st inst., the above club held their fortnightly meeting at the Philharmonic Hall, under the presidency of Mr. G. T. Vivian. There was a good attendance, the occasion being the fourth and last of the series of lantern-slide competitions, the subject being "Animal Study." The competition was of such a keen nature that a tie occurred between the contributions of two members, and a second vote had to be taken, Mr. de Silva ultimately being declared first, and awarded the club's certificate of merit, with a couple of realistic scenes from the hunting field, being pressed very closely by Mr. Berry with excellent specimens of groups of "Sheep" and "Pigs." Other first-rate productions followed, with but one point of difference, the competition being very close throughout.

Certificates of merit are now held by Messrs. Trigg, Jurd, Compton, and de Silva, and it will be necessary for these members to compete between themselves for the silver medal, the committee being set the task of selecting a suitable subject for deciding the contest.

News and Notes.

We have received from Mr. W. F. Slater (upon whom this Journal some time ago conferred the well-deserved title of the "Photographic 'Cook'") a programme of personally-conducted photographic excursions to the Continent during the season 1902. The following notes, taken from the book, should induce many of our readers to obtain a copy for themselves, so that an early opportunity of making choice of one of those pleasant Continental trips may be made. Mr. Slater says:—"The excursions I organised and conducted last year to the Continent, like those of previous years, were most enjoyable, and gave every satisfaction; many have already intimated they would be pleased to join a party again this year under my leadership. I have, therefore, arranged for five excursions, the details of four will be found in the following pages, the September excursion will be published later. The great popularity attached to these excursions exists in the fact that they are arranged for photographers, and personally conducted by a practical photographer. On these excursions a large amount of photographic work is done, and many photographers from different parts of the country are brought together, who, as a rule are very willing to help one another, and many hints may be learnt even by experienced workers, which make the trips successful socially. For the convenience of those who desire to develop one or two test exposures on tour, I carry a small pocket case of 'tabloid' photographic chemicals. Although these are photographic excursions, non-photographers are, needless to say, always welcome, and will find the same very interesting and enjoyable. The opinions of non-photographers in the past is that they prefer going with a photographic party because they see and learn much more than they would in the ordinary way. All the prices quoted are inclusive and cover all fares; second-class rail from London as per programme, third-class rail on all daily excursions, and saloon on all boats. Hotel accommodation: lodging, light, and attendance; meat breakfast and table d'hote dinner, consisting of soup, fish, joints, poultry, and sweets or ices; all gratuities The tickets from London are available to return singly any day, and are also available for a longer period than stated. The times given in the programme are the actual starting times of the trains and boats, and it is advisable that each member of the party should be at the station fifteen minutes before. It is absolutely necessary that the parties must number 20, and if any party should exceed 30, about 5 per cent. will be refunded to each one, see note under each detailed programme. All the excursions are by the Great Eastern Railway Company's route via Harwich, and it can be arranged that members may start from March or any other station on their system (except Peterboro', whence the fare will be 2s. extra) without extra cost. To save any disappointment, it is advisable that intending excursionists should send as early as possible a deposit of 5s. on the weekly and 10s. on the longer excursions, so as to register their names, the balance to be paid about ten days before departure of the excursions, as per date given under each detailed programme. All communications should be addressed to Mr. William F. Slater, 5, Firs Parade, High Road, Lee, S.E."

The Artistic Side of the late Mr. Rhodes.—No accounts of Mr. Rhodes hitherto published have referred to the artistic side of his personality. The imaginative and artistic sense was so strongly developed in him, and influenced his life and work to such an extent, that without due consideration of it no just estimate can be formed of his character. Artistic problems first presented themselves to his mind, when, as Premier of Cape Colony, he made his home in the Cape Peninsula. His intense and genuine love of the big and beautiful in natural scenery prompted him to buy as much as he could of the forest slopes of Table Mountain, so that it might be saved for ever from the hands of the builder, and the people, attracted to it by gardens, wild animals, and stately architecture, might be educated and ennobled by the contemplation of what he thought one of the finest views in the world. This love of mountain and distant view—the peaks of the South African plateaux are seen 100 miles away across the Cape flats—was deep seated in his nature, and he would sit or ride silently for hours at a time, dreaming and looking at the views he loved—a political poet. There are many stories of him telling worried and disputing politicians to turn from their "trouble of ants" to the Mountain for calm, and in the same spirit he placed the stone Phœnician hawk, found at Zimbabye, in the Cabinet Council Room, that the emblem of time might preside over their deliberations. The ennobling influence of natural scenery was present in his mind in connection with every site he chose and every building he contemplated; such as a cottage he built, where poets or artists could live and look across to the blue mountain distance; a University, where young men could be surrounded with the best of nature and of art; a lion-house, a feature of which was to have been a long open colonnade, where the people could at once see the king of beasts and the lordliest of mountains; the Kimberley "Bath," with its white marble colonnades embedded in a green oasis of orange grove and vine trellis, looking to the north over illimitable desert. Such things would perhaps occur to most men, but with him they were a passion, almost a religion. When first attracted by art problems, he characteristically probed down at once to bedrock principles, and, though often crude, limited, and almost too "colossal" and barbarously big in his ideas, he had an extraordinary instinct for choosing the right from the wrong, when both were put before him, and grasping the essentials of truth and simplicity in art. His first and greatest work in architecture was the preservation of the old colonial Dutch farmhouses, with their good colonial-made furniture, previously ignored and neglected, and the adaptation of their better characteristics to modern requirements. By so doing he influenced the public towards a respect for antiquity, and put a stamp of taste and originality on the present—and, it is hoped, the future—architecture of South Africa. This style was adopted without any pedantry or affectation, or, as some hinted, political motives, but with a genuine appreciation of its good points after the bad were discarded, and of its suitability to the country; caring little whether it was old or new, Dutch or English, as long as it was simple and good. He entered fully into the modern spirit of honest workmanship, taking pleasure, for instance, in having the metal work of his houses hand-made by local craftsmen. He started a tile manufactory near Cape Town for the main purpose of killing the blight of corrugated iron, and making the Cape peninsula worthy in beauty for the capital of South Africa. Of pictures he allowed himself the possession of but few, not from want of enjoyment of them, but because he looked upon them as luxuries. "I could build so many miles of railway for that," he used to say.—Mr. Herbert Baker, in "The Times."

At the Royal Institution recently Professor Otto N. Witt read a paper on "Recent Developments in Colouring Matters." He showed, with the aid of several interesting experiments, that the essentials of a dye-stuff were that the substance must not only be so intensely coloured as to be able to communicate its own colour to the substance holding it in solution, but must also be soluble in water or other suitable solvent: furthermore it must be even more soluble in the colloidal substance of the fabric. The dyed fabric was a solution of the dye in the fibre except in the case where a mordant was used, when a suspension of the precipitated matter resulted. All coloured substances could not be classed as dye-stuffs, for example, copper salts; and indeed there were few substances outside the aromatic series which exhibited the necessary

qualities. In the aromatic series selective absorption of light was common; it was not therefore surprising that numerous compounds of the class were available. Since the first attempts to cast off empiricism in the chemistry of colouring matters, there had been a careful comparative study of the constitution of these substances, and this had resulted in an ever-increasing knowledge of their structure. It was found that certain groups of elements were necessary in the molecule, these were classed as chromophores and auxochromic groups. Of the former some two dozen were known, and these could only exert their influence in the presence of the auxochromic groups, but few of which were known at present. Several interesting experiments showing the phenomenon of fluorescence were then performed. It was explained that it was caused by ultra-violet light. The azo colours were next dealt with. Their production was a direct result of the attempt to cast off empiricism, and place the study on a sound scientific basis, and the effort has been rewarded with continued success. An enormous number of these substances were obtainable, and, as a result, over three million dye-stuffs were accessible to the chemist, whilst more than five hundred were continually manufactured on the large scale. Passing on to another class of compounds known as the alizarins, the lecturer explained that these substances formed lakes by interaction with a mordant. These bodies must contain at least two hydroxyl groups in juxtaposition, otherwise the power of forming a lake was lacking. Compounds containing up to as many as six hydroxyl groups had been produced. Coming now to the production of synthetical indigo, Professor Witt said that this was one of the oldest problems of chemistry. It had been produced in the laboratory for over twenty years, but until recently it was thought impossible to produce it more economically than Nature, a necessary condition to make its production an industrial success. It was not surprising that the indigo planters had showed little apprehension of the danger of which they were occasionally warned. The various steps in the process, and the enormous difficulties which had been overcome by the Badische-Anilin-und-Soda Fabrik, were spoken of. The production of indigo was then shown experimentally. A small quantity of the ortho-carbonic acid of phenyl-glycine was fused with potash, this gave rise to the production of the potassium salt of indoxyl carbonic acid. This was poured into a large quantity of water and air blown through, when the indigo separated out in flakes. The lecturer said that one could not help feeling some regret that the indigo fields should disappear as the madder fields had done before. It was not all a disadvantage, perhaps, bearing in mind the bread famine predicted by Sir William Crookes, for the fields would be at liberty for the production of cereals. A specimen of benzene which was prepared by Faraday was exhibited, and the lecturer said it was a thing to be looked on with reverence. But what a development had taken place since that first basis was furnished for unravelling the mysteries of the aromatic series!

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

VERY MODERN JOURNALISM.

To the Editors.

Gentlemen,—The story about the artist and the American dried fruit company, published in your correspondence columns last week, has appeared in several papers recently, and the author of the reply quoted is generally reported to be Sir Philip Burne-Jones. If the story is not true, it ought to be, and it contains a moral which some of our "Napoleons of the Press" (elegant phrase) might take to heart, for the practice of endeavouring to get something for nothing has become popular with several journalistic concerns in recent years. This is true in respect of many of the photographic competitions organised for the "benefit" of "amateurs."

By the way, are you not somewhat too sweeping when you say that the halfpenny London news sheets are "written by office boys for office boys," though the cock-a-whoopiness and self-considered omniscience of some of the halfpenny papers is very irritating. Perhaps you are not aware that the news editor of the most successful of them has recently stated that in twenty years' time the penny daily will disappear—a courageous prophecy.—Yours truly,

J. A Reid.

Kincraig, Cutcliffe Grove, Bedford.
April 7th, 1902.

THE L. AND P. P. A. HENDERSON AWARD.

To the Editors.

Gentlemen,—It will be remembered that some time ago Mr. Alexander Henderson, a respected member of the London and Provincial Photo Association, offered an annual prize for the best paper upon a photo-chemical subject. I have now the pleasure to submit the rules under which this award will be made, and, as the matter concerns all classes of photographers, as well as members of the association, I shall be glad if you will publish them in full.

1. The award shall be known as the L. and P. P. A. Henderson Award, and shall be of the value of £5.

2. The award shall be made yearly to the writer of the best paper on a photo-chemical or kindred subject, preferably the former, which shall be communicated to the L. and P. P. A.

3. The award shall be made to a member of the L. and P. P. A., but, failing any communication of sufficient merit by a member, it shall be in the power of the L. and P. P. A. to make the award to a non-member.

4. Should the L. and P. P. A. decide that no communication of sufficient merit has been received during any one year, it shall have power to withhold the award, in which case the sum to be awarded would be carried forward, either as a separate award, or to increase the award for the following year.

5. The committee shall, for the purpose of facilitating the award, make a selection from those papers eligible, and submit these to the general body of the members, by whose vote the final award shall be made.

6. The secretary shall file all papers read before the association, and will also receive from members any articles of the nature specified which, appearing in the Press, are, in the opinion of such members, eligible for the award. These papers to be open to inspection by members at all meetings of the society.—Faithfully yours,

Walter D. Welford,
Hon. Sec. and Treasurer.

Warwick Lodge, 166, Romford Road, London, E.

THE CORNERPIECE.

To the Editors.

Gentlemen,—With regard to your kind notice, under the heading of "New Apparatus," I find that, through an omission in our circular, the fact that the frames were worked under Rhodes patent No. 15583/900, has led to the somewhat erroneous impression that I manufactured the article, and that I am responsible for the inspiration. I should be only too pleased to accept the credit for the happy idea, but honour should be given where honour is due, and in this case it is due to a fellow townsman, Mr. Rhodes, who is the patentee and manufacturer, and who has requisitioned my assistance in placing the same on the market through the trade.—Yours truly,

41, High Street, Aston, Birmingham. W. Tylar.
April 7th, 1902.

To the Editors.

Gentlemen,—In your issue of April 4th you speak approvingly of a frame for corners mentioned therein. I should be obliged, however, if you would kindly add that it is Rhodes' patent, and that my firm are the patentees and sole manufacturers of this article, and not Mr. Tylar, who is simply acting in common with others as wholesale agent for my firm, and he has expressed his regret that in his anxiety to secure the trade of such a quick-selling and highly-commended article he overlooked the fact that a circular he issued would be likely to mislead by causing others to think that there were two different makers of the same article, or that he was the inventor, patentee, and manufacturer only, as was evidently the case with you yourself when you reviewed it.

I must ask you to kindly insert this in your next issue, in justice to my firm.—I am, Sirs, yours respectfully,

John S. Rhodes,
For Rhodes, Edwards and Co.

140, Bristol Street, Birmingham.
April 9th, 1902.

Answers to Correspondents.

*** *All matters intended for the text portion of this* Journal, *including queries, must be addressed to* "The Editors, The British Journal of Photography, 24, *Wellington-street, Strand, London, W.C." Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* Messrs. Henry Greenwood & Co., 24, *Wellington-street, Strand, London, W.C.*

Photographs Registered:—

E. G. Ballard, 28A, Welsh Street, Chepstow. *Photograph from top of Wyndcliffe, Mon. Photograph of Chepstow Castle Photograph of Wyndcliffe. Photograph of Tintern Abbey. Photograph of Chepstow Town.*

A. Holborn, 25, Stokes Croft, Bristol. *Photograph of Group of National Union of Teachers. Bristol Conference of Delegates.*

T. E. Innes, 108, Wellington Road, Heaton Chapel. *Photograph of Heaton Norris District Councillors.*

M. E. Emmett.—As the studio will face due south, it will be well to glaze it with ground glass. Dark green blinds will be suitable for blinds for the top, and a similar colour for curtains for the sides.

Book Wanted.—"Learner" will be grateful to know the best book to be had on printing, dealing with every process.—In reply: "Popular

Photographic Printing Processes," by Hector Maclean, may suit you. Order it of your dealer.

RECEIVED.—The Brighouse Photographic Company, Telephoto, P.O.P., Victory, H. M. Cooper, R. Bennett, Copyright, T. Stokoe, and many others.—The answers to these have been unavoidably held over. They will appear in our next.

DEVELOPMENT.—A. E. S. G. asks: "What change takes place in the negative when it is developed? Is the deposited image metallic silver, silver oxide, or another form of bromide of silver?"—In reply: The image is composed of metallic silver.

EXHIBITIONS.—A. E. writes: "If I exhibit a photo in any provincial or town exhibition, can I exhibit the same photo in the Royal Photographic Exhibition? Would I stand the same chance of securing a medal?"—In reply: The photograph would stand the same chance of acceptance by the R.P.S. selecting authorities.

GUM BICHROMATE.—H. C. A. writes: "Can you send me any numbers specially giving practical instruction in gum bichromate work, or recommend me some book for that purpose?"—In reply: Let our correspondent procure a copy of "The British Journal Photographic Almanac" for 1899. It contains an excellent paper on "Gum Bichromate" by Mr. James Packham.

THE MCDONOUGH-JOLY PROCESS.—"TA-SANTI" writes: "I shall feel extremely obliged if you could inform me where I can procure a screen and prepared positive paper for the 'McDonough-Joly' process of coloured photography?"—In reply: To the best of our knowledge, the screens and paper are not at present articles of commerce.

COPYRIGHT.—"TAME" writes: "Some 12 months ago I took a negative by my own initiative of a group of volunteers about to go to the front. I find an enlargement has been made from one of the copies without my permission or authority. Have I a claim under Copyright Law against the party so acting? The negative has not been registered."—In reply: As the copyright was not registered, you have no redress. If you register it now you can restrain further reproduction being made from the picture.

SALARY IN BANKRUPTCY.—"OPERATOR" writes: "Will you please tell me how I stand? I am engaged at so much a year, and paid monthly. Under an agreement, a month's notice must be given on either side. There is a month's salary due to me. Shall I have to take so much in the pound, like the other creditors, or can I claim in full? I am told I can."—In reply: Being a servant, your wages must be paid in full. Therefore, take nothing less. Sometimes the liquidator may offer the composition that is paid to the other creditors; but servants must be paid in full; such is the law.

EXHIBITING ENLARGEMENTS.—B. writes: "A lady-artist, who has a show-case in town, gave me a photo of herself, taken by a well-known firm of photographers of this town, for enlargement. The finished picture pleases her very much, and she wishes to put it for a short time in her show-case. Will you kindly say if it would be right to do so, or would it be objected to as illegal?"—In reply: If the lady paid for the original photograph (as we presume she did), she is quite entitled to have it enlarged and exhibited wherever she pleases.

MIDGET FRAMES.—"FRAMES" writes: "Could you give me the addresses of any large fancy dealers who would be likely to supply little midget frames about the size of stamp? They are being sold here at some of our fancy shops. I have tried Messrs. Marion and Co., but they do not keep anything small enough, and cannot supply me with the address of any firm that would."—In reply: We have not seen the frames, so cannot suggest by who mthey are supplied. Try Fallowfield's, or Houghton and Son. You might also try E. Mander and Sons, Birmingham. Had we seen the frames, we might possibly have been able to help further.

FIRE INSURANCE.—"INSURER" says: "I have just insured my premises against fire, and I find on reading through the policy it seems that compensation, in the case of fire, is limited to one shilling for each negative, and ten pounds for any one lens. Now many of the negatives are worth pounds, and I have two lenses that cost me nearly thirty pounds each, and one a larger sum still. Is it usual to limit photographers' compensation in this way?"—In reply: It is usual to put a limit on the value of negatives and also on lenses; but you can insure them for a larger sum by special arrangement under another policy. Communicate with the fire office, or its agent.

BICHROMATE OF POTASH.—H. S. says: "I have during the past week or two been trying the gum-bichromate process, and a day or two ago a rash, with itching, has made its appearance on my shoulders. It has been suggested to me that it is due to the action of the bichromate of potash. Do you think that is the cause?"—In reply: We certainly do not. The general experience of those who have experienced the ill-effects of the bichromate is that they are confined to those parts that come in actual contact with the solutions. As you mention no rash on the fingers (which are usually the first to be affected) or the hands, we should say that bichromate has nothing to do with the trouble. It is very unlikely that working the gum process will giue you any trouble from the bichromate employed.

POSITION OF ISOCHROMATIC SCREENS.—H. C. writes: "I should be much obliged if you would tell me if there is any reason, and what that reason is, why isochromatic screens should not be fixed to the front of the lens? I am using a hand camera of the folding type, with bellows that taper to a very small size—little larger in size than the diameter of the lens—and do not see how the screens could be satisfactorily fixed inside the camera. The experiments I have tried so far with a screen in front have been failures, as the chemical focus (I think it is called) seems to be upset as regards the central rays, though not as regards the marginal rays, or at any rate to a lesser extent in the latter case. I have also found it impossible to focus sharply. Can you offer any suggestion as to the cause of this, and as to how the difficulty might be overcome?"—In reply: Some workers place the screen behind the lens, some in front, and others between the lenses. This latter is perhaps the most favoured position. It is possible that the central rays being upset while the marginal ones are not, may be due to some defect in the screen itself. It is better with some lenses to focus with the screen in situ.

EXPOSURES.—G. F. G. G. writes: "(1) What exposure is necessary to give a fully-exposed negative at this time of the year? Subject, seashore scene (not sky and sea), or street scene in bright sunshine, at 10 to 2 p.m. Kodak film. Burroughs and Wellcome's diary says 1-120, f/6; Imperial Plate Company's chart says 1-90, f/6 (reckoning Kodak film same speed as Sovereign plate); Wynne's meter coloured to tint in 15 secs., exposure 1-16 sec., f/6 (reckoning film as 90). I got some fine negatives under same conditions last summer in June, 1-25, f/16; and Scott's table says that for March multiply by 1¾, which would give 1-15 at f/16. See how these figures vary. I exposed Blair, Planchon, Kodak, and Sandell films as a test last Sunday at Brighton in bright sunlight, and gave 1-25, f/11. All were very much under-exposed (Wynne's time taken at the time as above). (2) Do you consider Wynne a correct guide? (3) Do you consider Watkins' meter better? (4) If so, which one? I exposed Sandell film Wednesday last in bright sunshine, street scene, 1-25, f/6, in London, as a test, and enclose result. Not over-exposed? Developer used for all films, except Sandell was the pyro soda. If Wynne is correct, surely 90 per cent. of hand-camera work must be under-exposed."—In reply: "(1) We should not have imagined that under the conditions all the films would have been under-exposed, and we would suggest that the speed of the shutter should be looked to. (2) The only point where this system is likely to go wrong is in the plate speeds. (3 and 4) We do not consider there is much to choose between them."

FLASHLIGHT PHOTOGRAPHY.—"FLASHLIGHT" writes: "I am asked to photograph a group of grammar-school boys, who are taking part in a dramatic entertainment. It must needs be taken the evening of the performance on the stage. I have not had the slightest experience in flash-light work. Should I find much difficulty in undertaking the work? I should esteem it a great favour if you would kindly give me particulars as to how to set about the work. What quantity of flash-light power would be necessary to take a 10in. by 8in. group? What distance from the figs.? Whether to have light on one side only, and how to diffuse the same? Would tissue paper do? If so, what size sheet? Is it necessary to have a reflector? If so, what material? I have only a Ross's doublet, which has a small stop. If the largest aperture, would the front lens behind the stop do better, or the front lens of a ¼-plate portrait? Would the latter be better? I should be glad if you will be good enough to mark out for me the exact method of procedure. It occurs to me I have a ½-plate portrait lens. If this is stopped down it would work quicker than the doublet. I am wondering if it will pay me to trouble with it, as I am inexperienced."—In reply: As we do not know the size of the stage to be illuminated, or how the boys will be distributed, it is impossible to give any idea of the quantity of powder required. It will be better to have lights on both sides, but one stronger than the other, so as to obtain some shadow. As the lens has a small aperture, it follows that a much stronger light will be required than if it had a larger one. If either of the components of the doublet be used by itself, a still smaller stop will be required than if it were employed in its entirety. The front lens of a ¼-plate portrait lens, if of the ordinary type, will not cover a 10in. by 8in. plate. Neither will a ½-plate lens. The best practical advice we can give you is to make a few experiments in the theatre beforehand; you will then be able to judge the amount of powder that will be required for the exposure and gain other experience.

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*** *The Editor can only be seen by appointment.*

*** *We do not undertake to answer letters by post.*

EX CATHEDRA.

Orthochromatic Plates and the Dark Room Light.

Professor Valenta has entered upon a very interesting inquiry concerning the sensitiveness of orthochromatic plates in process of development. Those who are accustomed to use colour-sensitive plates must have observed that exposure to the dark-room lamp has comparatively little effect. The plate exposed in the camera for a few seconds to red, green, or yellow light will show little or no fog, although it may have received considerable exposure to the red light of the dark-room lamp after development has once begun. Professor Valenta has sensitised a number of plates with various sensitisers for red, green, and yellow, and exposed them in a Steinheil glass spectroscope with a Siemens burner of 60 candle-power for 5, 30, 60, 180, and 300 seconds. The five exposures were made side by side upon each plate. Two sets of plates were thus exposed. One set was developed without treatment, and the other was dipped, before exposure, for half a minute in the developer subsequently used. It was at once apparent that all the dipped plates had suffered in sensitiveness for red, yellowish-green, and green, as well as blue and violet. Further comparison also showed that the loss of sensitiveness was greater in that part of the spectrum from line A to b than from b to the ultra violet. The loss is least apparent with dyestuffs of the Eosine group, but it is more marked with Glycian red, Diazo black BHN, Nigrocin B, Pluto black, Wool black 4B, Diamond black, Phenyl black, and Alizarine blue bisulphite. Although these latter dyestuffs are more affected by the developer than those of the Eosine group, the sensitiveness of plates prepared with Eosine sensitisers is not very marked when exposed during development to the red light of the dark-room lantern. The use of copper ruby glass, which absorbs the green rays, adds to the protection. These facts are of considerable importance to the makers of orthochromatic plates, and Professor Valenta proposes to give the subject further consideration.

* * *

English Manufactures and German Critics.

One of the choicest specimens of the outcome of that quality of mind, which the Germans call "Neid," is afforded by an article in a recent number of the "Central Zeitung für Optik und Mechanik." Mr. Angus introduced a discussion a short time ago at the Optical Society upon the deplorable state of the optical industry in this country, and drew a picture of the state of things in Germany as illustrated by the firms of Carl Zeiss, Leitz, and Reichert. Mr. Angus attributes this state of things, wrongly, we think, to the backward state of technical education in this country. We doubt if it has anything to do with it, and think the causes must be sought rather in the ideal devotion of one man, Professor Abbe of Jena, and the just protection afforded by the patent laws to inventions. But if we are to believe our German critics, the general state of manufacture in this country is so bad, and that of German manufactures so good, that before long we shall most assuredly be in the position Mr. Angus good humouredly assigned to us—that of having to send all our work to be done abroad. When that time arrives, and Germany becomes our servant, we shall be quite content to enjoy ourselves at the expense of the dupes of our Teutonic critics. Mr. Angus' ideal in manufacture appears to be for the Briton, everything British, and for the workman compulsory technical education. The advantages of foreign trade are ignored, and the artizan is made in a modified form the slave of the State. Much as we desire to see technical education, and that of the highest type, developed in this country, we think it not only useless, but a perversion of energy, to compel persons to learn, who have no desire to acquire knowledge. Returning to the field of optics, we would point out that under the stimulus of German competition the photographic branch, within the past ten years, has made considerable progress. Lenses technically equal to any made in Germany are manufactured in this country, and our German critics must not forget the fact that one of the oldest and best firms in Germany is at present engaged in the manufacture of a purely English lens, which is much appreciated by many German photographers. We have much to learn from Germany, but not in the way of manners.

The Radio-Activity of Matter. Under this heading the "Chemical News" (see page 306 of this week's issue) gives a very full abstract of a discourse delivered last month at the Royal Institution by Henri Becquerel, D.C.L., Ph.D., whose name is indissolubly linked with this subject. Much of the subject matter of this discourse has already appeared in these pages, but as a lucid and connected account of the whole series of recent investigations of a subject of marvellous interest it should be read by all photographers who take an interest in the subject. M. Becquerel traces the subject since he first took it up about half-a-dozen years ago through the various stages of the discovery and investigations by himself, Lord Kelvin, Messrs. Beattie, and de Smolan, Mr. J. J. Thomson, and M. and Mdme. Curie, etc., up to the discovery of polonium, radium, and actinium. He brings into full relief the fact that these self-radiating substances are not alike in the radiations they emit. He says, "The activity of radio-active bodies comprises three kinds of rays—rays which are deviable in a magnetic field, which appear to be identical with cathodic rays, and two sorts of non-deviable rays, one kind being very easily absorbed, the other resembling X-rays, and being very penetrating. Uranium emits principally the first kind, polonium gives only the second, and radium gives all three at once." Again: "The facts I have just related have exclusively to do with the obscure radiations which traverse opaque bodies, such as metal, glass, mica, etc. But there exists also another, quite different, phenomenon of which the effects are arrested by glass, mica, etc." The origin of the radiant energy of these radio-active bodies is still an enigma. One singular point about M. Becquerel's investigations is that he obtained one result of a remarkable nature which he was never able to repeat. With regard to the "perpetual motion" idea which centres round the perpetual nature of the radiation, he gives 1.2 milligrams of matter as the amount given off from a square centimetre of radio-active surface in a thousand million years.

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Fugitive Modern Colours and Photography. The paper read at the Royal Institution, which we briefly alluded to last week, by Prof. Otto N. Witt, "On Recent Developments in Colouring Matters," calls to mind the subject of the permanency of many of the pigments now employed in the arts. It is not unusual to see some of the posters on hoardings in which the pigments used in the inks have faded almost entirely away, even after only a week or two's exposure. We have seen examples of carbon pictures that have changed colour very considerably through fugitive pigment having been employed in the manufacture of the tissue. Now it is recognised that the carbon process is a permanent one, but that is only the case when permanent pigments are used for the tissue. In the three-colour process of photography the most suitable colours to employ are the brilliant transparent ones of the coal-tar series. Now it does not follow that all coal-tar colours are fugitive, because they are not. On the other hand, many are. So fugitive indeed are some as to show a marked change after only a few hours' exposure to bright sunshine. It is to be hoped that those who work the three-colour process of photography will only use pigments of known stability, as if others be employed it will tend to bring the process into disrepute. Very fugitive colours are sometimes used in chromo-lithography, as witness many of the brilliant prints issued with the Christmas numbers of the illustrated papers. We have noticed a marked change in some after being shown at the railway bookstalls for only a week or two. We, a short time ago, saw an amusing example of the fugitiveness of a colour. It was an announcement of the services shown at the entrance of a church not far from Hyde Park Corner. It read, in black letters, "oly rinity hurch, nightsbridge—ervices, undays—oly ays—ednesdays, ridays—oly aptisms, hurchings, etc." The capitals had been painted in a fugitive pigment, and had quite faded out. What the colour had been sufficient did not remain to show, but we assume it was scarlet, inasmuch as another notice-board, evidently more recently done, had the capitals in that colour, but they had changed, and much of the brilliancy had gone.

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Ink for Writing upon Glass. The glass bottles with a tablet with "ground-glass" surface are perhaps the beau ideal of a useful laboratory utensil, but failing the possession of such useful articles, our readers may be interested to learn of an ink used in the University of Bonn for writing labels and memoranda upon glass, the method of making which is communicated to the "English Mechanic" by W. R. Hubbert, of Detroit. "It consists of a mixture of three parts of a 13 per cent. solution of shellac in alcohol in the cold with five parts of the same strength of solution of borax in distilled water. The solutions should be mixed a drop at a time, and if a precipitate forms the mixture may be heated till clear. Enough methylene blue should be added to colour it a deep blue. This makes one of the handiest inks, for with it notes can be made on glassware, slides, etc., which dry quickly." He adds, "Either a sharp-pointed stick or a pen can be used to apply it. It is far handier than using gummed labels, and writes better than the Faber pencil made for the same purpose." It appears to us that a still simpler method would be to hold the shellac in aqueous solution by the method described many years ago by Mr. Watmough Webster—that is to say, by adding to the alcoholic solution of shellac a very small quantity of strong ammonia solution. Water may then be added in any proportion without precipitation taking place. While on the subject of writing upon glass, our readers may be reminded of the virtues of an etching ink which many years ago had a great vogue, being sold at all the stationers, though we have never seen it for a long time past in any place of sale. It consists of an ink whose basis is hydrofluoric acid, thickened by the addition of fluoride of ammonium, and rendered easy to distinguish after being written with by means of the addition of fine sulphate of barium. This ink is absolutely indelible, as it etches into the glass, and, further, the characters written with it remain white. It should be observed that this ink cannot be kept in strong glass bottles. It is best kept in bottles of lead or gutta-percha, but where such bottles would involve too great an expense an efficient substitute may be made by using an ordinary phial coated inside with paraffin wax, which can easily be done by first heating the bottle and then dropping paraffin in, and rolling the bottle so as to coat the whole inside surface. The cork should be also coated with paraffin.

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Phonograph and Photograph. Many are the uses which have been suggested, from time to time, by ingenious workers for the utilisation of spoilt plates and waste negatives. While some are content to make picture-frames of them, others use them for framing their cucumbers, if they do not venture a step further and build greenhouses with them. Celluloid, of which the majority of films are made, cannot be put to such purposes, nor would it be profitable to use them so, for celluloid has a much higher value than glass. Even in the form of shreds it has a market value, and in small quantities will serve for

making waterproof varnish of excellent quality. Mr. Stroh, who was lecturing the other night before the Camera Club, told his hearers that he had found a use for discarded films—a use, it may be added, which would never have occurred to anybody but Mr. Stroh. Every one knows that this prolific worker has lately invented a new pattern of violin, which, while emitting a greatly augmented volume of sound, vies with the finest "Strad" in quality of tone. The novel feature of this violin is that it has no body, merely a tube along which the strings are stretched. The bridge is in contact with a rocking lever, which is attached to a special form of diaphragm, which closes the narrow part of an aluminium trumpet or resonator. The diaphragm has a conical centre, which gives rigidity to the construction, but the vibrating portion is that which surrounds the cone. So much for the Stroh violin. Its inventor has now applied the same principle to the diaphragm of the phonograph—which he brought before the notice of the Camera Club—but the material of which the diaphragm is made is different. The cone is made of writing paper, and the flat part on which it rests is cut out from a disused celluloid film. At the apex the paper cone is furnished with a blunt point of sapphire, whose duty it is to tread in the footsteps cut in the phonograph cylinder by the recording stylus. The result is marvellous, and constitutes an enormous advance in the efficiency of this wonderful talking machine. The disagreeable nasal quality disappears, and speech, song, and instrumental music are reproduced with marvellous fidelity. Although it cannot be said that the phonograph can afford the same meed of pleasure which is obtainable from a good orchestra, Mr. Stroh's new diaphragm has made such a remarkable improvement in the instrument that we are led to hope that we are within measurable distance of perfection. It is interesting to know that this advance has been made with the help of a waste photographic product.

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Piracy. The word "piracy," according to the dictionary definition, means "robbery on the high seas," and, happily, we may regard that kind of pirate as being almost a thing of the past. He survives, in petticoats and pistols, in those lurid novelettes which are written for the edification of aspiring boyhood, and possibly in remote parts of the China seas he may yet be found in the flesh pursuing his nefarious calling. But there is another sort of pirate who seemingly, without let or hindrance from the law, infests the streets of London. This kind of pirate sells copyright pieces of music to the public, and to the great detriment of those who own such property. In every large community there are to be found men who prefer a crooked path to a straight one, and these pests of society, while careful not to risk their liberty by the commission of any flagrant outrage against their fellow men, are always on the lookout for ways and means of living at the expense of others. It is reasonable to suppose that when these rascals realise that the law of copyright can be evaded with impunity, they will cast about for some opportunity of sharing in the plunder which the law so considerately allows them. What could afford a better hope of success than the multiplication of the copyright photographs of celebrities which attract so much attention in the West-End shops? It is easy enough to copy photographs, and a good profit could be made if they were sold at a few pence apiece. If the law relating to copyright music is in such a parlous state that it can openly be set at nought, what protection can the law afford to a mere photograph, which, in comparison to a successful song, costs nothing at all? It seems, therefore, well within the bounds of possibility that we shall soon see barrow-loads of pirated photographs offered for sale by itinerant dealers. The public will presently tire of "The Honeysuckle and the Bee" and the other ditties which at present tickle its ear, and then the photographs will have their turn. Speaking to a well-known publisher of photographs recently, he told us that dozens of his pictures have been pirated. At first he took proceedings against the delinquents, after spending much money and time in tracking them down. Then he found that invariably he had to deal with a man of straw, and had the gratification of paying all costs. There is at present a great trade being done in pirated cinematograph films, and we are glad to hear that more than one action is pending against the accused men. It is doubtful whether, even if proved guilty, such persons can, in the present state of the law, be punished. They will probably walk out of court whistling "The Honeysuckle and the Bee."

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A Photographers' Church Parade. The St. Michael's "Parish Magazine" (Folkestone), edited by the Rev. Mr. Husband, who is widely known for the unconventional manner in which he addresses himself to the duties of his ministerial office, contains in its last number the following announcement:—"One of the greatest mistakes religious people have made, has been the tendency not to make our work and our play part of our religion, instead of what it ought to be, that our lawful business and recreations are part of our religion, as the late Professor Drummond used to teach us so beautifully in his exquisite books. It was with this thought in our minds that made us start 'Cyclists' Church Parades.' The invention of cycling is what we have much to thank God for. And it occurs to us that the same may be said of photography. Not only has it done much for surgery and for the alleviation of pain in our sick rooms and hospitals, but it has enabled us to possess faithful pictures of some of God's beautiful works in nature, at a cost within the reach of almost the poorest. We have therefore decided at an early date to hold in our church a 'Photographers' Church Parade,' to which professional and amateur photographers will be specially invited. No doubt, at the outset, some will say hard things about us, as they did when we first started 'Cyclists' Church Parades,' but we shall take no notice of them, but just live them down, and go on with our work." The precise manner in which Mr. Husband intends to develope his scheme of a photographers' church parade strongly excites our curiosity; but, in the absence of the necessary details, coupled with the avowed inention of the reverend gentleman to ignore any criticism which his extremely novel departure may provoke, it is difficult to express an opinion as to the feasibility of such a scheme promoting the religious aims of its author. Making every allowance, however, for the sincerity and good intentions of Mr. Husband, we do not find it easy to combat the impression that a church parade of amateur and professional photographers carrying cameras, and held some fine Sunday in a fashionable seaside town, may attract considerable public ridicule, a factor which we should think it desirable to remove as far as possible from religious observances. It appears to us that by connecting in the manner proposed photography with church services the association imposes a very severe strain indeed upon reason and common sense. The cycle, by its speed and convenience, certainly facilitates attendance at church, but where, may we ask, does photography "come in" in such a connection? Frankly, Mr. Husband's idea does not strike us as according with the fitness of things. We hope, nevertheless, that the reverend gentleman will not interpret this expression of opinion as indicative of a desire to "say hard things" of his scheme. On the contrary, if we thought a photographic church parade

would further his objects it should have our ungrudging support. We might even go the length of moving the Convention to hold one of its meetings at Folkestone, with Mr. Husband invited to preach a special sermon to the members, as is done at gatherings of the British Association.

SOME BUSINESS ASPECTS OF PHOTOGRAPHY.

III.

Railway Rates and Charges.

We propose this week to deal with a more purely business matter than we have yet dealt with in this series, on account of a recent conversation we had with the manager of a large plate-manufacturing company. "I do wish," he said, "you would give a chapter on railway rates; if you could drive into the heads of some of our customers some elementary notions about carriage of goods you would save all an immensity of trouble and use of early English. Only this morning I've had a most bullying letter for sending some plates by quickest and, of course, most costly route, in accordance with this telegram: 'Three dozen twelve-ten instantaneous, most urgent.' I sent by passenger train, and the carriers' charge is objected to."

We will therefore proceed to indicate the lines upon which the railway companies base their charges. This information will, as a matter of course, contain no novelty to experienced business men, but we know that to many indeed railway rates are an unknown factor.

First, it must be understood that the companies despatch goods by two main channels—passenger and goods trains. Usually, in the larger towns, there is a different office for each of the two despatches; in smaller towns there is one receiving office. When a parcel is to be sent by goods train it is necessary to send to the office at the same time a delivery or consignment note, which is filled in with the sender's and consignee's names and addresses, with also a description of any particular marking the package bears. Usually this is the address of the consignee; but, contrary to what is commonly supposed, it is not necessary for the package to have any address upon it, so long as there is a distinctive mark, such as a diamond, a square, a circle, in any special colour, and so on; but except where very large consignments are in question, an address is the simplest mode of distinguishing the parcel. The consignment note must state whether consignor or consignee pays carriage, and in this connection it must be remembered that practically the sender is responsible in case of dispute; for the carriers have a lieu on the goods to the extent of their charges for carriage. So much for the despatch packages by goods train. If they are to be forwarded by quickest route, they should be sent by passenger train, and marked in accordance. No consignment note is here requisite. It is desirable to have a parcels delivery book, in which the consignee's name and address is entered; these can be purchased for a shilling each at the stationer's. The railway officials will sign this if asked, and there is then evidence of receipt of goods in case of loss. (It is desirable even when sending by "goods" to have a receipt also. The various companies keep for gratis distribution books of blank consignment forms, with counterfoils; upon these counterfoils being filled in in duplicate they will give a receipt.)

We now come to the question as to which mode of despatch to select for sending goods out, or having them sent to order. "Ceterus paribus" passenger train despatch is quickest, but it is also usually by far the dearest, except between places a few miles apart. Formerly, for distances of about twenty-five to fifty miles, parcels of a few pounds' weight could be sent cheaper by passenger train than by parcel post; but of late years the railway companies have entirely accommodated their charges to those of parcel post. There is thus now no difference of charge, but the latter mode has a limit of weight and size; passenger parcels have no maximum size or weight. The rate is the same for all distances, just as in parcel post. Hence within that limit there is no advantage in sending parcels by train (with the exceptions to be mentioned), unless for such comparatively short distances that parcels can be sent and received the same day, and earlier delivery still be ensured by a parcel being delivered by a properly authorised messenger at the receiving end as soon almost as the train arrives. But to avoid delay special care should be taken that any messenger sent to the station for a parcel should have proper credentials. We have known cases where a parcel duly arrived was declined to be delivered because the messenger had no note of authorisation. This, we need not say, is, however irritating at the time, a very proper precaution to take. We may now give particulars of the special exceptions we referred to as giving the advantage to rail over parcel post despatch. The main one is the awkward subject of negatives. We believe that the parcel post authorities decline to entertain any claim whatever for negatives damaged in transit; the railway companies, though they would require substantial evidence of bona fides and original perfect condition of despatch, are not quite so exigent as this.

The disadvantages of passenger despatch are as follow:—Parcels of a specially fragile or light and bulky nature are charged a special rate of twenty-five to fifty per cent. extra, and certain goods of a specially delicate nature will only be received at "sender's risk"; that is to say, the companies will not hold themselves responsible in case of damage. This is important to bear in mind, for the prohibition includes such things as thermometers, hydrometers, etc.

We must leave the treatment of the "goods" despatch to a further article, merely premising here that the senders of frail goods—and our advice applies equally to either modes of despatch, passenger or goods—should always be most explicit in declaring them as such, for a reason. In the first case, if goods were sent and not declared as such the company would deem it a fraud; and, secondly, if frail goods, such as framed pictures, negatives, parcels of dry plates, were not declared, and were not marked "glass," etc., on their outside wrappers, the company would be held free from responsibility in case of loss or damage. We lay particular stress upon this point, for we have known of very many instances where, to avoid paying the increased rate for glass (and it must be remembered that "glass with care" always involves the extra rate by rail), people have sent parcels liable to such rate without declaration or label, and have lost the chance of getting compensation when the parcel has arrived with contents damaged.

A New Haven photographer, A. Hyatt Verrill, a son of Prof. Addison E. Verrill, of Yale University, announces further discoveries in his experiments with colour photography. Verrill says he has found it possible to produce "aurotypes" and "argentypes" simply by depositing gold and silver in metallic form on glass, wood, metals, and even on paper. The pictures thus made are claimed to be absolutely permanent.—"The Scientific American."

A terrible panic, resembling somewhat in its character the memorable Sunderland disaster, is reported from Wick, Caithness-shire. A cinematograph exhibition for school children was being given and the building was crowded. Soon after the performance opened a sheet of flame burst up, caused by one of the films catching fire. The great flare-up caused an immediate panic among the audience, the children rushing terror-stricken for the doors. The stairs were densely packed with those trying to escape, and many of the children were crushed severely, one, it is believed, fatally.—"Morning Post."

THEORY AND PRACTICE IN PROFESSIONAL PHOTOGRAPHY.

As may be assumed from the heading of this article, it, like the one preceding it, is on a business topic, and the points raised are whether a theoretical knowledge of photography is an absolute necessity to make a, commercially, successful photographer? It may seem almost heretical to, in a technical journal, raise such a point, but we know, as a matter of fact, that many photographers, not only those of the second and third rate type, but also some of those who are doing the highest possible class of work, know little, or nothing, of the theoretical side of the art they are profiting so largely by at the present time; but such is the fact, nevertheless. Indeed, we have heard more than one affirm that he knows nothing whatever about it, nor do they care anything at all about the subject. They are getting on very well, and that is all they desire, and that they could not improve their business one jot by a better chemical knowledge of the subject than they already possess—which, by the way, is practically *nil*. It must be admitted now that the plates are sold ready for exposing in the camera, and papers of all kinds, including platinotype and carbon, are supplied ready for the printing frame, any great theoretical knowledge of the reactions that take place in their manipulation is not actually necessary in order to secure even the best results.

It is often said that in the old collodion days, when the photographer had, perforce, not only to prepare his own plates, but also his papers for printing, the worker had to understand the chemistry of the subject. But, as a matter of fact, a large number of even the most successful of them, did not; or if they did, in many cases the knowledge was of a very superficial character. Many worked as much by rule of thumb as do the majority of workers at the present period. They knew, for instance, that when the silver bath went wrong, which it was very prone to do, particularly in hot weather, certain treatments would set it right again. Some, however, adopted an easier course than that; they at once discarded the solution for a new one, and precipitated the silver from the disordered one and added it to the stock of residues to be dealt with by the refiner. Hence it will be seen that the statement, so frequently made nowadays, that the photographer of the olden times had to possess greater chemical knowledge than is necessary to-day is much overdrawn by some writers who are not really cognisant of the facts as they actually existed.

At no time since the advent of the Art has there been such facilities for those who practise it to acquire a theoretical knowledge of the principles involved as at the present time—seeing the number of technical schools that are available almost everywhere. But it may be asked what proportion of professional photographers, or their assistants, avail themselves of them? The answer is, comparatively few indeed. If asked the reason, the reply, in the majority of cases, would be: What should I gain by attending them, as I turn out the best of work, and that is all that can be done? Is it? If professional photographers had a better theoretical knowledge of their work they would the better be able to cope with the troubles they occasionally meet with, instead of having to fall back on queries put to the editors of this JOURNAL for replies in the answers columns. It would surprise many of our readers to know that some of the queries on simple points that we have at times to reply to come from professional photographers who have long been established, and are carrying on very remunerative businesses. If these had but a little chemical knowledge of the work they practise they would at once be able to locate the source of their temporary troubles, instead of having to consult the editors of journals, although these are always pleased to render assistance. Many professional photographers who know nothing whatever of the theoretical side of photography take apprentices, with a premium, but what can they teach beyond the mere exposure and development of purchased plates, and the printing and toning of ready-sensitised papers, mounting, etc.? Surely this is not much to demand a premium for, considering that some years of useful labour are obtained at a nominal or, possibly no, cost. Too often, unfortunately, the employer does not encourage the apprentice to attend the technical schools so as to improve his technical knowledge, or even allow him facilities for doing so. In some cases even obstacles are thrown in the way of his acquiring more knowledge than the master is capable of teaching him. We have here been principally alluding to portrait photographers. The case, however, is somewhat different with photo-mechanical branches of the business; the schools specially devoted to this branch of photography are, as a rule, better attended by professional workers than are other schools by professional portraitists.

We have just remarked that some portraitists who are doing high-class work, and carrying on most lucrative businesses, have little or no knowledge of the theoretical side of photography, yet they are successful, and why? Simply because they have cultivated the art side of photography rather than the technical side, and also possess good business tact and enterprise. A mere theoretical knowledge without artistic ability, coupled with good business tact, will not, nowadays, go far in establishing a high-class business. The case was different a few decades ago. The public, or the more refined portion of it, at least, require something in addition to a technically-good photograph and likeness; it demands that the subject be artistically dealt with. Artistic training at the present time is quite as imperative as is a technical one—if not more so, seeing that almost everything is supplied ready for use. Therefore it behoves those who desire to bring up youths in professional photography to article, or apprentice, them with those who are capable of teaching them not only how to produce a technically-good photograph, but an artistic picture, and, at the same time, give them theoretical instruction with regard to the materials employed in their vocation. If the master cannot teach the latter the technical schools will, and such facilities should be afforded as to enable the apprentice to attend them.

MR. W. S. CAMPBELL, expert in technical photography, and art publisher, of The Press Studio, 2, Creed Lane, London, E.C., sends us his illustrated prospectus. The specialities of Mr. Campbell are: Technical photography for all trade purposes, especially for half-tone reproduction; correct lighting; preservation of detail in shadows; the use of orthochromatic plates for correct colour values; immediate delivery of prints, either in silver P.O.P., bromide, nikko, platinum, or carbon.

A HEALTHY Decadence.—The wave of pessimism which is passing over Great Britain as the result of her feeling the first phases of that stress of competition, which was bound ultimately to come upon her, does not seem to be warranted by the statistical facts of the last Board of Trade returns, according to which the foreign commerce of the United Kingdom during 1901 amounted to the enormous total of $4,353,585,000. The foreign trade of Great Britain is $750,000,000 greater than it was six years ago, and is now equal to $105 per head of population. These figures suggest that the "antiquated" British methods, of which we have heard so much recently in the public press, cannot be so altogether futile, especially when we consider that her foreign trade last year was more than double that of the United States. The total foreign commerce is made up as follows:—Imports, $2,611,195,000; exports, $1,402,495,000; and re-exports, of foreign and colonial merchandise, $338,233,000. If to these figures be added a vast sum of $7,500,000,000, representing the total over-sea trade of the British Empire, we cannot but feel that the long-deferred decadence is at least a healthy and vigorous one.—"The Scientific American."

ON THE RADIO-ACTIVITY OF MATTER.

A discourse delivered before the members of the Royal Institution, Friday, March 7, 1902, and re-printed from "The Chemical News."

THE property possessed by certain bodies of emitting invisible and penetrating rays was unknown six years ago. The speculations brought about by the experiments of M. Röntgen led to the examination of material bodies, to see if any of them had the power of emitting similar radiations; the phenomenon of phosphorescence naturally was first thought of, being a known method for the transformation and emission of energy. This idea, however, could not be applied to the phenomena with which we are occupied, but it was very fruitful. It led to the choice, among phosphorescent bodies, of the salts of uranium of which the optical constitution is remarkable on account of the harmonic series of the bands of their absorption and phosphorescent spectra. It was while experimenting with these bodies in 1896 that I first observed the new phenomena which I am about to bring before you this evening. I have here the plates of the double sulphate of uranium and potassium, obtained by Lipmann's method, which I used for my first experiments. After having placed one of these plates on the black paper which covered a photographic plate, and leaving it for several hours, I observed, on developing the plate, that the uranium salt had emitted certain active rays, traversing the black paper, as well as various screens interposed between the plate and the active body, such as thin sheets of glass, aluminium, copper, etc. I soon saw that this phenomenon had nothing to do with phosphorescence, or with any known method of excitation, such as luminous or electric rays, or any appreciable variation of temperature. I had to deal, therefore, with a spontaneous phenomenon of a new order. The absence of any known exciting cause on a body prepared in the laboratory several years ago, caused me to think that the phenomenon would have been the same at any time it might have been observed; it should therefore be permanent, that is to say, there should not be any appreciable weakening after a very long time. This is, in fact, what I have proved during the past six years. I will show you the first proof I had of the spontaneity of the rays; these rays have traversed the black paper which covered the photographic plate, and a thin strip of copper in the form of a cross. Here again is the radiograph, made about the same time, of an aluminium medal; the unequal absorption of the different thicknesses has caused the appearance of the effigy thereon. After the very first observation I observed that the new radiations would discharge electrified bodies, at some distance in the air, a phenomenon which gives us a second method for studying these rays; the photographic method is specially qualitative, while the electrometer furnishes numerical elements of comparison.

In the course of these first observations, I was led away from the path towards which later experiments brought me back by several facts, of which the following is the principal: Having protected a photographic plate by means of a sheet of aluminium 2m.m. in thickness, and having arranged on the aluminium several samples of phosphorescent powders, placed on separate plates of glass, and covered with small tubes like clock shades, the photographic proofs, obtained after forty-eight hours, showed silhouettes of the plates of glass just as if they had been produced by the total refraction and reflection of rays identical with those of light, but which must have traversed the 2m.m. of aluminium. This photograph is unique; I have never been able to reproduce it or obtain any action with the same sample of sulphide of calcium, nor with any other phosphorescent preparation. At about the same time M. Niewenglowski obtained an impression with sulphide of calcium, and M. Troost with hexagonal blende. To this day I do not know the cause of the activity of these products or its disappearance. These facts, and some others, gave me the idea that the new rays might be a transversal movement of the ether analogous to that of light; but the absence of refraction and a large number of other experiments made me abandon this hypothesis. In this same year, 1896, I found that all the uranium salts emitted rays of a similar nature, that the radiant property is an atomic one belonging to the element uranium, and electric measurements showed me that metallic uranium was about three and a-half times more active in ionising air than is the double sulphate of uranium and potassium. The same method enables us to study the *rôle* played by the gases in the discharge, and to observe that a sphere of electrified uranium retains its charge *in vacuo*, while in air it loses it. The rate of the fall of potential is sensibly proportional to the potential if the latter is only a few volts; it should be constant and independent of the potential when this is very high. Gas rendered conducting by these rays retains this property for some instants. Between two conductors maintained at constant potentials these rays set up in air a continuous current. These experiments were taken up and elaborated by Lord Kelvin in 1897, then by Messrs. Beattie and S de Smolan. In 1899 Mr. Rutherford showed how the phenomena due to the conductivity communicated to gases by uranium, and the existence of a maximum in the current produced, could be explained by the hypothesis of ionisation, to which the beautiful work of Mr. J. J. Thomson has given the seal of authority.

In 1898 M. Schmidt and Mdme. Curie observed, quite independently, that thorium has properties analogous to those of uranium, properties which were specially examined by Mr. Owens and Mr. Rutherford. Mdme. Curie having measured the ionising activity of a large number of minerals containing uranium or thorium, announced the remarkable fact that several minerals were more active than metallic uranium. M. and Mdme. Curie concluded that there must be a more active body than uranium in the mineral, and they undertook the task of isolating it. By treating one of the most active of these minerals, viz., pitchblende from Joachimstal, they first separated an active bismuth, to which they gave the name of polonium; then shortly afterwards they obtained a very active barium containing a new element—radium. These bodies are prepared by fractional precipitations, in which one is guided by the indications of the electrometer; the activity of these products is 100,000 times greater than that of uranium. About the same time M. Giesel succeeded in preparing some very active substances, and in 1900 M. Debierne announced the existence of a new element, actinium, about which, however, we have not heard many particulars. Of all these new bodies radium alone is characterised as a new element; it has an emission spectrum consisting of lines which do not belong to any other known body, and the atomic weight of the active salts of barium was found to increase with the proportion of radium present. The activity of uranium was not sufficient to excite phosphorescence in other bodies; M. and Mdme. Curie, however, observed this phenomenon with the rays from radium, and, further, that the salts of radium were themselves luminous, their luminosity being, like their radioactivity, spontaneous. The activity of radium produces various chemical reactions; it colours glass, it transforms oxygen into ozone, it changes white phosphorus to red, it ionises not only gases but also liquids, such as petroleum and liquid air, and insulating solid bodies, such as paraffin, developing in this latter body a residual conductivity which lasts a long time after the rays have ceased to act. It also causes on organic tissues serious burns analogous to those produced by X-rays. The sample of radium that M. and

Mdme. Curie have lent me for the purpose of this lecture enables me to show you a few of these phenomena—ionisation of the air, luminosity, and phosphorescence.

I have observed by means of the photograph I now show that the radio-activity of polonium will not traverse a thin sheet of black paper forming a small cylinder closed by aluminium or mica, and at the bottom of which was placed the powdered material; the rays from radium easily pass through this envelope; we shall see that still more profound differences exist between these two kinds of rays. The radio-activity of radium restores to certain crystals, and to glass, the property of becoming phosphorescent by heat which they have lost owing to a previous elevation of temperature. The phenomena of absorption, examined either by means of photography, by phosphorescence, or by ionisation of the air, showed the heterogeneity of the class of radiations emitted; subsequent observations have enlarged the field of this research. Towards the end of the year 1899 M. Giesel, and then MM. Meyer and Schweidler, observed that the rays of radio-active preparations were deviated by a magnetic field in the same manner as are the cathodic rays. For my part, at about the same time without having heard of these experiments, I observed the same phenomenon with radium. The experiment can be made in the following manner: A small paper cylinder containing a few grains of the radio-active body is placed horizontally on a photographic plate covered with black paper, between the poles of a magnet; the rays are thrown entirely to one side of the plate. I here show my two first photographs, one of which shows a concentration on one pole of the magnet. Very shortly afterwards I observed that the rays from the polonium are not deviated, and, consequently, that two kinds of rays exist—one deviable and the other non-deviable. M. and Mdme. Curie have made an electric examination of this subject, which has proved the simultaneous existence of these two kinds of rays in the radio-activity of radium, their unequal permeability varying with the distance from the absorbing screens. The accompanying photograph shows these two kinds of rays from radium. I have recently observed that uranium emits only deviable rays; that is, saving the existence of much less active, non-deviable rays. In fact, there does exist a third kind of ray which are not deviable, but are extremely penetrating; they have been shown more particularly by M. Villard. Thus, the activity of radio-active bodies comprises three kinds of rays—rays which are deviable in a magnetic field, which appear to be identical with cathodic rays, and two sorts of non-deviable rays, one kind being very easily absorbed, the other resembling X-rays, and being very penetrating. Uranium emits principally the first kind; polonium gives only the second; and radium gives all three at once.

Let us now return to deviable rays. The material theory of Sir William Crookes and Mr. J. J. Thomson can be applied to them, and the consequences can be verified with the greatest facility. In a uniform magnetic field the trajectories perpendicular to the field are circumferential to the path p which leads the rays to the point of emission. For an oblique emission making an angle with the field, the trajectories are helices enveloping the cylinders with rays $\rho \sin a$. By placing on a horizontal photographic plate parallel to the uniform field, a small lead box containing a few grains of radiferous barium forming a source of very small diameter, the rays are drawn down to the plate, and excite it on one side alone; a bundle of simple rays emitted in the plane normal to the plate and parallel to the field, should show theoretically an arc of an ellipse of which the axes are in the proportion of 2 and π. The accompanying photograph shows these theoretical arcs, obtained by reversing the direction of the field, the one in air and the other *in vacuo*, on a photographic plate enveloped in black paper; the intensity of the magnetic field was about 4,000 C.G.S. units. If we do not enclose the photographic plate, and if we arrange on it several strips of paper or of metal to form screens, we observe in the print of the radio-activity dispersed by the magnetic field, a species of absorption spectra. Each trajectory has a different curvature corresponding to rays of different speeds and having different penetrating powers. Here is an example of one of these prints, obtained in a field of about 1,740 C.G.S. units; the screens are a strip of black paper, a strip of aluminium of 0.1m.m. thickness, and a strip of platinum of 0.03m.m. thickness. To obtain a pure spectrum so that at each point of the plate a bundle of rays are found, of which the trajectories have all the same curvature, the rays should be made to issue from the source so as to pass through a small round opening; the result is the same as the preceding one. This latter also shows a very intense impression, due to the secondary rays, provided by the rays which were stopped by the lead cover over the active body, and in which was made a small opening through which the pure spectrum passed. The absorption varies with the distance of the screen from the active body, and the rays which are stopped by a screen placed on the plate are able to traverse this same screen when it is interposed at a point near their source. These experiments leave little doubt as to the identity of the deviable rays with cathodic rays. However, it was necessary to prove that they carry charges of negative electricity, and that they are deviated by an electric field. M. and Mdme. Curie, in a beautiful experiment, have shown that the rays of radium charge negatively the bodies that receive them, and that the source becomes charged positively. For this double experiment it is necessary that all the conductors and the source itself be completely enveloped in an insulating material, such as paraffin. For the active body examined the charge was 4.10^{-13} C.G.S. units per square centimetre of radiating surface per second.

For my part, I have shown and measured the electrostatic deviation by projecting the deviated shadow of a screen placed perpendicular to the field, on a photographic plate. One of these apparatus is here shown, as well as one of the prints obtained in which on the two halves of the same plate appear the two deviated shadows corresponding to the reversal of the electric field, of which the intensity was $1.02 \cdot 10^{12}$. The balistic hypothesis attributes these phenomena to material masses transporting charges of negative electricity with very great rapidity. Let m be the material mass of a particle, e its charge, and v its velocity. We know that in a magnetic field of an intensity H, the radius of curvature p of the circular trajectory is given by the equation $H\rho = \frac{m}{e} v$. The numerical value of the product $H\rho$ serves to show the character of each simple ray. On the other hand, in an electric field of an intensity F, the parameter of the parabolic trajectory is $\frac{m}{e} \frac{v^2}{F}$. The knowledge of these two values gives $\frac{m}{e}$—and v. With a value of $H\rho = 1600$ I obtained approximately $v = 1.6 \cdot 10^{10}$, and $\frac{e}{m} = 10^7$

These figures are entirely of the same order in value as those which led to the measurements made with cathodic rays, and the theoretical considerations with regard to Zeeman's experiment. From the above figures we deduce that, from the fact of the deviable radio-activity under consideration, there escapes from each square centimetre of radio-active surface

1.2m.grms. of matter in a thousand million years. By extending these measurements to radiations of different and well-known natures, we ought to be able to determine if the relation $\frac{e}{m}$ is constant, or variable with one ray or another, and whether these do not differ only in their speeds; I have not yet finished the experiments I undertook to decide this fundamental question, but recently M. Kaufmann has attempted to elucidate the matter. He combined, at right angles, the magnetic and electric actions; unfortunately, the experiment, which is very difficult to perform, did not give him one plate fit to measure. For the values of $H\rho$ comprised between 1,800 and 4,600, he found that the relation $\frac{e}{m}$ varied from $1.3 \cdot 10^7$ to $0.6 \cdot 10^7$, and the speed v from $2.3 \cdot 10^{10}$ to $2.8 \cdot 10^{10}$. The proof of a regular variation in the calculated relation $\frac{e}{m}$ is of considerable theoretical importance; if this relation was constant, as it seemed to be as the result of a large number of measurements, we might conclude that the slightly deviable rays, for which $H\rho$ is more than 5,000, have speeds considerably greater than that of light.

On the other hand, theoretical considerations have given the idea that the speed could not surpass that of the propagation of electro-magnetic disturbances; that is to say, the speed of light; and we have been led to consider the mobile masses in a magnetic field as endowed with a particular inertia which is a function of the speed. Under these conditions the calculated mass ought to be apparent, or at least partly so, and it should increase indefinitely as the actual speed approaches that of light. The figures published by M. Kaufmann bear out this hypothesis. Another consequence of this manner of looking at the question would be that there should be continuity between the deviable rays and those which are not, as the radius of curvature of the trajectories becomes infinite at the same time as the apparent mass. The photographic print already mentioned, as well as one of the following ones, showed, on the contrary, a very distinct discontinuity, although in the second one the exposure was sufficiently prolonged for the impression the least active rays, such as the penetrating non-deviable ones, to be distinctly visible. This proof was obtained in the following manner: In the uniform magnetic field of a permanent magnet, I placed, normally to the field, a photographic plate, then on this latter I arranged screens of lead fixed on a sheet of glass. These screens are pierced with openings normal to the plate, and destined to limit the width of the beam; in the path of these beams I arranged other screens, such as aluminium ones. Below the plate, opposite a narrow slit in a strip of lead, a small block of lead is placed, having a deep cavity normal to the plate, and in which the radiant body is placed. We have thus a narrow, linear source normal to the plate and several millimetres in length. The cavity is covered with a thin sheet of aluminium to stop the light rays. The figure represents a section made normally to the field of the beam, of which a part is deviated. Each beam corresponding to a determined speed gives an impression which is noticeably curved, as if the entire trajectory was marked on the plate. In these photographs the interior of the cylinders forming the screens is strongly affected by the secondary emission from the lead. The first picture shows that through each opening there passes an infinity of rays, constituting portions of the pure spectra. These meet with a strip of aluminium of 0.1m.m. in thickness, and traverse it without deviation, but not all with equal facility. The slightly deviated rays are penetrating, and excite secondary radiations when leaving the aluminium. The very deviable rays are stopped and give rise to points affected by an intense secondary radiation. One only of the two categories of non-deviable rays appears in the form of two fine lines opposite the source; these are very penertating rays, the others were arrested quite near the source. Another picture shows the simple beam obtained by a double series of openings; by one of them we can sometimes pass two distinct trajectories. The third figure is of interest, as it shows the straight beam traversing, without deviation, a sheet of aluminium placed obliquely to the line of trajectory; and, finally, the fourth one shows the transmission of simple rays through aluminium, and the secondary effects they produce. The same method has enabled me to observe that the secondary rays were themselves deviated by the magnetic field, in the same way as the exciting rays. The radiations from radium also comprise some which are very penetrating, consisting of the least deviable and the non-deviable rays, of which the properties seem to be the same as the Röntgen rays. These penetrating rays are but very slightly absorbed, and consequently their action on a photographic plate or on the air is very feeble, so that, by the preceding methods, we can get no very exact idea of their intensity. If we interpose in their path a very absorbent screen, they traverse it partially, but at the same time they become partially transformed into more absorbable rays. This transformation recalls that of fluorescence, and, through the secondary action, the effect immediately behind the screen is stronger than if this latter was not there. The photographic plate receiving the radiations —filtered through a thickness of lead of 1c.m.—gives a stronger impression through a sheet of lead of 1m.m. thickness than in the uncovered regions. The diagram shows the effect of the radiations coming from the sides of a leaden box after having traversed 5 to 12m.m. of the metal. These secondary phenomena may partially account for the appearance of shadows given by the edges of all the transparent screens placed over the photographic plates.

All the facts I have just related have exclusively to do with the obscure radiations which traverse opaque bodies, such as metal, glass, mica, etc. But there exists also another, quite different, phenomenon, of which the effects are arrested by glass and mica; they are comparable to those produced by a vapour of a special nature. This phenomenon was discovered in 1899 by Mr. Rutherford and by M. and Mdme. Curie simultaneously. Mr. Rutherford, while examining the radiations from thorium, observed that, besides the ordinary rays, there was another effect produced by an "emanation" consisting of a sort of vapour ionising the air. This vapour is deposited on bodies, principally those electrified negatively, and makes them momentaril radio-active. Mr. Rutherford made some very interesting measurements of this phenomenon. At the same time, M. and Mdme. Curie discovered that, under the influence of radium, bodies became temporarily radio-active. This is not the secondary effect already described, but a persistent phenomenon which disappears comparatively slowly from the moment when the action of the radium ceases. M. Curie has called this "induced radio-activity," and has made a very complete examination of it. He has observed that the phenomenon is produced with great intensity in a closed space, that induced activity is the same on all bodies and practically independent of the pressure inside the enclosed space, but that the phenomenon is not produced if we maintain a complete vacuum by removing the gases produced; solutions of salts of radium produce the same effect with greater intensity than the solid salts. Liquids, water of crystallisation extracted from active salts, or the water separated from an active solution by a semi-permeable membrane of celluloid, remain strongly radio-active; it is the same with the gases. These excited bodies produce the same effects as radium; they emit

a penetrating ray which traverses the glass vessels which contain them and makes these latter luminous. Induced activity is gradually propagated in gases in a sealed tube, even through capillary tubes and imperceptible cracks; bodies are excited the more as the volume of gas is greater in proportion to their surface. Phosphorescent bodies become luminous when excited. In a recent work, MM. Elster and Geitel have observed that atmospheric air has properties analogous to those of excited gases, and they have been able to collect on wires negatively electrified, traces of radio-active products. The cause of this radio-activity is a problem of the greatest interest.

Finally, there is a remarkable method of induction, which is of such a nature as to demand the greatest reserve in the conclusions which might be formulated relative to the presence of new elements in raido-active bodies. Every inactive substance which has been added to a solution of a uranium or radium salt, and which has subsequently been removed by precipitation, has become radio-active, and loses this radio-activity very slowly. This fact was first observed by M. Curie and M. Giesel, who rendered bismuth radio-active in this manner. In the case of uranium, a trace of barium, precipitated in the form of sulphate, became notably more active than the uranium; barium thus excited emits only deviable rays like uranium. After this precipitation the uranium salt, brought back to the solid state, is less radio-active than before; this loss of radio-activity can even be accentuated by successive operations, but the products gradually and spontaneously regain their original activity. The temporary diminution of activity after solution is a general fact for salts of uranium and radium. With salts of actinium M. Debierne has communicated a very great activity to barium. The barium thus excited can be separated from inactive barium; it can be fractionated like radiferous chloride of barium, the most active portions being the least soluble in water and hydrochloric acid. M. Debierne in this manner obtained a product a thousand times more active than uranium. Barium thus excited behaves as a false radium, but it differs from true radium in the absence of the spectrum and in gradually losing its power with time. Among the radio-active preparations a large number may be temporarily excited bodies. Such is the case with "polonium," which is apparently only excited bismuth. Uranium and radium are characterised by their emission spectra and by the stability of their radio-activity. The spontaneous activity observed in the case of different salts after solution might find an explanation in a phenomenon of auto-induction of the active molecules on the inactive one they are associated with. The origin of the radiant energy of these radio-active bodies is still an enigma. By the material hypothesis it does not appear unreasonable, by applying the phenomenon of the evaporation of an odoriferous body, to compare the emanation to a sort of gas, of which the molecules would have masses of the same order of size as electrolytic ions, and to identify the radiations with the cathodic rays resulting from the dislocation of these ions, and causing at the same time the emission of X-rays. We might thus ascribe the expenditure of energy to the dissipation of active matter. Although this hypothesis will account for most of the known facts, still there does not exist any precise experiment which sanctions it. I must not, however, dwell longer on this subject, of which I have incompletely summarised the present position, by emphasising the physical part, which comes more especially within my province, although the chemical side has given rise to work of the greatest interest. These questions have raised new hopes on the transformation of matter. Besides the exceptional conditions under which they enable us to examine the cathodic rays, they have raised, and continue to raise, fresh problems every day, of which the first and most mysterious is the spontaneity of the radiations.

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THE PERSULPHATES AND THEIR USE AS PHOTOGRAPHIC REAGENTS.

[A paper read before the Edinburgh Photographic Society]

WHEN I undertook to contribute a short paper to the society, it was understood that the subject should be really a chemical one, but connected with photography; for, although at one time I did a considerable amount of photographic work, it is now many years since I produced a negative. In fixing on the persulphates and some of their reactions as the subject of my paper, I did so because these salts are now of considerable importance to photographers, and, having been the first to prepare them and study their reactions, I am, naturally, specially interested in any of their applications. You must understand, however, that I have never myself used the persulphates for any photographic purpose whatever, though I have investigated somewhat fully most of the reactions on which their use depends; and it is therefore as a chemist, and not as a photographer, that I address you to-night. The persulphates were first prepared fully eleven years ago, the potassium salt having been shortly described by me in a note communicated by me to the Royal Society of Edinburgh, on 16th February, 1891. The method then employed still remains the only mode of preparation, and consisted in the electrolysis of a concentrated solution of an acid sulphate.

When an electric current is passed through an aqueous solution of a salt, the salt invariably undergoes decomposition into the metallic part, on the one hand, and that which is not metal, on the other. The former is liberated at the terminal connected with the negative pole of the battery (the cathode), while the latter is liberated at the other terminal (the anode). In a great many cases secondary changes take place as soon as the constituents of the salt are liberated, depending on the nature of the constituents and also on other conditions. In the case of potassium salts, sodium salts, and ammonium salts, as well as others, the liberated metal (or metal-like group NH_4) cannot exist in presence of water, but decomposes the latter with formation of free hydrogen, so that in such cases the latter gas is evolved at the cathode. The product liberated at the anode may undergo various changes, according to circumstances. It may act upon the material forming the anode; if the anode is unattackable it may act upon the water, or upon substances dissolved in the water, or the individual particles of the primary product may unite among themselves to form more complex particles of a secondary product. It is the last kind of action which gives rise to the formation of persulphates by electrolysis. When a dilute solution of an acid sulphate, say the potassium salt $KHSO_4$, is electrolysed, a great proportion of the hydrogen of it plays the part of a metal and travels with the potassium to the cathode, while SO_4 goes to the anode, and, on being liberated there, acts upon the water to form sulphuric acid and free oxygen, which is evolved. In a concentrated solution, however, much of the hydrogen remains united to the SO_4, and the group HSO_4 is liberated at the anode. Many of these HSO_4 particles when liberated act upon the water to form sulphuric acid and free oxygen, but many others unite together in pairs to form the more complex group $H_2S_2O_8$, which is persulphuric acid. The proportion of the liberated groups uniting in this way is greater the more closely the HSO_4 particles are packed together at the moment of liberation, and therefore it is advisable to keep the surface of the anode very small if a good yield of persulphate is desired. It is also necessary to keep the temperature low. In course of time, as the proportion of persulphuric acid in the liquid round the anode increases, potassium persulphate is formed from the persulphuric acid and the potassium bisulphate present, and being sparingly soluble, soon begins to crystallise out. On a small scale the preparation of potassium persulphate can be easily and simply shown in the following manner. A wide Y-tube, sealed at the bottom, but open above in both limbs, is filled with a saturated solution of potassium bisulphate. The

cathode, consisting of a cylinder of platinum foil or sheet lead, is immersed in the liquid in one limb, while the anode, consisting of a thin platinum wire, is immersed in the liquid in the other. The tube and its contents are kept cool by being placed in a vessel of cold water. On passing a current from a battery of two accumulators through the solution for some time, a considerable quantity of persulphuric acid is produced, and in about a quarter or half an hour potassium persulphate begins to crystallise out and collect at the bottom of the tube. On the large scale a "divided cell" is used for the electrolysis, that is to say, the liquid surrounding the anode is separated from that surrounding the cathode by means of a porous septum, so as to hinder as far as possible the transference of persulphate to the cathode, where it would be decomposed with re-formation of acid sulphate. Various other particulars have to be attended to, into which it is unnecessary to enter here.

Ammonium persulphate is easily prepared in the same way from ammonium bisulphate, and the sodium salt can also be obtained from sodium bisulphate, but with greater difficulty, as it is much more soluble in the acid liquid. These three are the only ones which have been obtained directly, others have been prepared indirectly from ammonium persulphate.

The crude products obtained by electrolysis are impure, and require to be purified by draining off the adhering acid liquor, washing with cold water, and, if the purest obtainable product is required, dissolved in warm water and recrystallising. Potassium persulphate is very sparingly soluble in cold water (about 1.7 per cent. at 0° C.); being much more soluble in warm water, it can be easily purified by recrystallisation. Ammonium persulphate, on the other hand, is very soluble in cold water (about 55 per cent. at 0° C.); it is, therefore, not nearly so easily purified as the potassium salt. The difficulties are still greater in the case of sodium persulphate. The dry purified salts can be kept for a long time without undergoing appreciable decomposition. I still possess part of the original preparation of potassium persulphate, and some samples which were prepared ten years ago and preserved for use in bottles in the ordinary way, have undergone hardly any chemical change in that time. Moist or impure specimens, however, decompose gradually with formation of acid sulphate and liberation of oxygen (partly as ozone), and ammonium persulphate is not so easily preserved as the potassium salt. By the decomposition of ammonium persulphate oxidised compounds of nitrogen may be produced. Solutions of persulphates gradually decompose, especially on warming, like the moist solids. The pure dry salts are immediately decomposed when strongly heated. Seeing that persulphates evolve oxygen in presence of water, it is evident they will act as oxidising agents. These oxidising actions are best seen in concentrated solutions, especially in presence of acids. In fact, a mixture of persulphate with sulphuric acid constitutes what is probably the most powerful oxidising agent known. On account of this oxidising action, persulphates may be, and in certain cases actually are, employed for bleaching and disinfecting purposes, and also medicinally. In moderately dilute aqueous solution, however, perhaps the most striking character of the persulphates is not so much a direct oxidising action as their tendency to take up metals and form sulphates. From this point of view potassium persulphate, $K_2S_2O_8$, to take a definite example, might be looked upon as potassium sulphate, K_2SO_4, united to an extra SO_4, this extra SO_4 being easily given up to form sulphate by union with a metal. Consequently a solution of potassium persulphate (or any other persulphate) not only attacks and dissolves most metals which form sulphates more or less soluble in water, but also decomposes many metallic compounds, abstracting the metal and thereby giving rise to many interesting reactions. The action on metals themselves is best seen in the case of copper, owing to the colour of its salt solutions. If strips of the bright metal are placed in a test tube and covered with a solution of persulphate, the solution soon becomes blue, showing that the metal is rapidly attacked; if a fairly concentrated solution of persulphate has been employed, the liquid becomes quite warm, indicating that the action evolves a good deal of heat. In such actions there is no evolution of gas, as is the case when metals dissolve in acids, the two sulphates being the only product—

$$(NH_4)_2S_2O_8 + Cu = (NH_4)_2SO_4 + CuSO_4.$$

A similar action takes place with other metals, including silver; there are certain peculiarities in the case of silver, which will be referred to subsequently. The actions with metals like copper and silver which do not dissolve in the common dilute acids, except nitric acid, are of considerable interest, as they permit of the use of persulphate solutions for the purpose of etching these metals, in place of the somewhat objectionable nitric acid generally used. The great ease with which some metals are attacked is well illustrated by shaking up some fine, clean, iron filings with a fairly concentrated solution of ammonium persulphate; the metal is rapidly dissolved, and there is great evolution of heat.

The action of persulphates in removing metals from their compounds, is illustrated by their behaviour towards a solution of an iodide; iodine is gradually liberated and sulphate formed—

$$K_2S_2O_8 + 2KI = 2K_2SO_4 + I_2.$$

Similar actions take place with chlorides and bromides, and there are others of considerable interest. I shall only refer further to one which is of special interest photographically—that with a solution of a thiosulphate ("hypo"). In this case a tetrathionate is produced, the same as when iodine acts upon a thiosulphate; in fact, this reaction can be employed as a method of preparing tetrathionates. Persulphate is a more powerful oxidising agent than chlorine water. Chlorine oxidises thiosulphate to sulphate, and it might have been expected that persulphate would also do so. This is not the case, however, the direct action being represented by the equation—

$$K_2S_2O_8 + 2K_2S_2O_3 = 2K_2SO_4 + K_2S_4O_6.$$

Some metallic salts are converted into higher salts of the same metal by means of persulphates. This solution of ferrous sulphate is quickly changed into ferric sulphate—

$$2FeSO_4 + (NH_4)_2S_2O_8 = Fe_2(SO_4)_3 + (NH_4)_2SO_4.$$

In other cases peroxides are formed; this is well shown by warming a solution of a manganous salt with persulphate. A similar reaction takes place with silver salts, and in this case the changes are of exceptional interest. With potassium persulphate, a black precipitate of silver peroxide is gradually formed on the addition of solution of silver nitrate or sulphate; in course of time this precipitate decomposes and dissolves, oxygen being evolved. With ammonium persulphate, however, the action is different; very little, if any, silver peroxide is precipitated, but the solution decomposes far faster than one to which silver salt has not been added. Under these conditions also the decomposition products are not merely those formed from a pure solution, as a considerable quantity of nitric acid is produced by the oxidation of part of the ammonium nitrogen, thus—

$$8(NH_4)_2S_2O_8 + 6H_2O = 7(NH_4)_2S_2O_8 + 9H_2SO_4 + 2HNO_3.$$

Although the oxidation is due ultimately to the persulphate itself, from experiments I have made there can be little doubt that the particular course which the decomposition takes is brought about by the intermediate formation of silver peroxide, which then acts rapidly on the ammonium. A small quantity of silver can thus cause the decomposition of a large quantity of ammonium persulphate in a relatively short time. The greater the quantity of silver in a given quantity of solution, the more

rapid is the change, and the rate is also greatly increased by rise of temperature. The great influence which small quantities of silver have on the decomposition of persulphates is best shown in ammoniacal solutions. In this case the products are again different, ammonia being oxidised to free nitrogen in accordance with the equation—

$$3(NH_4)_2S_2O_8 + 8NH_3 = 6(NH_4)_2SO_4 + N_2.$$

The action can be strikingly exhibited by preparing a cold saturated solution of ammonium persulphate in strong ammonia, and then adding to it a small quantity of silver nitrate solution. Until the silver is added no action is observable in the solution, even on standing a considerable time, but as soon as the silver is added effervescence sets in and steadily increases; at the same time the solution becomes warm, so that ammonia begins to boil off, and the action becomes quite violent. It is evident, therefore, that a soluble silver compound present in a solution of persulphate, though it may not make the persulphate a more powerful oxidising agent, nevertheless acts powerfully as a "catalytic agent" in accelerating the action of the persulphate, and making the change proceed in a manner different from that observed in the absence of silver.

We may now consider, shortly, the special applications of persulphates in photography. The first of these to be proposed was the use of potassium persulphate as a "hypo-eliminator," under the name of *anthion*. As I pointed out a considerable time ago, however ("Jour. Soc. Chem. Ind.," xvi. 399, 1897), such a use is based on an entire misconception of the action of persulphates on thiosulphates, and is open to two serious objections directly contradictory of the advantages claimed: firstly, the tetrathionate which results from the action is just as objectionable as the original thiosulphate, as it easily decomposes, giving free sulphur and other deleterious products; secondly, the persulphate is certain to attack the silver image itself. The latter of these objections, however, leads to the second proposed use of persulphates in photography, one which has proved much more practical and satisfactory than the other, namely, the use of ammonium persulphate as a density-reducer for negatives. The action of ammonium persulphate as a density-reducer is simply that of a silver solvent already referred to, silver sulphate being formed—

$$(NH_4)_2S_2O_8 + 2Ag = (NH_4)_2SO_4 + Ag_2SO_4.$$

Shortly after its introduction for this purpose, however, it was stated that ammonium persulphate differed from the substances employed for the same purpose, in that it acted to a greater proportionate extent on the densest part of the negative, and was therefore superior to other density-reducers in most cases where employment is desirable. A preferential action of this kind is just the opposite of what we should expect, and was at first inexplicable, and I understand that some observers have contradicted the statement. In view of what I have already shown, however, as to the effect of silver salts on persulphate solutions, it is now possible to give a reasonable explanation of such an effect. With a silver solvent unaffected in its action by silver salts in solution, we should expect the less dense parts of the negative to be most attacked (proportionately, of course), for the following reasons: Unless the action is a very slow and prolonged one, the quantity of solvent first taken up by the film will be replaced only to a slight extent as it becomes used up, owing to the somewhat slow exchange of material between the unabsorbed solution and that in gelatine. We may assume that at first the quantity of silver dissolved at any part is roughly proportional to the density of the image at that part, consequently wherever the density is greatest the solvent will be most weakened by the using up of its active ingredient there. The action will therefore become slower at these places, while continuing at an almost undiminished rate at points where the density is very slight; therefore, with such density-reducers, we should expect the dense parts to be proportionately less reduced than the others. In the case of ammonium persulphate, the same reasoning applies up to a certain point, for the greater dissolution of silver in the denser parts will cause a greater diminution of the amount of available persulphate there. But, on the other hand, the solution at these places has been rendered more active by the presence of a larger proportion of silver sulphate in it, and this increase in rate of action may be sufficient to balance or reverse the weakening effect due to greater destruction of persulphate. That the quantity of solution originally absorbed by the film is sufficient to bring about most or all of the action, without being replenished from that in the dish, is shown by the extent to which the action proceeds when the plate is bodily removed from the dish, which makes it necessary to destroy the persulphate in the film as soon as possible after the reduction has proceeded to a sufficient extent. This is effected by means of solution of sulphite, which is oxidised to sulphate—

$$(NH_4)_2S_2O_8 + 3Na_2SO_3 + H_2O = (NH_4)_2SO_4 + 2Na_2SO_4 + 2NHaSO_3.$$

If the above explanation is correct, a strong solution of persulphate, freshly prepared, should work best where reduction in contrast is required. Where a more uniform and proportionate reduction of density is required, a more dilute solution already containing a small quantity of silver salt would probably be preferable, as in such a case the local increase in the proportion of silver salt at the denser part of the image would have less effect relatively than would have been the case had the solution been quite free from silver originally. It is evident from what has been stated that solutions once used will not keep for any length of time, and their action may differ distinctly from freshly prepared ones, owing to the presence of the small quantity of silver sulphate which they contain.

HUGH MARSHALL, D.Sc.

THE ACTION OF ALKALIES IN DEVELOPERS.

[A paper read before the Photographic Society of Philadelphia, and re-printed from its Journal.]

IN making a developer, we start with two agents, the developer or reducing agent and the accelerator or alkali; the one represented by pyro and the second by the three alkalies, ammonia, soda, and potassia. In preparing the developer another substance is also used, which, on account of its character, deserves to be considered; that is, sodium sulphite. Unfortunately, the sodium sulphite which is found in commerce, and which is bought usually by the amateur photographer at the photographic supply houses, contains impurities. One of these impurities is sodium carbonate. This is the result of its imperfect manufacture. We have also another impurity, and that is when the sodium sulphite is exposed to the air for any length of time a portion of it becomes converted into sodium sulphate. Sodium sulphate is not a developer; on the contrary, it acts as a restrainer. The sodium sulphate, as you see it as a photographic chemical, varies very much in appearance. Sometimes it is in the form of translucent crystals. Sometimes they are covered over with a white powder, or you find that, instead of clear, regular crystals, they are irregular and opaque. Then you can discard it because it is impure. Then again, sodium sulphite, in as pure a form as we see it, is apt to absorb moisture, and you will find in summer time, in our climate here, where we have a moist and a hot spell coming together, the salt will liquefy and form a solid mass.

Ammonia is very seldom used in this country in the developer. In England it is used very largely. The usual English formula consists of pyro dissolved in water; the alkali consists of aqua

ammonia in more or less proportion. This has a strong tendency to fog, and a very large amount of bromide is necessary.

The question of the proper alkali is a very important feature in regard to the various developing agents usually employed. They are all alkalies, it is true, but they are just as different in their action with these different developing agents as if they were different individuals.

A very celebrated divine who was teaching in a theological school was very much annoyed by a student who tried to puzzle him with irrelevant questions. One day the student said: "Doctor, what is the difference between 'also' and 'likewise'?" The doctor answered: "I will tell you. Muhlenberg was a theologian. You are a theologian also, but not likewise." Ammonia, soda, and potassia are all alkalies also, but not likewise.

In examining the action of the different alkalies with the developing agents, we find a very marked difference. Take pyro, for example. It works almost equally well with both sodium and potassium carbonate, probably a little bit more energetically with the potassium salt. The use of a caustic alkali, however, with pyro, is entirely out of the question, as it produces immediate fog. On the other hand, hydrokinon works better by far with the caustic alkali than it does with the carbonate salts; and, furthermore, there is a very marked difference in the action between potassium carbonate and sodium carbonate. If equivalent quantities of sodium and potassium carbonate are taken, and noticing their action when using equal quantities of hydrokinon with each, it will be found that the development begins much more speedily with the potassium salt than with the sodium salt; and, in fact, the sodium salt is so slow as to be a comparatively useless agent. This property is taken advantage of in several well-known preparations on the market. If you will examine the hydrokinon developing powders put up by the Eastman Kodak Company, you will find that the contents of the two packages consist of pure hydrokinon in one and crystallised sodium sulphate and potassium carbonate in the other. This is the reason why it is necessary to wrap them in wax paper and tin foil, as the potassium carbonate absorbs moisture from the air and very rapidly deliquesces. Taking a developing agent which represents the other and extreme end of the scale from pyro, that is, amidol, we find that such a small quantity of alkali is required to put it into effective operation that the slow alkaline nature of ordinary crystallised sodium sulphite furnishes sufficient power, and no other alkali is necessary.

There is another question which might be of interest to you, and that is, when you are using alkalies in developing you may wish to know how many grains of the different alkaline salts are equivalent to one another. That is, if you are using a certain number of grains of sodium carbonate in your developer, it might be of interest to you to know how many grains of potassium carbonate you should use in order to produce the same effect. There is a little table which is quite valuable in regard to this, which has been compiled by O. G. Mason, M.D., which has been given repeatedly in the American Annual of Photography. I append it here. Equal work is done by—

112 parts of potassium hydrate,
80 ,, ,, sodium hydrate,
165 ,, ,, potassium carbonate,
106 ,, ,, sodium carbonate (dry),
286 ,, ,, sodium carbonate (crystallized),
168 gr. ,, sodium bi-carbonate,
268 ,, ,, potassium bi-carbonate.

As an addendum to that table I would add the following, taken from "Das Atelier," 1901: 180, by Von Huhl.

Von Huhl calculates as follows: The amounts of caustic soda necessary to produce phenolates with all the ordinary developers. This amount of alkali gives the best result in a developing solution. The figures in the first column give the amount of caustic soda to be used for every 10gr. of developer, and the figures in the second column the amount of developer to be used in each 100c.c. of solution. (If other alkalies are used, these figures in the first column must be multiplied by the following factors to obtain the amount to be used. Caustic potash, 1.4; potassium carbonate, 10; sodium carbonate, dry, 8; crystals, 16.—Ed.) Caustic alkalies must not be used with pyro or metol.

Pyrogallol	9.5g.	...	0.3-0.6g.
Pyrocatechin	7.2g.	...	0.6g.
Hydrokinon	7.2g.	...	0.5-1.0g.
Diphenal	5.0g.	...	—
Glycin	4.3g.	...	1.0g.
Adurol	4.2g.	...	1.0g.
Paramidophenol	2.8g.	...	0.4-0.7g.
Metol	2.3g.	...	0.6g.
Eikonogen	1.5g.	...	0.8-1.5g.
Diogen	1.2g.	...	1.2g.
Amidol	—		0.4-0.8g.

In reference to sodium carbonate, Dr. Miller has dwelt on a point that I think too much attention cannot be directed to. The average amateur photographer is not familiar with chemistry, and when he buys sodium carbonate he does not know of the technical and trade distinctions of the different forms, and, therefore, if he is not careful to specify exactly the kind he wants he is likely to have trouble.

It is safe to bear in mind that if you want *dry* carbonate of sodium it should be free from all water of crystallisation. If, on the other hand, you wish the sodium carbonate *in crystals*, you want clean, dry, hard crystals, that are clear. You don't want a powder with little white masses. Your crystals must be clean and hard and clear. They must not be wet or damp. If you take anything between these two you will not know where you are, and you will have an alkaline solution which there is no way of standardising. It is safe for ordinary purposes to use either one or the other, provided you select either one of these as a standard, and base all your calculations on it.

Dr. Chas. L. Mitchell.

LUMINOUS BACTERIA.

[Re-printed from "Nature," April 10, 1902."]

Luminous bacteria constitute a group of organisms which, under certain conditions, have the power of emitting light. They occur principally, if not entirely, in sea-water. It is, however, doubtful whether they give rise to any general luminosity of the sea, such as is caused by noctiluca and other relatively high forms of marine life, although it is possible that in the tropics, where the amount of non-living nutritive material is present in sufficient quantities, that bacteria do occasionally cause a general luminosity; but the opportunities of verifying this are rare. One organism in particular, the *Photobacterium Indicum*, from its forming a surface pellicle in artificial fluid cultures, which is very luminous, may at times cause luminosity of sea-water at the surface. It is remarkable that an unicellular organism such as a bacterium should have the power of emitting light. There is no evidence of any special structure in the cell itself, and in the present state of our knowledge it is difficult to regard it as other than a result of functional activity, exactly as heat is evolved by other forms of life, as an accompaniment of the metabolism of the cell. What is, however, the exact difference between the evolution of heat by some organisms and that of light by others it is at present impossible to say. Oxygen is absorbed in both instances and carbon dioxide evolved, but there is evidently some other factor, of which at present we know nothing. The fact that light and heat

are manifestations of the same form of energy may apparently simplify the matter; but further consideration shows that there is a different problem to be solved in each.

We are not acquainted with any artificial method of light production, in which chemical action takes place, where light is evolved except through the medium of heat; yet, in nature, by a simple cell, light is produced which is apparently unaccompanied by any invisible radiations whatever.

These organisms are sometimes referred to as "phosphorescent," but the term is hardly a suitable one, as the phenomenon is likely to be regarded as analogous to the emission of light by inert chemicals and minerals, or to the continued glow of vacuum tubes after an electrical current of high potential has been passed through them. In all marine light-producing animals, the light is not emitted continuously, but is given out at intervals in response to some stimulus or irritation. It is possible that bacteria act in the same way, but it is difficult to determine this point, as the individual organism is not sufficiently luminous to enable the observer to study it under the microscope by its own light. In fluid cultures they apparently respond to any agitation or excitation so long as the supply of oxygen is maintained, but they can be kept in a luminous condition on fluid media if oxygen is continuously supplied in other ways, although they may remain at rest. This can be done, for instance, by allowing the wool plug, used to close the orifice of the glass vessel containing a fluid culture, to become saturated with the culture, when the plug will continue to glow for days, although the culture in the vessel may only become luminous when agitated. This points to the agitation only resulting in the introduction of fresh oxygen, and not as being a direct exciting cause.

The number of species isolated up to the present is about twenty-five, but it is more than probable that some of these are identical, or, at any rate, closely related. In artificial cultivations, these organisms grow best on a medium containing a considerable percentage of a soluble chloride, in addition to the nutritive material. They will grow on an ordinary peptone-beef broth gelatine medium, but they do not all emit light, and none of them emit the maximum amount they are capable of producing. The best results are to be obtained by adding to the culture medium 2.6 per cent. of sodic chloride, .075 per cent. of magnesia chloride, and .3 per cent. of potassic chloride. Either of the chlorides which occur in sea-water, if added to a nutritive medium in suitable proportions, will cause some luminosity, but the results are not so good as on the medium mentioned. In the case of fluid nutrient media, some means must be taken to replenish the oxygen, as the amount held in solution is speedily exhausted. Either free oxygen can be allowed to bubble through the medium, in which case very brilliant cultures can be obtained, or frequent agitation can be resorted to. The temperature at which these organisms grow is variable. Those found in northern latitudes can grow and remain luminous at 0^0 C., the optimum temperature being about 15^0, at which reproduction is very rapid and luminosity at its maximum. Some organisms found in the tropics grow, however, at a much higher temperature, but none of them have an optimum as high as blood-heat, 37^0 C. Spectroscopically, the light emitted by these organisms is confined to a small portion of the visible spectrum, never extending into the ultra-violet or infra-red. Visually it only includes the green and blue, and photographically it extends very slightly further towards the violet.

J. E. BARNARD.

[Five phototypic illustrations to the above interesting article respectively show:(1) Spectrum of luminous bacteria in comparison with the spectrum of hydrogen; (2) cultures of different ages; (3) plate culture of luminous bacteria; (4) single colony of luminous bacteria magnified about 45 diameters; (5) fluid culture of luminous bacteria.]

Exhibitions.

THE PHOTOGRAPHIC AND OPTICAL TRADES EXHIBITION.

THIS exhibition is now being held at the Portman Rooms, Baker Street, W. It was opened on Friday, the 11th inst., and will remain open day and evening until Saturday next, the 19th inst.

In our issue of last week we printed a ground plan of the exhibition and a list of the exhibitors. Including, as the latter does, the names of a large proportion of the leading manufacturers and dealers in photographic apparatus and material in this country, it would have been safe to predict that an interesting exhibition would result. Not many years ago, a table down the centre of the gallery at the Pall Mall Exhibition sufficed for the display of almost every notable novelty or improvement in photographic apparatus that had been brought out during the year; and, although the simplification of the ordinary process of photography, owing to the adoption of the gelatine dry plate, quickly increased the number of those who practised photography both for pleasure and for profit, it is only in comparatively recent years that the production of photographic apparatus and material could justly be included among the important industries. That it has become so now, a visit to this exhibition would give ocular demonstration in corroboration of the testimony to the fact which this JOURNAL contains in its pages week by week. But although the extent of the growth of the industry, bordering as it does almost on the marvellous, is itself gratifying, it is no less a matter for congratulation that the improvement in the manufacture of almost every single article used in photography has made equal progression; and although work of the highest degree of refinement and finish is still, as it always must be, high priced, it is no longer the case that those who cannot afford to buy the best have to content themselves with apparatus of bad workmanship and design, and which ill performs the purpose for which it was intended.

Conversant though we are with much that goes on in the commercial world of photography, we must yet confess to some feelings of amazement at the variety of the cameras we met with in our progress through the exhibition. Cameras of every size and price, and for every purpose, from the magnificent specimen studio camera of Messrs. Watson and Sons, of the value of something like £30, to a ¼-plate automatic hand camera, made to sell at 1s. We should be sorry to have to make a guess at the actual number—one firm of manufacturers, Messrs. Seabrook Bros. and Co. state in the catalogue that they have 30 different styles on view—so it must be some hundreds, and probably several of the exhibitors have quite as many, if not more. When it is taken into consideration that these are but samples, and that the bulk turned out amounts perhaps to thousands of one pattern, some faint idea may be formed of those who join the ranks of photographers, or being old hands, buy a new camera in the course of the year. Upon this pleasing prospect of the demand to be met we present our congratulations to the firms we have named, and among others to Messrs. R. and J. Beck, Ltd.; Marion and Co., Ltd.; the Thornton-Pickard Manufacturing Company, Limited; A. E. Staley and Co.; W. Butcher and Sons; G. Houghton and Sons; the Busch Camera Company; Spratt Brothers; A. C. Jackson; the Columbia Optical Company; C. P. Goerz; Joseph Levi and Co.; O. Sichel and Co.; Benetfink and Co.; J. Lizars; J. J. Griffin and Sons, Ltd.; and A. Romanet.

In referring to cameras, we should mention that the demand for those to take rollable film is being well met. Quite a number of the manufacturers have hand cameras so designed, and in many cases these include notable improvements.

Lenses are naturally not very prominent objects in an exhibition, as they generally repose in modest retirement on the shelves of a glass case, and as very little can be learnt from the mere examination of the glass and brasswork, the lens-maker hardly gets a fair advertisement for his outlay. Nevertheless, though there are notable absentees among the leading opticians, in addition to plenty of exhibitors who show lenses of the ordinary and cheaper kinds, high-class instruments are shown by Messrs. R. and J. Beck, Ltd., who make a feature of photographs showing the performance of the Beck-Steinheil and their attachment; A. E. Staley and Co.; H. F. Purser; Watson and Sons; Clement and Gilmer, and C. P. Goerz.

Most of the firms we have mentioned include in their exhibit accessories for photographic work in some form or other, and the contrivances for lightening the photographer's labour, or for performing some special function, which deserve more than passing notice, are so plentiful that we do not attempt to enumerate them. Among the exhibitors who specialise, however, we may mention Messrs. J. Ashford, the Giraffe tripod stands; David Allan, lamps and metal ware of all kinds for photographic use; J. H. Taylor and Sons, graduated measures and glass work of all kinds; Rogers and Webster, and S. Alba and Sons, picture frames and mouldings for frames; Harry W. Cox, Ltd., X-ray apparatus, induction coils, and electric apparatus; A. Rosenberg and Co., metal tripods; Geo. Culver, Ltd., and the Anglo-American Optical Company, spectacles and ophthalmic instru-

ments; Lambert Mathews, lanterns; L. Kamm and Co. and Gaumont and Co., cinematographs; Chas. Zimmermann and Co., developers and agfa specialities; A. and M. Zimmermann, Schering's, pyro, and photographic chemicals; J. E. Lockyer, ready-mixed developing solutions and chemicals; the Bayer Company, Limited, Edinol developer, etc.; Johnson and Sons, nitrate of silver and chloride of gold; Burroughs and Welcome, chemicals in tabloids; Tyler and England Bros., and D. A. Lowtheme, mounts and albums; the Rotary Photographic Company, bromides, slow contact and negative; J. J. Griffin and Sons, velox and other papers, cartol developers, etc.; Marion and Co., Mariona and bromide papers; R. W. Thomas and Co., Ltd., plates and developers in tubes; the Quincey Photographic Development Company, the patent portable dark-box for photographic purposes; and the Aerograph Company, who provide an entertainment in itself in the demonstration of the capabilities of the instrument under the skilful handling of Mr. Burdick.

The organisers of the exhibition, Messrs. Marshall and Brooks, are to be complimented upon the admirable way the exhibition is conducted. To anyone who is interested in photographic apparatus, as a photographer, the show is a most instructive one, and to the photographic dealer the opportunity afforded of comparing various manufacturers' wares is one that should not be missed. Perhaps not the least attractive feature of the show to the ordinary visitor are the lectures given at intervals by Mr. T. C. Hepworth, on various photographic subjects, and by Dr. W. Hampson, M.A., on liquid air.

Commercial & Legal Intelligence.

Mr. J. Lizars, of Buchanan Street, Glasgow, writes:—"In consequence of the continued increase in business, I have been obliged to considerably increase my business premises in Glasgow, and in future my wholesale trade will be conducted from 3, Gordon Lane, Gordon Street, Glasgow, where also all goods are received and despatched."

Mr. J. C. Lee, practical and theoretical watchmaker, jeweller and silversmith, Market Place, Ashbourne, writes:—"I should be much obliged if you would make it known that I have a dark-room fitted with all modern appliances, for the use of amateur photographers visiting this picturesque neighbourhood. Also that I keep a full stock of Kodak Company's goods, and all the leading manufacturers' plates, papers, etc., of which I receive fresh supplies fortnightly to ensure their being perfectly fresh."

Kodak, Limited.—A statement has just been issued to the shareholders of Kodak, giving information as to the results of the past year's trading. From this statement it appears that the total net profis of the Associated Kodak Companies for the year 1901 were £393,769. This sum added to the undivided profits brought forward from the previous year amounts to £724,033. Dividends of 6 per cent. on the preference shares and 10 per cent. on the ordinary shares of Kodak have been paid, and in addition a bonus of 5 per cent. has been distributed to the ordinary shareholders, making altogether 15 per cent. for the year. The statement shows that after paying these dividends and bonus the undivided profits of the associated companies will stand at £528,791.

Scientific Nomenclature.—A scientist who discovers a new chemical element, a planet that has managed to elude the searching telescope, or a plant or animal unknown to the world, has the right to name the object discovered. To be sure, the privilege is merited, writes the "Scientific American," but what racking of brains it often entails was recently proven by the difficulty which Charlois of Nice experienced in baptising the thirty-four planetoids which he had discovered. When Piazzi, on New Year's Day of the nineteenth century, saw the first of these small panets, it was easy enough to follow the old rule of giving to celestial bodies the names of the Greek and Roman deities. For a long time the catalogue of mythological personages was quite capable of supplying the necessary names. But when celestial photography relieved the astronomer of much of the labour of telescopic observation, and the planetoids began to be numbered by hundreds, the list of mythological names was soon exhausted. Following the example of the Romans, Charlois personified the virtues, and thus created Amicitia, Fiducia, Modestia, Gratia, and Patientia. When he had no more virtues to fall back upon, he started with the city gods of those towns in which observatories are located, and was finally compelled to adopt proper names such as Ursula, Cornelia, Malusina. Charlois did not even shrink from giving some of his astronomical children the names of Charybdis, Industria, and Geometria. Not so long ago, Dr. Schwassmann, of Heidelberg, who, in conjunction with Prof. Wolf, discovered six planets, used the names Ella, Patricia, Photographia, Æternitas, Hamburga, and Mathesis. At one time it was suggested that the planetoids be simply designated by number. Had that suggestion been followed, everyone would immediately know the order of discovery. When the spectroscope revealed the existence of a host of new chemical elements, some patriotic but ill-advised chemist found it necessary to nationalise the new bodies, with the result that our chemical nomenclature has been enlarged by the names Gallium, Germanium, Skandium, and Polonium.

At the Nottingham County Court last week, before his Honour Judge Masterman, the proprietors of a company styling itself the Venus Art Studio were sued by Mr. James Allen, designer and draughtsman, 63, Noel Street, for £1, the value of a cabinet photo detained by them belonging to his wife. A representative of the Company was interrogated by his Honour, and, in reply, he said it was not a "limited" company; it was a London firm consisting of two gentlemen.—His Honour: I must have their names. Who are they?—Julius Brown and William Phillips, trading as the Venus Art Studio.—Plaintiff said his claim was for the value of a photo of his wife, detained by the defendants. He put in a receipt for the photo, which was read by his Honour. It acknowledged the receipt of "one photo, to be enlarged entirely free of charge. The usual price is 30s. Frames can be had from 15s 6d upwards. All photographs treated with the greatest care and returned when finished with." —His Honour. Did you give them this photograph of your wife?—My wife gave it.—His Honour: An dwhat was to be done with it?—They were going to make a sample. Now they won't return it without 15s.—His Honour: I have heard of this thing before. (To defendants' manager): Where is the photograph? Give it back to Mr. Allen.—The representative very reluctantly handed it over after being again smartly ordered to do so. He exhibited the enlargement in an "elegant frame." —His Honour: He says he doesn't want the frame.—Mrs. Allen said she was asked to allow the enlargement to be made as an advertisement. It was to be framed and given to her free for her to hang up to show to her friends.—His Honour gave judgment for the plaintiff, but as the defendants had returned the photo they would only have to pay the costs. Subsequently Mr. Allen applied for his claim to be amended. He asked for an injunction to restrain the defendants from publishing the enlarged portrait of his wife. His Honour asked the Venus Art Studio what they had to say to that? The manager denied having threatened to hang the portrait in a public-house. He said a "public place."—His Honour: Very well, I will grant the injunction restraining you from publishing it in any public place. The result is that the costs against the defendants will be raised very considerably. An injunction will be issued, and the costs will be on the highest scale. Be off with you! If you dare to do what you threatened, if you disobey that injunction, the consequences will be serious. Be off!

We have received from the Imperial Dry Plate Company, Cricklewood, the appended particulars of the Imperial Photographic Competition, in which prizes of over £500 in cash are offered. The classes are:—A (open to professional photographers throughout the world): First prize, £30; second prize, £20; two prizes of £10—£20; ten prizes of £5—£50; fifteen prizes of £2 2s.—£31 10s.; 100 prizes of £1 1s.—£105; total, 129 prizes—£256 10s. Prints sent in for this class may be of any size or subject. B (open to amateur photographers throughout the world): First prize, £30; second prize, £20; two prizes of £10—£20; five prizes of £5—£25; ten prizes of £2 2s.—£21; fifty prizes of £1 1s.—£52 10s.; 100 prizes of 10s.—£50; total, 169 prizes, £218 10s. Prints sent in for this class may be of any size and subject. Whilst prints less than ¼-plate may be entered in this class, it is pointed out that Class C applies to such small prints only. C (open to amateur photographers throughout the world): Three prizes of £2 2s.—£6 6s.; ten prizes of £1 1s.—£10 10s.; twenty prizes of 10s.—£10; total, thirty-three prizes—£26 16s. Prints for this class must be from negatives smaller than ¼-plate. The prizes wil be given to the best photographic prints entered in each class, subject to the annexed conditions:—(1) All prints must be mounted. (2) They must be on Imperial P.O.P., Imperial "Gaslight," or Imperial Bromide Paper, from negatives on Imperial Plates taken during 1902. (3) The name and address of the competitor, and the title of the picture, must be clearly written on the back only of each mount. (4) Each print must be accompanied by the outer label of the box of plates and the envelope or label of the package of paper used in producing the picture. (5) A competitor may send in any number of prints, but each must be entered separately. (6) All prints must be addressed and forwarded to us as below. (7) The package must be plainly marked on the outside "Competition—Class A, B, or C," as the case may be. (8) All entries must reach us—from Great Britain and Ireland, not later than the October 31st, 1902; from the Colonies and abroad, not later than December 31st, 1902. (9) Communications requiring a reply must be sent under separate cover. (10) In judging the prints, marks will be given (1) for artistic merit, (2) for technical excellence of negative, (3) for technical excellence of print, (4) novelty or difficulty of subject, (5) for trimming and mounting. (11) The decision of the directors of the company to be final. (12) The winning prints to become our property. Any other prints will be returned to the competitor if accompanied by a stamped and addressed label or envelope. (13) The negatives from which prize-winning prints are taken to be placed at our disposal on loan, if we require them, with the right to reproduce the picture for our own use. The copyright to remain the property of the competitor. (14) The prizes will be forwarded by cheque to the winners immediately after the close of the judging, and the names of winners will be published. (15) Competitors may be called on to submit any negative for inspection before the awards are made, the company paying carriage on those that are not awarded a prize.

Jersey Photographic Society.—At a meeting of the Jersey Photographic Society, held on April 1st, the following officers were elected: President, Dr. Stamberg; vice-president, Mr. C. R. Poingdestre; hon. secretary, Mr. R. Porter, Brighton Villa, Brighton Road, Jersey.

Sir Benjamin Stone, whose collection of photographs of historical interest is now assuming large proportions, visited Christ's Hospital last week, and succeeded in obtaining a series of negatives of the scholars and the staff. A set of these pictures will be preserved with the other photographic records at the British Museum.

Wanted: A Pretty Girl's Face.—The following advertisement appears in the "Photo-American" for April:—"A large firm desires to purchase the right to use the face of a pretty girl for advertising purposes. Subject should not be over 21 years of age. Address specimen photographs to Box 91, Washington, N.J."

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

April.	Name of Society.	Subject.
21	Camera Club	*The Concentration Camps in South Africa.* Mr. J. W. Williams.
21	Croydon Natural History	Mr. Rudler's Third Lecture.
21	Glasgow and West of Scotland	Paper on *Some Methods of Making Lantern Slides*, by Mr. Thomas W. Robertson.
22	Thornton Heath Polytechnic	Demonstration. *Cristoid Films.* By Richard Smith, Esq. (Sandell Films & Plates, Ltd.).
22	Newcastle-on-Tyne	*Platinotype Printing.* By Walter Scutt.
22	Leeds Photographic Society	*Chemicals used in Photography.* (Y.P.U.) Mr. B. A. Burrell, F.I.C.
22	Stonehouse Camera Club	Paper by Mr. Smith.
22	Birmingham Photographic	Members' Lantern Evening.
22	Croydon Natural History	Zoological.
23	Southsea Photographic Society	*Ozotype.* The Ozotype Co.
23	North Middlesex Photographic	*Telephotography from a Pictorial Point of View.* E. Marriage, F.R.P.S.
23	Croydon Camera Club	*Photographic Surveying.* The President.
24	Darwen Photographic	Members' Slide Evening.
24	Oldham Photographic Society	Lantern Lecture. *Oldham Worthies.* Mr. A. Marcroft.
24	Woolwich Photographic	*Toning.* G. Tapp.
24	Richmond Camera Club	Competition—Enlargements.
24	Croydon Natural History	*Peeps into Nature's Secrets.* Mr. R. Kearton.
24	Camera Club	*Tattooing.* Mr. Sutherland Macdonald.
24	London and Provincial	Discussion of 10th inst continued.
25	Croydon Natural History	*What Can be Done with a Hand Camera.* Mr. C. P. Goertz.
25	West London Photographic	*Mounts and Frames.* E. T. Holding.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

APRIL 3RD.—Mr. R. J. Kindon in the chair.

Mr. W. T. Wilkinson showed several photomicrographs of the photogravure bitumen grain, exactly one hundred times magnified. The different character of the grain in each was due to the fact that the plates had been in the dusting-box for one, two, four, and eight minutes respectively, and there was half a minute's rest between stopping the box and inserting the plate. The plate that had been in the box for eight minutes showed the finest grain.

Mr. Walter D. Welford passed round a bottle of Fuerst's Universal Sensitiser for the coating of postcards, leather, linen, etc. He had tried the solution on the cheapest postcards he could get, on the basis of the argument that a sized paper would give the best results, and that, therefore, poor quality cards would constitute a severe test. The solution is applied with a brush, and the card or other material allowed to dry. The results shown made it clear that even with poor quality paper good effects could be secured. The prints were fixed in plain hypo. The solution was of a very thin lemon-brown colour, and some conjectures were made as to its composition.

Mr. W. T. Wilkinson said that solution of silver nitrate would give similar results.

The presence of uranium was suggested by several, and it was thought possible that it might be a mixture of a salt of uranium and silver.

Mr. Welford said it was quicker than P.O.P. He thought that it wanted a plucky negative. A soft negative gave something too thin.

Mr. Rapson passed round a print and asked by what process it was made. It had every appearance of carbon, but he was told that it was not a carbon print.

Mr. Wilkinson said it was a print on citro-chloride of silver emulsion on cartridge paper, described by Abney. He was the maker of the print, and said that it was toned with a combined bath.

A discussion took place regarding the Watkins' system of Timing Development.

Mr. Wilkinson said he had three years' experience of it, and always found the method correct. The bulk of his work was done by leaving the plate for five minutes in the developer, without troubling about the method, but that was with well-timed exposures and a developer of known qualities.

Mr. S. H. Fry held that to a man who was a beginner in photography, with no knowledge upon which to base his actions, no knowledge of exposure, and so forth, a machine that times his operations seemed desirable, because, whether good, bad, or indifferent, he was sure to get some pictures as a result of following a rule. Machine work, in those circumstances, was better than guess work, because not only did the beginner not know what he was likely to get, but what he ought to try to get. Ultimately that beginner would depart here and there from observance of the system, although he might continue to use it. Mr. Fry thought that therefore the method was distinctly useful to a class.

Mr. R. P. Drage thought Watkins' system had come to stay. He spoke of the extensive use of the method that had come under his own notice.

Mr. P. Everitt styled the germ of Watkins' method an idea borrowed from Hurter and Driffield's system.

Mr. A. Mackie considered, however, that Mr. Watkins was entitled to the credit for pointing out that the total time of development was proportional to the time of appearance of the image. It seemed to him that if development were progressive, and went on at an even rate, the relation laid down by Watkins was correct.

Mr. H. C. Rapson put it that the system would come to grief in this way. Starting development at 65deg. Fahr., the developing factor might be 4 with certain solutions, but the temperature might drop to 50deg., when the factor might be nearer 12 than 4.

PHOTOGRAPHIC CLUB.

APRIL 2ND.—Mr. Hans Müller in the chair.

Two members were elected to the Club.

A conversational discussion took place regarding the production of images upon silver plates by metallic contact, as with coins, etc., followed by development, and a spirit of inquiry into the causes was manifest. It was mentioned that some of Mr. Friese-Greene's experiments lay in this direction, and it is expected that the member who referred to the matter will have something to report later.

The performances of the fluid lens of Dr. Grün were also the topic of conversation, and it was pointed out that the introduction of the fluid shortened the focus of the lens very much, so that, instead of working at, say f/8, it would be working possibly at f/3.

Mr. A. Mackie made some observations regarding the use of fine ground, oiled glass in copying, where it was desired to overcome "grain" in the original. One would expect a very peculiar result of this procedure, but as a matter of fact the copy seemed improved and there was little less of definition.

APRIL 9TH.—Mr. J. W. Zaehnsdorf in the chair.

Mr. J. R. Gotz read a paper upon some experiments he had been making in order to determine the value of different sources of light used with gaslight printing papers. The paper will be printed in extenso next week. A considerable number of test prints upon the various papers in question was passed round.

The chairman referred to the demonstration of a few weeks previously at which the question of the comparative value of gas and electric incandescent lamps was discussed, and said that he had both in his dark-room. He had come to the conclusion that, candle for candle, the electric glow lamp was not so actinic as the batswing gas burner. Mr. Gotz had, of course, upset the comparison by using the reflector with the electric lamp, but, deducting something on that account, the state of things that he found to exist in practice would probably be confirmed by Mr. Gotz's test.

A vote of thanks was passed to Mr. Gotz for his paper.

CAMERA CLUB.

A LARGE audience was attracted to the Club Rooms, last week, to hear Captain Wheeler's lecture on Military Photography, and the discourse aroused much interest, in spite of the rather curious circumstance that not a single military member of the Club happened to be present. Captain Wheeler began with an apology for bringing before his audience a paper which touched only the fringe of rather a big subject. But no apology was needed, for his statements were concise, they covered much ground, and were touched with that saving quality of humour which always commends a speaker to his auditory.

There are several applications of photography to military needs, such as the record of gunnery experiments, which the lecturer passed over with brevity. He urged that photography should be recognised by the authorities as a most valuable aid to the Service, and he considered that the Camera Club, holding such a representative position as it did, and numbering upon its roll so many military men, might do yeoman service in pressing this point upon the War Office.

He himself had taken up photography as far back as 1877, when he first commenced his military training as a cadet. Afterwards, in 1879, at Sandhurst, he took a camera with him as part of his kit. That was in the very early days of gelatine photography, but he was able to procure excellent plates and to do passable work. There was an old ruinous house at Sandhurst, which was supposed to be a fort, and served as an object-lesson to the students, who had to make drawings of it. He surprised his instructors by sending in, instead of a drawing, a whole-plate photograph of the pseudo fortification, and he was proud to say that this picture elicited the warm approval of Lord Wolseley to whom it was submitted.

He might remind his hearers that the Military Authorities of this country recognised photography as a possible aid as early as the Crimean war, when an official photographer was appointed. He went to the front with about thirty large packing-cases, and a portable dark-room which, at the time, was likened to a bathing-machine. It is not on record that any serviceable pictures were produced by means of this elaborate apparatus.

In 1880 the lecturer went to India with his regiment, and was amused, when taking snapshots of the natives, at the way in which the men would stand stock still long after the exposure was made. They had been used to posing for a wet-plate man. On one occasion a lofty Indian official refused altogether to believe in the rapidity of dry plates, and declared that it would be impossible for the lecturer to take him while walking. This was, of course, not impossible; but when the official saw the result, with his leg sticking out in front of him, he saw how ridiculous the picture made him look, and at once forbade its circulation. The lecturer eventually retired from the Army, and has since made a hobby of photography, and has given much thought to its extended use as an aid to military movements.

Officers often take up photography as a mere amusement. Often a good soldier will make a bad photographer, and vice versâ. He held

that the office of military photographer should be held, not by a mere amateur, but by a professional, who could be relied upon to produce good work—not necessarily artistic results. Photography would be most useful in the intelligence department of an army, but still better service would it be capable of in that necessary survey or examination of a tract of country which was understood by the word reconnaisance. Some of the military reports sent in by surveying officers left very much to be desired; they would be rendered far more valuable if accompanied by photographic illustrations. It is true that sketches can be made, but much loss of time is involved in filling in the details, without which no sketch is of any service. With regard to the best apparatus to employ for military purposes, he would prefer something of a circular, telescopic form, possibly made of aluminium so as to save weight, and to be used with celluloid films.

It had at one time been suggested that each soldier joining the colours should be photographed, so that in case of desertion the man could be more easily tracked. He certainly deprecated such a course, for it savoured of treating brave men as criminals are treated. Besides, such photographs sometimes led to curious mistakes. He had heard of a case in Russia where a man who was "wanted" had been photographed in six different positions, and these pictures were circulated among the different police departments. The head of one of these establishments wrote to his superior officer a few days after he had received the pictures to the following effect:—"Sir,—I have duly received the portraits you sent me of the six miscreants whose capture is desirable. I have arrested five of them, and the remaining one is under observation, and will be run down very shortly."

Photography is very useful in obtaining pictures of fortifications; but, as is well known, the greatest care is taken, in France especially, against such pictures being produced. Upon one occasion a pretty nursemaid was observed, at a certain town on the French Frontier, daily wheeling her baby-charge in a perambulator. For some reason suspicion was excited, and the maid turned out to be a young German officer, while the baby was a dummy concealing a camera.

Balloon photography, of which, unfortunately, the lecturer had no personal experience, was likely to be very useful in military operations, for pictures so taken embraced a very wide angle. The balloon school at Aldershot had already done much good work.

The discussion was opened by Mr. Cadett, who called attention to the Theodolite Camera invented by Mr. Bridges Lee, as a useful surveying instrument well adapted to military purposes. Mr. Inwards approved of the notion of a circular camera, but pointed out that the plates or films could hardly be circular, as suggested by the lecturer, but must be rectangular. Mr. Lambert suggested that Dallmeyer's recent modification of the telephoto lens—a front lens which could be attached to the hood of the ordinary lens, and which did not entail extension of the camera or any loss of speed in exposure—would be most useful for field work. He took exception to the lecturer's remark with reference to preferring a professional to an amateur worker. He himself had found that the ordinary professional photographer did admirable work in his own particular groove, but that the amateur was better when a great variety of work had to be undertaken. The Rev. Mr. Norgate called attention to the vast number of photographs sent home by officers from the present soat of war. Nine-tenths of these—and a large number had come before him in his editorial capacity—were quite unfit for publication, on account of the horrors they displayed. This was more particularly the case in regard to certain pictures taken after the action on Spion Kop. After a few remarks by the chairman for the evening, Mr. T. C. Hepworth, the proceedings closed with the usual vote of thanks to the lecturer, which was carried by acclamation.

LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

On Saturday last a half-day excursion was arranged for a photographic trip to Hall Road and Hightown, under the leadership of Mr. Anyon, for the study of sand-dunes, cloud effects, and river scenes. A party of twenty-eight members and friends turned out, who expressed themselves as highly pleased with the outing. One hundred and sixty-six plates were exposed.

RICHMOND CAMERA CLUB.

At the meeting on April 10th Mr. Morgan (of Messrs. Morgan and Kidd) gave a demonstration of "a new printing process." He introduced a new printing-out paper, giving fine sepia and brown tones, which will in a few months be on the market and will be distinguished by its economy.

Mr. Morgan first gave a short résumé of the various photographic printing processes, the course of which he pointed out that as regards economy of cost no advance had been made since Fox Talbot introduced the use of albumenised silver, the first practical printing process. Mr. Morgan then showed some very excellent specimens of prints on the new paper, which is self-toning, needing only to be washed, fixed, and again thoroughly washed.

DEVONPORT CAMERA CLUB.

There was a small attendance last week to consider the resignation of Mr. H. J. Hissett, the president. Mr. Parkman presided, and the Secretary (Mr. F. B. Langdon) read Mr. Hissett's letter, in which he gave as the cause for his resignation the cold indifference of the influential members. In regard to the exhibition, the lukewarmness was such that failure and a heavy loss could only result, and he felt bound to protect himself. He had instructed Trend and Co. to debit him with the cost of the dummy catalogues and the setting-up of the type for the prospectus, and there his liability must end. The chairman said the committee had always been prepared to back up Mr. Hissett. There had been no unpleasantness, and the letter came as a great surprise. There was something behind it all. The secretary said the members had guaranteed about £5 towards the exhibition, the president promising £1. Mr. C. Corydon considered this principle of guarantee bad. The exhibition scheme was a wild one. It had been a case of vaulting ambition overleaping itself. On the motion of Mr. H. Lamb, seconded by Mr. Joliffe, the president's resignation was accepted. Mr. R. J. Lamb was elected president for the remainder of the session, and Mr. J. F. Coombes was elected a vice-president. The exhibition was postponed from May 21st to September.

News and Notes.

C.T.O. Junior Telegraphists' Social and Recreative Association.—The "Telegraph Chronicle" states that:—"At a meeting held on March 7th it was decided to form an association, as indicated by the above title, for the purpose of promoting in every possible manner the recreative welfare of the junior staff. The following is the list of officers: President, J. Lister, Esq.; chairman, J. Grant, Esq.; vice-chairman, C. Worthy, Esq.; assistant chairman, Mr. R. E. Ketley; treasurer, G. R. Salter, Esq.; hon. secretary, Mr. J. R. Murray. It is proposed to form the following sections provided sufficient members signify their intention of joining: (1) Photography, drawing, painting, and general art; (2) music; (3) chess and draughts; (4) natural history; (5) horticulture; (6) general small woodwork, metal-work, and electrical; (7) literary; (8) junior swimming; (9) rambling; (10) cricket; (11) football; (12) cycling; (13) fishing. The proposed subscription is 1s. entrance fee, and 2d. per fortnight, with a small further subscription for each section joined, but this is as yet subject to modification. Over 100 persons have already promised their support to the association. It is proposed to hold a social concert about 29th April, prices to members 1s., non-members 1s. 6d., or double ticket 2s. 6d. The rules are very stringent regarding money matters. The leading idea is economy of funds and low subscriptions. This is the biggest idea ever launched in TS., and it is to be hoped will prove a success. The combination of athletic and instructive sections is an absolute novelty. The various societies and clubs now existing may eventually amalgamate with the new association, but for the present it is to be an association of juniors and for juniors. To the hon. secretary (Mr. J. R. Murray, of the A Division) is due the credit for the inception of the scheme, and it is owing to his energy that the affair has been started. He will be pleased to afford information on any point to intending members." It will be observed that one of the sections of the association is devoted to photography. The hon. secretary, Mr. Murray, is a son of the well known and respected photographer and dealer, Mr. R. C. Murray, of Garrick Street, W.C., whom we congratulate on his son's connection with an excellent educational movement.

The Late M. Cornu.—The "Times," in its obituary columns of Tuesday, April 15th, published the details of the late M. Cornu's career. Born on March 6th, 1841, he received his early education in the Lycée d'Orléans, and in 1860 entered the Ecole Polytechnique, where, after an interval spent at the School of Mines, he seven years later became Professor of Experimental Physics—a position which he retained till the end of his life. Cornu devoted himself mainly to researches in optics, which he regarded as the "science directrice de la physique moderne." The work by which his reputation was made was his determination of the velocity of light by Fizeau's method, which, by the improvements and refinements he introduced in the apparatus, was brought to yield results that compared in point of accuracy with those obtained by astronomical determination. The experiments were first made between the Polytechnic School and Mont Valérien, a distance or 6½ miles, and subsequently between the Paris Observatory and the tower of Montlhéry (about 14½ miles); they gained him, among other honours, the membership of the Academy of Sciences, where he succeeded A. C. Becquerel in 1878, and in the same year the Rumford medal of the London Royal Society, of which he was elected a foreign member in 1884. Among the other branches of optics to which he contributed were crystalline reflection, polarization of light, diffraction, and spectoscopy, especially of the sun. Other departments of physical science also claimed his attention, and he published memoirs on acoustic, magnetic, and electric questions, while one of his earliest investigations, begun in conjunction with Baille over thirty years ago, had for its object the determination of the mean density of the earth by the torsion-balance method and by Cavendish in his classic experiment. Professor Cornu was well known in English scientific circles, and made several public appearances in this country. He delivered more than one Friday evening discourse at the Royal Institution, the last being in 1895, when he discussed some physical phenomena of the high regions of the atmosphere. In 1899, as Rede Lecturer at Cambridge, on the occasion of the jubilee celebration of Sir George Stokes, he gave a polished and graceful lecture on the wave theory of light and its influence on modern physics, receiving the honorary degree of Doctor of Science from the University on the following day.

English Scenery.—Last week, at the Mansion House, Lord Avebury deliver a lecture on "English Scenery," illustrated by many lantern views. He pointed out that a large part of England was little above sea-level, and described briefly the condition of the country during the

glacial period. Mountain ranges used to be supposed to be due to volcanic upheavals, but now they were attributed to the contraction due to the cooling of the earth. Volcanoes had, however, largely affected our scenery—many North Country "laws" were the funnels of ancient volcanoes. A great deal of denudation of softer strata had taken place; thus Snowdon had been the bottom of a valley, but projected on account of the great hardness of the rock. After dealing with the structure of several English mountains Lord Avebury described the normal course of a stream from its source to the sea, the reasons for new loops, waterfalls, etc., and explained that our existing valleys had been formed at a time when the land stood some 200 feet higher than at present. To this cause, and to the tides, were due our excellent harbours, and consequently to a great extent our commerce. Lord Avebury then explained the laws which governed the courses of our rivers, and showed how the Severn and the Ouse were and long had been encroaching on the Thames. In fact, rivers had their wars and vicissitudes like nations. He then passed to the lakes. The larger of them were drowned river valleys, and like other beautiful things they were only temporary. After explaining the origin of our heaths and downs, he showed how English scenery was affected by law and custom. Our fields and hedgerows and timber trees were due to our system of land tenure, while that of France had given rise to the vast fields,divided into narrow strips without hedges. The ridge and furrow of the Midland meadows were stated to be due to the fact that it was all arable land at one time. Our systems of measurement were traced back to the time when our fields were tilled by oxen, the acre being the amount a team would plough in a day, the furlong or "furrow long" the length tilled before the ox required rest, and the rod or pole or perch being the length of the ox-goad. In conclusion Lord Avebury urged that our beautiful scenery was a great national inheritance. We were all great landlords if only we knew it. The landowner got the rent, but the landscape belonged to all who had eyes to see and were able to enjoy it.

THE late Sir John F. D. Donnelly, K.C.B.—Sir John Donnelly died at his house in Onslow Gardens on Saturday, the 5th inst. He was born in 1834, and was consequently in his sixty-eighth year. He entered the Royal Engineers in 1853, and the year after he joined he went to the Crimea, where he served with some distinction, being twice mentioned in despatches, and receiving, besides the medal and the Turkish decoration, the ribbon of the Legion of Honour. In 1857 he began the association with South Kensington which afterwards occupied his entire career. Sir Henry (then Mr.) Cole was occupied in the establishment of the South Kensington Museum, which commenced in 1855. Lieut. Donnelly was one of the young engineer officers whom Cole associated with himself, and of whose ability he made intelligent use in carrying out his schemes for the establishment of an art museum and the promotion of artistic and scientific education in this country. The two were for long intimately connected in their work, and each of them had a sincere regard for the other. When Sir Henry Cole retired from the public service, the South Kensington office was reorganised, the posts of Secretary of the Department and Director of the Museum, both held by Cole, being separated. Sir Francis Sandford, who was then Secretary of the Education Department, was appointed also Secretary of the Department of Science and Art, and Major Donnelly became Director for Science. On the retirement of McLeod of McLeod, the Assistant Secretary, he undertook the duties of that office as well. On Sir Francis Sandford's relinquishing the dual post, Colonel Donnelly was appointed Secretary of the Department, and he held the place till his retirement in 1899. The whole system of science and art education grew up under Donnelly's directions, and it may be truly said that the success of the scheme for instruction in science was very largely due to him. He devoted himself earnestly to the elaboration of a practical method, nor was it until other suggestions had been found unworkable that Donnelly's ideas were adopted and found adequate to the needs of the time. It was, in fact, only when Donnelly took the matter in hand that the teaching of science to the artizan class proved practicable. He retired from official life in 1899, having in 1893 been made a K.C.B. It was in 1860 that he became a member of the Society of Arts, but it was not until ten years later—in 1870—that he first took office on the Council. In the following year (1871) he brought forward the scheme of technological examinations which, carried on for some years by the Society of Arts with limited numbers and no great popular success, formed the foundation of the City Guilds Institute for the promotion of Technical Education. In the formation of this Institute Captain Donnelly was consulted, and his advice had considerable influence upon its character, while it may be said that it was entirely owing to his urgency that the scheme of technological examinations formed part of the Institute. From that time forward he remained, with such intervals as the regulations require, an active and valuable member of the Council, occupying the post of chairman in 1894 and 1895. The School of Art Wood-carving was established by his exertions. At his instigation a class was first started by the Society of Arts, and he afterwards succeeded in obtaining from some of the City Companies and elsewhere sufficient funds to carry it on to the present time. But a few months ago he was busily engaged in obtaining accommodation for the school on the premises of the School of Art Needlework, and in securing for it a more permanent organisation than it has hitherto succeeded in attaining. It was at his instance that the Society undertook the organisation of the very successful International Congress on Technical Education in 1897. Application had been made to the Government, asking them to hold such a Congress in England, and when the Government declined the invitation Sir John Donnelly suggested to the Council that the Society might undertake the duty. This, with some financial assistance from certain of the City Guilds, it did, and Sir John Donnelly rendered useful aid in the carrying out of the proposal.—"Journal of the Society of Arts."

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

THE PRESENT ASPECT OF COMMERCIAL PHOTOGRAPHY.

To the Editors.

Gentlemen,—During the past decade, what may be termed the commercial side of photography has passed through many vicissitudes, and at the present moment it looks as if several of it branches, which in the past proved highly remunerative to a large number of photographers, were likely to be classed with things unprofitable. This falling off is perhaps most noticeable in silver printing connected with commercial landscape work. For many years this particular branch of photography gave employment to a large number of hands in the printing departments connected with those professional photographers who made a specialty of photographing the numerous beauty spots, not only in this country, but on the Continent as well; and the public, through a long series of years, were solely dependent upon these scraps or silver prints for any souvenirs they desired of districts visited. The introduction of photo-mechanical printing may be said to have struck a death blow at silver printing as previously conducted in connection with this class of work. Collotype and half-tone process-blocks having, in a large measure, superceded the silver print. Apart from several large firms who made a specialty of this work, professional photographers in country districts were enabled to do a good turn over in selling local views, thereby making a fair addition to their income from such work, which proved a good stand-by when other branches of trade were dull. Photo-mechanical printing has interfered greatly with such commercial work, and the result of this interference is fast making its presence felt with the public, who, it must be confessed, do not seem to appreciate the tone process-blocks having, in a large measure, superseded the silver prints. Twelve whole-plate collotype prints are now freely offered for the paltry sum of sixpence, such as can be seen on sale at any of our leading book-stalls or railway stations; but who, possessed of any sense of judgment, would compare these cheap productions with the better-class silver prints in vogue for so many years.

Many of these photo-mechanical pictures are hurriedly got up to flood the market with representations of popular functions, which doubtless accounts for their inferiority as to quality. On the other hand, it is only fair to state that, in album form, there are a large number of highly-creditable productions in collotype and half-tone printing that must have interfered sadly with country photographers in their sale of local views to tourists, etc., during the summer season. In many instances photographers are themselves to blame for this interference with their trade in country districts, for it is well known many of such have played into the hands of the photo-mechanical printer and publisher by selling their interest in valuable negatives for a mere pittance of, say, half a sovereign or so. We live in a progressive age truly, and this process is not merely confined to mechanical improvements in manufacture. The introduction of electricity has in a sense revolutionised much that was only a few years ago looked upon as likely to be permanent for many years to come. It has within a few short months completely altered the aspect of nearly all our cities and large towns, so that photographs taken only a few years ago are now completely out of date, in so far as the appearance of many of their chief thoroughfares are concerned, and the public, always eager for the latest production and novelty, are not slow to recognise when a view, be it a silver print or a photo-mechanical production, is stale or out of date. It cannot be said that those firms who cater largely for the public by means of photo-mechanical printing are at all lacking in energy or enterprise when there is any prospect of a fair remuneration for capital invested. Still, there is no denying the fact that in many instances certain views have been reproduced by them at considerable cost which have turned out anything but "good sellers with the public." There are, and always will be, certain pictures, such as Burns's Cottage and other celebrated haunts, that will sell in any form like penny pies; but these do not represent the entire stock necessary to keep the wheels of a large concern moving so as to yield a remuneration for capital invested, and hence caution has to be exercised in selecting only certain districts whose views go well with the public before such firms would think of going to the expense of sending a special operator, in some instances many hundreds of miles, to photograph such scenes for reproductions. In such instances the photo-mechanical printer or publisher deals direct with the local photographer, in the hope of obtaining from him the right to reproduce a valuable negative, which it may have taken the local photographer many months of waiting to acquire.

With the local photographer the mere taking of a negative embracing some new feature in a street scene or new building is, of course, an easier thing to accomplish than would be the case where a firm has

to send an operator a long distance to provide such; for by reason of the fact that he is on the spot and ready to take advantage when the light and other circumstances are suitable, he can obtain negatives which those residing at a distance cannot hope to obtain. It is to such that the photo-mechanical printer looks for his best views, and in many instances, it must be confessed, succeeds in deriving for a mere nominal price the right to copy and publish such views. The photographer, not realising the injury he is doing to himself by making such a bargain, soon finds on sale in the local stationer's window or railway bookstall a well-executed series of views embracing his best-selling photograph, which for all time coming ruins his trade in the districts. And all this, very probably, by his having accepted the paltry sum of half a sovereign for the right to reproduce the same. Transactions of this kind are numerous, and the sooner country photographers realise that by parting with their negatives for such paltry sums they are playing into the hands of the photo-mechanical printer, the sooner will they safeguard their own interest. In this one item alone there is good grounds for the Professional Photographers' Association, which has only quite recently been formed, taking steps to protect the professional interest.

In olden times, or prior to the introduction of the collotype or half-tone form of mechanical printing, there was some inducement to a photographer to make a tour or send an operator into certain districts for the sole purpose of renewing or acquiring a new stock of negatives to supply silver prints to tourists or the public; but within recent years there is little or no inducement to do so, and this branch of work has practically come to an end, the outcome of which is fast being felt by authors and publishers, who find they have not the same supply of views to fall back upon in illustration of their works. A striking instance of this came recently under the writer's notice in connection with the sale of views of one of our best-known cathedrals. For years the entire trade was confined to the sale of silver prints, but two years ago an enterprising firm published an album of collotype views, completely killing the local photographer's silver printing. Consequently, it is not worth his while to take further negatives embodying many of the chief features now desired, the portions have had to be rephotographed at considerable expense, all to the professional's advantage for the time being. It is not merely, however, in connection with what may be termed stock views of well-known places, such as street scenes and landscapes, that commercial photography is suffering at the present moment. Many of our large functions, such as international exhibitions, which in previous years used to provide a large amount of work in silver printing, may be said to have passed completely into the hands of the photo-mechanical worker, and stationers and publishing firms who in former years were able to make a good return by the sale of scrap photographs, now find this portion of their trade worthless, and it is very questionable if the public are gainers by the substitution of the photo-mechanical print.

There is also another phase of this question. For many years a large trade was done in the sale of opalines or silver prints, mounted in optical contact with glass, such pictures being attractive by reason of their being enclosed in plush or other frames. Nearly every stationer's window or fancy store, as well as bookstall, kept a large supply of such views in stock. With the falling off in silver printing these attractive pictures have likewise suffered, for now a mere glance will show anyone conversant with photography that a large portion of what is now on sale are prints not from direct negatives at all, but second-rate productions from duplicate negatives. The reason for this inferiority is not far to seek. The falling off in the demand for plush frames by reason of the diminution in silver printing soon caused large firms of frame manufacturers to adopt some means to keep up their trade in the manufacture of plush framing and similar goods, and so they turned their attention to acquire the right to copy well-known views. Here again, in numbers of instances, the professional photographer gave himself away by allowing duplicate negatives to be made from his originals. These duplicates are put to no end of use by the frame-maker, who either uses them for collotype or second-class silver prints in optical contact on glass; all to the injury of the local photographer, who actually sees his own photographs being sold in the form of copies, at prices, including frame and all, which he used to get for his scrap prints alone.—I am, yours, etc.,

AN OLD PROFESSIONAL.

April 5th, 1902.

A NEW LAMP.

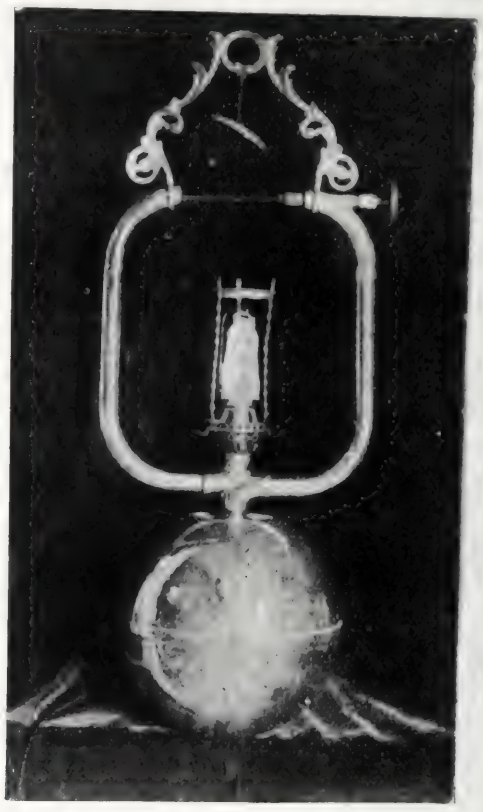
To the Editors.

Gentlemen,—A neighbour of mine has brought me a lamp that has been sent to him from America. I have tried it and roughly tested the power of the light, which is certainly more than double that of the ordinary Welsbach incandescent, and it would be, I should say, very useful for enlarging.

The lower part of the lamp consists of a steel globe, which is half-filled with spirit through the little valve in front. Air is then pumped in as when inflating a cycle tyre. The tube on the right hand reaches to the bottom of the globe. The rod across the top is a tube ending in a minute hole which is opened and shut by turning the milled head.

Before lighting, it is necessary to heat this rod, on opening which the spirit is forced in a thin stream through it, and, issuing as vapour, passes down the left-hand tube and acts as in an ordinary Bunsen burner.

I hope the enclosed photograph may render my account quite clear.



Do you know anything of these lamps, and, if so, can you inform me whether they are procurable in this country? The lamp itself bears no name or trade mark.—Yours truly,

Eagle House, Batheaston, Bath. LINLEY BLATHWAYT,
April 7th, 1902. Lt.-Colonel.

[We have not been able to trace mention of the lamp. Some reader may, perhaps, be able to assist Col. Blathwayt.—EDS., B.J.P.]

PHOTOGRAPHIC AND OPTICAL TRADES EXHIBITION, 1902.

To the Editors.

Gentlemen, —I shall feel obliged if you will notice in the next number of your valuable paper a slight alteration in the programme for this Exhibition for Saturday next, April 19th. The programme will be as follows:—3 o'clock, "Transvaal War and Photography"; 4 o'clock, "Colour Photography"; in place of "Practical Enlarging with Demonstrations." Both of these lectures by Mr. T. C. Hepworth.

Thanking you in anticipation, yours faithfully,

THE SECRETARY.

Harp Alley, Farringdon Street,
London, 15 April, 1902.

PARIS IN LONDON.

To the Editors.

Gentlemen,—I beg to inform you that this company has decided that during the forthcoming Exhibition of "Paris in London" no charge is to be made for the admission of hand cameras to the Exhibition grounds. I shall therefore be glad if you will give this publicity in your journal.

It is, furthermore, our intention to offer a prize later on for the best snapshot taken within the Exhibition grounds.—yours faithfully,

IMRE KIRALFY,
Director General.

The London Exhibitions, Limited,
Earls Court,
London, 15 April, 1902.

CAMERAS FOR USE ON THE CYCLE.

To the Editors.

Gentlemen,—In your interesting article, entitled "Cameras for Use on the Cycle," you describe a method of supporting the camera on the handle-bar. Some three or four years ago, I went so far as to

provisionally protect a similar device. I now suspect that, like a good many other "patents," there was not much novelty about it. I had never heard of or seen such a device, though it is evident from your article that such a support was in existence. Mr. H. G. Turner, of Manchester, the well-known maker of carriers, did not think much of the idea, though I imagine a support such as you describe would frequently prove of considerable utility.

The remarks of the author of your article mainly refer to small cameras. The daylight loading cameras will, doubtless, always be popular with a considerable section of the cycling community, despite "the photographic sensation of the season." The usual, or a common method of carrying such cameras, when cycling, is in a sling-case at the side, suspended by means of a strap passing over the shoulder, as when carrying a field glass. Many of the small cameras can be conveniently carried in this way, care being taken that they do not work round and interfere with the pedalling. The magazine-plate cameras are often best carried in the hand.

There can be no doubt that the best method of carrying stand cameras up to half-plate size is on the back, though, as you point out, in hot or wet weather there are objections. With the Turner bi-carrier there is a considerable amount of springiness, and for a half-plate camera I have used one of the ordinary patterns considerably, fitted to the back stays, with favourable results. An elderly person would, however, experience some little difficulty in getting into the saddle, and on this account a friend insists that men's bicycles should be built without the cross-bar, that is, like a lady's machine. He says it is much easier to mount such a machine, particularly in the dark. I cannot confirm those expressions from personal experience, though most male cyclists will agree that it is easy to slip the pedal when mounting in the dark. Carriers for the front of the machine can be procured. The back, I think, is preferable.

Mr. Turner makes a carrier specially designed for carrying the camera on the bicycle. The support on which the case containing the camera rests is on springs. Obviously, this is an improvement, as the vibration is to a great extent intercepted.—Yours faithfully,

J. A. Reid.

April 11th, 1902.

POPULARITY OF BROMIDE PRINTING PAPERS.

To the Editors.

Gentlemen,—For many years, for exhibition or competition purposes, it may be said that only two processes found favour with those workers who cared to enter the lists as competitors in the open classes connected with the exhibitions of our various photographic societies, these two processes being carbon and platinotype; indeed, so strongly was this marked, that many of the photographic reports anent our best exhibitions drew particular attention to the fact that, for exhibition purposes, either one or other of the processes mentioned became a *sine qua non* with those providing prints for competition purposes, and doubtless a large number of workers at the present moment are animated with the same opinion. Bromide, however, has, during the last few years, been steadily coming to the front, and it will doubtless come as a surprise to many to learn that, at one of the recent exhibitions in the west of Scotland, in which there was a class open to all amateurs in the United Kingdom, bromide, in one or other of its various grades, actually came out at the "top," in respect of numbers of prints sent in by various competitors throughout the kingdom, and also in so far as the awards were concerned, came out about equal with carbon. Since the introduction of these now popular printing papers, there has been a marked advance in respect of their quality. At first, it was argued that the difficulty of producing clear, high lights would never permit of such papers becoming really popular. This objection at the time may have been well founded in respect to one or two particular brands, but, like many other things connected with photography, had only to be experienced for a remedy being found for such shortcomings. The introduction of the matt surfaced papers may be said to have at one stroke brought bromide printing papers into the very front rank as a printing material, and the introduction of some of the newer forms of developing agents which have quite supplanted ferrous oxalate must also have weighed materially with a large number of workers who, for years, stood aloof from the use of these papers. The fact that nearly all our photographic societies hold their exhibitions somewhere about the winter season, no doubt does, to a certain extent, weigh with many in selecting bromide as the most convenient medium to employ for producing at what may be termed "the dead season in printing" anything like satisfactory prints for exhibition purposes. On the other hand, it must be stated that when such proofs are placed alongside those of carbon and platinotype, they seem to hold their own in respect of artistic qualities, which many of our best judges are not slow to appreciate, and it is, indeed, a fortunate thing for photographers that they have such a sheet anchor to fall back upon when other printing processes may be said to be out of the question. This, in a sense, semi-compulsory adoption of bromide as a printing material in the winter season has done much to bring it into the deservedly popular position it now occupies. Workers seeing the enormous advantages such confer have no doubt striven, by extra attention in manipulation, to produce results but little dreamt of when such printing material was first introduced, and, having gained so much by experience, they are not likely to discard so true a friend as a good brand of such paper invariably proves to be.—I am, yours, etc.,

Bromide Worker.

April 4th, 1902.

NEATNESS IN A LANTERN EXHIBITION.

To the Editors.

Gentlemen,—Some lanternists are content to illustrate or give their displays in a slipshod, uncouth fashion, as regards the apparatus, giving one the impression on entering the room, that the exhibition is a second-rate affair, or the paraphernalia of some itinerant seaside showman. It does not cost much time, or trouble, or expense, to give the apparatus at least a tidy and neat appearance, and the improved impression on the audience, to say nothing of the chances of improving the exhibition, is well worth it. The screen, for instance, should be squarely hung, so as not to look like a lop-sided or top-heavy sail from a yacht. It should be stretched as tight as possible, to present a smooth surface, and it should be, if not snow-white, at least clean-looking, and not smirched with dust and grime here and there. The appearance of a lantern screen is greatly enhanced if the edges of the sheet are neatly covered with some dark material. A few yards of dark red or navy blue calico, about eight inches wide, pinned all the way round the sheet, and draped, if you like, with a ribbon, in the centre of each side, not only intensify the whiteness of the screen, but give the whole thing a smart and neat appearance, at the cost of a few pence, hiding seams, and rings, or jagged edges, in a wonderful way, whilst the pictures themselves look 20 per cent. better for this improvement. The table on the platform, if the lecturer uses one, should not look like a bare second-hand affair just arrived from the brokers or furniture sale, but should have a dark, self-coloured cloth, a bright glass of water, and a pretty plant or two in front of it, though this latter point is not so essential as the table cover. As to the lantern fixtures, these are often stuck up in a very rough and ready way. Some lanternists are content to stick the lantern on the top of a pair of steps, until an accident happens, and then they look for something more suitable. The lantern should be, in the first place, fixed squarely and firmly, on a good standing table or strong box, so that there may be no vibration when a slide is inserted or withdrawn. If the instrument is shaky, the picture will "didder" on the screen in a most irritating manner. When all is fixed up firmly, a dark cloth should be drawn over the boxes or the table, to cover up all except the lantern itself. If an indiarubber tube is connected from the lantern to the gas jet, it should be raised high above the heads of the audience and out of reach of mischievous youths. The simplest way to do this, if the jet is not conveniently near, is to fix a map pole, or other long rod, in an upright position, near the lantern (fasten to the table leg or box), and carry the tube over the hook at the top of the pole, and so to the jet.—I am, yours, etc.,

April 6th, 1902. Esperance.

THE BANK NOTE FORGERIES.

To the Editors.

Gentlemen,—Considerable excitement, it seems, has been created of late by the large number of forged Bank of England notes that have been put into circulation, and been seized. The police court reports do not say where they were produced, or by what method they were done. But that they must be a very good imitation of the genuine thing is proved by the fact that they have been accepted at banks without detection. It would be interesting to learn if photography, or any of the photo-mechanical methods, were employed in their production. It would at first sight seem, comparatively, a simple thing to imitate the English bank note, if the paper were available, by photo-mechanical methods, but the paper has hitherto been the difficulty with would-be forgers. How that has been overcome in this instance is not disclosed. One of the things that will strike many is the price at which these spurious notes were negotiated, *i.e.*, something over half their face value. This would lead one to imagine that these spurious notes were exceptionally good imitations of the genuine ones.—I am, yours etc.,

Bank Note.

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Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY, 24, *Wellington-street, Strand, London, W.C.*" *Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

PHOTOGRAPHS REGISTERED:—

W. Smith, 18, Station Street, Spalding. *Two photographs of Mrs. A. Gibson and two photographs of Rev. J. C. Jones, M.A.*
T. pence, chemist, Fort William, N.B. *Photograph of a herd of Highland deer.*
E. Walton, 30, North Street, Horsham. *Photograph of C. F. Farley and photograph of A. Shrubb.*
A. Deneulain, 41, Craven Street, Strand, W.C. *Photograph of Madame E. Lehmann.*
C. E. Weale, Victoria Road, Tamworth. *Photograph of Volunteers.*

THE NEO-CYCLOSTILE.—T. Stokoe would be glad to know the maker of, or agent for, the Neo-Cyclostile duplicating machine.—In reply: Will some reader oblige with the desired address.

HOPEFUL.—We can only suggest an advertisement in our outer columns, or in some of the French papers listed in our ALMANAC. In our opinion, however, your prospects would be quite as good in London as in Paris.

"AMBITIOUS."—We should advise you to procure and study a copy of Abney's "Photography with Emulsions," in which many formulæ are given. But we doubt if you will succeed in making plates as cheaply as those procurable commercially, irrespective of their qualities.

COPYRIGHT.—"COPYRIGHT" writes: "Will you kindly inform me if I can mount photos which I have copied (not copyright) on mounts bearing my name without being liable to be prosecuted by the original photographers?"—In reply: There is nothing in law to prevent your doing so if you choose; but the usual custom is to write "copied by" over the name of the copier.

TONING P.O.P.—W. B. writes: "Being a reader of your valuable paper, I should be pleased if you could recommend me a toning solution that will easily give good black tones on ordinary P.O.P. (gelatino-chloride)?"—In reply: We do not know of any toning solution that will give good black tones on glossy gelatino-chloride paper. If you desire really good black tones, we should recommend you to use one or other of the platino-matt papers—they will yield them in perfection.

BURNISHING BROMIDE PRINTS—HAND CAMERAS.—W. L. asks: "(1) Can bromide prints be burnished on a double roller burnisher—hot for enamelled surface, and cold for matt paper? (2) When using a hand camera with focussing adjustment, is the distance between the plate and the subject, or from the lens to the subject, to be taken into consideration? This is for very near subjects, and with an extra large aperture, f/4.5."—In reply: (1) Yes, if the prints are perfectly dry. (2) From the lens to the subject.

TONING P.O.P.—"P.O.P." writes: "Could you give me some information with reference to toning P.O.P. prints which have been printed in the sun, but through tissue paper, as the argument is by an experienced printer and toner that it reduces the silver, making them harder to tone than those printed in the shade? But my experience is, you get better prints and better tones when printed quickly."—In reply: Practically there is little, if any, difference between printing in sunlight subdued with tissue paper or in the shade.

PHOTOGRAVURE.—"GRAVURE" asks: "(1) The titles and price of any up-to-date books on photogravure? (2) Where evening instruction in the above process may be had. (3) And if the classes are restricted only to those employed in that branch, or if, as a carbon printer, I should be eligible to attend."—In reply: (1) "Photogravure," by Mr. Herbert Denison, to be obtained by order of a dealer. (2) The Polytechnic Institution, Regent Street, W. (3) The classes are open to all.

COLOUR PHOTOGRAPHY.— W. C. Grubb writes: "In the BRITISH JOURNAL ALMANAC for 1891, page 624, there is an article describing the results obtained by a system of colour photography. The article contains a number of circumstantial details, and apparently the process is all that one could wish for. Can you tell me whether anything further has been made public with regard to the process, or whether it turned out quite impracticable?"—In reply: The process died with the inventor, and was never commercially of any value.

LENS QUERY.—R. Bennett writes: "As a reader of your JOURNAL in the Far East, I wish to ask whether a small chip of about this (-) size occurring in the back combination of a Dallmeyer stigmatic lens of $\frac{3}{16}$in. diameter would practically injure its utility? The lens was received by me in this condition from the makers, and I am wondering whether to reject it."—In reply: So slight a chip will make no practical difference whatever in the performance of the instrument. It will be well, however, to put a touch of ink, or black varnish, on the chip, so as to prevent any possible chance of reflection from it.

COLLODION POSITIVES.—"AMATEUR" writes: "I should like to try to make a glass positive, but don't know the way to do it. I shall be glad if you will give me the following information: about what to coat the plate with, and what developer to use for same? What is the best address to buy the materials, etc.?"—In reply: The necessary formulæ for the glass-positive process will be found on pages 1,086-7 of the ALMANAC. Working details you will obtain from any of the old works on photography. The earlier editions of the late Mr. Jabez Hughes', for example. All the necessaries may be had from Fallowfield's.

COPYRIGHT.—M. C. writes: "I have recently photographed an oil painting, now the absolute property of a corporate body, of which they would like to supply copies for sale. The artist has been dead for 20 years (the painting being about 40 years old); but there is an opinion that originally an engraving was made of the painting. Would it be any infringement of the copyright to sell photographs taken direct from the painting? I should be glad to have your opinion on this matter, which I think is of some importance to our profession generally."—In reply: Of course, if there is no longer a copyright in the painting, photographs taken of it may be sold without let or hindrance. If an engraving has been made that in no way alters the case.

AN AMATEUR TURNING PROFESSIONAL.—"VICTORY" writes: "You see from enclosed what line I am in. I am also fairly well advanced as an amateur photographer, and purpose by next spring taking it up professionally. In the meantime I wish to work myself up, and should be glad to know what books you would recommend me to get, dealing chiefly with portraiture in and out door? (1) Studio construction? (2) Good, all round manual for portrait photography? (3) Presume following discounts will be lowest allowed profession: Plates, £5 lots, 20 per cent.; papers and chemicals, 10 per cent.?"—In reply: (1) Bolas' book on the subject; Marion and Co. (2) "The Studio, and what to do in it," by the late H. P. Robinson. (3) As a professional photographer, you will obtain the usual discounts, whatever they may be.

REPRODUCTION PROCESSES.—"HGIEL" asks for: "(1) Name and address of a good firm who will produce for me a view book of this town, containing, say, 16 views, in collotype, or suitable process, to sell at 1s. each? (2) What process do you consider most suitable and up to date? (3) Cost to make the book copyright? (4) If made copyright, would all photos contained in it be copyright, or only in the book form, and not when sold as photographs singly in platinotype or P.O.P.?"—In reply: (1) The Autotype Company, New Oxford Street; Wyndham and Co., Acton, W.; and other collotype printers will do the work for you. (2) The collotype process, or for large numbers the half-tone block process. (3) One shilling each print. (4) Better make each separate picture copyright; that will include copyright in the book.

STUDIO BUILDING.—"BURTON" writes: "(1) I have a portable building. 20ft. by 12ft., eaves 8ft., floor to apex of roof 11ft. Would this angle be sharp enough for glass of roof? (2) I propose pulling shed apart in the middle and putting 10ft. of glass between; but as this would only give me 15ft., would it be better to put the glass on to one end? Should only have glass north side. (3) Could you give me name of firm for reliable glass? (4) Should like to use iron instead of wood for frame for glass; like Mr. Debenham's studio, I believe. Where can I obtain it? (5) Is —— reliable firm for studio camera, etc.?"—In reply: (1) Yes. (2) We should not advise the end to be glazed; 15ft. at the side will be sufficient. (3) Any good glass merchant will supply a suitable glass. (4) Any local horticultural builder will supply you with iron sash bars. (5) We should think so.

A WAGES QUESTION.—H. H. writes: "The firm of process-engravers whom it is my privilege to serve have recently posted a notice at their works to the effect that after a certain date employees who come late will have their wages docked for lost time at double overtime rates. (1) Are they within their right in doing so; and, if not, (2) how can the workmen effectively show their dissatisfaction with this arrangement? I may add that until now lost time was stopped for at single overtime rates, and that excessive love of punctuality prevents my employers from giving even five minutes' grace a week."—In reply: (1) We should say they certainly were. All employers have, of course, the right to frame their own regulations, and it rests with employees whether they accept them or not. (2) Simply by leaving their employment, after giving due notice. We suspect that it is the continued unpunctuality of the employees that has brought about this drastic rule. Punctuality is an essential in all large establishments, and there is no reason whatever why the hands should not keep their time.

DAMAGED DAGUERREOTYPE.—BRIGHOUSE PHOTOGRAPHIC COMPANY say: "(1) We are sending by this post an old photograph on tin which we got for copying. Unfortunately it was damaged when taken out of frame, as you will see the mark on sky and part of roof. Can you tell us, please, how, or what with, the damage done can be remedied? We should be greatly obliged for any information on above. (2) Can you also advise as to best way for copying a photograph of that sort? For, as you will see, the brightness of the tin gives a lot of reflection, and the result, therefore, in copying it in the ordinary way is not quite as satisfactory as might be desired. We enclose stamps for return of photo sent."—In reply: (1) The photograph is not on tin, but on a silvered copper plate; it is a Daguerreotype, though not a good specimen. It has been damaged by want of care in the handling, and the damage is irreparable. (2) Light the picture in such a way that there are no reflections from it in the direction of the lens, also so that there are none on the picture itself. Better use a light falling on the picture at an angle of about 45 degrees.

THE BRITISH

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*** *The Editor can only be seen by appointment.*

*** *We do not undertake to answer letters by post.*

EX CATHEDRA.

The Colonial Exhibition at the Royal Exchange.

The Gresham Committee, at its meeting last week, decided to keep this very interesting exhibition open for another fortnight, the date of closing it being fixed for Saturday, May 3. This show does not appear to be so well-known to our readers as it deserves to be. It is true that photography is not a feature in it, still there are a number of photographs shown, but they are of an illustrative type, such as one sees in home industrial exhibitions, showing works, machinery, and the like. Yet they serve to show the state of everyday photography in the Colonies, perhaps, better than regular specimens of photography would do. One of the exhibits is specially interesting. It is specimens of the different woods grown in the Colony, and it is accompanied by photographs of the trees as they are growing. These photographs are each framed in the wood depicted. The value of the gold shown in the exhibition is simply fabulous. In one small case, for instance, no less than £28,000 worth is shown in the form of ingots, nuggets, dust, etc. Messrs. Johnson and Sons show two huge evaporating basins of nitrate of silver and chloride of gold, made for photographic purposes, representing a value something like a couple of thousand pounds. Another interesting exhibit to photographers by Messrs. Johnson is ten ounce ingots of different metals, to illustrate their comparative weight by their size. One can scarcely imagine, for example, that the gold ingot is of the same weight as that of the aluminium. We should advise our readers who have not already done so to pay this exhibit a visit before it closes.

* * *

Glass Bottles.

Among most persons the interest in a bottle altogether ceases when its liquid contents sink too low to show a tide mark in the interior, but there are persons who love bottles for their own sakes, and quite irrespective of their past or future contents. These persons, in a word, collect bottles and keep them in cabinets, just like some others collect coins, or postage stamps, tobacco pipes, or penny toys. The collecting hobby is a distinctly useful one, for most collections gravitate insensibly towards the public museums, and the commonwealth is the richer by the acquisition. In the April number of the "Century Magazine" will be found an article entitled "At the Sign of the Carboy, a Chronicle of Bottles." Bottles of all sorts and sizes, of every shape that the wit of man can conceive, are here, and the paper is fully illustrated by a series of drawings. Now, it is to these illustrations that we want to call attention. They are line drawings, and as drawings there is nothing to object to, for they are carefully executed, and are no doubt true to the originals. But a pen and ink drawing, we venture to say, is not the happiest medium to employ for representing lustrous, light-spangled, iridescent, fairy-like glass. We might as well expect to pourtray with a pen a soap-bubble. Photography, on the other hand, reproduces all the beautiful lights, shadows, half-tones, and reflections peculiar to glass with the greatest fidelity, and we are constrained to ask why, with the two methods of illustration available, the wrong one was chosen? We know full well that there are many subjects of illustration in which the camera can never approach the work of the pen, pencil, or brush, but in the representation of glass ware photography is supreme, and it seems a pity that it was not employed in the case referred to.

* * *

Do the Public Care for Permanent Photographs?

If one takes up an album of family portraits of comparatively recent production, we cannot but be impressed with the number of fading or changed photographs it contains. If one makes a comment on the fact, the reply usually is "All photographs fade, you know." But is there any reason why they should, even if they are silver prints, because there is evidence to the contrary in the thousands of photographs that were produced thirty and forty years ago that are still unchanged. Yet the public seem content with what they at present get, accepting it as a natural thing that they may be expected to fade during the course of a few years, or even less. What seems to be in demand now is a thing of beauty, without any consideration as to whether it

will be "a joy for ever" or not. Hence the number of jaundiced portraits one sees in family albums now-a-days, which, after the prototypes have departed this life, will have faded altogether, "leaving not a wrack behnd." Now the question is whether the general public would pay a little extra for pictures, if by so doing they could ensure greater stability in them? Albumen pictures, when carefully produced, have proved themselves more permanent than are gelatine ones as ordinarily made, but they require more skill to produce, and, moreover, something more in cost for the materials for their production. Will the "common or garden" public pay an extra price for them?—we doubt it. At no time has the carbon process, and the platinotype process, been so much in favour for portraits as at present. Both of them are permanent processes, and for prints by either process an enhanced price is charged. But are they paid because the pictures are more stable, or are they not rather paid because the results, as pictures, are liked better than the glary gelatino-chloride prints? It is an interesting question.

* * *

Ceramic Photography. Has ceramic photography ever been any very great commercial success? Vitrified photographs, on enamel, are very delicate and beautiful, and they have the undoubted advantage of being quite permanent, yet notwithstanding all this they do not ever seem to have caught on with the public to any great extent, even with those to whom price is not a consideration. Ceramic photography dates back to the very early sixties. The first, we think, to produce them was Lafon Carmarsac, and he was quickly followed by Joubert, and later on by Tunny, Henderson, and others, who produced excellent work. But the demand for it, considering its excellence, was very limited, and that is the more surprising, inasmuch as at the time it was introduced portraits in jewellery, brooches, lockets, and the like, was in the height of fashion. High prices, at that time, were paid for coloured photographs to be worn in brooches, much more than a burnt in photograph would cost, yet there was but a very limited demand for the latter. The late Queen was a great admirer of enamel pictures, and had a large number done of members of the Royal Family and others, for her private collection of portraits. Some few years ago it was announced that the present Queen had a number of photographs, taken by herself, transferred to, and burnt in, on a tea service, so that it will be seen that ceramic photography has not suffered from lack of Royal patronage, which is generally supposed to lead, to a great extent, the fashion. Yet, in spite of all this, the business in photo-enamels is no greater now than it was in the days of the past. The other day we were in the reception-room of one of the first photographers in the Metropolis, where some excellent pictures on enamel, in elegant settings, were shown. In reply to a query, we were told they were greatly admired by all, but very rarely were orders obtained for them. The price, though high, was evidently not the reason, because with the *clientèle* of this establishment that is of no moment. What is the explanation?

* * *

Photographic Workshop Regulations. Photography and its ramifications, in the form of photo-mechanical industries, has now assumed an importance that it never possessed before. This necessitates that a great deal of the work (for example, the printing for large portrait establishments) has to be carried on in what may be termed workshops that come under the Factories Act. In the large photo-mechanical work—process-blocks and the like—a still larger number of hands are employed. Now, photographic employees, as a rule, have never been particularly noted for excessive punctuality in their getting to business, hence in some cases stringent rules have been found necessary to enforce punctuality in many establishments, in the interests of the employers, either in the shape of fines for late attendance or a stoppage of wages for the time lost. Last week we had to reply to a correspondent, in the "Answer Column," with reference to a new regulation that had been adopted by the firm by which he is employed. His grievance is that the firm had posted up a notice to the effect that "after a certain date, employees who come late will have their wages docked for lost time at double overtime rates." Evidently, our correspondent is not over-punctual in his hours, or it would not affect him. From the letter, we gather that overtime in this establishment is paid at a higher rate than ordinary wages, hence it follows that if no regulation were enforced, a man who was, say, half-an-hour late, would have to do the work that would have been done if he had kept his time, in overtime, and be paid for it at an extra rate. But the previous rule, we assume, prevented that, and we gather that it was not sufficient to ensure punctuality, consequently the pay docked had to be at double overtime rate to ensure it. Punctuality is an essential in all large business establishments. Supposing that each man was only ten minutes late a day, see what that would amou to in wages paid at the end of the year. In the building, engineering, and similar trades, the gates or doors of the works are closed at a certain time, and not opened again till after the next meal-time. Consequently, the workman has to lose a quarter or half-a-day's work—and pay. But in these places the employees are rarely late. A similar regulation might be found to work well in large photographic workshops. In some we think it is.

* * *

A Photographic Sell. No one likes to be made a fool of, and perhaps we, as a nation, who pride ourselves on the flaunting declamation that we "never, never, never will be slaves," have a particular and patriotic objection to being "sold." For these reasons it makes a man sadly thoughtful to innocently read through half a column of what he believes to be news, to find out in the end that it is only a specious advertisement. Possibly it is a hopeful sign of the continued popularity of photography that one of these ingenious advertisers chose for his bait last week the gruesomely-attractive head-line, "Death and the Camera." We confess, to our humiliation, that, in spite of our long journalistic experience, we unwittingly read through part of this concoction before we discovered its commercial aim. After that, we read it from beginning to end, as a study in the new method of advertising. The paragraph begins by suggesting how useful is the photographic camera in providing a picture of the features of loved ones, to be treasured after their removal by death. "In this connection," it goes on to say, "an interesting experience has been related by a Hull woman, who was considered so ill that her death was only a question of time." In view of that fact, her friends persuaded her to have her portrait taken. She did so, but soon after she began to try Dr. Blarney's Buckram Pills, "and she is to-day as healthy as ever in her life." (For obvious reasons we have given a fictitious name to the medicine.) We are next told the name of the sufferer, who was honoured by an interviewer, who asks her various questions about her ailments. The unfortunate woman seems to have had every complaint known to the faculty, and they were all chronic. She had dizzy fits, she could hardly walk, the very sight of food nauseated her, and she was reduced to a shadow. Her nerves all went wrong, she

had pains in her head, homicidal mania, obscured vision, and a doctor who recommended an operation. The best medical advice did her no good, and in a fit of despondency she went to have the afore-mentioned picture taken, so that when she was gone—not to the photographer's, but to a better land—her friends could look upon the presentment of her wasted form. We are not told whether the operator had the hardihood to ask her to "look pleasant," but it is obvious that the poor woman, with all those complaints hanging around, could not comply with such a request. "But," says the narrator, "just when she felt like dying," she sent for some Blooming Buckram Pills, and they cured her. "You may believe me or not, but a few boxes cured me of my defective sight, and made me so well again that I went out and washed clothes in order to get money to buy more pills." Poor woman! She could not have been quite cured, a little mental aberration remained, or, being cured, why more pills? The advertisement concludes with the usual list of diseases which the pills, in common with other nostrums, will infallibly cure, and with the assertion that the case of the distressful washerwoman of Hull is but one of hundreds which prove their marvellous merits.

* * *

Acetylene. Everything having any connection with light should be of interest to the earnest photographer. But there is one illuminant which by this time many must regard as a veritable Will-o'-the-wisp, so skilfully does it elude all inquiry as to its behaviour. So conflicting, indeed, are the reports received about the performance of acetylene, as a rival to oil, gas, and electricity, that few seem to know what to make of them. A few weeks ago we were rejoicing that the London General Omnibus Company had seen fit to illuminate their vehicles with this brilliant form of light, and we naturally regarded the new departure as a sign that acetylene had been found, after careful experiment, to be the best form of light for public carriages. But almost before we had learnt to luxuriate in the beams of the new lamps they disappear, and the old oil lamps, old enough and crude enough in design to have lighted Noah's ark, are back in their customary sockets. Why this retrocession has been made is quite inexplicable until the mystery is solved in the law courts, for an action, we learn, is pending with reference to the vehicular employment of the lamps. We might, by commenting upon a matter which is thus *sub judice*, be guilty of contempt of court, as well as contempt for Noah's ark lamps, but we may surely ask whether there is anything radically wrong with acetylene that it gets "no forrader," in omnibuses or anywhere else? It has been shown at various exhibitions, many learned commissions have reported upon it, and yet with its many alleged virtues it is, so far as can be ascertained by a nocturnal perambulation of the Metropolitan streets, not in use. Many photographers in country districts, where the roads are not yet furrowed by gaspipes or electric mains, would be glad to adopt acetylene for their work, were they sure, before going to the expense of an installation, that it would serve them well. The fact is that opinions as to its efficiency are most conflicting. We happen to know of two private houses where acetylene has been adopted, and we will call the occupants of these houses A and B. A has had the gas in use for eighteen months, and is thoroughly pleased with it. His residence is in an isolated position, is far from any gasworks, and the acetylene burners have replaced as many petroleum lamps. There is no smell from the gas, and in every way it is deemed satisfactory. B, on the other hand, has nothing but abuse for acetylene. After using it for twelve months, and being subjected to noisome smells, bad light, soot, and other disagreeable happenings, he made the people who supplied the installation remove it, and refused to pay a penny piece of their account for the year's maintenance. We can only judge from these two narratives that A was fortunate in securing a good system of apparatus, and that B had a very indifferent one. That this is quite possible is shown by the recent report of the committee on acetylene generators, which has been published as a Parliamentary paper, in which it is stated that uneasiness in regard to possible danger has not been uncalled for, and that although most of the apparatus tried was satisfactory, there was reason to believe that more than one was withheld from being tested, owing to knowledge of the fact that it would inevitably give a bad result. It is possible that our friend B was saddled with one of these latter machines.

* * *

City Grime. The principal thing which strikes a Londoner when for the first time he visits a foreign capital, be it Paris, Berlin, or Brussels, is the wonderfully clean appearance of all the buildings, both public and private, and he sighs as he thinks of the soot-begrimed walls of our own cathedral and of most of the other notable buildings in the British Metropolis. It was Dean Milman who said, in allusion to the circumstance that Wren's masterpiece was paid for by the City duty on coals, that the coals had had their revenge in blackening the walls of the sacred building. There is nothing beautiful about soot-stained stone, and the suggestion has recently been made that our public buildings and statues should have a general clean up, or clean down, in honour of the Coronation year. We heartily second this proposition, for if it were carried into effect a new London would be revealed, and architectural beauties previously clogged up with the solids of many a byegone fog would once more become evident to the eye. The course recommended would certainly give a spurt to the sale of photographs of the London streets, for everyone would want pictures of the city with its face clean. But we are very doubtful if any amount of washing would make our dreadful London statues presentable. They are for the most part monstrosities, and we may be grateful to the murky atmosphere which has clothed them in such inky cloaks. The exact nature of the compound which defiles our London buildings, and which is deposited upon them layer by layer, and year by year, may be guaged from certain experiments which have recently been conducted at Manchester, a city which suffers much from the same complaint. A painstaking inquirer there collected a patch of snow which had lain on the ground for ten days, and which did not differ in tint from the snow lying round about. Needless to say, Manchester snow does not long retain its pristine purity, and this ten days' old sample was certainly not white. The experimenter melted this snow and carefully examined and weighed the residue, which represented the contributions which it had received from the atmosphere since first it fell from the clouds. The analysis showed that this foreign matter consisted of nearly one-half carbon, in the form of soot, while the other half mainly consisted of ash—the two constituents being bound together by a goodly proportion of heavy oil and grease. Calculation showed that, assuming that the same conditions prevailed for a hundred square miles around and including the city, something like thirty thousand tons of this delectable mixture must in the ten days have descended upon that doomed area. London would, of course, show as bad, or a worse record, and certainly, considering the greater number of chimneys, both of the manufacturing and domestic pattern, the space covered would be proportionately greater. But how is the cleaning of our buildings to be

brought about? This question is easier answered than some would imagine. A few years ago a couple of fire engines appeared one night, when the streets were clear of traffic, opposite the Mansion House, and proceeded to squirt water with great deliberation over that historic edifice. The effect was magical, the soot and dirt coming off in lumps and flakes. The Lord Mayor's residence looked so bright and clean the next morning that the city clerks did not know it, and almost lost their bearings. Of course, the grime soon collected again, but for a long time the Mansion House benefited by this midnight visitation of the fire brigade. Surely the same course could be pursued in the case of other buildings. At any rate, the experiment, which would cost next to nothing, would be worth trial. It would be a great thing to behold London, even for a short time only, free from its garments of sack cloth and ashes, and the coming Coronation would be a fitting occasion upon which to remove such sombre habiliments.

THE PUBLIC RECOGNITION OF ART PHOTOGRAPHY.

The correspondence between Mr. J. C. Strauss, of St. Louis, U.S.A., and Col. John A. Ockerson, Chief of Departments Liberal Arts, St. Louis, with reference to a special building being assigned at the St. Louis Exposition, 1903, for a display of "Art Photography," must have been read by many photographers in this country with no small amount of interest. The full correspondence was published in our issue of April 11th, 1902, and is illustrative of the desire of American photographers to have their productions classed as works of art, rather than as mere mechanical illustrations. It would be difficult for our American brethren to choose a more suitable advocate than Mr. Strauss, whose fame has spread to these shores, and whose originality and great skill have won for him the applause of those who are able to judge such work.

But even Mr. Strauss does not seem able to convince Col. Ockerson of the strength of his weapons or the justness of the position he is fighting for, and his terrible threat only brings from the Chief of the Department of Liberal Arts a reply which we confess we expected all along. This cry-out for the standardising of camera productions as works of art is no new one to us, and though we do not pretend to have Mr. Strauss' intimate knowledge of the status of American work, yet, judging from our experience in this country, we can only regard it as the wailing of the infant for recognition rather than the evidence of the man which has to be recognised. It was but the other day that we were talking to a well-known portrait painter on this very subject, and his remarks cannot fail to be of interest to our readers. Sitting opposite to us were two children with their father—one of them was quite a tiny fellow of about four, while his brother would be somewhere about ten years old. These youngsters interested our friend greatly, and, after watching them for some time, he turned to us and said:—"You see those little fellows opposite to us? What an object of study they are for some of you photographers! I wonder, though, how many of your most prominent portrait workers could analyse the difference of their faces? Just look at the young one for a moment. You notice the peculiarities of the infant at once; the oval and elongated form of the head, with the greatest length being from the forehead to the occiput; the forehead is full and practically flat at the eyebrows, while the jaw-bones and other bones of the face are diminutive; the neck, too, is so short and small, compared with the size of the head, which is due to the peculiar projection of the occiput. Take the elder boy: Here you see the great increase in the size of the superior maxillary bone and, due to this, the effect of the raising and lengthening of the bones of the nose and the strengthened appearance of the ossa malac, or cheek bones. You notice the greater firmness and distinctiveness of the angle of the lower jaw, due to the growth of the large teeth.

"This is much more noticeable, though, in the adult, and if we turn our attention to the man we shall see at once the evidence of what I just said about the development of the prominent ridge along the course of the eyebrows. You notice it at once, don't you, and you want an explanation, eh? This ridge, known as the supra-obitary, is caused by a cavity which is formed here by the layers of the os frontis, and it is the enlargement of this frontal sinus that makes the prominence over the eyes which is peculiar to manhood. Watch our man for a moment or two, and you will notice the wonderful changes of expression which are recorded on his forehead. His eyes are not to be seen, but his brow is as a mirror recording the various emotions that his paper arouses in him. A sensitive man, truly, and a most suitable illustration for my remarks. Ah! Pliny was right when he said: 'Frons hominis tristitiae, hilaritatis, clementiae, severitatis, index est.' And what a number of photographs have I seen in which this characteristic of manhood has been most carefully removed by the retoucher? Take an almost equally prominent case which you see daily in photographs, aiming at being pictures—of women showing a bare neck and shoulders. You will see the sterno-mastoid muscles contracted and stretched out owing to the inelegance of the pose, till the first things that catch the eyes are those prominent lines in the neck. They may be an ornament in a male heroic figure, but in the female they are nearly always ugly. These muscles, if too prominent in their development, should be so relaxed that they accommodate themselves to the surrounding soft parts and avoid any constriction of the skin.

"These are but the purest elements of artistic anatomy, and yet many photographers have often told me that they know nothing whatsoever about it, nor see any use in it to them. It is sufficient for them that they can expose and develop a plate properly, and leave the rest to the retoucher and printer. How can you expect works of art to be turned out by such people? It is sheer madness, and is treated as such by the real artists, who know their work from beginning to end. There are some of you even worse than this, who openly state that an elementary knowledge only of the technique of photography is necessary to enable you to turn out works of art. When is it you are going to learn that you must walk before you can run, that you must have the whole technique of your craft at your fingers' ends, and almost be unconscious of its presence, before you even attempt to make a work of art? The very methods of your profession are contrary to the creation of such works. Art cannot be commercialised as you photographers try to do it—it is not possible that a portrait picture can pass through half-a-dozen hands and come out at the end a worthy production to compete with a masterpiece of one worker, who has done everything himself, and put the study of years into his work. How many of you are there who would give up your life and your prosperity for the sake of your calling? And yet this is what by far the majority of painters are doing daily. They prefer to barely keep body and soul together than to give up their ideal. No detail is too trifling for them to study. They strive daily to master the philosophy of their art, and no one is more conscious of their faults than they are. Such men as these truly live the inner life of art, while the majority of you photographers are totally unconscious of such a feeling touching you. It is suf-

ficient for you to take a portrait of your sitter, which may turn out to be more or less pleasant to both parties, and you at once arrogate to yourself the title of 'Art Photographer,' and place it in gold lettering over your doorway.

"You have it in your power, though, to produce veritable gems of art, if you but devote yourself sufficiently to your work, but you must dive deep and tackle your subject in the same way as the old masters tackled theirs before you can ever hope to compete with them. No one knows this better than those artists whom you ask to judge your works, and these men are full well aware that the failure of your productions as works of art is due, not to the camera and its accessories, but to the incomplete and in many cases faulty knowledge of the photographer." And, indeed, we think our friend is right, but there are doubtless photographers in America and this country who perhaps can justly claim the title of artists, but whether they are sufficient to fill a separate building with their productions is quite a matter of speculation. We think they are not sufficient, and in the interests of photography itself prefer to see it take up a humbler position rather than bring on itself the contempt of the more serious thinkers.

SOME BUSINESS ASPECTS OF PHOTOGRAPHY.

IV.

Railway Rates and Charges (Continued).

It has been suggested to us that some more explicit details regarding rates for frail and bulky articles would be useful, and we therefore include two abstracts from the parcels rates of one of the largest railway companies. The first is as follows, those articles not likely to be needed by a photographer being expunged:—

ARTICLES FRAIL OR VERY BULKY IN PROPORTION TO WEIGHT.

Packages, frail, or very bulky in proportion to their weight, such as—

. . . . Stags' heads; picture frames; marble clocks packed in cases; light furniture, packed; bottles of medicine, in packages; photographic cameras, parcels containing brittle articles, such as glass, china, or porcelain. . . . packed—when at company's risk are charged 50 per cent. more than the ordinary parcels rates, and when at owner's risk 25 per cent. more than the ordinary parcels rates. A risk note must be signed when the articles are carried at owner's risk. If insurance be effected, only the owner's risk rates will be charged.

This is followed by the paragraph below:—

Magic lantern slides and photographic plates packed in boxes when sent at *owner's* risk are charged at ordinary parcels rates, and when not so consigned, at 50 per cent. more than the ordinary parcels rates. . . . Furniture unpacked, Welsbach lamps, incandescent lamps, mantles for incandescent gas lights, barometers, thermometers, phonographs (not on wheels), phonograph cylinders, gramophones, symphoniums, ships' compasses, chronometers, and other delicate scientific instruments are only conveyed at owner's risk, and the rates will be 25 per cent. more than the ordinary parcels rates.

At this stage it will be well to allude to insurance. Any article over the value of ten pounds is, by the Carriers' Act, beyond the pale of recovery under ordinary circumstances. Hence, when sending a lens or camera or valuable picture, etc., it should be declared and insured. The rate for doing this depends upon the particular article, and varies from one shilling to ten shillings per cent. Articles are divided into four classes. Class 2—two shillings per cent.—includes glass of all kinds, except as named in Class 4—ten shillings per cent—which includes stained, or silvered, or bent glass. Class 3—five shillings per cent.—includes pictures and paintings; and the company reserve the right of inspecting the parcel before it is fastened up, and we may say they often exercise this right.

We are now at liberty to take up the thread of our remarks upon sending parcels by goods trains. This mode is less expeditious than by passenger train, there usually being but one delivery and one collection daily, and for some of the smaller towns, especially those not on the direct lines of rail, there too frequently are most annoying delays, and goods may be some days in transit. These are facts which it is very necessary to bear in mind when selecting a route for receiving or despatching goods. No doubt the plate worker we referred to was aware of all this when sending the parcel by passenger train, and being reproved in consequence.

As to the actual rates of carriage, we believe that none of them publish a list, but they will always quote a rate for any particular class of goods between the senders and consignees' towns. The companies seem to guard these rates from the public eye as much as possible. But what they do publish is a "railway classification" book, in which almost every kind of goods under the sun is entered and divided up in the main into Classes 1, 2, 3, 4, and 5. Anyone who has much to do with railway despatch should purchase one of these books; he will find it very useful. He need only get the rates for each of the five classes between his town and that where he mainly buys from, and refer to his class book to know which he will be charged. But here again care is needed. If he has his mounts invoiced as *rough cardboard* it will cost only about half the rates for "mounts." Then again, cameras come into a dear rate; chemicals vary according to how they are packed. Hydrochloric acid, as we have before pointed out, if packed in sawdust in boxes, does not come under the specially "dangerous" articles with a large minimum of charge, as, to our exact knowledge, many of the large wholesale houses to this day believe.

One important point remains to be mentioned, and that is the return of empty packages. In the case of large crates that hold picture frames they are usually costly articles, and should be returned and have credit given for them. But in cases where there are many such cases received it is better to send two or three at once, as they go as one despatch, and there is a large minimum charge for empty crates—ninepence or a shilling. It should be noted that, whether full or empty, when sending by goods train a number of packages of the same class of goods form one consignment, and are charged *en bloc*, not singly. If sent by passenger train, each parcel is charged separately. Hence when a photographer, as often happens, has a large delivery of goods, say mounts, to receive, he must be on the *qui vive* against the railway delivering them singly and charging singly, possibly at two different rates. We know for a fact that this is done; hence we put our readers on their guard. Even if they are charged at the same rate, there might be a loss, for when a rate per ton is quoted parcels under three hundredweight are charged more in proportion. The exact proportion is found in the classification book, and as there is a mimimum rate it might easily happen with small packages that the charge would be in excess of the passenger train rate. All these points should be remembered, a memory storage of facts that may on occasion be the means of materially influencing expenditure.

Rontgen Society.—At the ordinary general meeting, on Thursday, May 1st, 1902, at 20, Hanover Square, the chair will be taken at 8.30 p.m. Mr. Ernest Payne will open a discussion upon "The Relation between X Rays and Allied Phenomena in Light and Electricity."

ON THINGS IN GENERAL.

Coming events cast their shadows before, as the poet Campbell wrote, and his words suggest the possibility of Copyright Acts and all that they portend, for we seem to have had no inconsiderable amount of subjects presented for discussion all tending to that end. There is one point I believe I have raised before, and I fain would lift up my voice about. On March 15, in these pages, appeared a letter enclosing a cutting regarding a case which had been before the Appeal Court in Glasgow, before Sheriff Principal Berry, the matter under dispute being the right to exhibit a picture against the sitter's will. The writer of the letter suggests that the subject is one that should be taken up by the Professional Photographers' Association, in the sense of endeavouring to obtain power to make such use of photographs. Then again in the next issue appears an answering letter, stating that, as the writer understands the law, "the negative belongs to the photographer . . . but he has no right to use it. . . . I have seen some suggestions that it would be well to change this state of affairs, and confer on the photographer a complete copyright, enabling him to use the negatives as he chooses. I think that such a change would be against the interest of the best man. . . . Let the photographer offer to sell to his customer the negative at a reasonable price, and let this offer be made with the proof prints." The world would be a melancholy place if everyone held the same opinion on all subjects, but to me it appears simply extraordinary that there should be two opinions on this particular subject. That everyone should have the desire to exhibit or to publish another person's photograph against the latter's wish is to me inexplicable, and whether the portrait was paid for or not would not alter the ethical aspect of the question. It appears to me more than inexplicable: it is sheer madness to publish such views. To exhibit or publish under such circumstances is an act so foreign to all dictates of gentlemanly feeling and is such a wanton invasion upon the privacy of a citizen that when the next copyright bill comes before the House, the mere mention of such wishes on the photographer's part would be so certain to raise the opposition of the whole House, that real justice to photographers would not be meted out, and clauses most fatal to their interests would be in danger of being passed during such a revulsion of feeling as would take place. This may seem strong language, but I entertain the strongest feeling against any such contention, and I can only hope I may not be a male Cassandra.

A cognate topic is *inter alia* dealt with by "An Old Professional," on April 18, when he writes of photographers permitting the use of their negatives to the mechanical printer for use for one or other of the many purposes to which local views are now put. He points out the cause of the decadence of the view trade, and shows how foolish photographers are to permit for a mere song the use of negatives the result of hours and perhaps days of preparation and especial working, "all this very probably by his having accepted the paltry sum of half a sovereign for the right to reproduce the same." Now the great point to be made here is this (and here it would be well to say that the Professional Photographers' Association could not do a better thing for the profession than to compose and issue a letter of general advice upon the topic), a large number—I will not say the majority, but a very considerable proportion—of those who initiate a correspondence with photographers whose pictures they desire to utilize, generally allude in an off-hand manner to the "usual sum, five shillings," for permitting the use of their copyrights. Now, a large number of photographers are not members of the Copyright Union, such bluff is apt to answer its purpose. The Editor would not permit anything libellous here, hence I will say that this plan has been carried out in the case of one of the most largely advertised and popular books of the day, a book published in monthly instalments. Half-a-guinea is the minimum fee to be accepted under the rules of that body, and I believe it is honourably carried out: but this is unknown to many, and the bluffing succeeds. One of the magnates of the illustrated weekly publications once had a heated discussion with a photographer who was showing him some recently-taken portraits of a highly popular character, and for which he wanted several guineas. "You photographers think you can bleed us as you like," said the magnate. "Nothing of the sort," said the photographer; "the illustrated papers have killed the sale of celebrities. Half-a-score of years ago, I should have had orders by the thousand for this, for sale all over the country; but nowadays the old customers wait for their weekly papers, and expect to find everything and everybody there, the consequence being that instead of a thousand, I'll get an order for a twelfth of a dozen, 'on approval.'" If the Professional Photograpers' Association and the Photographic Copyright Union work in harmony, they will be able to do heaps of good in this one direction alone.

Although I know that editors of technical periodicals always keep a sharp eye on possible advertisements couched under innocent surroundings, and in unassuming language, and the benevolent despot that rules the destiny of these pages is not likely to be any instance to the contrary, I yet am going to boldly give a free advertisement, in the full assurance that he will not refuse it for a firm of trade enlargers. Messrs. Julius Brown and William Phillips are photographic enlargers, and they trade under the name of the Venus Company—as sworn to in the Nottingham County Court by a person representing them. Their mode of doing business is my warrant for supposing the Editor will not refuse its description herein, and it may be best described in the words of a witness. Plaintiff said his claim was for the value of a photograph of his wife, detained by the defendants. He put in a receipt for the photograph. It acknowledged the "receipt of one photograph, to be enlarged entirely free of charge. The usual price is 30s. Frames can be had from 15s. 6d. upwards. All photographs treated with the greatest care, and returned when finished with." The witness said: "They were going to make a sample, but now they will not return the photograph without 15s." His Honour said: "I have heard of this thing before. (To defendants' manager): Where is the photograph? Give it back to Mr. Allen." His Honour gave judgment for the plaintiff, but as the Venus Company had returned the photograph, they would only have to pay the costs. There was an important and expressive sequel. The plaintiff wished to amend the claim; he asked for an injunction to restrain the defendants from publishing the photograph in any public-house. The defendants denied this, and said it was public place, not house. All health to the judge, who evidently had a strong opinion on this class of business. "Very well; I will grant the injunction restraining you from publishing it in any public place. The result is that the costs against the defendants will be raised very considerably. An injunction will be issued, and the costs will be on the highest scale. Be off with you! If you dare to disobey that injunction, the consequences will be serious. Be off!" Evidently this feebly copying of the methods of a well-known person dating from Paris will have no sympathy from English judges.

By the by, can anyone tell me what "an ordinary professional photographer" is? At the discussion at the Camera Club on Captain Wheeler's lecture on Military Photography, when he recommended that the office of military photographer should be held, not by a mere amateur, but by a professional who could be relied upon to produce good work—not necessarily artistic results. Mr. Lambert took exception to such recommendation.

"He had found," he said, "that the ordinary professional photographer did admirable work in his own particular groove, but that the amateur was better when a great variety of work had to be undertaken." If the "ordinary professional photographer" means what in plain English it ought to mean, I say that such a statement is uncalled for. An ordinary professional photographer showed me a record of work done in a short period previous to reading the above. It was something as follows: "So many portraits taken and printed from in carbon, platinotype, and silver. So many views of mansion and grounds. A prize dog and a gentleman on horseback. A flashlight group of a dramatic perfomance. A number of lantern slides, reduced from 12 by 10. Enlargement in carbon; ditto platinotype; one ditto bromide. One view of a stationary steam engine in a dark corner, etc., etc." How many amateurs could have undertaken such a varied assortment of photographs in short, and done the work successfully? I really think Mr. Lambert ought to explain or withdraw. At this lecture Captain Wheeler referred to the fact of photography having been recognized by the military authorities at the time of the Crimean War, and describes how the appointed one took thirty big packing-cases and a portable dark-room like a bathing-machine, but said it was not on record that any serviceable pictures were produced. I do not know who this photographer was, nor what he did, but I do know that some excellent large photographs of scenes in the neighbourhood of Sebastopol were taken, and were published. It is a long time ago, but I remember them well, particularly one of a desolate valley, entitled at the time "The Valley of the Shadow of Death." I think, but am not quite sure, that these pictures bore the name of Roger Fenton; but it is now nearly half-a-century ago, and memory plays tricks over such a period of time as that.

I notice a letter from a correspondent, "Bank Note," describing the excitement caused by the issue of forged Bank of England notes that had been put into circulation and seized, and some of which has been received without question at the banks. "Bank Note" speaks of the difficulty that would be experienced with the paper, and wonders whether any photo-mechanical means were used for printing. With regard to the latter, the printing by such means would be a very simple matter, and as to the paper the great difficulty would be obtaining a strong enough sample. As to the water-marking, that should offer no difficulty whatever. Any cigarette smoker who rolls his own cigarettes and uses Rameses paper may see an exemplification of what may be done in that direction. The beautifully clear water-marking to be seen thereon is not water-marking at all, but is produced by strong pressure from a relief block. Poor Woodbury, a great many years ago, patented a process for producing such effects by pressure from a modified Woodburytype block of the well-known type. There is then the rough edges; but Burton showed a long time since that these could be imitated by dissolving in nitro-sulphuric acid, as though making pyroxline. However, I must not help the counterfeiters too much, or I shall be having the authorities down upon me. I will conclude by hoping that Coronation Day doings may shower many of the genuine articles into the laps of the photographers of Great Britain.

FREE LANCE.

THE Austin-Edwards Monthly Film Negative Competition.—The prize camera for the current month has been awarded to Mr. James Dunlop, Myrtle Bank, Wilson Street, Motherwell, N.B., for his negative "Silver Birches."

THE London Etching Company, of 3, Holborn Place, High Holborn, W.C., send us a copy of a table of reductions which they have just published for the use of art editors and others. The company have frequently felt the want of it themselves, and believe that it will prove to be a daily time-saving reference of much value and convenience.

THE PRINTING VALUES OF VARIOUS SOURCES OF LIGHT RELATIVE TO SLOW BROMIDE (GASLIGHT) PAPERS, TRANSPARENCIES, ETC.

[A paper read before the Photographic Club.]

SEVERAL demonstrators have lately come before us showing the capabilities of slow bromide papers for contact printing, and as the question of the printing values of the various artificial lights employed or recommended for this purpose seems somewhat uncertain, and the statements made somewhat contradictory, I have thought that establishing these comparative light values by experiment might be a useful thing, especially as this class of papers have of late been brought into notice, and that various brands are now in the market.

It will be seen that the general run of these papers are about of the same sensitiveness, and also that the images partake very much of the same character. The usefulness of these papers lies, no doubt, in the fact that they may be handled safely in a room lit up by ordinary gas or lamplight at a reasonable distance from the source of light, while that same kind of light can be used at a short distance as the light from which the image is obtained. In the results obtained from these experimental exposures there is no attempt at making pictures, and the prints must not be taken as representing the best that can be obtained with any one brand of paper. In fact, they are not to be looked upon as criticising the papers, but simply as showing how correct exposure makes up the image. The prints are obtained by experimenting with each individual brand until a normal development is obtained, giving as good gradation as can be got with the paper with a normally developing image, timing the development for the first appearance of the image and the complete development. The normal time for development was taken as one minute and exposures continued until that normal was reached.

It will be seen, however that not all the papers are amenable to that treatment. The Eastman Dakko is best at 1½ minute development, at which the best results as regards density and regularity of development are obtained; while "Velox," though the most rapid and sensitive of the papers, takes 10 seconds with a normal exposure before any signs of an image appear; while in the case of all the others the image appears in five seconds. The variations need not be looked upon as defects or advantages; they simply show the characteristics of the various papers. The exposures were all made at 12in. from the source of light for gas and electric.

The magnesium ribbon exposures have to be adjusted to the circumstances of the case, as far as distance goes.

I may here say that it is a bad plan, and misleading as to the value of the light employed, to expose a print at a very few inches from the source as sometimes is recommended. To expose a half-plate print at 3in. or 4in. from a Bunsen is giving it a very uneven exposure; the plan adopted is to move the frame about in a kind of circular motion, which is supposed to equalise the exposure. It does nothing of the kind. The correct plan is to expose a frame at a proper and settled distance from the light, so that the angle of light is within 45deg. The illumination is then fairly even, for at that angle, which is meant for the corners, the most distant corner will have about 75 per cent. of the light falling on the centre of the print, that is perpendicularly. The top of the 25 per cent. will hardly be noticed in the print, and may be helped by a slight movement to and fro of the frame in the direction of its greater dimension.

Dodging the frame about in all manner of ways cannot give even illumination, and is no guide at all as to the

time of exposure, for the whole image is not exposed at one and the same time. The statement as to the exposure a print has had is, therefore, misleading. The distance should vary according to the size of the plate, its greatest dimension being alone considered. A half-plate should not be brought nearer than 8in. or 9in., nor a whole plate nearer than 12in. to the source of light. The time of exposure must be regulated accordingly.

DAYLIGHT EXPOSURES.

When daylight is used the plan is to reduce it to a manageable commodity. The exposures in this case were made in a room facing east, in a moderately good light such as we have in London in winter, and at mid-day to one or half-past, but without *sunshine*, at 12in. distance from the window.

The normal exposure was taken as one second, and brought down until I obtained a normal development, guided by the artificial light exposures. With bright daylight, the plan is to fix a greater distance, such as 10in. or 2ft., from the window, and eventually to expose behind a tracing paper or other translucent material, which may be either fastened to the window or over the printing-frame. Diffused light only must in all cases be used. The tabulated figures show results with such daylight as I have described, taking one second as a normal exposure with the resulting development and appearance of image equal to that obtained from the artificial sources of light, as follows:—

Taking daylight as requiring one second's exposure for obtaining with an average of one minute's development a good print, we have the following results, averaged from numerous exposures:—

	Time in seconds.	Comparative light value.
Daylight	1	... 1,000
Acetylene (24 c.p.)	12 to 15	... 60
Incandescent (Welsbach) gas	25	... 30
Electric (glow) lamp (16 c.p.*) ...	35 to 40	... 20
Batswing burner gas, 16 c.p. ...	42 to 50	... 16

With regard to daylight, I need hardly say that in summer the value of the same light would be from 2,000 to 3,000, and in open places—country, seaside, etc.—probably 5,000 always excluding direct sunshine. The value of the light will, of course, stand in the inverse ratio to the time required for exposure, as the table shows. The table of comparative exposures is shown below. Some of the discrepancies in the time of development may arise from the composition of the developer:—

	Normal development. Image Finished in.		Acetylene.	Gas incand.	Incd. 16c. Fish-tail electric glow.		Magnes. ribbon.	Daylight.
	Sec.	Min.	Sec.	Sec.	Sec.	Sec.	In. Ft.	Sec.
Velox ...	10	1	6	12	†16	30	½ to 3	½
Dekko ...	5	1¼	40	90	100	120	1½ at 1	2
Wellington	5	1	20	30	35-40	60	½ at 2	1
Columbia	5	1	15	20	40	60	¾ at 1	1½
Rotokon	3 to 5	⅙		(Not sufficient paper.)				

All development was carried out with the developer recommended. J. R. Gotz.

We are informed that extensive building operations are just on completion at the works of the Gem Dry Plate Company, Limited, Willesden Green, N.W. A new and complete paper plant has been erected, to coat, reel, and cut a mile of paper a day, 41 inches wide. Although Gem P.O.P. is the newest brand on the market, it has been found that a 26in. machine has been quite unable to meet the demand by professional photographers and wholesale houses for the company's paper specialities. An extra coating machine for plates has also become a necessity, and will be installed by May 1st.

* Electric incandescent used had an opal reflector.

† The Durand electric lamp was under a white (opal) reflector or shade; all the other lights had no reflectors. I should deduct about 30 per cent. from its light value, or add not less than half as much to the exposure, when used without the reflector.

TESTS OF SAMPLES OF SODIUM CARBONATE.

[A paper read before the Photographic Society of Philadelphia, and re-printed from its Journal.]

In behalf of the Technical Committee, six samples of sodium carbonate, selected at random, were titrated, with the purpose of showing that when one buys this article he really can have little certainty of what he is getting for his money. The method of titration was to dissolve a carefully weighed portion in distilled water, to which solution a drop of methyl orange solution was added. Sulphuric acid, 4-10 normal, was then run in until change of colour occurred, when the number of cubic centimetres so used, multiplied by 0.0212, gave the number of grammes of Na_2CO_3, assuming that no other alkali was present. This latter assumption was probably not perfectly correct, except in the case of 1 and 2, but the fact that the solution may have contained a little sodium or calcium hydrate is of no importance from the standpoint of the photographer, since he is interested in the total alkalinity rather than in its exact form. From the amount of Na_2CO_3 so found was calculated the percentage in the sample. In no case was the latter dried, as would be done in an analysis to determine the purity of the product, since what was here desired was the alkalinity of the specimen as found in commerce, thus adhering to the conditions of photographic practice.

1. Sodium carbonate, dry, absolutely C. P. This was found to contain 91.3 per cent. Na_2CO_3. The other 8.7 per cent. doubtless consisted of water, not of crystallisation, but absorbed from the atmosphere. Thus, according to Krauch (Pruefung der Chemischen Reagentien) dried soda readily absorbs about 10 per cent. of moisture.

2. Sodium carbonate, crystallised, C. P. This contained 68.6 per cent of Na_2CO_3. This sample, being crystallised, should have contained only about 37.1 per cent., or, more accurately, 37.06 per cent., since, as ordinarily prepared, the crystals have the formula $Na_2CO_3 + 10\ H_2O$. The discrepancy is to be explained by the efflorescence of the crystals, which in this case was marked.

6. Washing soda (from a different grocer). Contained 50.3 per cent. Na_2CO_3.

4. Carbonate of soda ("The Mascotte"). Also granular. Contained 84.1 per cent. Na_2CO_3.

5. Washing soda (obtained from a grocer). Contained 43.5 per cent. Na_2CO_3.

6. Washing soda (from a different grocer). Contained 50.3 per cent. Na_2CO_3.

In considering these results, we must bear in mind the inherent peculiarities of the compound. For example, according to the temperature of crystallisation and other conditions, the crystals may contain 1, 2, 3, 5, 6, 7, 10, or 15 molecules of water, the ordinary number being 10. On the other hand, it may readily be dried so as to contain no water. In addition, as has already been said, the dried substance tends to absorb moisture from the air, while the crystals tend to give up a considerable part of their water of crystallisation by the spontaneous process of efflorescence. Under such circumstances it is little wonder that the commercial product is always of uncertain composition, even if originally pure. It may be said, however, that if one select clear, transparent crystals, they will generally correspond more nearly to the theoretical strength than will such as have become white on the surface, the white coating being an indication of efflorescence.

On account of the importance in some developers of using the proper amount of alkali, perhaps it will not be amiss to describe, for the benefit of such members as may not be familiar with chemical processes, a very simple method of estimating with sufficient accuracy for the purpose the strength of any

sample of sodium or potassium carbonate. In regard to the latter, it may be remarked that owing to the deliquescent nature of this compound, a good deal of water is usually weighed as carbonate when solutions are made up. Weigh off 5.3 grammes sodium carbonate, or 6.9 grammes potassium carbonate, dissolve in a moderate quantity of water, add a single drop of a weak solution of methyl orange, which will give the solution a pale yellow colour. Normal sulphuric acid is then added until the colour changes to pink. The number of cubic centimetres so added gives without any calculation the percentage of carbonate present in the substance being tested. Thus, if it require 60c.c. to cause the change of colour, the substance contains 60 per cent. of carbonate. Of course, the most accurate way to add the acid is from a burette, but for the present purpose a small graduate of 25c.c. capacity can be substituted, filling it two or three times if required. The normal acid can be purchased and kept indefinitely in a well-stoppered bottle, or an approximate solution can be made by mixing pure sulphuric acid and water to a strength of about 5 per cent., and then, after allowing the mixture to cool, adjusting it by small additions of water or acid so as to get a solution of the specific gravity 1029 as tested by the hydrometer.

Finally, we may make up the alkaline developing solution itself by hydrometer, and in this way avoid all question in regard to the amount of water contained in the carbonate. This method, however, will be correct only if the carbonate be reasonably pure, any impurity except water affecting the result.

DR. CASPER MILLER.

MERCURIAL INTENSIFICATION.

DR. GEORG HAUBERISSER has been continuing his experiments with mercurial intensification, and in the "Photographische Chronik" for March 30 he suggests a new method of blackening the bleached negative, or, rather, a modification of a well-known method.

Dr. Hauberisser points out that the mercurial intensifier is that most generally adopted, despite the disadvantage of having to use two solutions. To avoid this trouble, a one-solution intensifier, consisting of mercuric sulphocyanide, has been introduced, but the disadvantage of this preparation is that if allowed to act too long the negative, instead of being intensified, is bleached, and, therefore, prints weaker, and that the negative must then be treated with one of the usual blackening methods in order to give satisfactory printing results.

It is, of course, well known that various blackening agents, such as ammonia, ferrous oxalate, and sulphite give different degrees of intensification, and, further, that the ammonia method gives somewhat unstable negatives, whilst ferrous oxalate and sulphite give permanent results. In the negative intensified with mercury and ferrous oxalate the image is formed of metallic silver and metallic mercury, and it is possible to readily re-intensify the same. As, however, ferrous oxalate is rarely used now, Dr. Hauberisser's experiments were to see whether any of the newer developers could be used, and he points out that amidol is frequently suggested instead of ferrous oxalate; but this contains sulphite, and, as pointed out already by Dr. Hauberisser,* the final image of a sulphite intensified negative contains a sulphur compound of silver, so where an amidol developer was used, the presence of sulphur was proved to exist in the black image, thus proving that the sulphite of the developer plays the entire, or a considerable, part of the reduction. As, with exception of the pyrocatechine, all the organic developers contain sulphite, this alone, in conjunction with potassium hydrate, gives a satisfactory substitute for ferrous oxalate.

To test the action of the developer, a plate was exposed under a photometer, developed, fixed, and washed, and then cut into three strips, one of which was dried, the other two being bleached in a 2 per cent. solution of mercuric chloride, well washed, and one blackened with sulphite and the other with pyrocatechine; they were then washed and dried. The three strips were now printed from on collodio-chloride paper, and it was found that the strip intensified with pyrocatechine had about double the density of that treated with sulphite, and showed one more number than was visible on the unintensified strip.

It is advisable to make up the pyrocatechine just before use from the following stock solutions, which will keep:—

A.

Pyrocatechine	2g.
Distilled water	100cc.

B.

Caustic potash	20g.
Distilled water	100cc.

Immediately before using, mix 5cc. of A, 5cc. of B, and 50cc. of water.

It is important, if this method of intensification is used, that the bleached negatives be thoroughly washed, for if any of the mercury solution is left in the film this will be reduced, and cause fog. It will be found that in the majority of cases it will not be necessary to carry the bleaching process so far as usual; that is to say, it need not be carried through to the glass side of the negative.

R. E. CHESTERMAN, D.Sc.

* "The Sulphite Intensifier," B.J.P., March 21st, p. 228.

AN APPARATUS FOR REDUCING OR ENLARGING.

MANY of us have a large stock of negatives taken during the bright weather, which, if made into lantern slides and exhibited on a sheet, would not only please the amateur himself, but interest a number of friends. The question of the expense of a lantern need trouble no one in the present day. A really serviceable instrument for use with oil or gas can be purchased for a guinea. The lantern will also be found very useful in other ways, as, for instance, in enlarging, the condenser and light can be utilsed. The usual method adopted in making slides is by contact, but this is not always possible, as, in the case of a 5 by 4, or ½-plate negative, we shall then want to reduce the view, and it is necessary to have some arrangement for that purpose. I propose, in this short article, to give a description of an apparatus that will render this operation more simple, and allow it to be carried out more expeditiously than would be the case with make-shift methods. As probably the negatives to be reduced will be ½-plate or 5 by 4, I shall give measurements that will serve for the first-named size, using a lens of 5½ inch focus. If a longer focus lens is used, the length must be increased, and if one of a shorter focus, correspondingly reduced.

We will first of all make the platform on which to erect our apparatus. This should be about 26 inches long, by about 9 inches wide. The width will depend entirely on the dimensions of the camera used.

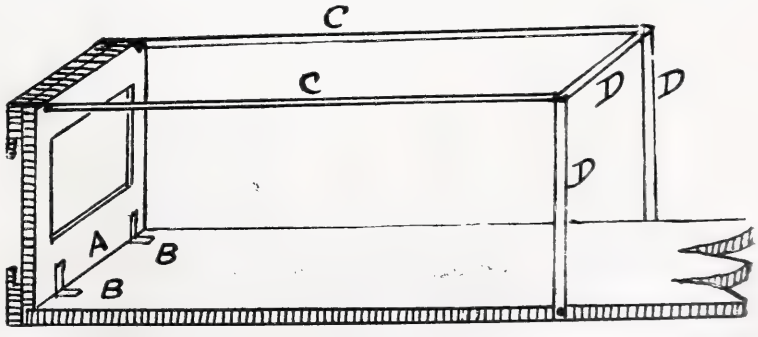


Fig. 1.

It should be slightly wider. The reason for this will be seen later on. At one end of this platform we must construct a frame in which to place the negative to be reduced (fig. 1). Make this about 10in. high, by about 9in. wide. To do this cut two pieces of wood

9 inches long by 2¼ inches wide, and two other pieces 10 inches long by 1⅜ wide. Join these together by cutting as in Fig. 2, and fasten



Fig. 2.

at the four corners with screws. Now cut two slips of wood to screw to the edges of the opening so as to form a groove for the negative to slide in. These slips should be placed so that all the negatives can be seen through the aperture of the frame. An improvement on this method, which will enable the reader to enlarge from lantern plate size to ½-plate, if required, can be effected by using a dark slide to support the negative, instead of simply placing it in the groove. For this purpose we shall need to make the grooves to take a dark slide instead of a negative, and at the same time it will require to be made more carefully and strongly. Two pieces of wood will be required 9 inches long by 2¼ inches wide. Cut a groove off each piece, as in Fig. 3, so that when these are screwed firmly to

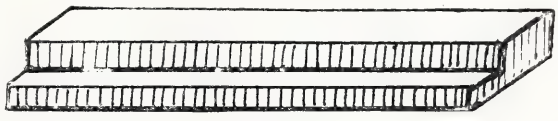


Fig. 3.

the frame it will allow the rebate of the dark slide to move easily, but at the same time fit tightly up to the frame. This may seem a lot of trouble, but it is very useful at times to be able to utilise the apparatus for enlarging, and will repay the reader for the time expended upon it.

The frame should now be fastened to the platform. This must be done at right angles. An easy way of doing this is to purchase two iron brackets, and fasten these as in Fig. I.B.B., but be sure they are at right angles.

Now, fix two pieces of wood 15 inches long to the top corners of the frame Fig. I.C.C. The thickness of these is immaterial, provided they are strong enough to carry the covering that will ultimately be placed over them. Two pieces of cane would answer the purpose very well. Fasten the other ends to a bridge, that will be made at Fig. I.D. This is done by cutting two pieces of wood 10 inches long and screwing to the two sides of the platform, afterwards fastening a piece across the top to form the bridge.

Our next business will be to cover this all over with some light-tight material. Whatever substance is used for the purpose, cut a piece about 32 inches by 19 inches. Fasten this with glue and nails over the whole framework, leaving the two ends uncovered, and leaving the extra four inches of material at the bridge end. The reason for this will appear later. The width (32 inches) will allow the material to be fastened underneath the platform, and will render the arrangement more light tight (an absolute necessity if we intend using it as an enlarging apparatus at times).

We will now turn our attention to the other end of the platform. Upon this we must erect our camera in such a position that the lens will point exactly to the centre of the frame fixed for carrying the negative at the other end. If a ½-plate camera is used, it will be found that it can be placed on the platform, and will require very little adjusting. If, however, our camera is smaller, we shall be compelled to make a raised platform in order to get the camera the required height. Should the camera have a sliding back arrangement, as well as a long extension, it will be only necessary to screw it in position, and any alteration in focussing can be made by moving the back and front. If, however, it has not these advantages, it will be necessary to make some provision for shifting it at least three or four inches. Several ways of doing this may present themselves, but probably the

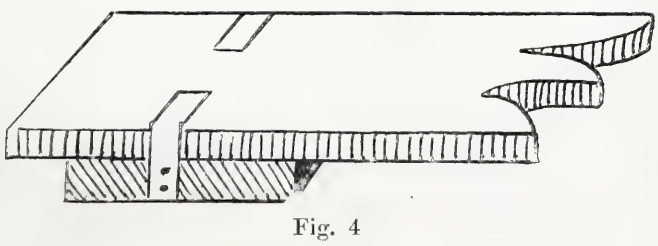


Fig. 4

easiest will be to make a slit 4 inches long in the bottom of the platform, large enough to admit the tripod screw. The camera can then be moved backwards and forwards, and fastened firmly in any required position. This arrangement will, of course, only answer if the camera stands on the bottom of the platform. Should a raised platform be needed, it will be necessary to make the raised piece the same width as the bottom platform. Fasten two brackets at each side with screws, so that the other part of the bracket goes underneath the platform. A glance at Fig 4 will, no doubt, make my meaning clear.

We shall now require a carrier in our dark slide, in which to place the lantern plate, and on which we make the slide by reduction. These can be purchased, but if the reader chooses they can be very easily made with a piece of card or millboard. If one piece is not thick enough, take two pieces, paste well, and press tightly together. An aperture the size of a lantern plate should then be cut out with a sharp knife, and four pieces of card pasted over the four corners of one side so that they project just over the cut-out aperture. On the other side, paste pieces over two of the corners, and at the other end fasten a little pin, so that when the plates are inserted the pin can be turned and keep them in position. See Fig. 5. Now fix the

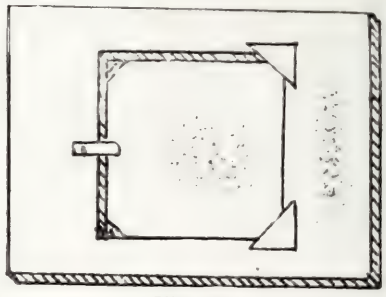


Fig. 5.

camera on the platform. Rack the front out so that the lens is about 8 inches from the focussing glass. Slide this along until there is about 3 to 4 inches between the lens and the bridge with the covering over. Gather up the ends of this covering and fasten with a piece of elastic, so that it will fit over the lens. We shall now have a light-tight covering from the back of the apparatus, carrying the negative to our camera, in which we have the lantern plate. In this position, with a lens of 5½ inch focus, the apparatus should be about in register to reduce a ½-plate negative to lantern size. Any other sized reduction can be made by altering the distance between the lens and lantern plate, remembering that the less the reduction the greater the distance between the lens and back of camera, and the less between the lens and the negative to be reduced. To use, place negative at one end, with film side pointing to the lens, and cover over with a cloth. Take the apparatus to the light, and draw shutter at the other end, exposing the lantern plate. Raise cloth from cover negative, and give the necessary exposure. J. H. Burke.

PHOTOGRAPHIC TRADE ASSOCIATION.

Report of the Council, 1901-2.

In presenting the first annual report, your Executive have to announce a year of labour in fighting against an attempted monopoly of the trade. Events have proved that the formation of the Association has been a step in the right direction. It has, in a great measure, consolidated the trade, and, as the photographic trade is becoming such an important industry in the country, it is essential that there should be some such body to watch over its interests. Early last year, Kodak, Ltd., sought to impose certain prohibitive restrictions which were very much resented by the majority of the dealers throughout the country. To fight any action that might have been brought against any individual dealer, a guarantee fund was opened and was largely subscribed to. Through the position which the Association took in this matter, these conditions were withdrawn. Other conditions followed of a less aggressive nature, but the Company ceased to supply their specialities to the wholesale members of the trade. Although the present conditions are not as aggressive as the first, they are looked upon as inquisitorial and as an attempt for shutting out improvements. Your Executive, therefore, are doing everything in their power to place the dealer in an independent position, and towards this end a number of wholesale members of the Association have combined together to place certain rollable film cameras and films on the market, so that the members of the trade may have a choice of apparatus, and thus maintain the right to carry on their business on lines which are in accordance with the national traditions.

Two general meetings of the Association have been held, both of which were highly satisfactory, there being a good attendance at each. Four circular letters have been issued by the Executive to members, besides a number of circulars to the trade generally. The roll of members at present numbers 585.

There have been eleven meetings of the Executive and Council, the attendance being as follows:—

TOWN MEMBERS.—*G. Barclay, 8; F. Bishop, 1; *G. M. Bishop, 8; *A. C. Brookes, 7; *W. F. Butcher, 10; H. M. Dennes, 0; *J. J. Elliott, 4; *R. Green, 9; *G. Houghton, 11; *E. W. Houghton, 10; L. M. Isaacs, 5; D. A. Lowthime, 4; *J. Lillie Mitchell, 10; H. F. Purser, 4; W. Salt, 0; *A. S. Spratt, 10; C. Tyler, 2; *C. H. Watson, 3; *J. B. B. Wellington, 9.

COUNTRY MEMBERS.—A. H. Baird, Edinburgh, 0; M. Ballantyne, Glasgow, 0; P. C. Curtis, Dublin, 0; M. W. Dunscombe, Bristol, 0; G. Frost, Alton, 2; J. Henderson, Aberdeen, 0; F. K. Hurman, Newcastle-on-Tyne, 1; *F. V. A. Lloyd, Liverpool, 0; E. Marlow, Birmingham, 2; J. Williams, Cardiff, 1.

Three members, namely, Messrs. H. M. Dennes, P. C. Curtis, and E. Marlow, have either resigned or their positions have become void through severing their connection with the trade.

The Executive have to thank the London Stereoscopic Company for placing a room, at 54, Cheapside, at their disposal for holding meetings.

The total receipts for the year amount to £171 5s. 10d., and the expenditure to £197 3s. 4d., showing a deficit of £25 17s. 6d. Against this, there are still subscriptions due to the extent of £62 17s.

The Association's best thanks are due to Messrs. Houghton, Green, Spratt, Elliott, and Butcher for their loan of £10 each in order to carry on the preliminary work of the Association.

By order of the Council,

J. BROOKE WILKINSON,
Secretary.

Balance-sheet for the year ending March 31st, 1902.

CASH ACCOUNT.

RECEIPTS.

1901-2.	£ s. d.	£ s. d.
To Subscriptions—298 Retail	75 18 9	
,, ,, 90 Wholesale...	94 10 0	
		170 8 9
,, Loan		50 0 0
,, Interest		0 17 1
		£221 5 10

PAYMENTS.

1901-2.	£ s. d.
By Secretary	22 5 0
,, Assistant Clerical	7 13 9
,, Rent of Office	10 10 0
,, Rent of Room for Special Meetings	8 13 0
,, Stationery	9 11 0
,, Printing	36 17 1
,, Postages	65 12 1
,, Law Charges	33 19 8
,, Sundries and Bank Charges	2 1 9
,, Balance	24 2 6
	£221 5 10

ASSETS.

	£ s. d.
Balance at Bank	22 0 6
Balance in hand	2 2 0
180 Unpaid Retail Subscriptions	45 0 0
17 Unpaid Wholesale Subscriptions	17 17 0
	£86 19 6

LIABILITIES.

	£ s. d.
Due to Messrs. Houghton, Green, Spratt, Elliott, and Butcher, for Loans of £10 each	50 0 0
Balance	36 19 6
	£86 19 6

* Denotes members of the Executive Committee.

PHOTOGRAPHIC SURVEY OF SURREY.

THE following circular has been issued:—

Dear Sir,—A Provisional Committee has been formed for the purpose of inaugurating a photographic survey of the county of Surrey, an object which, it is believed, will receive the support, not only of photographers, but of others in any way connected with the county. The purpose of the survey will be to take and preserve permanent photographs of the scenery, geology, and natural history, antiquities, buildings, streets, social life, and public events of the Surrey of to-day, as well as the reproduction of old prints, maps, and records of the Surrey of the past. The value and interest of such a record it is unnecessary to dilate upon. Equally unnecessary is it to remind you that no county is changing more rapidly than Surrey, and in none therefore is the need for such a survey more urgent.

It seems to the Provisional Committee that the first step to take in the direction indicated is to communicate with all the photographic, scientific, and other working societies in the county whose addresses can be ascertained, to ask them for their support and co-operation, and to call a general meeting at which they should be represented. The business of this meeting will be the election of the executive council and officers, the framing of rules, and the consideration of such other business as may be brought before it.

We have therefore been instructed to invite your society to send two delegates to a meeting, to be held in the Lecture Room of the Central Public Library, Town Hall, Croydon (by permission of the Libraries Committee), on Friday, the 9th May, at 8 p.m.

The Provisional Committee will have certain proposals to bring before the above meeting with reference to the general lines of the work, and the storage of the collection, where it may be properly arranged, and, what is a very important point, where it may be available for consultation by the public at all reasonable hours.

We confidently count upon the support of your society in this effort, and shall be glad to hear from you in regard to the matter.—We are, yours faithfully,

W. W. WHITAKER, B.A., F.R.S., F.G.S.,
Chairman Provisional Committee.
L. STANLEY JAST, Chief Librarian,
Croydon Public Libraries,
Hon. Curator pro tem.

J. H. Baldock, F.C.S., Lanternist and Recorder, Croydon Natural History and Scientific Society.
G. R. Beckett, Hon. Sec., South Norwood Photographic Society.
A. K. Coomara-Swamy, B.Sc., F.L.S., F.G.S.
G. Clinch, F.G.S., Hon. Sec., Anthropological and Archæological Committee (Croydon Natural History and Scientific Society).
F. Foss, J.P., Croydon County Council, Chairman Libraries Committee.
C. L. Faunthorpe, Hon. Sec., Photographic Committee (Croydon Natural History and Scientific Society).
H. Maclean, F.G.S., F.R.P.S., President, Croydon Camera Club.
E. A. Martin, F.G.S., Hon. Sec., Croydon Branch Selborne Society; Hon. Sec., Footpaths Preservation Society.
E. Mawdesley, B.A., LL.B., Town Clerk of Croydon.
G. W. Moore, Hon. Sec., Croydon Natural History and Scientific Society.
H. W. Monckton, F.L.S., F.G.S., President, Geological Association.
H. Keatley Moore, B.A., B.Mus.
J. Noakes, Croydon County Council; Croydon Camera Club.
A. Roods, Hon. Librarian, Croydon Natural History and Scientific Society.
G. Robinson, South Norwood Photographic Society.
W. P. D. Stebbing, F.G.S.
W. W. Topley, Geological Committee, Croydon Natural History and Scientific Society.—Members, Provisional Committee.

H. D. GOWER,
55, Benson Road, Croydon,
Hon. Sec. pro tem.

PRESENTATION to Sir H. Trueman Wood.—Sir William Preece, as chairman of the Society of Arts, entertained the members of the council of that society at dinner at the Hotel Victoria on Thursday in last week. The guests were the Duke of Abercorn, Lord Belhaven and Stenton, the Lord Chief Justice of England, the Hon. R. C. Parsons, Sir Frederick Abel, Sir Edward Durning-Lawrence, M.P., Sir Edward Birkbeck, Major-General Sir O. T. Burne, Sir William Abney, Sir John Wolfe-Barry, Sir Robert Giffen, Sir William Roberts-Austen, Sir Benjamin Baker, Sir E. Montagu Nelson, Sir Westby Perceval, Sir John Pender, Sir George Birdwood, Sir William Lee-Warner, Sir Henry Trueman Wood, Mr. Michael Carteighe, Mr. R. Brudenell Carter, Professor James Dewar, Professor Francis Elgar, Mr. J. G. Gordon, Mr. Robert Kaye Gray, Mr. Alexander Siemens, Mr. Carmichael Thomas, Professor J. M. Thomson, and Mr. Henry B. Wheatley. A portrait of Sir Henry Trueman Wood, the secretary of the society, painted by Professor von Herkomer, was presented to Sir Henry by the chairman in the name of the subscribers, who were all present, or past, members of the council.—"The Times."

PROPOSED MEMORIAL TO FOX TALBOT.

THE village of Lacock has reason to be proud of its association with one so distinguished as Mr. Fox Talbot, the inventor of photography, and father of the present owner and occupier of its famous abbey. Though his genius has won for him an imperishable name, still it is desirable that in the church of the parish in which he died there should be some substantial record of his worth. William Henry Fox Talbot died on the 17th of September, 1877, and soon afterwards it was suggested that a memorial to him should take the form of remodelling the chancel of Lacock Church. The matter fell through at the time, but since then it has never been lost sight of, and it is felt that the time has come when definite steps should no longer be delayed. There is at present no other monumental record of Mr. Fox Talbot than a short inscription on his gravestone in Lacock cemetery. With the chancel he was, as lay rector, intimately connected, and many of his ancestors from the sixteenth century, including his father, are buried in a vault under the adjoining Lady chapel. The present chancel was erected in 1776, in a style, if it may so be called, completely at variance with the fine mediæval church to which it is attached. The proposed works of remodelling consist chiefly in the removal of the ugly plaster cove ceiling and substitution of an open timber roof, which will enable the fine chancel arch, now partly blocked up, to be seen to full height. There will be a new east window, with simple panelled reredos beneath. The north side is occupied for the most part by the beautiful fifteenth century Lady chapel, which is separated from the chancel by two fine arches, which, of course, will remain exactly as they are. The south side will have a new organ recess in the western part, and a three-light window, with sedilæ under, in the eastern part, with a priest's small doorway between. Externally, the walls will be finished with an ornamental parapet, and the roofs covered with tiles. Internally, all the fittings will be new, as at present these are only temporary deal ones. The choir and clergy seats will be in oak, with open panelled fronts and solid ends, and the lectern and litany desk will be made to harmonise. The floor is to be laid with stone paving, and all the old monuments will be re-instated on the walls. The plans of the work of restoration have been prepared by Mr. Brakspear, and the matter has been entrusted to a committee consisted of the following:—The Right Rev. the Lord Bishop of Bristol, Miss Awdry (Notton House), Mr. C. H. Talbot, Miss R. C. Talbot, Mr. G. Ll. Palmer, Mr. Charles Awdry, the Rev. W. G. Clark-Maxwell (Clunbury Vicarage, Salop), Mr. J. E. Gladstone, Mr. E. Eyres, Mr. T. Pike, and the Rev. H. W. Armstrong, Vicar of Laycock, who has accepted the office of treasurer. About £400 has been received, leaving £600 still to be raised. In these days, when amateur photography is a rage, and when photographic societies and clubs are dotted all over the country, if those who derive such gratification and pleasure from this fascinating hobby would contribute a modest sum towards the memorial to the originator of photography, the amount required would be forthcoming many times over, and no further local effort would be necessary. The object is one which should commend itself to all who possess a camera, and we shall be pleased to hear from the treasurer that the appeal has resulted in the receipt of subscriptions from various parts of the country.

The committee, with the object of procuring additional funds, last week held a two days' exhibition and sale of paintings and sketches in water colour in the Oddfellows' Hall, Lacock. Upwards of 240 drawings were effectively arranged. The major part of those for sale are the works of Miss R. C. Talbot, and sketched while touring in Italy ,Switzerland, Norway, France, England, Scotland, and Ireland; these alone were sufficient to make up an interesting exhibition, and testify to her industry and energy. She has been very successful in her delineation of quaint old houses, and there were many sketches of fascinating scenery, in which the colouring generally is harmonious and good. Another very large donor was Mrs. Gilchrist Clarke, whose picturesque subjects displayed considerable talent. The other donors of drawings included Mrs. Hamilton, Miss Chetham Stroude, Mrs. Story-Maskelyne, Miss Bayfield Clark (of Wingfield, Trowbridge), and Mrs. Mundy. Those who kindly lent pictures were Mr. Griffiths, of Melksham; Mrs. Lawrence Green, of Bowden Hill; Mr. G. Ll. Palmer, and Mrs. Hare (sister of Miss Clark, of Trowbridge). On the wall was hung an enlarged photo of Mr. Fox Talbot, which naturally attracted the attention of visitors. Specimens of his photographic engravings were exhibited, and the clearness and distinctness with which delicate ornamental work is reproduced could not be improved upon at the present time. The Rev. H. W. Armstrong showed a photo taken from the original photograph, taken by Mr. Fox Talbot, in 1835, four years before Daguerre brought out his system. It is a latticed window in Lacock Abbey, and when first taken the sections of glass, about 200 in number, could be counted with the help of a lens. In an enlarged photo the panes are perfectly distinct.

There was a large number of visitors during the afternoon, and many of the drawings were disposed of. Selections of music (vocal and instrumental) were given at intervals. Miss Frances Wyld officiated as accompanist, and she joined Miss Clark in vocal duets. Violin solos were artistically given by Miss Annie D. Scott, and Mr. Le Duc Bucknall's violoncello solos were much appreciated. Tea was provided, and for the nominal charge of sixpence per head parties of visitors were permitted to visit the cloisters and other interesting parts of the abbey.—"The Devizes and Wiltshire Gazette."

New Books.

Stonyhurst College Observatory Report for 1901. Compiled by Rev. W. Sidgreave, S.J. Clitheroe: Printed by A. Blacon, "The Times" Office.

We have again to acknowledge receipt of the annual results of meteorological and magnetical observations at Stonyhurst Observatory. The following extracts from the director's report will convey an idea of the scope of the work of record and observation that is undertaken there:—

"The total rainfall of the year was 8 inches below the average; which was a loss of 17 per cent. to the annual water supply. But the scarcity felt in the autumn was the result of the greater loss of 10.4 inches between May 1st and September 30th, which is over 50 per cent. of the average fall in this period. Two heavy rainfalls in October, on the 5th and 8th, brought up the amount in this month to the average. In November an excess of over 3¾ inches, or 87 per cent. of its average, fell on two days, the 11th and 12th; and the total fall on this month was 8.19 inches in 11 days. In December 5.7 inches of rain fell on 25 days. The total fall in the year was just under 39 inches, and of this amount 15 inches fell on 13 days. The mean temperature of the year was very nearly the annual average. The relatively warmer months were April, May, July, and September. July was the warmest month, at a mean temperature 5.3 degrees above the average. The shade temperature reached 80 degrees and over on 9 days, and just touched 89 degrees on the 20th, which is the highest recorded at Stonyhurst.

The mean barometric pressure of the year was about the average. In the rainy month of December the pressure was generally low; less than 29 inches on 10 days, and never up to 30 inches, the mean height being 0.29 inch below the month's average. Strong winds at 37 miles per hour and over were recorded on 14 days—January 26th, 27th, and 28th, March 2nd, April 2nd, 4th, October 6th, 18th, November 19th, 20th, December 6th, 8th, 9th, 23rd—all with low barometric pressure, except on November 19th and December 6th, when the readings were close upon the annual average. The strongest of these gales was at 53 miles per hour on December 23rd. The special observations of clouds and wind, in connection with the meteorological balloon ascents have been sent every month to the International Meteorological Committee through the London Meteorological Office; and quarterly statements of magnetic calm days have been sent to the same committee through the secretary of the Magnetic Section at Upsal. The solar surface drawings during the year number, technically, 235 on as many days, including 91 blank sheets recording a perfectly clean surface. The mean spotted disc-area, deduced from these, is 0.29 (the unit being 1-5,000 of the visible disc) against 0.55 of the preceding year. And the mean daily range of the magnetic declination is 9.1 minutes against 9.7 minutes of the preceding year. The experiments with a small prismatic camera, mentioned in the last year's report, were completed just before the appearance of the new star in Perseus. A detailed description of the instrument is given in the introduction to a paper on the spectrum of Nova Persei, read at the December meeting of the Royal Astronomical Society, and printed in the December number of the Monthly Notices. Eighty-six photographs of this spectrum have been obtained on 51 dates since February 28th. Half of these were taken before the end of April; and the other half between August 24th and December 20th. Several attempts were made in May, which failed through the loss of light at the low altitude of the star. In the intervening summer months the prismatic camera was employed in Arcturus and α Cygni for the construction of its wave-length curve; and on β Lyrae and γ Cassiopeiæ for the extension of their spectra into the shorter wave-lengths. The visual spectrum of the Nova was also observed on 15 nights in March and April, and the results are published in the Monthly Notices of the Royal Astronomical Society, May, 1901."

"The Year's Photographs, 1901." Price 7s. 6d. Published by Iliffe and Sons, Ltd., 3, St. Bride Street, London, E.C.

Looked at simply as a production, this volume is one of the most tasteful that has come under our notice, at a time when special pains are devoted by publishers of photographic literature to the "get-up" of the many additions which are being made to the list of works on the fascinating subject of photography. The 96 reproductions of photographs shown at the last exhibition of the Royal Photographic Society and the Photographic Salon are engraved in half-tone and separately printed, the ink in many cases having been chosen to match the colour of the original print. Each picture is mounted on brown paper, and the title and the critical letterpress are also printed on separate pages. The book is bound in white canvas-covered boards, the top edges are gilt, and for the letterpress bold type and good quality paper have been used. The volume makes a beautiful addition to the photographer's library, and does Messrs. Iliffe very great credit.

Whoever is responsible for the selection of the photographs has exercised a catholic choice. The collection tells you at a glance what

the pictorial photography of the hour is like. It is true that mediocrity and the commonplace assert themselves here and there, but the exact point at which the line should be drawn in such a matter varies, of course, with the individual, and cannot be arbitrarily expressed. On the whole we do not think that the choice could have been improved upon. The anonymous critic or appreciator is well equipped for his task, and shows that he brings a trained mind to bear in his work of analysis. If anything, he is too full of his subject, so that he bubbles over with it, and occasionally in an excess of zeal and imagination allows himself to write sheer rubbish. Thus, of Mr. Moss's "Bosham," he says: "On the shore there are three busy figures, where," etc. The figures are indistinguishable blobs of something or the other. On Mr. Davison's two photographs he is quite silent. Of Mr. Cadby's "Shirley Poppies": "How well, in this simple arrangement of blossoms is the tremulousness of the flower upon the long frail stalk made manifest." We fail to detect any manifestation of tremulousness whatever. Of Mr. Cadby's "Madeleine": "It is not altogether unwelcome to taste the tonic sharpness of it," etc. What is tonic sharpness, and how do you taste it in a photograph? Of another exhibit: "Perhaps the effect would be gained if the photographer had let herself go' more in the matter of the title." Really, now, is the effect of a photograph heightened by the title? Of Mr. S. E. Wall's "Derelict": "Lying, as she does, clothed in this fairy gossamer of golden mist, with only the sun for companionship (the sun is not visible, by the way), she forms one of the grandest and sweetest pictures that were ever made by photographic agency"! A large order, truly. "Pleasing detail of cobbles"; a "hand full of character"; "interesting detail such as the carved kerbstones," are phrases which credit the critic with an observant eye, and perhaps show him at his best. If, however, in his next volume, which we hope to receive in due course, he will moderate his transports of praise, we think he will be well advised. We value and appreciate pictorial photography as much as anybody, but in the book before us the indiscriminate laudation that is plastered on some of the prints, in our opinion, is out of all proportion to what is called for. Still, we cordially welcome "The Year's Photographs" for its many beauties and excellencies.

"Kosmos" Collodio-Chloride Paper. Agents: Chas. Zimmermann and Co., 9 and 10, St. Mary-at-Hill, E.C.

This paper, which is of matt surface, is intended for the production of prints ranging in tone from sepia to black. The following is an epitome of the directions accompanying the sample sent us:—Print very strongly, so that the shadows show a bronzed appearance. After printing wash the prints for about 10 minutes, changing the water three or four times. For sepia or black tones the prints have to be toned first with gold and afterwards with platinum. The gold-toning bath is thus prepared:—Stock Solution A.: Borax, 150 grains. Acetate of soda, 150 grains; water, 35 ounces. Stock Solution B.: Chloride of gold, 15 grains; water, 3½ ounces. For use, mix 1 part of B with 40 parts of A. The bath should be used once only. After leaving the gold-toning bath the prints should be well rinsed, and then placed in the platinum toning bath. The platinum toning bath consists of:—Potassium chloroplatinite, 15 grains; fluid phosphoric acid, S.G. 1.120, 225 grains; water, 21 ounces. The toning in this bath will take 10 to 20 minutes, according to the amount of platinum in the bath at the time of using. When exhausted it should be discarded, as the bath cannot be strengthened. After the platinum toning the prints should be well washed in running water, and fixed in a solution of hypo, 4 ounces to the pint of water, and finally washed in the usual way. Carrying out these instructions we obtained admirable results. The tone obtained is much dependent upon the degree to which the toning in the gold bath is carried. For black tones the prints require to be fully toned; for sepia tones they should be removed while quite warm in colour. We have further tried treating the prints in the ordinary way with the sulpho-cyanide bath, and also with the combined bath, made with the Agfa toning and fixing salts, with quite satisfactory results.

"The Practical Photographer's Vade-Mecum." Price 2s. 6d. Published by Cadett and Neall, Limited, Ashtead, Surrey.

From this little book two sections are detachable: an exposure record occupying 28 ruled pages, and one devoted to tabular and miscellaneous matter, which takes up 24 pages. The latter section is an exceedingly useful compilation, lens formulæ, plate speeds, and tables relating to the use of the lens, the shutter, and the exposure meter, being the principal features. A view meter is attached to the cover By the simple use of perforated cards the focal length of the lens required for taking a given view may be ascertained with little trouble, the figures being read off from the face of the meter. The exposure meter data, printed on card, are attached to the inside of the back cover. Shortly described, this meter is on the slide-rule principle, and the factors are brought into calculation with the utmost ease. The "Vade-Mecum" condenses and serves up in convenient form a great deal of information that is necessary to successful photography. Perhaps the able compiler will note, when a second edition of the book is called for that London knows no "Tait Museum."

"Merck's Photographic Chemicals." 64 pages; gratis. Published by E. Merck, 16, Jewry Street, E.C.

The object of this little book is set forth in a prefatory note:—"Frequent inquiries addressed to me have suggested the desirability of compiling a few short notes on the essential features of the most important chemicals employed in photography and allied processes. These notes, which I herewith submit to perusal, include directions for the application of developers, fixing baths, toning baths, etc. Some of these are prepared in the form of tablets and cartridges, which are increasing in popularity every day." One of the features of the book is a list of the chemicals commonly used in photography with some of their synonyms.

Commercial & Legal Intelligence.

St. Claire Reynolds, Ltd.—The above-named Company has been registered with a capital of £1,000 in £1 shares. The objects of the Company are to carry on the business of photographers in all its branches, and as painters, producers, and publishers of portraits, or landscapes, or other subjects, in all mediums; as printers, reproducers, and publishers of works of art, book or other publications, dealers in photographic materials and apparatus, photographs, pictures, etchings, Christmas and birthday cards, artistic work in leather, metal, wood, or any other material, and other works of art of any description; as dealers in all things used in connection with cricket, football, and athletic sports; to acquire and turn to account any lands, estates, and other property. No initial public issue. Table A mainly applies.

Claim for Unmounting and Remounting.—At the last sitting of the Exeter County Court, Messrs. Scott and Son, photographers, late of Exeter, sued Mr. Charles Rowland, of Trews Weir, Exeter, to recover the sum of £1 5s. for unmounting and remounting photographs. The plaintiffs' case was to the effect that defendant ordered 100 photographs to be soaked and remounted, but before the work was completed he took them away. An album was also ordered, but Mrs. Rowland afterwards said she did not want it. The defendant said the work was delayed by the closing of the plaintiffs' Exeter premises, and the photos were taken away before they were completed. His Honour said he thought the claim was excessive, and gave judgment for the plaintiffs for 12s. 6d. only.

Warwick Competitions.—The following is the list of awards of the Warwick Competition for the current month: £1 prize, G. R. Dumbrill, Upper Berkley Terrace, Clifton, "Skating at the Fishponds." £1 prize, Miss M. C. Eames, Bache Isa, Llangollen, "Chrysanthemums." £1 prize, W. P. L. Harrison, Beaumond Cross, Newark, "A Portrait." £1 prize, Miss K. R. Image, St. Margaret's, Bury St. Edmunds, "Study of a Cat." £1 prize, G. Kilvington, Hawera, Taranaki, N.Z., "Hot Springs, Whakarewarewa." £1 prize, J. T. Roberts, Eridge Terrace, Thornton Heath, London, S.E., "A Young Handyman." £1 prize, R. C. Ryan, Compton Avenue, Brighton, "Dusty March." £1 prize, A. P. Varlow, The Retreat, Coalpit Heath, near Bristol, "Contentment." £1 prize, Miss A. M. Walters, Forthampton Vicarage, Tewkesbury, "Study of a Child." £1 prize, H. J. Ward, High Street, Charing, Kent, "A Country Wedding."

Re Ernest Arthur Day, photographer, formerly carrying on business at 92, Regent Road, Yarmouth, and at 2a, Davey Place, Norwich now of Davey Place, Norwich.—The above-named debtor appeared for his public examination at the Yarmouth Bankruptcy Court on Tuesday last, before the Registrar. The summary of accounts filed by the debtor showed liabilities estimated at £491 9s. 4d. and a deficiency of £417 15s. 10d. In reply to questions put by the Official Receiver, debtor said he was originally a draper's assistant. In May, 1894, he started business at Witney as an amateur photographer. He had about £70 worth of apparatus and £10 cash; but in October, 1895, his goods were seized for rent. In October, 1895, debtor went to Norwich and assisted his mother in the conduct of a licensed house, but in May, 1896, he entered into partnership with Mr. E. H. Banger, at Norwich. There was no partnership deed. The partnership was dissolved in March, 1893. Debtor afterwards maintained the Davey Place shop, while Mr. Banger conducted the Benedict Gate branch. In September, 1899, at which time he considered he was solvent, the debtor took premises at Regent Road, Yarmouth, and paid £30 for entry. The rent of the premises was £130, and the lease was a repairing lease. Debtor estimated having spent over £50 in repairs. His position was entirely due to the Yarmouth speculation. The examination was closed.

"It doesn't favour my wife," pleaded the defendant, Mr. Mathew Baxter, of Dunscar, Bolton, in the Manchester County Court recently. "I suppose you use the word 'favour' in the Lancashire meaning," said Judge Parry, "that is, that it is not like your wife?" Mr. Baxter admitted that his Honour had comprehended his meaning. The subject of discussion was technically described as a portrait on canvas in special frame, its value being appraised by the plaintiff, Mr. Charles Champion Bradshaw, artist, of Bury New Road, Manchester, at three guineas. Mr. Bradshaw had executed two portraits of the kind, the one of the plaintiff and the other of Mrs. Baxter, from photographs. His full charge was six guineas. Towards this sum the defendant had paid him in instalments £3 16s. 3d., and had refused further disbursement on the ground already indicated. He was satisfied with the artistic treatment of his own lineaments, but declined to pay for the picture of his wife. The Judge inspected the portrait of Mrs. Baxter. He said: "I don't think it is bad for the money. You don't expect to get a Millais for three guineas. Doesn't your wife like it?"—Mr. Baxter: "No."—The plaintiff: "She has altered a great deal since it was taken."—The defendant: "The card does not alter."—The plaintiff: "It is exactly like

the photograph."—The defendant said that if he could get a picture exactly like his wife he would be satisfied. His Honour said he thought Mr. Baxter must be satisfied with the portrait. It seemed to him to be a good likeness considering the money charged, which, in his opinion, was not an unreasonable amount. Judgment was given for the plaintiff for £2 9s. 9d. and costs.

In the King's Bench Division, on Tuesday last, before the Lord Chief Justice and Justices Darling and Channell, the Mayor and Corporation of Stockport appealed against the dismissal of a complaint under the Stockport Waterworks Act, 1861. Mr. Loehnis said he appeared for the appellants, the Mayor and Corporation, and he did not think the respondent was represented. The special case stated by the magistrates raised the question whether the use of water for the purpose of amateur photography was a domestic use. They had decided that such a user was domestic, and he contended that it was not. The professional photographer would, of course, have to pay extra for the water he used for photographic purposes, because he came within the words which imposed an extra charge when water was used for the purposes of trade or manufacture. The question of the amateur photographer had, however, become a very serious one in recent years, owing to the popularity which photography had attained. The Corporation contended that in this case the respondent had used water for photography, which was not a domestic purpose, and that therefore he was liable to pay 10s. That contention, however, the magistrates had overruled. In this case the respondent complained of the supply of water not being good, and one of the Corporation officials went to his place and found that he had a photographic room there and a dark-room. In order to clean his plates he used a considerable quantity of water, for which he ought to pay. Counsel understood that the plates were in such cases put under the tap and the water was left running all night, and an expert who was called by the respondent stated that to clean plates properly the water must be allowed to run for at least two hours. In this case, however, the exact nature of the user was not set out.

Alleged Photographic Frauds.—At the West London Police Court on Tuesday last week, Isabella Fielding, a photographer, who had been carrying on business in Hammersmith Road, was brought up on remand, before Mr. Lane, K.C., charged with obtaining 4s. from John Simmons, a hairdresser, of Adrian Terrace, Earl's Court, by false pretences. There were a number of cases against the prisoner, who had exhibited photographs in the front of the house calling attention to the business. In the case of the hairdresser it appeared that he and his cousin were posed for their photographs, the prisoner receiving 4s. and promising to supply six cabinets of each; but they were never received, though there were several calls and excuses made. Detective-Sergeant Allen said he found a camera, but not any lens in it.—The prisoner: "I am not guilty."—The Magistrate: "Where are the negatives?"—Prisoner: "I sold them."—The officer said the negatives sold were old. Alice Buttery, a servant, of Girdler's Road, Brook Green, said she paid the prisoner 6s. for a dozen cabinets, but she never had them. She charged her on finding that she had all her things packed up, and was leaving the house. There were other cases, all the witnesses stating that they parted with their money believing that the prisoner was carrying on a genuine business of a photographer. Sergeant Allen produced the camera, and said that morning the prisoner handed him the duplicate of a lens pledged on the 27th of February last.—The Magistrate: "The probability is that there was no lens in March or April."—Sergeant Allen said there had been no legitimate business since December last. The prisoner intimated that she had another lens, and said she had the brokers in, and other people entered the house. She was asked if she could produce any person who had received photographs, and as she gave an affirmative answer, Mr. Lane granted a remand to give her an opportunity of doing so.

The International Photographic Exhibition, Turin, 1902.—We have received the following, with request for publication:—"The edifice destined to the International Exhibition of Artistic Photography, which is promoted by the Subalpine Photographic Society, has risen, modestly hidden between two groves of oaks, in the 'Valentino Park' on the spot where the avenue from the monument to Amedeus of Savoy leads down to the Mediæval Castle. It is still too early to say anything about its facade, on which will artistically be arranged appropriate symbolic devices; but, from the interior, nearly finished, the importance of the forthcoming exhibition can be conceived. The main building is composed of three parallel galleries; the middle one being destined to Italy and those on each side, divided into 11 halls, will form as many foreign sections, in which almost all the civilised world will be represented. It has been a difficult task that of obtaining exhibits from exhibitors of so many different nations, as artistic photography is generally practised by amateurs, who have no special object in meeting expenses and running risks for the sake of having their work admired by a public thousands of miles away, who scarcely will appreciate it as much as it deserves. It is consequently noteworthy that this exhibition is based on the mere fondness of art and is free from any business-like feature, as a very strict selection shall be made by the accepting committees, who will in every case reject whatever does not come within the compass of artistic photography. Nevertheless, it is presumed that the exhibitors will be over 200, and the fact of gaining admission to the exhibition will in itself constitute an honour, of which will remain a lasting token in the shape of an artistic badge modelled by the clever sculptor, Mr. Rubino, and which shall be presented to each exhibitor by the Subalpine Photographic Society."

In re Kodak (Limited and Reduced).—This was a petition for the confirmation by the Court of a reduction of the company's capital. The company was incorporated in England in 1898, and was formed to acquire and carry on the business of the Eastman Photographic Materials Company (Limited), and to carry on the business of manufacturers of and dealers in photographic materials, etc., in England, the United States, and other countries. It carried on business both here and abroad. Another object was to sell or dispose of the undertaking of the company or all or any part or parts of its undertaking, business, or property, for such consideration as the vendor company might think fit, and particularly for shares of another company. The memorandum of association also gave power "to distribute any property of the company among the members in specie." The capital of the company was £1,600,000 in £1 shares (of which 600,000 were preference shares). The Eastman Kodak Company was registered in 1901 in New Jersey, and was the owner of 250,000 fully-paid ordinary shares in the Kodak Company. A provisional agreement was entered into last October under which the Eastman Company was to buy and take over the undertaking (except the English business) of the Kodak Company, part of the consideration being the allotment of fully-paid preference and "Common" shares in the Eastman Company to the Kodak Company or its nominees. The agreement was made conditional on special resolutions being passed reducing the capital of the Kodak Company to £250,000 in £1 ordinary shares by distributing the shares of the Eastman Company forming part of the consideration among the Kodak shareholders (other than the Eastman Company), and by cancelling all the Kodak shares except the 250,000 held by the Eastman Company. The agreement was also conditional on the reduction being confirmed by the Court. It was arranged that a sum of over £30,000 claimed by the Commissioners of Inland Revenue as income-tax should be invested in Consols in joint names pending the decision of the question whether the claim was justified. Terms had been come to with the only shareholders who dissented. Mr. Warmington, K.C., Mr. Danckwerts, K.C., and Mr. Kerly, Mr. Astbury, K.C., and Mr. Cann, and Mr. Rowlatt were counsel for the parties, the last-named gentleman appearing for the Commissioners of Inland Revenue. Mr. Justice Buckley, after discussing the question whether what was proposed to be done was paying off any capital which might be in excess of the wants of the company within the meaning of section 3 of the Companies Act, 1877, said that having regard to the wording of the memorandum of association and to what was said in the House of Lords in "British and American Trustee and Finance Corporation v. Couper" (1894, A.C., 399), he had jurisdiction to make the order, and he accordingly sanctioned the reduction of capital.—"The Times," April 15th.

Fire at the Paget Prize Plate Works.—Soon after 2 o'clock on Thursday morning, April 17th, a fire broke out on the premises of the Paget Prize Plate Company, Limited, Callow Land, Watford, with the result that one block, that in which the photographic plate business is carried on, was practically destroyed. The company have been established in Watford some 12 years, and employ a considerable number of hands, mostly girls, some 50 or 60 of whom found on arriving at their work that, owing to the fire, they had to return to their homes. The outbreak turned out to be one of the most serious that the brigades have had to contend with in the town for years. The fire started in the engine room. An employee named Samuel Brooks was on duty, and it appears that while he was in the boiler-house his attention was called to a bright light in the engine room near by. He soon discovered that this particular room was in flames, and at once gave the alarm. The Callow Land District Brigade, under Lieutenant R. A. Thorpe, turned out with promptitude, and, after connecting their hose with the hydrant, they ran out a length of over 300 yards and tackled the flames by breaking entrances through the windows. The Town Brigade, led by Captain C. H. Peacock, and Messrs. Sedgwick's Brigade, under Captain Harold Sedgwick, followed in quick time. It should be added that the London and North Western Railway engineers also assisted with a couple of lines of hose from the railway supply. The police, under Superintendent Wood, also rendered considerable assistance. At half-past two the reflection from the flames could be seen in the sky for a long distance. Immediately the nature of the fire was known, instructions were sent to the pumping station for the best possible force to be put on, and by this means sufficient water was obtained to keep the steamer well supplied. It was apparent that nothing could save the block where the fire was located, and the firemen's efforts were chiefly directed to preventing the flames reaching the surrounding buildings. The block in question was the original one in which the Watford business was commenced, the other premises being extensions. The fire burnt with great fierceness. In the engine room ventilating fans were at work, and these accelerated the progress of the fire, which had a clear run along the roof of the block, owing to a false ceiling. The two six-horse power engines for driving the electric dynamo were much damaged. The other rooms in the department were devoted to photographic plate work, and the stock and machinery burnt is of considerable value. No estimate of the damage could be given by one of the managers when approached on the subject by Press representatives, but the loss is very considerable, and the figure of £10,000 has been mentioned as rather below the mark than otherwise. The firemen succeeded in saving two valuable machines, and fortunately some barrels of petroleum standing near the building were seen in time to be rolled out of danger. The "dark" rooms used for developing were soon changed to light. The business was completely dislocated by the disablement of the engines, but the firm lost no time in meeting the emergency by making temporary arrangements pending the re-erection of the block. The loss is, we understand, covered by insurance. The cause of the fire is probably connected with the electric wiring. The firemen deserve great praise for their efforts. Every man was wet through to the skin, and considerable risk was run through the falling roof, iron shafting, and cisterns of water. The fire was practically under command by 6 o'clock, but several little outbreaks later on had to be tackled with hand pumps.—"The Watford Observer."

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

April.	Name of Society.	Subject.
26	Richmond Camera Club	Outing to Slough and Burnham Beeches.
26	Liverpool Amateur	Excursion to Bidston. Leader, Mr. E. Simnett.
26	Camera Club	Ramble—Bideford.
26	Ashton-under-Lyne	Ramble—Bottoms Hall Wood. 1.45.
28	Southampton Camera Club	*Chemistry of Light and Pyro-Soda Developer.* M. O'Connor.
28	Camera Club	*Some Principles of Painting Applied to Photography.* By Mr. A. W. Rimington.
28	Croydon Natural History	Mr. Rudler's Fourth Lecture.
29	Melbourne Working Men's Col.	Lecturette: *Trip Round the World.* Mr. H. Hampson.
29	Stonehouse Camera Club	Paper by Mr. R. H. Walling on *Hand Camera Work.*
29	Birmingham Photographic	*What are our Aims?* Mr. Smedley Aston.
30	Southsea Photographic Society	A Social Evening.
30	Southport Photographic Society	Annual General Meeting and Exhibition of Members' Work
30	North Middlesex Photographic	*Up the Rhine with the South London Photo. Society.* W. F. Slater, F.R.P.S.
30	Camera Club	Last day for submission of photographs for the Members' Annual Exhibition.
May.		
1	London and Provincial	Lantern Lecture—*Spain.* Mr. R. Beckett.
1	Camera Club	*The History and Use of Swords.* Mr. E. Seyd.
1	Sunderland Photographic	*Grange-over-Sands as a Photographic Centre.* By Mr. J. Deans.
1	Röntgen Society	Dr. Ch. L. Leonard. A paper.
1	Röntgen Photographic Society	Discussion Evening. Mr. Ernest Payne will open a Discussion on *The Relation between X Rays and allied Phenomena in Light and Electricity.*

ROYAL PHOTOGRAPHIC SOCIETY.

APRIL 15TH.—Lantern Meeting. Mr. J. J. Vezey, F.R.M.S., in the chair.

Mr. S. Aitken, F.R.G.S., addressed a crowded audience upon the "First Ascent of Mount St. Elias." Mount St. Elias is in Alaska, and it is the mountain that the dauntless Duke of the Abruzzi set himself to scale some years ago. Commencing with a group of the explorers forming the expeditionary party, which included Signor Vittorio Sella, famed for his mountain photographs throughout Europe, Mr. Aitken traced the travels of the small party who had set themselves the difficult task of climbing this out of the way and inaccessible peak in the far away north-west of America.

The photographs were wonderful examples of what can be done under adverse conditions by men of the stamp of Vittorio Sella, and the descriptive matter conveyed by Mr. Aitken was also extremely important and interesting. A number of other views were shown, illustrating other climbs by the same party in the Himalayas, amongst the snow-clad peaks lying in a very inaccessible country.

A hearty vote of thanks was given to the lecturer.

APRIL 22ND.—Technical meeting. Mr. Ernest C. Fincham, M.R.C.S., L.R.C.P., in the chair.

Dr. T. Charters White gave an interesting lecture on "Photo-micrography," followed by an exhibition on the screen of some seventy slides of various minute structures from animal and plant life. The lecturer remarked that more than twenty years' study of photography with the microscope, so far from satisfying his cravings, had only served to increase his interest in the investigations that this branch of photography enabled one to pursue. Referring to the question of magnification, the lecturer observed that while a certain worker he named contented himself with magnification of 1,500 diameters, his results were well-defined, but when he essayed the production of enlarged images up to 3,000 diameters the results were blurred and fuzzy. With this in mind, Dr. Charters White had limited himself to moderate amplifications, leaving it to the lantern to supply any further enlargement required. Unless such critical work as bacteriological research be taken up, the installation of apparatus for photo-micrography need not be expensive. The lecturer confirmed Mr. Andrew Pringle's words in reference to this question, viz., "Exceedingly good work has been done, and may be done again, without any special apparatus beyond a microscope and camera. The microscope has only to be turned to the horizontal, a camera run up to the eye-piece end of the microscope, all light not passing through the optical lantern excluded by means of a velvet tube or cone passed from a photographic lens tube (the glasses being removed) to and over the end of the microscope tube." Very simple apparatus suffices for magnification up to 250 diameters, which, if the results are to be shown by means of the lantern, is all that need be sought. For ordinary purposes an enlargement of 70 diameters is often sufficient, permitting one, as it does, to secure critical definition that might be difficult to obtain with greater amplification. A simple apparatus used by the lecturer consists of a lidless box on one side, screwed firmly to a base-board, which is divided longitudinally into three portions and dovetailed so that the middle portion is free to slide in and out. In the left end of the box is made a circular hole to admit the eye-piece end of the microscope.

The microscope used is one by Beck, with a short trumpet-shaped tube, and very substantially made, so as to secure the solidity that is so essential in the work. There is an achromatic condenser and a revolving diaphragm plate pierced with holes of various diameters from half an inch to a pin-hole. The lamp has a flat wick, of about half an inch in width, and burns the best water-white kerosene oil. The focussing-screen is of clear glass, with very fine diagonal lines drawn with a writing diamond. The ruled side should be placed towards the object. The sliding base-board is marked every six inches to facilitate the operator in securing the degree of enlargement that he may desire, as with a microscope of a certain power he knows that each mark means a certain enlargement. Perfect stability is necessary before one commences operations, and freedom from vibration is most important, especially when working with high amplifications. A vibration of 1-1,000 inch when dealing with magnification of 1,000 diameters means a displacement of an inch in the photograph, which would, of course, be worthless. It is preferable to work in the basement of a house to the upper floors. The light should be accurately centred for clear and sharp definition, and this being secured the object may be placed in the microscope. With the aid of a Ramsden eye-piece the object may be sharply focussed on the scheen. The *crux* of the whole business, however, is the exposure. The colours of the object bear very much upon the calculation one is called to make; but when a satisfactory result has been obtained, a note of the conditions and nature of the object assists one very considerably in future work. Finally the lecturer warned his audience that it was best not to expose the plate immediately the object was focussed, for the gradual heating-up of the parts of the microscope, etc., caused an expansion which often entirely blurred the image as seen on the screen, where at first it was sharply defined.

Dr. E. J. Spitta said that Dr. Charters White had posed as the great champion of low-power work, but his work showed that he was also an able worker in the high-power field. The speaker felt called upon, however, to speak in defence of the high-power work, which was the hobby of some, and entered into a discussion concerning the question of definition in the higher amplifications.

Mr. T. E. Freshwater followed with some appreciative remarks anent the pictures shown, and styled himself as one whose work lay principally between Dr. Spitta's high power and Dr. Charters White's low power.

A hearty vote of thanks was passed to Dr. Charters White for his lecture.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

APRIL 10TH.—Mr. R. P. Drage in the chair.

COMBINED TONING AND FIXING.

Mr. Ernest Human opened a discussion upon this subject, admitting the fact that very beautiful results were to be obtained by the use of certain formulæ in which toning and fixing were accomplished together; on the other hand, there was the fact that the risk of fading and deterioration with other baths was very prevalent. Mr. Human advised a preliminary washing of the prints before treatment with any of the combined baths, in spite of any directions to the contrary, and for the reason that all papers contained tartaric or citric acid for the preservation of the good printing qualities of the paper. The acid tended to decompose the hypo with the precipitation of sulphur and the evolution of sulphurous acid gas, which do not conduce to excellence of results. If the prints be first well washed, the risk of danger from this source is minimised. Mr. Human said that one of three things must happen when using the combined toning and fixing bath. In the first place, toning and fixing may proceed simultaneously, and come to completion at the same moment. In the second place, the print may be fixed before it is toned; and in the third place, the print may be toned before it is fixed. With an old bath, or indeed with any bath, it is practically impossible to bring about the first state of things, so that it may be taken that the majority of prints are either toned before fixing is complete or fixed before the toning is complete. If prints that are fully toned before fixing is complete be removed from the bath, washed and dried, it is too much to expect them to do anything but fade. On the other hand, if the fixing is complete before the desired tone is reached and the prints are kept in the bath, in all probability sulphur toning takes place, and the pictures are also liable to fade. Mr. Human added that sulphur toning was the more dangerous because a freshly sulphur-toned print may be indistinguishable from a purely gold-toned print. The addition of alum to combined baths was to be avoided. Mr. Human then put the question: "Can we guard against the dangers I have outlined?" and asked the members to take up the discussion.

The chairman said that it was well known that he was an advocate of the combined bath. Paper-makers as a rule said that combined baths were not to be recommended, but he thought that it was time that their chemists had worked out a satisfactory formula, one that could be expected to give reasonable permanence to the print, save the time of the operator, and the number of processes that have at present to be gone through. Most careful workers, with combined baths, now treat the print with a final bath of hypo to ensure complete fixing.

Mr. W. T. Wilkinson thought that the discussion would be fruitless unless the members dealt with some particular phase of combined toning and fixing. There were elaborate baths having 20 or more ingredients, and others of a quite simple character. If the bath contained free acid he would not give much for the life of the print, but if the bath were alkaline permanence of result was not a difficult matter. It had been said that the prints should be washed before toning, as in the case of the separate baths, and then that the prints should be put in plain hypo

before final washing. It seemed to him that the saving of time referred to did not come into the question at all if combined baths required as many operations as the separate method. The results given by some combined baths were very nice indeed.

Mr. T. K. Grant thought that it was six of one and half a dozen of the other. On the Continent there was undoubtedly an old use of the combined baths, while in this country there was similarly old usage of the separate baths. He thought the question of getting good or bad prints by either method hinged upon the point of sufficiently long experience on the part of the person using either method. He entertained a strong belief that the combined bath could give results that were equal in every respect to those of the separate baths and vice versa. He would also point out that Lumiere recommended that the prints should be washed for two or three minutes before being toned in the combined bath.

Mr. J. S. Teape remarked that if one washed the print before toning it should be printed to a deeper tint.

Mr. A. Mackie thought it very vague to speak of "a combined toning and fixing bath." There was no such thing. Numbers of formulæ were in existence, all of them different, and some of them acid and some alkaline and neutral. What sort of bath was Mr. Human alluding to?

The chairman looked upon the putting of the print dry into the bath as one of the boons of the combined method.

Mr. J. S. Teape said that when the Eastman Company brought out their P.O.P. he received a print upon it, said to be toned by their combined bath. The print had been half-exposed to the light ever since, but there was no apparent change from the lovely tone it had when made.

Mr. J. A. Sinclair considered that good tones and lasting prints could be secured with fresh combined baths, but when they were used over and over again they got weak, and it was not to be wondered at that the prints were useless.

Mr. A. Mackie quoted cases of professionals who, taking up for commercial purposes, the combined-bath method, had suffered very much by the continued return of photographs toned and fixed in this way which had gone wrong.

Mr. A. Haddon saw no likelihood of saving time if the preliminary washing named by Mr. Human and the second fixing by the chairman were to attend the use of the combined bath. He spoke against the admixture of hypo and alum, and pointed to the defects due to sulphur that would result.

Mr. Furley Lewis mentioned a print made some 20 years ago by the lead acetate combined bath, which, so far as he could see, was as good as when made.

Mr. Haddon also spoke against the use of sulphocyanide for any toning formula, and was joined by Mr. Welford. A vote was taken, and it appeared that ten present were in favour of using something other than sulphocyanide in toning baths, while six present signified that it satisfied them.

April 17th.—Mr. J. W. Hodges in the chair.

Mr. P. Everitt passed round a copy, measuring 20in. by 15in., of an old line engraving of "St. Cecilia," published in 1790, and engraved by Wm. Sharp from the original by Dominichino. It was taken with the new Steinheil lens (f/10 series), of 23½in. focus, shown and described by the speaker at this association some weeks ago. He could not say whether the copy was made at full aperture or not, but it was certainly an excellent piece of work.

Mr. Piper gave a very interesting lecture upon

"English Chapter Houses."

After explaining their origin and use, Mr. Piper had recourse to some ground plans of several cathedrals to illustrate the position and general form of the chapter houses. In chronological order he dealt with the chapter houses of Durham, Gloucester, Bristol, Ripon, Kirkstall, Furness, Oxford, Chester, Exeter, Canterbury, Rochester, Worcester, Lincoln, Lichfield, Westminster, Salisbury, Wells, Manchester, Southwell, and York. Mr. Piper was bitterly opposed to much of the restoration work that has been permitted in several of our cathedrals, and particularly angry was he with certain well-known "anti-restoration" architects who, given the chance, have done much to mar the serenity, grace, dignity, and force put into what he called the "frozen music" of the master minds who conceived and pieced together these undercrofts, vestibules, portals, shaftings, vaultings, and carvings, and the rest that goes to make up the lovely cathedral churches of this country. He held that the original work, though sorely mutilated, could never lose its beauty of contour and finish, and that restorers who had tampered with these wonderful piles had assumed a knowledge greater than that they possessed.

Mr. Piper's lecture was illustrated by slides and plans of a most interesting character, but it was his delivery and language as well as his technical ability, that engaged the attention of the audience until a late hour.

PHOTOGRAPHIC CLUB.

April 16th.—Mr. F. A. Bridge in the chair.

The chairman asked the meeting to consider the two following questions concerning copyright in photographs: (1) How do portraits of Royalty become the copyright of the photographer? (2) Is there a record of any case of infringement of the copyright in portraits of Royal personages having been tested in the law courts?

Mr. Hans Muller doubted whether the photographer really had any copyright in such photographs.

The chairman said that a photographer could of course invite Royalty to give a sitting, just as one might an actor or other notable person. In the case of an actor one might pay him a consideration for giving the sitting, but not in the case of Royalty. If a member of the Royal Family came for a sitting and paid for the work, how could the copyright be that of the photographer? In the other case, supposing he came for a sitting upon invitation, he placed it in the power of the photographer to make a lot of money perhaps by the sale of what would be the copyright photographs of the particular photographer, not to speak of the valuable patronage.

Mr. Geo. E. Brown thought that possibly the King and the Royal Family would regard it as a public duty that their photographs should be available for circulation. They would go therefore to a house of repute to have the photographs made, and it would be part of the undertaking that the copyright was the photographer's, and that he was free to publish copies.

Mr. A. Mackie thought that the King would go to the photographer by invitation. He had actual knowledge of the fact that negatives of the late Queen, of the King in full regalia, and of the present Queen in her robes as a Doctor of Music, had fetched large sums for publishing purposes, so that presumably there were some rights attaching to ownership of the negatives.

CAMERA CLUB.

April 21st.—So much has been heard during recent months about the Concentration Camps in South Africa that the announcement of a lecture on the subject was not likely, perhaps, to be received with hilarity. But when it was understood that the lecturer was Mr. J. W. Williams, who was sent out to the seat of war, by the enterprise of the "Daily Express," to find out the truth, and nothing but the truth, about these bones of contention between political parties; and when, moreover, it was learnt that Mr Williams had taken an eye witness with him in the shape of a camera, an interested audience became assured to him. We may say at once that the pictures from a photographic point would not pass muster at an exhibition, but for all this they were most interesting, and are valuable as faithful records of what their producer actually saw.

Mr. Williams had great difficulty in obtaining permission from the authorities to go to South Africa, but after a game of ping-pong between the various Government offices—in which he assumed the unenviable role of the ball—his persistency carried the day, and he started for the Cape. He had an absolutely free hand when he arrived at the Concentration Camps. He could go where he liked, he talked to the Boer men and women in their own language, and gathered a vast amount of information which, we may say at once, went to the credit of much-malingered Tommy Atkins and his superiors. At the camp at Bloemfontein there was much sickness, chiefly typhoid fever, owing to bad water. This stopped as soon as supplies could be obtained from artesian wells. The Boers were all most kindly treated by the authorities, and those with whom Mr. Williams talked fully acknowledged this. Our Tommies could often be seen carrying the Boer children, or fetching water for the women, while the male Boers looked on and laughed heartily at what they regarded as a huge joke—for they are accustomed to treat their women as slaves, rather than as companions. The food in these camps was abundant, so abundant, indeed, that until the practice was stopped, the women would load waggons with the surplus victuals and send the food out to the fighting commandos. Both men and women were found plenty of work in the camp, and were well paid for doing it.

Some of the most interesting photographs were those which showed the construction of the blockhouses. The larger of them contain as many as fifteen men, and are built of blocks of granite. Others, where stone is not available, are made of corrugated iron, with banks of sand-bags piled up around them. Others, again, are of stone, with iron roofs The men are by no means unhappy in these isolated dwellings, for they are relieved of the routine work of a camp, and have plenty of leisure. The heat is their main trouble, and this is also true of the Concentration Camps, when five persons are allotted to each bell tent. The total number of men, women, and children, who are dependent upon the British Government in these camps is 115,000, and the expense entailed is about £11,000 per day.

Nothing was heard by the Boers on commando of the alleged ill-treatment in these camps until they got hold of some English and Continental newspapers. Then it was that Steyn wrote to Lord Kitchener to make inquiries into the matter. Lord Kitchener replied that the reports were quite without foundation, and added that he would be only too glad to send the women and children en masse into the Boer camp. Steyn's reply was that if Lord Kitchener carried out this threat, they (the Boers) would resist it by force of arms. The mortality in some of the camps was certainly great at first, but people at home did not realise the difficulties with which those in command had to deal. Hundreds of women and children were forced upon our hands daily, and it was impossible at once to provide for them properly. Moreover, even when the camps were fully equipped with doctors and nurses, the Boer women were so utterly ignorant that they rejected all advice, and doctored their children according to their own crude notions, with lamentable results.

The great difficulty ahead is to know what to do with all these women and children after peace is declared. We cannot turn them out on the veldt to starve, and there are no registers to refer to in order to find out the whereabouts of fathers and husbands. As to the men, they smoke their pipes and regard the situation with indifference, but with the women it is different, and so far as the educated ones are concerned, they feel the humiliation of their position acutely.

The paper—if paper it can be called, for Mr. Williams lectured entirely without notes—gave little scope for discussion. One member, however, took the lecturer to task with regard to his statistics, and confronted him with certain statements in the Blue Books. Instead of five persons to one tent, these statements went to show that there were often double that number. He also quoted from reports to show that the women and children had been kept short of food.

To this Mr. Williams replied that he spoke from personal knowledge. That no women had complained to him as to their treatment, although he had taken pains to question them. He saw surplus food stored up in every tent he visited, and he knew for a fact that our men had on many occasions slept out on the bare ground in order that the women and children should be sheltered under canvas. He ventured to say that there were thousands of men and women in our large towns at home, even in the City of London, who would go down on their knees and thank God if they were as well off as these Boer refugees.

Mr. Williams spiced his remarks all through the evening with epigram and anecdote, and he gave evidence of possessing a quaint, dry humour, which was most acceptable to his hearers. Speaking of the wounds caused by modern rifle bullets, he instanced many cases where a bullet had gone clean through a man without touching a vital part. He had spoken to a soldier who had had a bullet right through his head. Another was riddled through the body and went on riding all day, not knowing that he had been wounded until the doctor made the discovery. This man was quite well again in two days. Very different was it, as Mr. Williams pointed out, in the days of the old "Brown Bess," when the bullet was round, and weighed an ounce or more. "When a man was hit with that, he concluded that he had had enough of glory, and took a back seat, but now a soldier waited until someone said to him: 'Excuse me, sir, but you're shot.'" Many such sallies as this pleasantly punctuated Mr. Williams's lecture, and a hearty vote of thank greeted him at its close.

CROYDON CAMERA CLUB.

On Wednesday, 16th inst., the president, Mr. Hector Maclean, F.R.P.S., gave an address which was followed with much attention, on "Photographic Literature." He began by saying that, like the monograph on the clothing of certain South Sea Islanders, who went unattired, his address would end before it began, if he had to speak on photographic literature as the word "literature" was understood in its best significance; for there was no photographic literature, only what might be termed letterpress. Perhaps this was just as well, as literature, instead of technical information, would hardly be helpful. He advised amateurs to read a good deal more than they usually did, providing they avoided books of the shilling "snipit" description. Mr. Maclean said he should not classify his subject, nor observe any orderly sequence, but just make a few typical quotations from various books which his audience, he had no doubt, would like to know more about after hearing some of their contents. He asked those present whether they had ever heard of Robert Hunt? He was not surprised to find that no one had a notion of whom he alluded to. Mr. Maclean proceeded to read two paragraphs from one of Mr. Hunt's books, published in 1850. The first described how Mr. Hunt had been able to obtain positive colour images; the second gave most curious particulars of photographic printing with the expressed juices of certain flowers. Next the works of H. P. Robinson received attention, the lecturer remarking that they possessed the distinct advantage that however much one may disagree with the writer's opinions, the books were at any rate brightly and forcibly written. They were a pleasure to read, and were from the pen of one who was saturated with pictorial knowledge, and who successfully practised a good deal of what he preached. Other books described, and from which Mr. Maclean read short extracts, some of which caused intense amusement, were "Naturalistic Photography," written by him who at one time wished to "kick his lying camera to the zenith"; "Photography as a Fine Art," which trumpets the American amateurs: and Tindall on "Selection and Subject." The works of Hamerton, Hinton, and Burnet were also alluded to. Coming to more solid branches, Abney's treatise and Dallmeyer's telephotography were touched upon, and many other works of similar import. Several citations were also given from "Finishing the Negative," which the lecturer had found of much service.

The photographic magazines also received attention, as also did the weekly journals. When Mr. Maclean volunteered that, if confined to one journal for his photographic current information, he should certainly consult the Saturday issue of the "Morning Post," there was much laughter.

In the subsequent discussion Mr. Salt gave his opinions respecting photographic journals.

Mr. S. H. Wratten agreed with the lecturer about cheap books being too often written by literary hacks not fully conversant with the practical technique of their subject.

Mr. Rogers said he valued no book more than a volume he had of the "Photographic Society's Reporter," a monthly publication which was, he regretted to say, long since defunct. He also reminded the meeting that Mr. Maclean had omitted to refer to his own two excellent books, "Photography for Artists" and "Popular Photographic Printing Processes."

Mr. Harpur desired to know where he could purchase the books referred to by the lecturer. He did not care to read borrowed books, but to own those which he thought worthy of his attention.

The lecturer having replied,

Mr. A. E. Isaac proposed, and Mr. Hicks seconded, a vote of thanks, which was adopted with sustained applause.

SOUTHAMPTON CAMERA CLUB.

The above club held its fortnightly meeting at the Philharmonic Hall, on the 14th inst., when Mr. G. Vivian occupied the chair, and also manipulated the limelight lantern.

There was a good attendance, and the company, which included many ladies, much appreciated the "Amateur Photographer Prize Slides, 1901," with copious criticisms by the Editor, Mr. A. Horsley-Hinton.

The slides, about 150 in number, were excellent, and exhibited a very high order of pictorial and technical merit.

The next meeting, on the 28th inst., will conclude the winter programme of the club, when Mr. M. O'Connor will give a lecture and demonstrations on the complex subject of the "Chemistry of 'Light' and 'Pyro-Soda.'"

NORTH MIDDLESEX PHOTOGRAPHIC SOCIETY.

April 16th.—Mr. R. Child Bayley gave a lecture on "Hand-Camera Work." His opening remark was that he would not recommend anyone taking up photography for the first time to start with a hand camera. To learn the details of manipulation a stand camera was best. As to the choice of a hand camera, one that admitted of use on a stand was preferable. It should permit of focussing either by scale or on a screen. The shutter should be of a reliable type and allow of varying the speed, not by a friction brake, which was always unreliable, but preferably by a pneumatic arrangement, as is very commonly fitted now. The lens should be as good a one as could be afforded; one working at about f/6 was very useful. The best plate holders were dark slides. Many magazine cameras were unreliable, and stuck at an awkward moment.

Rollable films were convenient if the weight must be cut down, but in the hands of a beginner did not give such certain results as plates.

Judging distances should be practised. A man's height, roughly two yards, was a convenient unit to measure by. Thus if a man could lie down twice in the distance from the object focussed for, set the scale at 12ft.

BLAIRGOWRIE AND DISTRICT.

The monthly meeting was held in the Photographic Rooms, Blairgowrie, on Tuesday evening, Mr. James Richardson, vice-president, in the chair. It was reported that the tie in B class in the highest aggregate in the season's work between James Donaldson and W. D. M. Falconer, for which a special competition was arranged, had resulted in a win for the former, and the chairman therefore handed to Mr. Donaldson the prize—a Shew Xit camera, presented by Mr. J. W. Petrie. The "Macgregor" duplicate medals won during the last two seasons by D. G. Monair were presented to him by the chairman, and special thanks were accorded Mr. Macgregor (a former member) for his continued interest in the association. The "Tree Study" competition (B class) resulted in: 1, Geo. Grant; 2, L. Falconer, junr.; 3, Jas. Richardson. The R.P.S. lecture on "Home Portraiture," by P. R. Salmon, was read, and provoked an interesting discussion. A proposal made for an excursion was favourably received.

G.E.R. MECHANICS' INSTITUTION—PHOTOGRAPHIC SECTION.

The above society had a lantern show of slides, kindly lent by Mr. Slater, entitled "Here and There on the Continent," being selections from sets illustrating some of the Continental trips organised by Mr. Slater under the auspices of the South London Photographic Society, and travelling over the G.E.R. routes to the Continent. The slides were of a very good order, and testified to the abundance of work for the camera found on these trips.

BLAYDON AND DISTRICT CAMERA CLUB.

The annual meeting of the above club was held on April 17th, when the following officers were elected for the year:—President: Mr. William Steele; vice-presidents: Arthur Payne, F.C.S., J. M. Gatheral, R. Cubey, Hy. Dalton, Dr. Smith, Rev. H. P. Napier-Clavering, Dr. Morrison, Dr. Brown, and Dr. Plante; committee: Thos. Howdon, J. T. Ramsay, Thos. C. Hughes, Jno. Bales; treasurer: Chris. Robson; secretary: Alex. B. Cunninghame, Gelt House, Blaydon-on-Tyne.

During the evening the secretary was presented with a handsome carved oak aneroid barometer by the members, as a mark of their esteem.

At the last meeting of the Newcastle-on-Tyne and Northern Counties Photographic Association, Mr. T. Fitzgibbon Forde, of Sunderland, gave an address on "Trimming, Mounting and Framing," showing by practical demonstration how an apparently useless print may sometimes be made into a work of art simply by trimming down sufficiently and judicious framing. Mr. Forde uses two L-shaped pieces of dark cardboard for determining the amount of print that may with advantage be dispensed with, and uses an ordinary penknife for trimming, and recommends for amateurs, at any rate, some of the good mountants which may be had from all dealers in photographic materials. Mounting and framing by contrasting colours he considers dangerous, as it is at all times difficult and unless "happy" in its results, is very apt to be very much the other way, but in certain cases may be used with advantage.

Patent News.

THE following particulars of recent patents are specially drawn for the BRITISH JOURNAL OF PHOTOGRAPHY by Messrs. Hughes and Young, patent agents, 55 and 56, Chancery Lane, London, W.C., who will give advice and assistance free to our readers on all patent matters:—

PATENT APPLICATIONS.—No. 7,164.—Oliver Imray, Chancery Lane. "Improvements in photographic-plate holders."

No. 7,179.—George Croydon Marks, Chancery Lane. "Improvements relating to photographic cameras."

No. 7,225.—Harold Dennis Taylor, Buckingham Works, Bishophill, York. "Improvements in certain photographic lenses."

PATENTS ILLUSTRATED.—No. 22,200.—Photography.—Patentee: N. Conti, 14, Rue St. Simon, Paris. Cameras; roller slides.

Relates to a panoramic camera, in which the picture is impressed on a film mounted on rollers. The lens is mounted in a cylinder, which is capable of being rotated on a vertical axis. Behind the lens is mounted a fan-shaped chamber, which turns round with the lens, and spreads the image on to the film supported by the curved glass.

No. 22,201.—Photography.—Patentee: T. J. Smith, 3, Henry Road, New Barnet. Toning.

Relates to a method of toning bromide prints to render them permanent and get a variety of tones. The print is first bleached with a solution containing bichromate of potash and hydrochloric acid; it is then treated with a solution of sodium sulphantimoniate, and toned with a solution of ammonium sulphide.

No. 22,235.—Photo-Mechanical Printing.—Patentee: A. Hoffmann, 9, Altenburgerstrasse, Cologne.

Relates to a method of producing photo-mechanical printing surfaces on cylinders. A flat negative, or the like, is rolled on a cylinder coated with sensitive material, the section of the negative in contact with the roller being illuminated by a band of light. The plate and roller are connected by gearing, so that there is no sliding at the line of contact. By changing the ratio of the gearing a distorted picture may be produced on the cylinder.

News and Notes.

THE CHANCES ARE IT DIDN'T.

Seth Meeker came in the other day to ask me if there wasn't some sort of camera he could take along with him down to the old farm in Maine where he spent the greater part of childhood's happy hour, long, long ago. Said he was going to visit the home of his ancestors, which he hadn't seen in twenty-five years, and that there were some very fond memories connected with many of the nooks in the river and around the old town that he would greatly like to photograph and keep green in his memory if there was some camera, as he had been told there was, which would do the work without his knowing anything about photography. I cautiously informed Seth that while it hadn't got that perfect as yet there was one camera that most anybody could understand the handling of, and if he wanted to try he had best get a Bullseye, which nearly did it all. I consider that this advice was extremely friendly and conservative, and it is Seth's own fault that it was not put to the test. You see, when Seth got to the store he found that the Bullseye was not anywhere near so dear as some others, and as he has made his "pile" and thinks a thing is better if it costs much, he got what they told him was the best in the house—a 5x7 Montauk with Collinear lens and a beautiful red leather bellows. He was carefully shown how to use it and departed with a firm belief that he could bring back two hundred souvenirs of his trip as easy as nothing at all. He entertained the firm conviction that the instrument, the value of which no one doubts, would do the whole figure itself. Did it? Perhaps that question might be left to the reader of the following letter from Ransom Elkins, the wag of Pohunk Flats, Maine. Elkins wrote just as he felt and just as he always does to an old friend; I append the letter just as written:—"Dear B. J.,—Seth meeker wus down to see the ol farm en brot a camry long sos to make photoes of all the ol femileir spots he sez he didn't no much bout phoetogriffie but his camry wus wun thet wurkd itself an you sed it did so i jes take my pen in hand hopin you en mis b is wel. En so be i. well seth Got a talkin down to the store bout the ole femileir spot a hull lot but cy lawson he sez it wus peuler how it cud be so dern femileir beins Seth hednt see it in morn twenty five year but Seth sez sez he its all jes like it use to be. HE drinked a powerful lot ov Lem hills, cider en sed et tuched the spot wich it probly did so longs it aint safe ter drink No moren thre glass of it bimeby Seth Lowed to go en let his camry do some of them ol femileir spots o hisn en He sashayed over to lovers Lane whair mary Ann Bellew an him useter spark en owin to that Jones Boy havin give him away to mary Ann whose over 60 now en plane nuf to stop a tranelud ov book agts She wus thare settin in same ol sete the useter set en buss away like turtil duvs in quater ov a century back waitin fer seth. And when Seth he seen her he lost intrust in thet peticler ol femileir spot en run like all hel. An his camry didnt take no photoe of the seen neether ez nere ez we all cud jedge. Some Later he got moar cider in en rezolushunned to let his camry take the ole mill by the Dam were owr ole swimmin hoal useter be But ov coars ther aint no mill by the dam site no moar tho the site is planely to be sene. An he got his camry up on a 3 legged stick he hed but the camry hed red bellusses en deekin perkinnes Bull he seen it afore it hed begin to work An we dident say nothin but run cauze ther want time an Torrus (thats Perkinses he cow) he come up in a grate hurry an he But seth in the ole femileir spot were he useter get it down to the skool-house wen him an me was boys. Torrus amed to pitch Seth en the camry clean over the dam site inter the ole swimmin pool en he accordinly done so en the camry must be thare yit. We Dont think it took no photoes but cuddent Ask Seth cause he repared to his house en atter changin of his cloze went strate to the deepo en left fer new York without no more intrust in ole femileir spots wuth noticin cept were torrus hed made it panefully apparient fer him to call to mind. We all want you to ask seth if he kin send us any of them photoes the camry took cause he promused a lot to us an we want them bad if the camry took em cause we aint got no photoegraffir an he sed he wood send us all a lot, did it take em. So no moar from yours friendly Ransom Elkins." I fear I will have to write Ransom that I don't like to interview Seth on the subject, but from my experience with cameras the chances are it didn't take the views.—B. Jabers, in "The Photo-American."

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

THE NEO-CYCLOSTYLE.

To the Editors.

Gentlemen,—In answer to your query on page 320, the makers of above are The Cyclostyle Co., Ltd., 34, Snow Hill (wholesale), and 79a, Gracechurch Street (retail).—Yours faithfully,

J. H. ROBERTSON.

Pall Mall Factory, Thornton Heath,
April 18th, 1902.

To the Editors.

Gentlemen,—In reply to the inquiry of T. Stokoe, re Neo-Cyclostyle, I desire to say that the ordinary machines, with flat metal plate, can be obtained from Messrs. John Heywood, Deansgate, Manchester. Prices run from 25s. to 63s.; printing surface of the former 8⅝in. by 6in., of the latter 16⅔in. by 13⅔in. A useful one, 10⅝in. by 8½in., for £1 11s. 6d., I have had for a little time, and it has proved satisfactory. If Mr. Stokoe desires a more speedy and costly machine, the Rotary Neostyle, about £6 10s., is to be had from the Scottish Neostyle Company, 121, St. Vincent Street, Glasgow. If he will send post card to them for booklet and specimens (as I did), he will receive a mass of matter that will both instruct and interest him. I was allowed a small discount for mine at Heywood's.—Yours respectfully,

ALFRED ROGERS.

Rose Bank, Chester Road, Stretford, Lancashire.

To the Editors.

Gentlemen,—In reply to T. Stokoe, the address of the makers of the "Neo-Cyclostyle" is 79A, Gracechurch Street, E.C. They make several forms of it, the cheapest for octavo size being 25s., quarto 31s 6d. But if much work has to be done well and quickly, the "Cyclostyle" form is the better apparatus, though dearer—i.e., octavo, £3 10s.; quarto, £4 15s.; but write for one of their price lists, which are illustrated.

J. H. BALDOCK.

St. Leonard's Road, Croydon.
April 19th, 1902.

ACTINIUM.

To the Editors.

Gentlemen,—In the report of M. Becquerel's address at the Royal Institution (p. 306), M. Debierne is mentioned as announcing the existence of a new element, "actinium," in 1900. Can you, or any reader, inform me whether this has any connection with the "actinium" discovered in 1881 in association with zinc?—Yours, etc.,

J. DORMER.

April 19th, 1902.

THE KODAK DISCOUNTS.

To the Editors.

Gentlemen,—We have pleasure in informing you that from the 15th inst., the retail prices of our bromide papers are reduced about 25 per cent. In the case of the popular 6d. packets the reduction is 33⅓ per cent. A list giving the new prices in detail is enclosed. At the same time we have taken the opportunity of bringing our enamelled bromide paper—Nikko—into line with the other Kodak bromide papers.

Up to the present the price of Nikko has been in advance of the prices of our other bromide papers. In future all will be the same price, and consequently the reduction in respect of Nikko amounts to about 40 per cent. The prices for enlarging upon Nikko paper are also reduced to exactly the same scale as for enlarging upon our other bromide papers. The price of Dekko will remain as before. These important reductions cannot fail to greatly increase the popularity and use of bromide papers amongst all users of artificial light papers. It will prove a benefit to the photographic trade generally, and add a stimulus to the practice of enlarging. We shall be obliged if you will kindly announce this important change in our prices in your valuable Journal, and with thanks in anticipation, we beg to remain, yours faithfully,

KODAK, LIMITED AND REDUCED.

43, Clerkenwell Road, London, E.C.
April 18th, 1902.

A PROPOSED PHOTOGRAPHIC CAMP.

To the Editors.

Gentlemen,—There is probably no more enjoyable holiday or outing than a camping-out party. All those who have tested its delights will agree with me on that point, and its other essential element is its cheapness. A ten days' outing should not cost much more than £4 to £5, including hire of tents, hire of boats, food, drink, and smoke. For that amount, a thoroughly enjoyable time may be completely assured. To be as brief as possible, I have been asked by one or two photographers, who are desirous of taking part in a camp, to see if a few other photographers would join us in the idea, so that the party might be large enough to raise an occurrence to the dignity of an event. If a party can be formed, I am quite willing, for the first year, at all events, to organise and carry it out. For the first year I would suggest that we visit the River Avon and camp somewhere between Stratford-on-Avon and Evesham, with Tewkesbury a little further on for the architecturally inclined. It is my own favourite camping ground, I have old camping chums in the district upon whom I could count for local assistance, and I think for the first year a central position will be better than near London. There are also more favourable conditions in that district than obtain upon the Thames.

It is rather early to give any idea of the arrangements, as so much depends upon the size of the party. If a small and compact one, say, not exceeding fifty for the first year (a course I strongly advise), we should probably do our own catering, with an occasional dinner outside upon an excursion day Photographers can thus use their knowledge of under and over exposure in the matter of cooking bacon for breakfast. Each sleeping tent will have three persons, which gives ample room, and there will be a large tent for meals, concerts, etc. In addition to photography, other attractions would be the ladies' day, a regatta, sports, tennis, and ping pong tournaments, and other things. There will also be some apparatus for those musically inclined. Rules and regulations will be few and simple, and the executive authority will be simply a captain and two lieutenants as his assistants. It is to be a pleasure party, so there will be no papers or even demonstrations, except those that are unpreventable. Towards the end of the time a meeting will be held to decide as to next year. The camp will be pitched within a reasonable distance of some village, so that a member could lodge his wife or sister there, and yet still be himself a camper. These are the rough ideas (the camping, however, will not be rough nor will it be of the feather bed description, but something between), upon which I can enlarge later. What I desire to know now is, whether any of my numerous friends all over the country will join me in the venture, for some week in July next, and it is in order to bring the idea before them that I invoke your assistance in the matter of publishing this letter.—Faithfully yours,

WALTER D. WELFORD.

Warwick Lodge, 166, Romford Road, London, E.
April 19th, 1902.

THE ACTION OF ALKALIES IN DEVELOPERS.

To the Editors.

Gentlemen,—In your issue of April 18th, you publish a paper by Dr. Chas. L. Mitchell, on "The Action of Alkalies in Developers." In this paper a table, ascribed to Dr. O. G. Mason, states that equal work is done by 80 parts of sodium hydrate and 286 parts of sodium carbonate crystals (1 : 3.57). This table has been published in your Almanac for some years, and has always been ascribed to Mr. G. E. Brown.

As an addendum, a further table, by Von Hubl, is given, which states that 9.5 parts of sodium hydrate give the best result in a developing solution, with 10 parts of pyrogallol, subsequently, however, adding the caution that caustic alkalies must be used with pyro. Further, an editorial note states that 16 parts of sodium carbonate crystals must be used for every part of sodium hydrate. At first sight this appears to be a direct contradiction of the statement in the previous paragraph that 3.57 parts of sodium carbonate crystals do the same work as 1 part of the hydrate. The difference may possibly be explained by the fact that the chemical and photographic activities of the salts do not agree, but as they stand the contradictory statements in the same article are puzzling.

On working out the number of grains of sodium carbonate crystals required to give best results with 2 grains of pyrogallol, the table gives 30.4, which is considerably in excess of that commonly employed.—Yours faithfully,

E. J. PHILLIPS.

1, Poet's Road, Highbury New Park, N.
April 18th, 1902.

MR. LIZARS' NEW PREMISES.

To the Editors.

Gentlemen,—A number of English firms have written asking if it is my intention to close my London warehouse because of the notice appearing in the trade journals last week of the addition to my Glasgow establishment, and I shall feel glad if you will insert a short notice to the effect that I have no intention of doing so, but that the additional premises in Glasgow have been taken to accomplish the ever-increasing volume of business conducted from that centre.—I am, dear Sirs, yours faithfully,

J. LIZARS.

101 and 107, Buchanan Street, Glasgow.
April 22nd, 1902.

A PHOTOGRAPHERS' CHURCH PARADE.

To the Editors

Gentlemen,—I thank you for our kind reference to our proposed "Photographers' Church Parade," which is fixed to take place on Sunday afternoon, May 18th, at 3. I shall hope to give a short address explaining the matter, and the text from the Bible I intend taking will of itself explain why photographers should have their "Church Parade. I am not one who thinks that religion means simply going to church, but I like to link on the Arts and Science to Religion. Genius and the power to invent are Divine gifts, and I think we ought to thank God for all His gifts, not some of them. To my mind, our "Church Parade" will be like saying "Grace" before a meal, and I am sure, if we acknowledge the Hand of God in Art and Science, it will bring a special blessing upon them.

Though photography is only, as yet, in its infancy, yet see, for example, what the X-rays have already done for surgery and for sufferers in pain! I may just say that we shall not expect photographers in the congregation to bring their cameras into church, any more than our cyclists at our annual "Cyclist's Church Parade" bring their cycles into the church. Again thanking you for your reference in last Friday's BRITISH JOURNAL OF PHOTOGRAPHY, I remain, very truly yours,

E. HUSBAND.

43, Dover Road, Folkestone.
April 22nd, 1902.

THE LITTLE WONDER LAMP.

To the Editors.

Gentlemen,—When turning over the advertisements in a New York hardware journal to-day I noticed the enclosed. It seems to be the lamp inquired for by a correspondent in your last issue.—Yours truly,

WM. GOODWIN.

3, Lynedoch Street, Glasgow.
April 21st, 1902.

[The lamp is that referred to by Colonel Blathwayt in our last issue. It is called the Little Wonder, and is obtainable at the Turner Brassworks, 44, No. Franklin Street, Chicago. It is thus described in the advertisement kindly sent by Mr. Goodwin :—The only successful under-generator pressure lamp. Burns hydro-carbon gas. Is absolutely safe, and makes the brightest and the cheapest light on earth, except the sun, bar none. The Turner Little Wonder burner cannot clog up, no matter how long used.—[Eds. B.J.P.]

PHOTOGRAPHY IN COLOURS.

To the Editors.

Gentlemen,—I enclose herewith for your perusal a short article, cut out of the Editorial column of a leading local newspaper, the "Western Mail," of Saturday, the 12th inst., announcing, "on excellent authority that the problem of photography in colours has been solved at last." I don't know whether this "marvellous triumph" has come under your notice or not, but I have no recollection of seeing any reference, either to the name or the process, in the Journal. Probably it is nothing more than a modification of, or perhaps some improvement in, the working of the three-colour process, which has often been stated in the Press to be a "direct process in colours." It would be interesting to know whether there is really anything in this new discovery to entitle it to the claim set up, and perhaps you will be able to enlighten your readers on this subject.—Yours obediently,

COLONEL.

"It is stated on excellent authority that the problem of photography in colours has been solved at last. Scientific experimentalists have

long been grappling with it all over the world, and Cardiff readers will recollect one set of results so beautifully exhibited some time ago at a conversazione of the Naturalists' Society. But we are now told that an American—Mr. Verrill, of New Haven—has hit upon a process for the reproduction of colour in photography direct from Nature itself. The results are stated to be surprisingly soft and accurate, and when the discovery comes to be generally applied it will add immensely to the enjoyment of the æsthetic section of the community. So marvellous a triumph must win for its discoverer imperishable fame."

[The paragraph sent us by "Colonel" has attracted our attention in various newspapers during the past few weeks. It was quoted in this Journal of February 28th. We have not been able to trace authentic details of the alleged "discovery."—EDS. B.J.P.]

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY, 24, *Wellington-street, Strand, London, W.C.*" *Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

FERROTYPE DRY PLATES.—"REGULAR SUBSCRIBER" asks: "Can you tell me where I can get "Ferrotype" dry plates? I have heard there are such things in the market for making direct positives."—In reply: Fallowfields, Charing Cross Road, used to supply them, and we believe they do so still.

PURPLE TONES.—F. O. writes: "Could you kindly tell me the paper used to obtain the distinct purple tone occasionally seen in photography? I do not mean the purple tone of the ordinary P.O.P."—In reply: In all probability the paper employed was albumen paper. That will yield very rich purple tones with a vigorous negative. So will collodio-chloride paper with a similar negative. Of course, if we saw the prints, we could say more definitely the paper they are on.

RETOUCHING.—"GORDON" writes: "Would you kindly give me your opinion of the retouching on enclosed prints. I have lately been taking lessons, and should be glad to know if you think I might be successful as a retoucher? I have taken prints before and after retouching."—In reply: The work shows some promise, but there is much room for improvement. Too much of the modelling has been removed from the faces, and they appear flat. We should advise you to persevere with the work.

ADDRESS WANTED.—W. H. B. asks: "Can you or your readers furnish me with the address of a Paris house who supply portraits of heads (women and children mostly) in quantities, for reproduction in fashion plates, etc.? I am seeking the information for a Canadian firm of process-engravers, who require a pretty constant supply, and shall esteem your assistance."—In reply: Perhaps Messrs. Nops, Ludgate Hill, London, E.C., might help our correspondent. Let him write them.

PRINTING PROCESS.—"BROWNE" writes: "I enclose a small picture of a lady, and should be pleased to know how the paper is prepared, I mean sensitized? I think it is coated with some solution of iron."—In reply: The print seems to us to be a silver one on salted drawing paper, lightly toned. It does not seem to be an iron print; but prints with similar appearance may be produced in different ways. Without making chemical tests, we cannot say, positively, whether it is by an iron process or not.

STAINED PRINTS.—R. K. writes: "I send enclosed a ¼-plate print, one of a batch that I have just finished. The stain comes up after about 1½ hours' washing. They are on ——, toned with sulphocyanide. I don't think that any hypo could have got on it before toning. I shall be very pleased if you could let me know what is wrong with them?"—In reply: The stain on the print sent is due to its having been allowed to stick to another while in the fixing bath, or may be to the bottom of the dish, so that the "hypo" did not have free action all over.

IDENTITY OF PROCESS.—"BORNE" writes: "Having seen some photographs on a kind of metallic paper, in various colours, should be extremely glad if you could tell me where to obtain the same, and if it be difficult to work."—In reply: As the pictures you have seen are in various colours, they are probably those produced by the Metalline Company, and they treat their process as a trade secret. A metalotype paper is sold by the Columbia Camera Company, and may be had through any dealer; but this only yields black colours. Had you sent us a picture to see, we might, possibly, have told you how it was produced.

STUDIO BLINDS.—"FESTINA LENTE" writes: "I am troubled with the sun shining into my studio, owing to a low ridge and western aspect. Of course, I have a full set of blinds for lighting purposes, but this does not diffuse the light sufficiently. Can you suggest anything better to put on the glass than whitewash or tissue-paper? I might mention I cannot afford to have wooden screens put up on the roof outside."—In reply: We should recommend you to get some light wooden frames made to fit in the roof, and cover them with tracing linen. They may be fixed with turn-buttons, and then can be easily removed when not required.

COPYRIGHT.—E. C. R. writes: "I have a photograph of a minister of a church near here, and have been asked to make an enlargement from same, to hang up in one of the rooms connected with the church. I should make the negative myself, but should have to get the enlargment made by a trade enlarger; then I should finish it myself. I should esteem it a favour if you would tell me whether I should be infringing by doing this, as the photograph is marked 'copyright'? Of course, I should not make any charge for the enlargement."—In reply: If the portrait is copyright it would be an infringement of it to make an enlargement from it. That you make no charge for making the enlargement makes no difference. The penalty is for reproducing a copyright picture.

"PROCESS WORK."—"SAN REMO" asks: "(1) What is process work? (2) Is it possible by this process to make small blocks for illustrating advertisements? (3) Can a photographer accustomed to ordinary photographic processes learn process work by the aid of books alone? (4) What is the approximate cost of the necessary apparatus? (5) What books are most suitable for a novice to study?"—In reply: (1 and 5) We cannot spare space in this column to explain the process. You had better get Verfasser's work on "Half-Tone Process on Zinc and Copper." It may be had from Dawbarn and Ward, Farringdon Avenue. (2) Yes, certainly. (3) Yes, with practice. (4) Better write to Messrs. Penrose and Co., Farringdon Road, E.C. They supply all the necessaries for the work, and will supply you with a price-list.

ENLARGING, ETC.—J. S. W. L. writes: "(1) Which is the best lens to use for copying? (2) Also, which is the best to use for architecture? I mean to get straight walls; when I photograph a square building I get it this shape (barrel), instead of being square. Is it through the lens being too short a focus, or what is the reason? (3) I have an enlarging lantern with 9in. condenser. When enlarging (from whole plates) I find, when focussing on a sheet of paper, that if the centre of the picture is in focus the rest of the picture is out of focus. Would I remedy this by buying an enlarging objective? (4) If a person pays for photographs at a sitting, do I hold a copyright in them if made copyright?"—In reply: (1) Theoretically, one of the anastigmat type, because they have a perfectly flat field. (2) A lens of the same type, or of the R.R. kind. The trouble of which you complain is not due to the lens employed, but to the camera being tilted and the swing-back not having been brought into use. (3) The fault, no doubt, lies with the condenser. A 9in. condenser is not large enough to evenly illuminate a whole-plate negative. One of at least 10½in. in diameter is necessary for the purpose. (4) No, certainly not.

CARBON-TISSUE MAKING.—J. D. writes: "I am anxious to try my hand at making carbon tissues for photographic printing, but cannot get any detailed instructions. Can you give me any information as to its manufacture? I have made a trial, but found that after floating the paper on the pigment and gelatine mixture, and hanging same to dry, it turned out to be full of small boles, i.e., the emulsion seems to have been driven off face of paper by air bubbles exuding from the paper. Can you suggest a remedy? Also, I should be glad if you will tell me where to get the proper kind of pigment. The ones I tried were ordinary house-painters' dry colours, which are not very finely divided. If you could refer me to somebody's work, or give me a few hints on the subject, I should feel obliged."—In reply: The manufacture of carbon tissue is by no means easy without proper plant and appliances, and no full details of the method have been published. Those who make it commercially keep their experiences to themselves. Evidently the paper you have employed is not of a suitable kind. Try one with a harder and closer texture. The pigment you have used is useless for the purpose. You must get that employed by artists, as supplied by the artists' colourmen. A very convenient form is that sold in collapsable tubes for water-colour work. We should say you will do far better to purchase the tissue, which may be had in all colours, than to attempt to make it for yourself.

*** NOTICE TO THE TRADE, WHOLESALE AGENTS AND BOOKSELLERS.—*A Contents Bill is issued with each number of the* JOURNAL, *and copies may be had on application to the Publishers.*

*** NOTICE TO ADVERTISERS.—*A Revised Tariff for advertisements in the* JOURNAL *is now in force. Blocks and copy are received subject to the approval of the Publishers, and advertisements are inserted absolutely without condition, expressed or implied as to what appears in the text portion of the paper.*

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THE BRITISH

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*** *The Editor can only be seen by appointment.*

*** *We do not undertake to answer letters by post.*

EX CATHEDRA.

Professor Abbe. A rumour has been current that Prof. Abbe had decided to retire permanently from Jena, owing to differences of opinion with his colleagues and employés of the Carl Zeiss Optical Works. We are glad to see that a categorical denial has been issued by the directors of the firm, who state that there is not the least foundation for these rumours. Professor Abbe's visit to Lugano is based upon considerations of health, and will be longer than usual, with a view to the completion of some scientific work.

* * *

A New Lens. The well-known optician, C. P. Goerz, of Berlin, has placed upon the market a new lens of the symmetrical type. Each combination consists of two lenses, enclosing an air space. The lenses are comparatively thin, which implies less loss of light from absorption, but the greater number of reflecting surfaces may be looked upon as an opposite factor. The intensity of the more rapid series ranges from *f* 4.5 to *f* 5.5. The slower series has an aperture of *f* 6.3. The focus of the lens may be taken as the measure of the length of the plate, sharply covered at full aperture, excepting in the sizes exceeding about 7in. The covering power of the latter is rather less. Although the combinations are very close to each other, the angle of good definition appears to be restricted to 62deg. or 66deg. It will thus be seen that the new lens will not supplant many of the well-known types of anastigmatic lenses, which may be looked upon as universal instruments, owing to their comparatively large aperture and wide angle of defining power. On the other hand, the rapidity of the new lens will be found a great advantage.

* * *

The Iris Diaphragm Shutter. The *Deutsche Photographen Zeitung*, in reviewing the exhibition of apparatus at Weimar, on the occasion of the German Photographic Convention, falls into a mistake, which we should call insular if it had happened on this side of the North Sea. Speaking of the Iris shutters shown by the firm of Carl Zeiss, the writer says that the Jena house was the first to use the stop of the lens for the mechanism of the shutter. The Iris shutter is a much older invention than the writer supposes, and we doubt if the firm of Carl Zeiss lays claim to more than the invention of the particular varieties with which their name is associated. The first German patent granted for the Zeiss Iris shutters was dated February 7, 1893, so far as we are aware. However, in that interesting compilation, "Abridgments of Specifications, Class 98, Photography," issued by the Patent Office, a much older specification will be found. On April 22, 1887, a patent was granted to T. R. Dallmeyer and Beauchamp, for a shutter fitting in the lens tube, between the lenses. It consisted of a number of segments of sickle, or chopper-like form, mounted on pivots fixed in a ring. By rotation of the ring the segments were moved to and from the centre. Subsequent patents were taken out to protect improvements in the shutter. This antedates the Zeiss invention by nearly six years.

* * *

Trade Prospects. The advent of warmer weather and the brilliant days with which we have been favoured have given a strong impetus to amateur photography. Turn which way we may, the hand camera is ubiquitous. A few years ago it was thought that the bicycle would interfere with the progress of amateur photography; but it would seem that the wheel has had the contrary effect, and added a considerable number of enthusiasts to the army of camerists. In the construction of apparatus the tendency appears still to be in the direction of smaller sizes. Portability has not been the only inducement which has brought about this state of things. The facilities which have been provided for the production of enlargements and the admirable bromide papers which can now be obtained have doubtless contributed largely to the abandonment of large cameras. Lenses, too, of very short focus and exceptional rapidity can now be had, and give the

amateur the opportunity to secure pictures in out-of-the-way nooks and corners, typical of most interesting phases of life. It may be looked upon as an axiom that every advance in the manufacture of plates, films, and printing materials, every improvement in lenses and cameras will add to the number of photographers, whether amateur or professional. This year brings with it many improvements in various directions, and the prospects seem to be that the demand for photographic materials will be larger than ever.

* * *

Germans and the National Bias. The paragraph which appeared a fortnight ago in our "Ex Cathedra" notes concerning English manufacturers and German critics has prompted a German friend, whose opinion we highly value, to send us an extract from the "Grenzbote," a well-edited German weekly paper. We infer, from the remarks of our correspondent, that he is in complete sympathy with this sharp criticism of the attitude of the German daily papers, and we believe that the same feeling is shared by a large number of the more highly-educated people in Germany. The writer in the "Grenzbote" addresses his countrymen in the following terms: "We Germans abroad are generally more respected than loved, not because we may be indiscreet, but because we are fond of singing our own praise, and have the most unfriendly and unneighbourly Press of the civilised world. We ask ourselves, are some of these people suffering from delusions, which drive them to extravagance and persecution? Do they drink absinthe, or think other nations cannot understand our language? Do they believe that to Germans belongs the privilege of smiting every other nation on the face without being thought the worse for it? If the German Press were the voice of the German people, which it is not, then the German nation would be the most envious, poisonous, fungoid growth of the five continents of the world. It is far from pleasant to say this, and worse to see evidence of it daily. We confess that we see articles in the papers nearly every day which compel us to clasp our head with both our hands and ask if we, or the other people, are not quite right in the upper story. Would to God it were we! Our frail voice is raised in warning, and passes away almost unheeded."

* * *

Photograph Tailoring. Astronomers, surveyors, and other scientific workers have long known that photographic images will give reliable data upon which to calculate relative distances. Possibly the knowledge of this fact has inspired a certain tailor of Wisconsin to conceive, develop, and patent a process by means of which his customers can be photographically measured for their garments. We all know what the usual method is: how the tailor measures us across our back, along our half-bent arm, and how he gaily casts a tape equator about that rotund portion of the form politely called "the lower chest," all the time calling out cabalistic figures to his minion, who enters the particulars in a book. A later day comes round, and the coat is tried on; pins are inserted and extracted, and various chalk marks are made to indicate the latitude and longitude of future buttons and button-holes. Now all this worry is saved to the customer by the new photographic process. At one end of the tailor's *atelier*—it would be rude to call it a workshop—is a camera, while at the other end is a frame about 7ft. high and 4ft. broad, which is stretched across with vertical and horizontal wires, so as to form a series of squares. Behind this squared screen of wirework the customer steps, and is photographed in various positions—front, back, and side views being taken. By means of pictures thus obtained, divided as they are into measurable squares, the tailor is able to calculate the various distances from point to point, and can promise his patron a perfect fit. We have said that the new method of measurement is a relief to the customer, and so it undoubtedly is, for none of us like to be pulled and pummelled about, just as if we were lay figures. But what does the new system mean for the unfortunate tailor? In addition to his ordinary sartorial occupation, he will have the burden of taking three or four negatives for every garment, or, at any rate, for every suit, and must also obtain positive prints from those negatives before he can get to his more legitimate work. Then there comes in the usual uncertainty as to light and the other hundred obstacles which assail the photographic worker. Considering all these difficulties, we fear that this union of the camera and the shears will not be very generally adopted. Perchance it will be confined to the vicinity of Wisconsin, where its patentee dwells. In less civilised regions master snips will be content to use the humble yard measure, as of yore, and leave the camera to the inferior business of portrait-taking.

* * *

Artists' Mistakes. Some painters, but not all, are very hard upon photographers when the latter step out of the beaten track, and attempt to produce something artistic. Then it is that we are told of the impossibility of achieving anything which can be called a picture by the manipulation of a mechanical box, and the poor camera man is politely requested to take a back seat. But artists, although they like to sit in judgment upon us, are by no means omnipotent, and the list of mistakes and incongruities which they have allowed to creep into their compositions would consume much ink and paper. Among the older masters it was the common custom, as we all know, to dress their models in the costume of the day, quite irrespective of time or clime. Let us quote one or two instances. There is in the National Gallery (Edinburgh) a picture of the finding of Moses, in which the Egyptian princess and her women are represented with the long waists and hoops associated with the Court, not of Pharaoh, but of good Queen Bess. At our own National Gallery, ladies at the Court of King Darius are similarly adorned. In the Bethnal Green Museum there is, or was, an ivory carving of the good Samaritan, one of the servants of whom carries a flint-lock musket! And rumour tells of a painting somewhere of the Prodigal Son, in which that penitent youth returns to his ancestral home in a yellow post-chaise! But even in the representation of natural things, painters, and modern ones, too, have been known to perpetrate strange blunders. A rainbow turned inside out, with regard to its colouration, has been introduced into a picture more than once. A well-known picture of "The Star in the East" shows a crescent moon in the same quarter of the heavens. Doubtless the artist has been told more than once by candid friends of this incongruity. But if that artist happened to be abroad last Tuesday week shortly after sunset, he would have noted an appearance in the sky which would help him to silence all cavillers. Wherever the firmament was not obscured by clouds, the crescent moon would be observed close to the Eastern horizon, instead of being in attendance on the setting sun, as it usually is. Furthermore, it had no business to assume the crescentic form, for, according to the almanac, it ought to have been "full moon." The almanac, happily, supplies the reason for this lapse on the part of Diana. The goddess was eclipsed. She rose in the East, veiled with the shadow of the Earth, and shortly afterwards, owing to the

partial withdrawal of that veil, she showed the form of the new moon. Curiously enough, in places where the air was clear, and the view of the horizon unimpeded, it was possible to see the images of both sun and moon at the same instant, although, of necessity, the earth must have been directly between them. This was owing to the effect of refraction by our atmosphere, the image of the sun remaining above the horizon after the orb had really sunk below it, and that of the moon appearing before it was actually due. The painter's crescent moon in the East can thus be ingeniously accounted for, but the inside-out rainbow requires further consideration.

THE Professional Photographers' Association.—There will be a meeting of the General Committee at 51, Baker Street, London, W., this (Friday) evening, May 2nd, at six o'clock. Business:—Nomination of new committee (as rule 12). To receive suggestions re alteration of rules. Discussion on fire insurance rates. Reports of local branches.

"A BAD Effect on Art."—The eighth free picture exhibition at the Town Hall, Stratford, organised by the West Ham Corporation, was opened on Saturday by Mr. Seymour Lucas, R.A., in the presence of a large company. Mr. Lucas said he had no doubt whatever that such exhibitions as the one they were about to open did much to foster an appreciation of the beautiful. In the days when he was a student there were only three public picture galleries in London, and he might remark that his own small success in art was due to the Bethnal Green Museum, a visit to which he used to regard as a great treat. Galleries filled with examples of the works of the greatest artists had a great educational influence. The important events of history were imprinted on his memory by pictures rather than by reading. The Church in the Middle Ages thoroughly realised the advantages of pictures. In the days of the Renaissance many of the churches were turned into little picture galleries and had their influence. He had left the Royal Academy to open that exhibition, and would remark that some of the pictures that would be thrown open to the public view in a fortnight's time were very, very fine. This year there were 200 fewer pictures than last year, and those painters who had to go through them thought that a blessing. Speaking of the work of the painter, Mr. Lucas said that photography had had a bad effect on art. It served to present things in a literal sense rather than a poetic sense. Realism in art was not wanted; the great painter put into his work his art, and it was that which was the merit and value of the work. Plate-glass, which flooded places with light—whereas art was all light and shade—had also robbed art, but all these things in time would correct themselves. The exhibition will remain open (Sunday included) till May 10th.—"The Times."

THE Röntgen Rays.—At the Royal Institution last Friday Mr. J. Mackenzie Davidson lectured on the "X-rays and Localisation." Dealing with the use of the rays as a photographic agent, he showed how the definition of a photograph obtained with them was affected by the relation of the anti-cathode to the cathode in the tube which produced them. The X-rays took their origin at the point where the cathode stream met a solid; hence they were generated at the anti-cathode. But this latter did not stop all the stream, part of which passed on till it met the glass of the tube, when more X-rays were produced, although less powerful ones. Hence radiation was going on from a comparatively large surface, and in such circumstances a sharp shadow was not to be expected. To obviate this defect it was advantageous in practical work to stop these odd rays by surrounding the tube with an opaque substance like red lead, which was scraped away at the point where it was desired the rays should issue. An additional advantage of this procedure was that the operator was protected from them and the unpleasant physiological effects they were capable of exercising. Mr. Davidson performed several experiments with the rays, among other things showing that their action on a photographic film was different from that of light. Taking a sensitive plate, he placed on it a metal design and exposed it to Röntgen radiation for two minutes, protected, of course, from ordinary light. He then took the plate out of its envelope and exposed it for five minutes to the electric light with which the room was lighted. On development the plate yielded a reversed image, the design coming out dark on a light ground. The same result was not obtained by exposing a film first to ordinary light and then to Röntgen radiation. The importance of this was that it suggested the possibility of making plates so much more sensitive to X-rays than to daylight that theycould be developed in daylight—an obvious advantage if a dark-room were unattainable, as might easily be the case in a campaign. The last part of the lecture explained how the exact position of a foreign body—say a needle—in the tissues could be located by the aid of these rays. No information as to the depth of the body below the skin could be obtained from a single photograph, but if two photographs were taken by a tube placed at known distances from a fixed point not only would they give a picture in perfect relief if placed in a stereoscope, but data were obtained from which by a geometrical construction the depth of the object below the surface could be measured. This method had been applied with success to the localisation of a fragment of metal in the eyeball, and thus enabled an object to be removed which sooner or later would destroy the sight.

TONING METHODS.

LAST week we raised the point as to whether the public generally really cared sufficiently for the permanency of their photographs to pay a little more for them if that could be reasonably promised. Turning from the general public to amateurs, we may put a similar query: Will they go to any little extra trouble, in order to secure additional stability in their results? In the majority of cases we doubt it. Amateurs of the present day, as a rule, want to obtain their results with as little trouble to themselves as possible, quite regardless as to whether they are lasting or not.

At a recent meeting of the London and Provincial Photographic Association, reported in our last issue, the evening was devoted to a discussion on combined toning and fixing. From the report, it will be seen that no new facts were elicited, and the old ideas, *pro* and *con.*, which have so often been quoted, were reiterated. Judging from the report, one may fairly assume that the combined bath is not much in favour with the members generally, as far as regards stability of results; unless it is used under conditions that entail nearly, or quite, as much trouble as is involved in toning and fixing separately. Will the general run of amateurs go to this extra trouble merely for the sake of a probable prospect of greater stability in their prints? One speaker, an amateur, said that he looked upon putting the print dry into the bath as one of the boons of the combined method. From this it may be assumed that he, like many others, considers trouble before permanence. According to the report, the same gentleman also referred to the fact that "paper makers, as a rule, said that combined baths were not to be recommended, but he thought that it was time that their chemists had worked out a satisfactory formula, one that could be expected to give reasonable permanence to the print, save the time of the operator, and the number of processes that have at present to be gone through." That the paper-makers discourage the employment of the combined method—notwithstanding that with all makes of paper the tones it yields are excellent and that it simplifies the working of their manufactures—is a very good proof, if no other were needed, that the system is, more or less, dangerous as regards the durability of the pictures.

All gelatine printing-out papers contain a considerable amount of free acid, and, of course, if they are put into the combined bath, or any "hypo" solution, some of the hyposulphite of soda is at once decomposed, and sulphur and other injurious agents set free in the paper—as has frequently been pointed out in these columns—which will eventually tend to its destruction. If the prints are well washed, to remove the free acids and the free nitrate of silver from the film before it is put into the bath, this risk is, to a great extent minimised. But will the users of the combined bath take this little extra trouble with the view to greater stability? Furthermore, this procedure renders the operation of toning somewhat slower; also the use of a second solution of hypo after the toning. Although this would certainly conduce to more perfect fixation, it, again, entails an additional operation. Would it, therefore, be adopted by those who object to a little trouble?

At one time amateur photographers were experimentalists, and to them must be accredited most of the improvements and discoveries in the art. Now, however, they seem to rest entirely on the manufacturers of material, instead of making researches for themselves. If the latter cannot give them what they think ought to be done, why should they not work out for themselves some method that

will fall in with their ideas, for, as a rule, they have more spare time on their hands than the manufacturers have? One of the speakers at the meeting, the other night, intimated that the combined bath was more largely employed amongst professional photographers on the Continent than it is here. Is that a fact? We are inclined to doubt it.

It is sometimes mentioned during discussions on the combined bath, though it does not seem to have cropped up on this occasion, that thousands of prints, toned by the combined method when it was the only one used, in the early days of the art, are still in existence, and are as good as ever they were. But this argument would not apply to the present combined bath if then used. In the old bath there was nothing but hyposulphite of soda, gold, and water. It contained no acid, alum, lead, etc. All of which tend to fugitiveness in the picture. Furthermore, it contained a very considerably larger proportion of hyposulphite of soda. For example, the proportion of "hypo" was about half the quantity of water employed—some workers used a still larger proportion than that. Then the minimum was ten ounces to the pint of water, and to this was added ten grains of chloride of gold. Notwithstanding this large proportion of hypo and gold, this system was abandoned, alike by professionals and amateurs, in the late fifties and early sixties, when the combined system was proved to be theoretically wrong, for the "alkaline," or separate toning, method, which has been adhered to ever since for albumen paper. Now let us look at the modern formulæ for combined baths. Taking several now before us, we find that the maximum proportions of hyposulphite is five ounces to the pint of water; in some it is much less. When it is considered that a considerable amount of its fixing power is discounted by the decomposition brought about by the acid, alum, lead, and other additions, it is practically considerably below that strength. Hence it is not surprising that the desired tones, particularly when they are of the warmer tints, are reached long before the prints are properly fixed, and, as the result, so many jaundiced photographs that are now to be met with. With the old, simple, strong bath of hypo and gold only, the toning proceeded slowly, taking for the deep purple tones an hour or more; hence there was no fear of imperfect fixation. It will now be seen that no comparison could be made between the combined bath of old and the modern one. We have left out of consideration the difference in the paper used and the large amount of silver it contained, and the stronger character of the negatives employed, when the old combined bath was in vogue, as that subject has so often been dealt with in these columns.

A New Studio in Glasgow.—Mr. John Stuart, jun., informs us that he has acquired the old-established business carried on at 120, Buchanan Street for close on half-a-century, and will henceforth conduct it on his own account. The property, in which the business is at present carried on, is to be demolished at May term, to allow of a more modern structure being erected in its place. Mr. Stuart, jun., has, therefore, found it necessary to lease new premises at 59, Bath Street (a few doors west of Renfield Street). Mr. Stuart is now in possession of the new studio and suite of rooms. The reception room has been fitted up in the most elegant manner, while the dressing rooms are furnished and arranged for the convenience and comfort of his patrons. The atelier has been specially constructed for the production of the highest class of artistic photography. Mr. Stuart will be in constant attendance at his rooms, and will photograph all patrons personally; children's photographs will be a specialty. Miniatures on ivory will also be a feature of the business. Enlargements in carbon on paper or opal, platinotype, and Mr. Stuart's new "Etchographs" will be prepared under his personal superintendence. Outdoor photography in all its branches conducted under his direct guidance, as formerly.

COLLODION POSITIVES.

Much attention has recently been directed to the beauties and the defects of the old daguerreotype process, and many are loud in their praise of the structureless quality of these pictures on metallic plates. It may be assumed that most persons judge of this old process only by the portraits which they have seen. But to appreciate the wonderful capabilities of the daguerreotype it is absolutely necessary to study pictures of a more comprehensive character. Some years ago Messrs. Negretti and Zambra, who for so many years held the appointment of official photographers to the Crystal Palace, showed us a number of daguerreotype pictures which they had taken of the beautifully-decorated Alhambra, Pompeiian, and other interior courts of that ornate building—pictures taken in the old days before the paint and gilding had become smirched by troups of holiday makers, and long ere the æsthetic aims of the founders had given place to the democratic switchback, roundabout, and other intoxicating delights. These pictures were full of the most exquisite detail, and retained their pristine freshness.

But there is another early process which is extinct as the daguerreotype, and which followed quickly on the heels of Archer's discovery of the wet collodion method—a process which gave such perfect and lasting results that it would be worthy of attention, even if we had not a special object in view in reverting to it, as will presently be seen. We allude to the positive collodion process which, for many years, held premier position as the most popular method of picture making, for the very good reason that the portrait was taken and finished "while you wait."

The collodion positive was produced by exactly the same method as the later ferrotype, or "tintype," as our American friends call it, save that the support of the delicate film was glass instead of iron. Two pictures taken by this process are before us as we write, and knowing their history, we are able to assign a date to each which we know to be approximately correct. One consists of a family group which was taken fifty years ago in a drawing-room at Chester Square, London. It is noteworthy as being an early specimen of photographic portraiture taken in an ordinary sitting-room, by an amateur worker. The other is a simple half-length portrait taken by a professional photographer in the year 1859. It bears a printed ticket on its back, which runs thus:—"W. Pugh's Photographic Portrait Rooms, 21, James Street, Cambridge. State of the weather no object. A portrait (frame included), 6d. *Portraits on paper from 2s. 6d.*"

The portrait group taken by the amateur has an unvarnished film, and the picture has suffered from abrasion. The other photograph has been varnished, and between it and its cover glass is a metallic oval mount, the whole being bound together in a flexible metal frame, and subsequently placed in an imitation leather case. Whether all this was included in the sixpennyworth it is now impossible to say, but, as a testimonial to Mr. Pugh's workmanship, it may be stated that the picture is as bright and perfect in every respect as if it had been completed yesterday, instead of 43 years back.

Although these pictures are technically known as collodion positives, they are, of course, in reality negatives—thin negatives which are bleached so as to give a positive effect when viewed by reflective light. We should get precisely the same appearance by bleaching a thin gelatine negative with mercury and holding behind it a black surface, so that the shadows shall be dark instead of transparent. The collodion positive worker provided this black background by filling in the back of the frame with a square

of velvet, or by giving the back of the glass a coating of black varnish. The latter is the more economical plan, and it is noteworthy that in the instances under review the professional photographer has adopted it, while the amateur, reckless as to cost, has employed velvet.

And now we come to our main object in directing attention to this old process. It must occasionally fall to the lot of the modern photographer to be asked to make a copy or an enlargement from a picture of this kind, and unless he be an old stager his probable mode of procedure will be to make a new negative from the picture. It will be seen from what has gone before that this is not necessary, for the picture itself is a negative, and by reason of its thinness it is just the kind of negative to make, with careful manipulation, an excellent positive enlargement.

The first operation is to take the picture carefully out of its wrappings, and to remove the black varnish, if there be any, from the back of the glass. Perhaps the best way is to scrape it off, for treatment with a solvent would be liable to affect the varnish on the face of the picture. The glass is then put in the enlarging apparatus and a bromide print taken in the usual manner. Of course, any other process which commends itself to the photographer may be employed; we merely mention bromide paper as a ready means of carrying out the operation.

There is, however, one little matter which must not be overlooked in dealing with positive pictures on glass. It must be remembered that they are reversed. The owner of the picture will be quite oblivious of this fact, and it will be next to impossible to make him appreciate it. It is certain that if he is handed an enlargement in which the face looks to the left, whereas in the original it looks to the right, he will, although it be excellent in every other respect, reject it. The photographer may truly urge that the new picture is more correct than the old one, but he will never convince his client. It will therefore be as well not to attempt impossibilities, but to reverse the original work in the enlarging apparatus so that the new image may look the same way as the old.

A collodion positive portrait, possibly of a loved one who has gone over to the majority, has, like the daguerreotype, an extra value, because there is no negative to fly to for an extra copy. It is the one and only image taken in the camera. But by the method which we have suggested it assumes the rôle of negative, and many positive enlargements can be taken from it. We remember a case in which the head of a family was remembered only by his good works, and by one of these old collodion positives. From that positive we were able in half an hour to obtain sufficient enlargements to go round, and we were fully rewarded for our labours by the manifestations of real delight which crowned our work. Perhaps our remarks may lead some of our readers to a similar pleasant experience.

On his return from the Isles of Scilly, the Homeland Association forwarded to His Majesty, with other volumes, a copy of their handbook for the charming flower-growing islands. As an evidence of the King's desire for the prosperity of the beautiful and interesting health resorts of Great Britain, His Majesty not only accepted the copy, but has expressed, through Sir Francis Knollys, his wish to receive all further "Homeland Handbooks" to be issued by the association.

R.P.S. Informal Meetings.—The Royal Photographic Society inaugurates on Tuesday, May 6th, at 8 p.m., at 66, Russell Square, a series of informal meetings, which will be continued on the first Tuesday in the month during the session. The idea is to afford the members an opportunity for discussing in a friendly manner subjects of photographic interest which cannot conveniently be dealt with at the formal meetings when papers are read. As the occasion is also that of the first opening of the society's house from 10 a.m. to 10 p.m., it is hoped that the members will accept this invitation of the House Committee, which has the arrangements in hand, to attend and take part. The photographs by Mr. C. Yarnall Abbott, of Philadelphia, that are now on exhibition at 66, Russell Square, will remain on view until Saturday, May 10th. Non-members will be admitted on presentation of visiting card.

INSECT-PHOTOGRAPHY.

Amongst the great and ever-increasing army of photographers, both amateur and professional, there must be a large number who are more or less interested in insect life. Many, no doubt, collect, or have collected, butterflies and moths, beetles, and spiders, but how few are the photographs we see of these most interesting and beautiful creatures! Yet what a wide and varied field of work awaits the photographer who is interested in insect life, for the subjects are to be found in all situations and at all times of the year.

On the coldest and most dreary day in winter, if we know where to look, we shall find some busy and interesting members of the insect world to photograph. Descend to the regions of the kitchen on a cold winter's night, an hour or so after cook has departed to bed, and watch by the light of the dying embers in the grate, the weird, creeping forms that glide silently over the floor. The little dull-coloured cricket cautiously comes out of his snug retreat at the back of the stove, and, sitting on the hearth, illumined by the soft, ruddy glow of the fire, sings a cheery song of appreciation. Families of the so-called "black-beetle," which, by the way, are not beetles at all, but closely related to the earwigs, crickets, and grasshoppers, march swiftly across the kitchen floor in search of food. Papa and Mamma cockroach lead the way, their long thin antennæ gently twitching, and swaying from side to side, apprehensive of danger. Behind the parent cockroaches come, straggling, their fat, oval-bodied children; the more venturesome of whom make short, rapid excursions on their own account, away from the main party. At last one of the families espies the little heaps of brown sugar which we placed upon the hearth, and focussed with our camera more than an hour ago. Quickly and silently, we take up the pneumatic balls of our magnesium lamp and camera shutter, and with breathless excitement wait for the cockroaches to begin upon their supper. Puff! For something under the fifteenth-of-a-second, the kitchen is filled with a dazzling glare of light, followed by supreme darkness and the sound of many little feet, scuttling rapidly away. But no matter, we have got our photographs of the cockroaches' supper party.

With the advance of spring and early summer, caterpillars become much in evidence in the garden, the orchard, and in the fields and lanes. Although many of them, when held in the hand, or placed on a piece of paper, appear to be conspicuous enough, with their bright green bodies slashed with tufts of vari-coloured hairs, yet when we attempt to photograph the caterpillars feeding on their natural food-plant, and surrounded with foliage, we soon very fully realise how well and closely those dots and dashes of colour blend and harmonise with the surrounding play of light and shade. For field work in this direction, and also for photographing the caterpillars on their food-plant at home, a series of different tinted washable canvas backgrounds will be found very useful. They should measure somewhere about 3ft. by 2ft., and need not be mounted on wooden frames, but rolled up into a convenient size for carrying. One of these backgrounds placed directly at the back of the branch or twig on which the caterpillar to be photographed is feeding, will go a long way towards the production of a really successful picture; as it will not only do away with the confused blurr of out-of-focus foliage, which would otherwise appear as a background, but will greatly help to differentiate the caterpillar from its surroundings.

To photograph insects on the wing, hovering over flowers, is extremely difficult. Either a twin-lens camera or a "Mirai camera," with which the object to be photographed is seen upon a ground glass screen up to the instant of the exposure being made, must be employed; and even then the greatest care and patience will be required to ensure success.

It is by no means so difficult, however, to photograph butterflies, moths, and other winged insects, at rest. Butterflies, during the warm, sunny weather, are constantly on the wing from about seven o'clock in the morning until four or five o'clock in the afternoon. Very early in the morning, ere the sun has overcome the fresh crispness in the air, these beautiful creatures may be seen resting asleep upon tall stalks of grass, or twigs, and the under-side of leaves, their wings folded back, and perfectly motionless. Possibly, by the time a photograph has been taken of the insect with folded wings, the air has grown sufficiently warm to rouse the butterfly from its sleep. This awakening is often heralded by what I may term a "winking" of the wings—that is to say, they are slowly opened and expanded, and closed again, the alternate actions being repeated several times ere the insect takes flight, so that it is quite possible, with a little watchfulness and care, to successfully photograph the butterfly still resting upon the leaf or stem of the plant, and with its wings expanded.

Beetles are by no means easy to photograph satisfactorily amongst their natural surroundings, for they are restless creatures, and easily frightened, with, perhaps, the exception of the male Stag beetle and the Devil's Coach-horse, both of which will stand their ground and assume the most threatening attitude when they are angered and find retreat cut off. The best plan is to carefully collect the beetles, and bring them home alive to be photographed. The specimens should then be placed on a fair-sized piece of board, part of which has been previously focussed on the screen of the camera, and when the beetle, in journeying over the board, passes across the space within the focus limit in a suitable position, the instantaneous exposure can be made.

Spiders, their webs, and nests, are most interesting to photograph. From the common garden spider alone, quite a large and interesting series of pictures is obtainable; these would show her at work building her beautiful snare, its completion, the capture of some victim, such as a good fat bluebottle fly, &c. One of the most beautiful natural history photographs I can remember having seen was of a perfect web of the common garden spider, taken early one frosty October morning. A piece of black velvet had, with the greatest care, been placed to form a background, against which the delicate web, covered with hoar-frost and sparkling in the morning sun, stood out as if made of finest silver wire and precious gems. From a purely scientific point of view, these photographs are of the greatest value, as they give us truthful representations of the ways and manners of insect life. With a comparatively small amount of trouble and patience, it is possible to form a photographic record of the whole life-history of an insect, such as a butterfly or moth, from the time it emerges from the egg, a tiny, crawling caterpillar, through all its changes and growth, until it finally bursts from the dry chrysalis case, and comes forth a beautiful, winged creature. The outfit required for successful insect photography is by no means very extensive, nor need it be very costly. A hand camera, as well as a stand camera, will be useful. The stand camera should be as rigid as possible, and have a good extension of bellows. The hand camera must have some certain means of focussing, and the best form will be found to be some species of twin-lens hand camera, or one of the Miral type, in which one lens projects the image on to both the sensitive plate and full-sized focussing screen, on the top of the camera. A good rapid rectilinear lens, as silent a time and instantaneous shutter as possible, and a supply of special rapid plates, complete the purchasable outfit. But the most vital part of the whole outfit for successful insect photography is an unlimited amount of patience and resource, and a real love of Nature. Without these inborn qualifications, it is useless to attempt this branch of photography, but to those who possess them, it will prove to be a delightful, all-absorbing, lifelong hobby.

F. Martin Duncan.

OPTO-TECHNICS.

[A lecture delivered at the Society of Arts.]

I.

Though we often hear of the magnitude and growth of the engineering industries, of the chemical industries, and of the electrical industries, we seldom hear of the optical industries, or of their importance in the national life. Few persons have probably ever considered what are the optical industries, how varied in character, and of what magnitude. Yet they are no inconsiderable part of those industries—using the word in its widest sense to include trading as well as manufacturing—which, like engineering and the chemical and electrical trades, are based upon science and scientific invention. According to the London Post Office Directory, there are 216 firms described as "opticians," within the postal area, which excludes most of the suburbs. But, in addition, there are numerous other trades, amongst which are glass manufacturers, glass grinders, glass polishers, glass silverers, looking-glass makers, magic lantern makers, magic lantern slide makers, microscope makers, micrometer makers, optical turners, optical-case makers, opera-glass makers, photographic apparatus makers, photographic frame makers, photographic lamp makers, photographic lens makers, photographic material makers, photo-printers, photo-gravurists, photo-lithographers, spectacle makers, spectacle-case makers, spectacle lens makers, and telescope makers. This category does not include the makers of levels, theodolites and surveying instruments, or photographers or photographic artists, nor does it include the purely professional class of ophthalmic surgeons. It one were to include the employees of the optical shops and factories, the warehousemen, shopmen, assistants, foremen, fitters, clerks, and labourers, the total number of persons employed in the aggregate of the optical industries would be found to be very great. It is impossible to state it with even approximate accuracy. It cannot be less than 15,000 to 20,000 persons in the London district alone. What the number may be in Great Britain of simple opticians, or of opticians who combine the trades of jeweller and optician, or of pharmacist and optician, I do not know. But, merely classifying together those whose optical work consists chiefly in dealing with spectacles (many of them also trading in opera-glasses, telescopes, microscopes, cameras, &c.), and including assistants brought up to the trade, the number of opticians in the trade must be at least 10,000 within the United Kingdom. While it is true that many of these are mere traders, it cannot be too strongly stated that for all of them, unless employed as labourers, errand-boys, or simple attendants, a certain amount of optical knowledge is an absolute necessity. All those in particular who have to sell, supply, fit, or adapt spectacles to customers, must have a real working knowledge of the first principles of optics, of the properties of lenses, and of the optical functions and relations of the eye as an instrument. This implies a certain scientific training. In the case of the optical manufacturers and their employees, a further training in optical science is necessary; and for the masters and foremen of the optical factories, this training must be a highly specialised one, involving both theory and its technical applications. For them, above all, a technical training in optics is a prime necessity: and it must be thorough.

Having thus briefly glanced at the optical industries themselves, let us take a similar brief review of the science of optics which lies at the basis of all these industrial and commercial developments. Optics, the science of light and its properties, is concerned in the first place with the laws of refraction and of reflection—mainly with the former. The essential fact, both in the refraction and in the reflexion of light, is angular deviation. The light which was proceeding from some source, in some particular direction, is, when refracted or reflected, caused to proceed in some other direction at an angle with its former path. It is fundamental in this most elementary part of

optics, to know the simple physical facts about the angles concerned in refraction and reflection, and their relation to the surfaces at which the light is so refracted or reflected. The physical fact that in the act of refraction, ordinary light is dispersed into a series of coloured constituents, is also a fundamental point. Now, refraction occurs whenever light passes from one optical medium to another, as when, for example, light passes from air into glass; and since different kinds of glass act differently from one another, any complete grasp of these simple, physical facts will involve some further knowledge. It will, in fact, necessitate a knowledge of optical glass: its varieties, their respective virtues and defects, their refractivity, their dispersivity for colours, the degree of rationality or irrationality of their dispersion For technical purposes it is also needful to know how the various kinds of optical glass differ amongst themselves in density, hardness, and in liability to atmospheric deterioration.

Now, to study but the first of these points, the refractivity of glass, requires a certain amount of preliminary knowledge. For, since the index of refraction is measured by, and defined as a ratio between, the trigonometrical sines of certain angles, its proper comprehension is only possible to those who have already comprehended what is the meaning of the sine of an angle. So there must be a basis of mathematical knowledge. Also in technical work it is vital that refraction should be studied by the use of the instrument appropriate for the exact measurement of angular deviations, namely, the "optical circle," also sometimes called the "spectrometer." Further, since the power of any lens or combination of lenses depends not only on the refractivity of the glass or glasses used in its construction, but on the curvatures of its surfaces, it is necessary as a preliminary to know and be familiar with the definition of "curvature"—a purely geometrical conception—and for technical purposes it is necessary to be acquainted with the proper instruments for measuring the curvatures of surfaces, the so-called "spherometers," and with the methods of using them and of working out the calculations appropriate to them.

We see, then, that as a necessary foundation for any sound technical knowledge of optics, there are at least four things essential:—

(1) A knowledge of certain physical facts and laws relating to the angular deviations of the paths of light in being refracted or reflected.

(2) A knowledge of the varieties and properties of optical materials, particularly of optical glass.

(3) A knowledge of elementary mathematics up at least to the trigonometry of one angle, and a certain facility in using algebraic and trigonometrical formulæ in calculation, and in using mathematical tables.

(4) A working, personally acquired, knowledge of the instruments that are used in the optical measurement of angles, and in the measurement of curvatures of surfaces.

It would, perhaps, be more rational to put these four fundamental requirements in a different order.

(*a*) Mathematical knowledge and practice in calculating.

(*b*) Knowledge of the general physical properties of light, refraction, dispersion, reflection, &c.

(*c*) Practice in using, and comprehension of the principles of such optical measuring instruments as the spectrometer and the spherometer, also the focometer and other instruments.

(*d*) Knowledge as to the optical properties of glass of different kinds, and of a few other substances used in optical work—quartz, fluorspar, Canada balsam, water, cedar-wood oil, &c., acquired by observation with measuring instruments. The first of these can be taught in the class-room, or less advantageously learned from books. The second can be taught and learned in like manner, but ought, from beginning to end, to be studied by the aid of experiments. The third requires the use of instruments of precision, and is most appropriately followed in a properly-equipped optical laboratory. The fourth, provided the other three have been really learned, not crammed, nor skipped, may be acquired from tabulated recorded results of observation, accompanied preferably by reference to a set of specimens.

He who has been trained, or has trained himself, in these four elementary parts of optical science, will have acquired a knowledge of lenses, prisms, and mirrors, and of the dependence of their respective optical properties upon their geometrical shapes, and the material of which they are constructed. "Matter" and "form"—the old battle-words of Aristotle and the schoolmen—both must be studied, because both are essentially concerned in the properties of any and every lens or prism. The formulæ for the power of any lens or prism, always in every case contain two factors, one depending purely on the physical properties of the glass, the other purely on its geometrical shape. Hence the fundamental necessity in optical study of *experiment* to supply the first, and of *mathematics* to express the second. But he who has mastered this bit of elementary optics has yet much to learn.

Our eyes, being optical instruments, and instruments liable to many grave defects as well as to diseases, it is vital that the optician should acquire a sound knowledge of the optical properties of the eye, and of its defects as an optical instrument, even though he may never have to study its diseases, or be required to know anything about their treatment or cure. His first business with the eye is with its optical construction, its adjustments, and the use of spectacles to correct its optical defects. This study of the eye involves a little elementary anatomy and a little elementary physiology; but more than either it involves a comparative study of the eye with other optical instruments: best of all a comparison with the camera, since the eye-ball is itself a camera of most exquisite construction, with lens in front, with automatic iris diaphragm, with automatic focussing by the aid of an auxiliary lens behind the diaphragm, and with a sensitive film at the back whereon the images are focussed. Every young optician ought to assist his own studies by getting a sheep's eye or a cow's eye to cut up with his own hands. If he rests content with looking at a book, instead of making friends with the nearest butcher, he throws away a chance. But every young optician will find that his knowledge of the eye will be woefully incomplete if he stops short here. Nothing will better help him to realise the defects of the eye than to study the defects of other optical instruments. A single common convex lens, the fatter the better, will provide him with a highly defective optical instrument. For he has yet to learn a new chapter in optics.

The study of the various aberrations of lenses will go a long way toward perfecting the training of an optician. He cannot study them without both experimenting and thinking. He will not understand them unless he has really grasped the more fundamental parts of optical theory. To understand aberrations he must perforce learn, if he does not already know, the bare essentials that have been already mentioned. And when he comes to study the defects of his lens by trying its optical performance on different objects, trying to get by its means sharp images of luminous objects, such as bright points, bright lines, bright pictures, he will discover, or he may be taught, that the defects which the scientific men call aberrations fall into two classes—one depending on *material*, the other depending solely on *form*. He will learn that the defect which causes the image of a bright white point to be surrounded with coloured margins—which the learned call "chromatic aberration"—is due to the material—the glass—and its unequal refractive action on the differently-coloured constituents of light. If he pursues the

subject more deeply, he will discover that there are three different sorts of chromatic aberration, one affecting the position of the image, another affecting the size of the image, and a third, a residual one, which occurs when a second lens, made of a different kind of glass, is applied to reduce or correct the first sort. He will, in this way, be led to consider how an achromatic lens can be made out of two lenses; and if his teacher or his text-book is up to date, he will learn that there are two sorts of achromatic lenses, an old sort in which the two kinds of glass were a light crown and a dense flint; and a new sort in which there is a dense crown and a light flint. He will also learn that there is some advantage in combining three kinds of glass (or two kinds of glass with a third material, fluorspar) to form a still more perfect *apochromatic lens*. When he turns to those defects which depend not on material but on form, he will find a fine complication awaiting him. Prolonged studies of clever opticians in time past have enabled us to classify the aberrations due to the spherical curvatures of the lens surfaces under five categories. There is *central aberration*, preventing accurate focussing in the middle of the field; there is *coma* (or zonal aberration), causing blurred images at the margins. There is *radial astigmatism*, making the images of points into little lines; there is *curvature of the image*, preventing it from being all in focus at once on a flat screen; and lastly there is *distortion* of the image itself, causing straight lines to look curved. That makes eight defects in all, to which there must be added yet one more—the chromatic difference of the spherical aberration. And if he would go on to learn how these nine defects—three kinds of chromatic aberration, five kinds of spherical aberration, and one mixed sort—are to be cured in the design and construction of a camera lens, he will become an accomplished optician truly.

But long before he has mastered the theory of these aberrations, he will necessarily have encountered a great deal of other optical information. He will have found a whole class of phenomena dependent upon the size of the light-waves. The *diffraction* phenomena, which occur when light is sent through small apertures, will have been noted. He will have come across the colours of thin films, due to the *interference* of light, the typical case of which is Newton's rings. He will have been led, therefore, to study interference. He will have learned the significance of the various orders of colours in Newton's rings. Possibly he may have had to acquaint himself with the investigations of Fresnel, and to study the wave theory in general. He ought to work with the *interferometer*, and measure wave lengths. Now that *diffraction gratings*, thanks to the labours of Nobert, Rayleigh, Rowland, and Thorpe, are to-day made in splendid perfection, and cheaply, he will have made observations on the diffraction spectrum, and will have compared it with the spectra produced by prisms of glass. In studying prismatic spectra, he will have found that the lines of the spectrum are spaced out in different ways by different kinds of glass. All kinds of glass crowd up the red region of the spectrum, as compared with the equable spacing observed in the diffraction spectrum, while some kinds of glass produce a relative crowding of the spectrum in the yellow and green regions more than other kinds of glass. This *irrationality* of the spectrum will naturally have prepared him to learn that there are some substances which produce a spectrum which is *anomalous* in having the colours in a different order—in which, for example, red light is refracted more than blue light, and in which red and blue are both refracted more than green. Then he will also discover that there is another great class of beautiful phenomena which depend on the particular direction in which the light waves may be vibrating—the phenomena of *polarization*, so-called, and he will have met with double-refraction.

Further, he will have been led to enquire into the laws governing the amount of light that is received from a given source at different distances, and those which govern the measurement of the brightness of lights. The subject of *photometry* will thus have come within his range of knowledge. Finally, his attention will have been drawn to various *optical illusions*, and he will have had to consider sundry physiological properties of the eye, the *theory of colour-vision*, with its bearing on the tri-chromatic photography and three-colour printing, as well as the facts of *binocular vision*, upon which the stereoscope is based.

Now, considering that every optician above the grade of a mere workman ought to know something of all these things, and that the competent optician must be master of a great many of them, the question arises how is his education to be carried out? How and where can he acquire all the varied scientific information, with its experimental and mathematical basis?

In another branch of applied science—that of electrical engineering—a very similar problem is presented. How is the young electrician to learn the technics as well as the practice of his trade? Well, in that case, it has been recognised for twenty years that a proper systematic training is requisite, and provision has been made for it. In the factory, and in the drawing-office, as apprentice or pupil, he has to work at the constructive side, and learn by his own hands what electrical engineering is. But all over the country there are classes, schools, and technical colleges, to which he can resort for instruction in the physical phenomena, for teaching in the theory, and for exercise in the application of the theory to practice. Electrical laboratories have been organised and equipped at great expense, that he may learn electrical measurement and electric testing, and verify for himself the known laws of electricity. In a word, the subject of *electrotechnics* is a recognised branch of education for the trade of electrician or electrical engineer.

But what is there to correspond for the education of the optician or optical engineer? Where are the classes in optotechnics? Let us see how far provision exists for those four elementary requirements which were laid down a few moments ago.

(*a*) The mathematics can be taught by the secondary schools; adequately taught, if only they will adopt sensible reforms in mathematical teaching and abandon the superstition that dragging a boy through the logical toils of a fossilized Euclid is the way of either teaching him geometry or of making him think.

(*b*) The physical facts and laws of elementary optics can be taught also by the secondary schools, or at least by those secondary schools which have proper provision for experiments in the lecture-room and in the laboratory. Very few, even of the organised science schools, have, however, proper equipment for the experimental teaching of optics. It is taught as a branch of general physics or of the hybrid "subject," Sound-Heat-Light rolled into one; and seldom has the teacher himself had any training in practical optics. The ordinary science teacher is not in the habit of describing the powers of lenses in the international unit, the *dioptrie*. He is usually innocent of any knowledge of Gauss's method of treating lens problems. In short, his optical knowledge is largely circumscribed within the elementary university text-books of the last half-century—books written by university dons for university students. Nevertheless, with proper experimental appliances, such lectures may serve a very useful purpose; and the future optician will be none the worse for elementary instruction in other branches of physics, including heat, acoustics, and electricity.

(*c*) Practice in optical measurement, with the use of the spherometer and of the optical circle as goniometer and spectrometer, together with practice in measuring focal lengths and the

like, can only be acquired in an optical laboratory, or in the optical department of a physical laboratory. While so many of the secondary schools are well equipped for chemical and electrical teaching, it is a matter of extreme regret that so few of them are properly provided with optical appliances.

(*d*) Acquaintance with the varieties of optical glass, and with the few other transparent bodies used in optical constructions—quartz, Iceland-spar, fluor-spar, and Canada balsam—can readily be provided by a small collection of specimens in the museums of the science school. But specimens of optical glass and of spar cut to the shape of prisms for use in the laboratory ought also to be available.

SILVANUS P. THOMPSON, D.Sc., F.R.S.

THE VERRILL PROCESS OF COLOUR-PHOTOGRAPHY.

[We are indebted to our contemporary, "Wilson's Photographic Magazine," for the following account of Verrill's process of colour photography, to which many references, founded upon a telegraphic report, have recently been made in the British press. "Wilson" reprinted the article from the Chicago *Chronicle* of March 14th last, and it is here presented in a slightly condensed form. It will be seen that Mr. Verrill claims to have discovered some special emulsion upon which he makes prints in colours through a negative taken behind a screen. This is a very remarkable claim indeed, and we confess that we should view it with considerably less scepticism if the remarks attributed to Mr. Verrill credited him with something more than an extremely amateurish knowledge of colour photography. The particulars given are meagre in the extreme, so that it is impossible to foretell how far this very mysterious process is likely to realise its inventor's idea that it will revolutionise the photographic art.—ED. B.J.P.]

[IN his studio on the third floor of a bank building in this city, A. Hyatt Verrill, son of Professor Addison E. Verrill, of Yale University, is busily engaged in developing a process in photography which, if it reaches a practical stage, will, in his judgment and in the judgment of a number of prominent Yale men, revolutionise photographic art, and invade the field of the portrait painters and the water-colour artists. Young Verrill claims a new discovery in colour photography that surpasses, as far as his tests have demonstrated, all previous results in this direction. Verrill is about thirty-two years of age, and is not a professor, as some persons have designated him. He has written much for the magazines, but his great hobby is photography. Yale professors who have any special work in photography always consult him, and these professors are deeply interested in the experiments in colour photography on which he is working. Five years ago this enthusiastic photographer began experimenting with the different methods which several German professors claimed they had discovered for photographing nature in its varied colourings. In none of these experiments could he obtain satisfactory results, and, according to the statement of Mr. Verrill, the German professors have been obliged to acknowledge failure in their work along this line of natural reproduction in colour. Mr. Verrill went on experimenting along original lines, with the result that he turned out the past week half-a-dozen coloured photographs taken directly from nature, and these were presented to the Connecticut Academy of Science by his father, Professor Verrill, who has taken a deep interest in his son's investigations. Some of the pictures were copies of water-colour paintings of Bermuda fishes in groups, such as the angel fishes, parrot fishes, and doucella. Another was a Bermuda landscape, in which the true blue and green tints of the water were well brought out, as well as the soft, creamy colour of an ancient stone residence at Wallingham and the natural grey of the rocks. Mr. Verrill, in discussing his discovery, said: "My method is to photograph direct from nature, develop my plate, and print my negative on photographic paper, which, after being developed and fixed, gives the exact reproduction of the scene in all its minute colourings. By my method I can get the iridescent shades of the sea shell, the blue of the sky, and changing lights of the sunset as accurately, or muchm ore so, than can be secured by a water-colour artist (*sic*). The more brilliant colours are the hardest to accurately reproduce by my method, the delicate shades and the gradations of colour being perfectly and clearly reached in my finished pictures. At present my method is not available for use in photographing animals or in making portraits of life, as the exposure is too long. In this, however, I have made much progress, for when I first began to experiment it required an exposure of two or three hours to get the required result. Now an exposure in the bright sunlight of thirty minutes is all that is required. As you can see, only on a very calm day is it possible to secure a landscape under these conditions, but I am still working to perfect my plan, so that in time I hope it will be practical for life subjects. To do this, I must either use a lens of greater rapidity or more highly-sensitised plates. The lens which I use is one which I had made to order, and is a very rapid one, costing me about 150 dollars, but I find that the best results are to be obtained by working with the plates rather than the lens. The plates I now use are about five times as sensitive as the ordinary plates used in photography. Some idea of this sensitiveness may be secured when I tell you an incident that occurred in taking a picture in a cave in Bermuda. In focussing for my picture there I had the owner of the cave hold a candle in front of the camera. Just before lighting my fuse, as I was about to take off the cap, I told the man to step back. He did not do so quickly enough, and I got a photograph of himself and the candle, the only light being from the candle itself.

"Of course, I use a screen, but although this process is not a secret one, I do not feel called upon at present to describe it or the development of my plate. The secret, however, of the entire process is in the emulsion on the photographic paper I use. This is my own invention, and for the present, at least, must remain a secret. It is here that I have met with some of the greatest difficulties in my work. The paper required for the emulsion should be a tough stock paper, such as is used by manufacturers of the leading photographic papers. This kind of paper is necessary, inasmuch as the process of developing and fixing is a long one, and the paper is being wet and dried by turns for over one hour. The paper is printed when damp, and the amount of changes it has to undergo is disastrous to any but the toughest kind of paper. The stock paper that I refer to is made only in Germany, and all that is sent to this country is bought and controlled by the photographic trust, so that it is impossible to obtain the stock paper until it has been treated with the emulsion of the concern which prepares the paper for the market. I have been obliged to buy this prepared paper, remove the emulsion, and then apply my own emulsion, in order to get anything approaching satisfactory results. This is both expensive and not always as conducive to the best work as I should wish, for the paper frequently becomes roughened by s omuch manipulation. It is almost impossible to secure paper that has not been treated with acids, and if these are present it spoils the work of my preparation. The emulsion that I use has to be mixed up fresh, for it has no keeping properties, so that the work on finishing pictures of this kind has to be rapidly pushed forward when begun.

"After a negative is ready for printing, about two hours' work is required before a finished picture is ready. The printing is done by dull light, and it requires a great deal of experience to tell how long a time is required for the best results. Ordinary printing frames are used, and when developed the

prints have to be dried very quickly by artificial heat. Any little variation in the smallest detail makes a great difference with the perfection of the finished picture. The cost of this work is not as much as many people will at first imagine, considering the amount of time required in making the prints. The finished pictures will cost about four or five times as much as ordinary prints, but of course are not to be compared from an artistic point of view. At present the method is only serviceable, as I said in the first part of the interview, where a long exposure can be given. It will, however, be invaluable to those who have collections of birds, minerals, or other inanimate things that they wish photographed in original colours. For instance, I can photograph a painting, and bring out the natural beauties of the original so that it will be impossible to detect the slightest variation. In this it will surpass water-colour drawings, for there it is impossible to secure a perfect reproduction of the original. One of my first undertakings in this line will be the photographing of the famous Hyatt collection of Sandwich Island sea shells. The collection was given to Harvard by the late Alpheus Hyatt, assistant professsor of archæology of Harvard University. For many years before his death, Professor Hyatt was exceedingly anxious to have a coloured reproduction of the shells for illustrating purposes. The collection was such a valuable one, costing many thousands of dollars, that Professor Hyatt did not wish to trust it in the hands of the lithographers, and it was only possible to secure any coloured pictures of the shells by transporting the collection to the studio of some such expert. The attachments used in this work and the cameras are very cumbersome, so that it was not expedient to undertake photographing the shells at the museum where they were on exhibition.

"The only other method would have been to have a water-colour artist reproduce the colourings, and then make a three-colour half-tone from that. This would have been very expensive and not entirely satisfactory, for the shells are beautifully shaded, from the most delicate pink to the brightest blue, many of the colours shading into each other in such a way as to give an iridescent effect. To obtain that effect by any coloured photographic method known, or even by water-colour, would be out of the question. I can now photograph this collection, and in the finished picture get all the colours as in the original shells. The method will also be largely used by persons owning valuable oil paintings, for the finished photograph will be as beautiful in colour as the original picture." Mr. Verrill stated that he did not intend to patent his discovery. "In the first place," said he, "the real secret of the process is in the formula of the emulsion, and if I patent that, I must make it known at the Patent Office, where it can be seen by every amateur in the country. The patent would only protect me from professionals selling the emulsion or pictures made by this process. It would not prevent amateurs making pictures for their own use, however. Again, the entire process could not be patented, for I have combined many different processes, all of which are not original, so that would prevent my patenting the entire method. For the present, both the method of taking the pictures and the formula of the emulsion I shall keep secret, although I have no fear, even if I made the formula public, and keep the latter a secret, that anyone could get any successful results. It has taken me five years to reach this stage of partial perfection, and I am confident that it would take years for anyone to arrive at anything like success with only a part knowledge of the process. Later, however, I may make the entire process public. At present there are some imperfections, aside from the long exposure required, in the process. For instance, I have not succeeded as yet in getting a satisfactory vermilion tint. As I said, the bright reds are the hardest colours to get, but I am confident that it only means a little more experimenting before I can remedy that deficiency. It must be remembered that it is only a week since I finished my first pictures, and that I have not had time since then to work out some of the weak points in the process."

THE WORK OF THE OPTICAL SOCIETY.

[Abstract of Presidents Address.]

Speaking as I do before the Optical Society, it is natural and proper that I should refer in the first place to the origin and progress of our own particular work. The advantages of association for the purpose to which I alluded just now were very fully and insistently brought before the attention of the trade; and it was, I think, on the 27th of April, 1899, that an informal meeting of some half-a-dozen gentlemen —Messrs. Aitchison, Cocks, Willmott, Purser, Sanderson, Grenier, and Salt—constituted itself as a committee, having for its object the formation of an Optical Society to promote intercourse between all sections of the optical trade—particularly from a social point of view—and to work with and not against bodies at that time existent which were particularly devoted to the settlement of educational and business questions. On the 28th day of the same month, Mr. Thornthwaite, who was at that time Master of the Spectacle Makers' Company, quite independently proposed at a meeting of the late Optical Committee that the formation of an optical society on lines which had been suggested in "The Optician" ought to be considered. Clearly the time had become ripe for the formation of a society such as this which I have the honour to address; but to the seven gentlemen I first mentioned must be accorded the credit of having initiated the scheme, and, by their energy and enthusiasm, carried it forward to a triumphant realisation. If, without drawing invidious distinction, I might be allowed to particularise two only of the founders of the Optical Society, I would name one—Mr. Wm. Salt—whose unselfish devotion during the past three years has done more than any one other agency, and perhaps more than the work of all the rest of us put together, to promote the development and welfare and honour of the society. I would name also Mr. Aitchison, to whom the society is indebted for support of very material character, and whose initiative we have to thank for some of the most important departures we have thus far made.

What are the chief things we have accomplished thus far? First and foremost, I would put (I have already put) our social organisation. The conversaziones held by this society are functions in every way quite remarkably successful, considering the yet short duration of our corporate life. The friendly intercourse that we enjoy at these social meetings must, in very many cases indeed, be attended with mutual benefit, commercially as well as otherwise. The exhibitions of instruments that we have had, I venture to characterise as among the most valuable features of these entertainments; and I hope that in future such exhibitions and demonstrations may be made a more regular and prominent feature of our social gatherings than has sometimes been the case. We cannot do better than follow the lead of the Royal Society in this matter, and it seems to me that, besides welcoming the exhibits of absolutely new inventions (which, of course, the organisers of our social meetings will always be glad to do), we must derive many advantages from the opportunity of examining the various types of ophthalmological instruments, under conditions in which there is no obligation whatever to decide whether or not any particular instrument is one that it is desirable to acquire for one's personal use. It must always be remembered that an exhibition of ophthalmological instruments is one of a highly specialised character, and not likely to appeal much to the public at large; so I believe that, if ever an important and thoroughly representative exhibition of such instruments is got together in London, it must be (as I think Dr. Walmsley before me suggested) under the auspices of the Optical Society, whose authority and influence would alone be adequate to ensure success. In the meantime, I am sure that we would all welcome demonstrations at our meetings with the various types of sight-testing appliances—just as we should welcome the accession to our library of a representative collection of trade catalogues. This brings me to another phase of the work of the society—that of the collection and collation of trade literature for the benefit of our members. I am sure that the thanks of all of us are due to Mr. Sutcliffe, our present librarian, for the valuable work that he is doing in this department. And at the same time, if our gratitude may take the classic form of "a lively expectation of favours to come," I would express the hope that, in accordance with suggestions which have been made from time to time, we may find that in the near future that the lending department of our library is in full operation, to the benefit of many, and especially of country members. This mention of our friends in the provinces leads me to express the strong sympathy that I have, and which we all feel, I am sure, with proposals for closer association of our society with the several bodies now working independently of us, but with like aims. It seems to me that a close affiliation of these local societies with our London organisation would be of enormous benefit; and I am glad to know that the Council has already given

this matter some attention. The subject of standards is one to whose importance we are all alive; and I am not tempted to say more upon the matter here than that I trust no conclusions will be arrived at by any of the sub-committees charged to make recommendations on this point, without the very fullest consideration. And I hope, I am sure, together with all present here, that when standards of calibration are eventually formulated by our society, they will be accepted and adopted by opticians generally, not only in this country, but, I venture to say, throughout the world.

Another direction in which our society is doing useful work is in the promotion and development of scientific knowledge, applied in connection with the optician's craft. Many scientific societies exist which profess this sort of thing for their sole end and aim. In our case, I am glad to say that we have other objects in view besides the cultivation of pure science; yet I think we may well pride ourselves on the high character of many of the technical papers which have been contributed to our proceedings, and on the scientific eminence of some of those lecturers we have been privileged to hear. I may say, without compliment or exaggeration, that several contributions to the proceedings of this society deserve to take rank with what is best in scientific literature. It is a natural transition from the mention of original research and invention, and methods of work in the factory or testing room, communicated through our society, to pass to the discussion of education in a broader sense—as applied in the process of "qualifying" among those of us who have already attained to man's estate, or else to preparing our youthful friends of the coming generation for those duties to which they are expected to devote themselves a little later in life. This is indeed a big question. And here again the Optical Society is fortunate in having organised a most energetic and efficient committee, to take the whole subject under consideration for the purpose of elaborate report. It is to the initiative of Mr. Aitchison that we are indebted for the constitution of this committee; but it is very largely to the activity of Mr. Angus, the hon. secretary, that we owe the gratifying progress which has been made thus far in the elaboration of that general scheme of studies which it is our object to evolve. The subject naturally divides itself, broadly speaking, under three heads. First, the education of the workman; second, that of the young optician just apprenticed, or about to be apprenticed, to our trade; third, that of the man already engaged in the business, as a merchant handling optical, photographic, electrical, nautical, philosophical, and mathematical instruments, as a photographic chemist often called on to advise his amateur customers respecting the performance of their dark room work; and last, although by no means least, as a Refractionist, on whose advice members of the public have to rely for the correction of their mechanical defects of vision, and to whose hands the execution of oculists' prescriptions is entrusted. For the education of our workmen there can be no doubt that the workshop is the proper place—it is the educational institution *par excellence;* but the extent to which it is employed for this purpose of turning apprentices into workmen having a competent all-round knowledge of their trade is, naturally, a matter of private contract between master and man; it is a matter of arrangement in which the employer is compelled to act with due regard for his own interests, present and prospective; and it is, unhappily, quite true that, under existing conditions in the manufacturing industries, circumstances often necessitate that workmen should be occupied, from the commencement until, perhaps, the end of their industrial career, in a very limited range of manual operations. Here, then, in view of this diminution in the educational facilities of our workshops, brought about by the introduction of complex machinery and the subdivision of labour in its use, we can recognise the enormous utility of such places of manual learning as is the Northampton Institute, presided over so ably by our past president, Dr. Walmesley. The technical classes held there provide a substitute for such variety in workshop experience as is not now to be gained by young men whose parents are unable to afford a substantial premium for the privilege desired. There is no doubt that, simply by bringing under the attention of the trade those special advantages which the Northampton Institute and some other institutes of the same kind offer for the instruction of young instrument makers, our Educational Committee will do a valuable work. When the intention is that a young man should apply himself, not merely to mechanical work (a certain amount of mechanical work is called for even in the retail shop, if small repairs are to be done, and slight adjustments in spectacle frames are to be executed, as they should be), but if in addition to this mechanical work the beginner intends to devote himself to the professional occupation of testing eyesight for the correction of its non-pathological defects, then a broader and higher education is, of course, called for. The professional refractionist ought to be a man of refinement and of general culture, so that he may impress his customers with a feeling of confidence in his ability. The public have to judge by superficial evidence, of course, as they know nothing of the technicalities of our science; and it is certain that they will be inclined to accord most credit for professional ability, in those quarters where the possession of a good general education is apparent. No doubt these considerations will have due weight with our committee as they formulate their scheme for the preparation of young men intending to adopt the career of an optician. Happily, the advantages of modernised technical education are not confined by any means to the coming generation. That "it is never too late to learn" is true in the most literal sense of the words; and the movement that has been on foot for some years past, having for its purpose to bring about a higher standard of knowledge and of skill among those established in the industry, has been attended with results of a most gratifying character. The impulse to this higher technical education in the matter of sight testing and so forth has come from within the body of the trade itself, although as a reflection perhaps of the tendency that has manifested itself so strongly in trade journalism during the past decade. Some of our leading opticians—I do not take the liberty to mention names here—have made a close study of the optical characteristics of the human eye for very many years past; but others there are, as I say, whose interest in the more recondite branches of the art of sight testing has only been awakened in comparatively recent times. Many of these latter must feel a real debt of gratitude towards our friends, Mr. Lionel Laurance, Mr. Sutcliffe, and others, who have devoted themselves to the exposition of the science of visual optics as it is involved in the business of a retail optician. I am sure if we have regard to some of the papers that have been read before the optical societies in this country, by men who were avowedly quite ignorant of the subject of refraction up till the recent period I speak of, we must admit that the progress made in these studies among the older members of our industry has been phenomenally rapid, and most creditable, both to our teachers of visual optics, and to the students themselves. A special faculty is called for in the work of education when undertaken with reference to matured minds, long unaccustomed to the reception of knowledge from the mere school teacher or lecturer, and I think that in this particular respect the members of our trade in this country have been most fortunate at a critical juncture in the development of events.

Speaking of the instrument-making trades, the term optician, which we apply to one employed in connection therewith, is a term that is not infrequently interpreted in too narrow and literal a sense. The optician surely is any person who is engaged in the manufacture or sale of philosophical instruments in general—not merely eye glasses and spectacles, as some purists would have us believe. There are, indeed, very few of the instruments devoted to purposes of scientific research, which do not depend very directly on some application of the laws of physical optics; and even where there is no such dependence, as in the case of many electrical appliances handled by opticians, the same sort of acquaintance with practical physics that is so useful to one dealing in telescopes, microscopes, opera glasses, spectacles, cameras, and so on, finds its application. The photographer's outfit is essentially of an optical character, since the lenses and other appliances we use in "painting by light" involve applications of all the principles that we employ in constructing the more severely optical instruments, such as opera-glasses and so forth, and even necessitate the further elaboration of these principles to a very considerable extent. There are comparatively few opticians who do not handle photographic apparatus nowadays, but this is only another way of putting the fact that to-day everybody is a photographer. The camera is omni-present, and those who, by their scientific training, are qualified to handle such instruments intelligently, and to advise their customers on the special applications and use of the various kinds of objectives, yet do not do so, sacrifice deliberately one of the most interesting and lucrative parts of the optician's trade. I think it is becoming ever more widely recognised that all kinds of instruments of measurement and observation—whether they relate primarily to optics as the field glass, or to electricity as the inductorium, or magnetism as the compass, or heat as the thermometer, to acoustics as the phonograph, to chemistry as the balance, to physiology as the sphygmometer, or to electrolysis as the galvanic cell—all these things are such as it behoves opticians to concern themselves with. For what retail (or, for that matter, what wholesale) merchant other than an optician possesses the necessary technical knowledge to fit him for adjusting or operating and explaining the various instruments in question? So wide is the scope of all that information which distinguishes those we term qualified opticians that it is hardly to be supposed this could all be attained in any reasonably short course of instruction, nor be attested by any examination for which we can fairly expect members of the trade in general to enter. We must not hope to realise the ideal as yet; we must be content with the accomplishment of those things which are feasible. And if we look to the ground covered by the spectacle makers' examination, for instance, while we regret, as I have said before, that there is no definite reference to sight testing, we should not, I think, regret the fact that only the rudiments of those sciences which it does refer to are covered by the questions set. A general knowledge of applied physics is the very best foundation on which a retail optician can build up that sound judgment (in such matters as the adapting of spectacles) which is so important for success in his career. We must not suppose that a man's judgment and skill in the affairs of his business or professional life are to be gauged absolutely by any examination. The examination may show, and ought to show, that a sufficient ground work has been laid, and that the general principles which must guide one in dealing with

the problems of refraction have been grasped; but it can scarcely demonstrate the extent to which a student is fitted, by the type and development of his own mind, to apply those principles successfully and with facility when dealing with the complex forms of ametropia met with in every day practice. Even young medical men, at the conclusion of their arduous course of studies, find themselves equipped with a theoretical rather than a practical knowledge of many such disorders as they are, later, called upon to treat. It is learning in the first place, but also experience, that makes the skilled physician; and I venture to say that the same statement may be made with reference to refractionists also. Let us seek by all means to have the principles of sight testing explicitly recognised in our examinations, but let us not be misled into supposing that to pass an examination is the chief end and aim of those studies in which young opticians are counselled to engage.

It is altogether to publicity in the discussion of these matters that we must look for the elucidation of that modus vivendi under which we can "work out the salvation" of the trade. And I am glad to say that, just at the present time, there is evidence on the part of some of our representative men of a gratifying readiness to come forward and express their views in the Press, and state arguments concerning questions of trade policy. I could wish—and I hope that I shall not be going too far in saying this much by way of criticism—that such expression of opinion or statements of fact should always be made with due regard for the solidarity of trade interests, by which I mean the close ties of a commercial nature which bind together the retail optical trade in relation to matters respecting which, the public upon the one hand, and the medical faculty on the other, have their own axes to grind. We should try by all means to discover points of unity rather than grounds of difference between ourselves, for if we fall into the natural mistake of carrying too far our expressions of dissent from this or that method used by our neighbours or competitors, we shall put weapons into the hands of those people who profess to think that spectacles and eye glasses should be sold at the lowest of store prices by every stationer, ironmonger, "et hoc genus omne"—refusing to recognise the claim of the optician to be paid on a just scale for skilled professional work. And again we shall strengthen the position of those medical gentlemen whose desire is to substitute, for such chaos in the retail optical trade as is implied by the state of things I just now mentioned, a system under which the public would seek prescriptions for spectacles only from their medical advisers, while opticians would be reduced to occupy the menial position of dispensers only. Let us be careful not to "foul our own nest," with danger of such consequences as these. For it is exceedingly clear—at any rate, it is so, to my mind—that, with a strong pull, and a pull together, retail opticians are now in the position to assert themselves and vindicate the rights of their calling with such effect as has never hitherto been possible. I have said that the trade has developed largely within the past ten years, which is a fact upon which we may all congratulate ourselves; but I would add that, in my humble opinion, the expansion of trade in the next ten years should far exceed anything hitherto attained. We have just learned that, for the future, military men are to be freely permitted to wear glasses for the correction of those visual defects from which, as we all know perfectly well, they are by no means exempt. It is a tardy response on the part of the War Office to a call which I myself gave expression to, a number of years ago, and which has been repeatedly urged on the attention of those in authority—notably, by our energetic friend, Mr. Laurance. And now that it is come, the result is bound to be a radical break down in the absurd prejudice against the wearing of glasses, with which we have had to contend for so long. The prejudice I speak of arises perhaps mainly from the fact that spectacles were at one time regarded as the escutcheon of old age. The idea has, however, lost ground very considerably, since it has become public knowledge that there are many defects of sight in which the use of spectacles is advisable and highly advantageous, even from the earliest years. But there is another deeply-rooted prejudice against spectacles, which finds expression in the idea, so long and so obstinately entertained by our military officers, that wearing glasses is in some way inconsistent with a man's efficiency in that occupation which calls for the fullest expression of all manly characteristics. And I believe that the effect of the new army order, by dispelling this misconception and demonstrating that wearers of glasses are as eligible as other people for all field sports (because even for the great field sport of war itself), will be to break down altogether the last vestiges of dislike to using glasses on the part of the young and athletic section of our population.

CHARLES HYATT WOOLF.

HACKNEY Photographic Society.—On the 22nd ult., Mr. Sims, of the Rotary Photographic Company, gave a demonstration on Rotograph bromide paper and negative paper.

THE Peerless Note Book.—A new edition of this useful little photographic pocket-book has been published by Messrs. Houghton. "It contains a quantity of information for photographers, together with an accident insurance policy and a tourists' directory of dark-rooms throughout the United Kingdom. It is obtainable of all photographic dealers."

PHOTOGRAPHY AND THE HOLY SHROUD.

[Reprinted from the "Times."]

IT is seldom that we are in a position to derive from the chemical sciences any direct evidence, whether confirmatory or destructive, with regard to the recorded facts of history. The latter lie plainly in another category, and it is to documentary testimony, to the comparative method in the various fields of its application, and to the still speaking witness of ancient monuments and inscriptions that the historian and his critics have recourse in order to attain the particular kind of truth which they pursue. Questions of historical fact, we have all been reminded, are not to be analysed and tested in the laboratory. Yet none the less, physical science does from time to time throw an astonishingly vivid light upon the indistinctness of what, measured by the uncounted æons with which she deals, is still a recent past. A very striking instance of this illuminating power has—if we are to accept the conclusions at which two distinguished French scientific men have arrived—just been afforded by the investigation which Dr. Paul Vignon, an eminent French scientist and a teacher of zoology at the Sorbonne, has been conducting with reference to the so-called "images" of the body of the dead Christ imprinted on the "Holy Shroud" that is preserved at Turin. Visitors to the cathedral of that city will recall the singular chapel which is the shrine of this relic, whose past history is lost in the mists of traditional antiquity. It is said to have been brought from the East in the fourteenth century, and in the following century it passed into the hands of the House of Savoy, and was deposited at Chambéry. Finally, it was transferred in 1578 to its present resting-place by Duke Emmanuel Philibert, who wished to spare Carlo Borromeo, the sainted Archbishop of Milan, the fatigue of a pilgrimage to its distant Savoyard shrine. The Shroud bears upon it, traced in hues of brown, what is alleged to be a double impression of the figure of Our Lord, the outlines both of the face and back of which have reproduced themselves with wonderfully distinct exactness. So seldom, however, is it exposed to view that this remarkable characteristic had almost been forgotten when, in May, 1898, some photographs specially taken of it by Signor Secondo Pia, of Turin, with the consent of its possessor, the King of Italy, once more drew attention to this strangely living likeness. Eighteen months ago these photographs came under the notice of M. Vignon, who, recognising their exceptional importance, at once began that inquiry, of which the results were made public in a paper communicated to the Académie des Sciences in Paris by M. Yves Delage, his colleague at the Sorbonne.

These results are interesting and significant in the highest degree. M. Vignon found that all descriptions and pictorial representations of the "Holy Shroud," from the mediæval period onwards, recorded the same impressions which are visible upon it to-day, but that they were frequently blurred or misunderstood, as nothing short of modern photographic process could adequately interpret them. He further satisfied himself that the portrait imprinted on the Shroud was not a copy of any known work of art, and was indeed, in its lifelike and commanding reality, one which could not be reconciled with the theories of those who, building on an ambiguous legend, asserted that it was an archaic painting of the Middle Ages, transformed by some means into the appearance of a photographic negative. He then undertook a series of researches into the conditions under which impressions analogous to those apparent on the "Holy Shroud" might be produced upon a sensitive surface by another body. These researches have been such, in his opinion, as to corroborate certain well-known details in the Gospel narrative. According to Scriptural tradition, the winding sheet in which the dead Christ was laid was steeped in oils and aloes. The effect of vapours thrown off from the dead body upon these would be, so far as M. Vignon and his *collaborateurs* have been able to ascertain by experiment, to embrown them, thus producing an "image" of the kind exhibited by the "Holy Shroud," those parts of the impression being most distinct where the body was in closest contact with the impregnated linen. And the hypothesis would account also for the peculiar colour of the imprints, which is said superficially to resemble that of dried bloodstains. As was pointed out in the interesting comments of the "Lancet" on this subject (see extract below, Eds. B.J.P.), there is nothing inherently improbable in these conclusions. A similar phenomenon may be always expected to occur in presence of an oxidising process, and such a process of chemical change is what would appear to have taken place in this instance. M. Vignon's theory is that the aloe-steeped shroud acted, so to speak, as a photographic plate, on which a faithful picture was recorded. Such an explanation seems certainly the most satisfactory method of accounting for the extraordinary way in which, we are assured, the *stigmata* of the dead Christ reappear in the impressions upon the "Holy Shroud." At all events, it brings within the bounds of scientific possibility the reproduction of those marks of wounding and flagellation which, it is declared, are imprinted with such curiously minute accuracy upon the winding-sheet. As our contemporary observes, M. Vignon's investigations give rise to scientific problems of the highest importance. They seem to indicate the possession by the human body either of radio-active properties, or, at all events, of the capacity for throwing off vapours whose emanation produces a similar effect. And

the unique significance of those events, upon our knowledge of which M. Vignon's researches bear, gives the latter an interest deeper than that of science. Whether the light which he has thrown upon them is *siccum lumen*, time alone can show.

It would be presumptuous, and indeed impossible, on our part to offer at present any opinion as to the ultimate value which may be assigned to the result of his inquiries. But it may be said without hesitation, that he has raised a question of the most absorbing interest, and that the distinguished position, both of himself and of his colleague, Professor Delage, in the scientific world of France, is such as to ensure for his conclusions the most careful and appreciative consideration from men of science everywhere, as well as from the millions of the human race whose religious emotions are centred in the divine tragedy of Calvary.

Commenting upon this subject, the "Lancet" says:—"The remarkable description which appears in our Paris notes of the photographs taken by M. Vignon and exhibited by him of the winding-sheet preserved at Turin and traditionally said to be that of Christ, seems to justify the belief that the human body is either radio-active or that it gives of "vapours," which exhibit a similar action to light upon sensitive surfaces. We have frequently recorded in our columns the fact deduced in an elaborate research by Dr. W. J. Russell, F.R.S., that almost all substances are able in the dark to act on the photographic plate and to produce a picture. The phenomenon would appear to be established always in the presence of an oxidising process, and Dr. Russell at length came to the conclusion that peroxide of hydrogen was the main factor concerned. In the case of the sheet in which tradition says that the dead Christ was wrapped, we have the analogue probably of a photographic plate or sensitised film. The cloth was impregnated with oils and aloes. It is well known that fixed oils are sensitive to oxidation, and aloes contain constituents, allied to the pyrogallic acid series, which would probably turn brown in the presence of an oxidising process. The action by which, therefore, the image of the dead Christ was recorded on the cloth would appear to be due to chemical change rather than to the effect of light. On this explanation an exact image, even to minute details, such as wounds produced by the thorns and marks of the blood drops and of flagellation by whips of a definite kind, is not by any means beyond the bounds of probability It is an intensely remarkable and interesting instance of the light which the very latest developments of scientific research may throw on traditions and controversial matters in history. We are face to face undoubtedly with a set of new phenomena, giving distinct indications of the existence of emanations hitherto not recognised from both animate and inanimate bodies. The discovery of these emanations has been due to the fact that they affect the sensitised silver film, but there is no doubt that there is a very large number of substances also which are affected in a similar way, though not to the same degree as silver in the presence of albuminous substances. Natural photographs appear on all sides, as is proved by the simple experiment of placing an opaque object on grass or on fresh gravel exposed to the light. An exact outline of the shape of the object will be found on removing it after a time. The property of radio-activity is different, the substance in this case actually emitting radiations itself. The images due to the emanation of vapour are yet another but not less interesting phenomena, as is abundantly manifested in the case of the traditional winding-sheet of Christ."

The "Standard," of Saturday, April 26th, contained the following:—"The photographs of the Holy Shroud, at Turin, which Doctor Vignon displayed to the Academy of Sciences, have been placed on public view at the offices of the 'Figaro,' where very large numbers of persons have called to inspect them With reference to this relic, the 'Matin' to-day publishes the following letter:—

"Monsieur le Directeur,—It may not be without interest, on the occasion of the learned discussion of which the Holy Shroud of Turin has been the object at the Academy of Sciences, to recall the fact that the Holy Shroud, venerated by the Catholic Church, has not existed for three centuries. We have, as an authority for this assertion, Rabelais, who tells us, in the first book of 'Gargantua,' chapter 27, that when the monk Jean des Entommeures, gave such a reception to the miscreants who were stealing the grapes from his convent, 'some dedicated themselves to Saint Jacques and the others to the Holy Shroud of Chambéry; but it was burnt three months later, so much so, that not a single shred was saved.' The indication is too precise, and too clear not to recall a historic event which is beyond question. If the Shroud of Chambéry was destroyed, that of Turin can only be of comparative moderness, for the labours of the learned professors, who, moreover, have only seen photographs of it.—Pray accept, etc., FRANK PUAUX."

ILFORD, Limited.—The directors have declared an interim dividend at the rate of 8 per cent. per annum for the half-year ended April 30th.

MR. WILFRED EMERY, manufacturer of "Apek" cameras, etc., of High Road, Cricklewood, announces a sale of hand cameras, cameras, lenses, tripods, etc., at great reductions. A four-page list will be sent free on application.

Exhibition.

WEST SURREY PHOTOGRAPHIC SOCIETY.

The fourteenth annual exhibition of the West Surrey Photographic Society, which was held at the Railway Hotel, Battersea Rise, S.W., on the 23rd to the 26th April, was distinctly creditable to the society, although the phenomenal advance of last year's exhibition was hardly maintained. We noted that about two-thirds of the whole number of pictures exhibited were printed on bromide paper—either direct prints or enlargements—and although a bromide print may be admirable in itself, a succession of bromide prints is apt to give a rather tame impression, for, naturally, there cannot possibly be the same diversity of treatment with one printing process that would be the case if the particular process were chosen most suitable for the subject. We fancy the growing popularity of bromide printing had very much to do with the want of progress shown at most of the metropolitan exhibitions this year. It is so exceedingly easy to get a passable result that there is a great temptation to avoid processes which require more care and skill in manipulation, and to rest content with results which are merely passable.

The society, however, has not done badly. Several of the architectural photographs were very good indeed, and a few of the figure studies showed good intentions, even if they were not quite successful, and a very great improvement indeed was shown in the lantern slides, which were not a strong feature in last year's exhibition. There were no classes, and the awards were of equal value. The judges, Messrs. H. Vivian Hyde, Alexander Mackie, and J. C. S. Mummery, made the following awards:—"Misty December," W. T. Marriott; "Sixty Years Ago," R. Barkell; "Springtime," J. G. Tryhorn; "North Choir Aisle, Norwich," W. G. Rowse.

New Books.

"The Lens." By Thomas Bolas, F.I.C., and George E. Brown, F.I.C. 176 pp. Price, 2s. 6d. London: Published by Dawbarn and Ward, 6, Farringdon Avenue, E.C.

This is one of the most conscientious compilations that, of late years, has been sent us for review. If anything, the authors—who are, perhaps, unnecessarily inclined to treat their subject a little too much from the standpoint of bibliography, rather than from that of photography—are too profuse in indicating their sources of references. They have, besides, a somewhat irritating knack of pulling you up now and then, and saying, in effect, "If you want to know more about this point you must refer to So-and-so's article in 'The Photogram' of so-and-so." This is the sort of thing that the class of person to whom "The Lens" is addressed will not take the trouble to do. If we know anything of the readers and students of photographic books, they are usually contented to take the accuracy of references for granted, and to rely upon the first-hand authority of the compilers. In the book before us there is too much "see 'Photogram,'" etc., and not enough of Mr. Bolas, whose knowledge and authority are excelled by few English writers. However, these things do not detract from the sterling value of a book over which we have spent some profitable hours. It is an ideal volume for the photographer, who, to an acquaintance with the practical value and peculiarities of the lens he uses, wishes to add sufficient theoretical knowledge of its principles of construction to qualify him for taking an intelligent interest in the important subject of the formation of the developable image. The authors expound their theme in simple terms. We may cite as a happy example of their powers of elucidation Chapter VII. which treats of dispersion in a clearer manner than we have seen in any other English text-book—and we have read them all, alas! The book consists of thirteen chapters and has 150 illustrations. It is full of sound and valuable information, but we think that here and there the pruning knife might have been used with advantage. De la Crouee's revolving sector on the lens hood (p. 32) is to-day of historical interest only; and there are many similar cases where the declared aim of the book "to explain the properties of the photographic lens . . . and to give instruction in its selection and proper use" has been lost sight of in the eagerness to sacrifice the purely photographic to the purely bibliographical. May we ask, too, where the British "General" Almanac is published, and who is "Dr." Goerz? These minor blemishes, however, do not appreciably minimise the excellence of a book which, in our opinion, time will show to be of more service to the student of the photographic lens than to the every-day user of that beautiful product of optical science. For the latter class the late Mr. Traill Taylor's little book, despite its many defects and omissions, is, perhaps, the best that has yet been published.

The Homeland Handbooks. London: Published by the Homeland Association for the Encouragement of Touring in Great Britain, St. Bride's House, 24, Bride Lane, Fleet Street, E.C.

We have received No. 17 of the series of Homeland Handbooks, entitled "A Guide to Epsom and the Epsom District," written and illustrated by Mr. Gordon Home, and containing an introduction by "A. R.," which has been attributed to Lord Rosebery.

The book is full of information regarding Epsom, and contains a full description of the country villages grouped around the town. There are forty illustrations, most of them from original drawings. The book is published at 1s. 6d. net, bound in cloth, with map; or 9d. net in paper cover.

"No. 17" is pleasantly written and illustrated throughout, and forms an excellent guide to one of the most charming districts near London. Author, artists, and photographers have our personal thanks, for as we turn over their interesting pages we are reminded of many pleasant jaunts, on foot, with cycle, and with camera, passed in the neighbourhood of the famous little town whence, we believe, the celebrated but nauseous salts do not emanate. We cordially recommend No. 17 of the Homeland Series to all lovers of the picturesque, and in particular to tourist photographers.

"How to Improve Bad Negatives." By Edward W. Newcomb, Editor of the "Photo-American." 65 pp. Cloth: $1.50. Published by the author, at Bible House, New York City. Sent post-paid on receipt of $1.50.

Our confrere of the "Photo-American," who is a voluminous contributor to the Trans-Atlantic photographic press, and whose writings invariably bear the stamp of practical knowledge, thus summarises the contents of the little volume before us:—

"In the book will be found a great number of simple, easily-applied remedies for all manner of bad negatives. It is not a mere compilation of time-honoured but out-of-date formulæ; it gives the best methods used in my practice to-day. By its aid anyone can readily turn very bad, unprintable negatives into really choice ones. The author speaks from long experience, and has used every method given in his book successfully and frequently."

The full scope of the book is indicated by the Contents:—"Chapter I.: Under exposure. Perfecting by bleaching and copying. Chaper II.: Under development. What it is. Tissuing. The intensity film. Intensifying. Reproducing. Chapter III.: Reduction of contrasts. Causes of contrasts. Persulphate reducer. Retarding by dabbing. Ground glass substitute. Use of tissue. Gambcge. Chapter IV.: Even reduction and dodging. Farmer's reducer. Local reduction. Etching. Blocking out. Masking. Chapter V.: Covering defects of plate or print. Spotting holes and scratches. Spotting prints. Making spotting tints. Spotting lantern slides. Titling. Chapter VI.: Miscellaneous ailments. Cracked negatives: to print. Transferring a film to new support. Cementing. Retouching. Removing stains. Removing pencil marks. Bubbles in glass. Varnishing. Rounding sharp edges. Reticulation. Rainbow streaks. Slow fixing. Clouds: to stump on. Dissolving film. Removing varnish."

The information in the book appears sound and reliable, and of a nature to be of practical service to amateur photographers.

Commercial & Legal Intelligence.

At the Marlborough Street Police Court on Wednesday last, Reuben Vernon Brooks, described as a photographer, living in Plough Road, Clapham Junction, was charged with forging and uttering a cheque for £15, and obtaining by fraud £4 10s. from Mesrs. Sands, Hunter, and Co., of Cranbourn Street, W. The prisoner, who pleaded guilty, stole the cheque from an old cheque-book belonging to the landlord of a house in which he used to lodge, and induced the prosecution firm's manager to accept it in payment for goods and hand him £4 10s., the balance, in cash. It was ascertained that the account on which it was supposed to have been drawn was closed in 1883. Mr. Denman dealt with the case as one of false pretences, and sentenced the prisoner to six months' imprisonment with hard labour.

The "Palace" Hand Cameras Prize Competition.—Messrs. Hyde and Co., 1, Palace Street, Buckingham Palace Road, London, S.W., offer the following prizes for the best photographs taken with either their "Palace" folding hand camera or their "Palace" magazine hand camera:—1st prize £20, 2nd prize £10, 3rd prize, £5, 10 prizes of £2 each, 20 prizes of £1 each, with an additional prize of £5 for the most interesting photograph of any official or public Coronation celebration at home or abroad. The competition will close September 30th, 1902, but in order to give competitors residing abroad an equal opportunity, prints will be received up to the 31st October, 1902. The judges are Mr. Thomas Bedding, F.R.P.S. (Editor of the The British Journal of Photography), and Mr. E. J. Wall, F.R.P.S. The following are the rules of the competition:—(1) The competition is open to all purchasers of our "Palace" hand cameras. (2) The photographs sent in must have been printed from negatives taken with a "Palace" hand camera. (3) All prints must be mounted. (4) The prints may be of any subject, and may be enlarged at the option of the competitor to any size, not exceeding 12 by 10 inches. (5) Not more than six prints can be submitted by any single competitor, but the prizes are awarded to single prints and not to a set. (6) Any brand of plate or any printing process may be used. (7) An entry form, which must be duly filled in, witnessed, and forwarded with the prints, accompanies every camera. (8) If desired, the original negatives must be submitted for the judges' inspection. (9) No competitor can obtain more than one prize, except in the case of the additional Coronation prize, which may be awarded to a print that has secured one of the other prizes. (10) The winning prints to become our property, and also the right to reproduce the same. Unsuccessful competitors can have their prints returned by enclosing stamps for postage. (11) All prints from competitors resident in the United Kingdom must be received by September 30th, 1902. From competitors abroad prints can be received up to October 31st, 1902. (12) No member of Messrs. Hyde and Co.'s establishment is eligible to compete. (13) The result of the competition will be published on November 20th, 1902. (14) The judges' decision is in all cases final.

At the Crewe Bankruptcy Court on Friday last, before Mr. Registrar Speakman, Thomas Mason, carrying on business at "The Crewe and District Advertising, Photographic, and Publishing Company," came up for his public examination in bankruptcy. The gross liabilities were £284 18s. 5d. (but the debtor admitted there were further liabilities to be scheduled), and the assets were £20 8s. Mr. K. S. K Feltham appeared for the debtor, and Mr. F. Kinsey for creditors In reply to Mr. T. Bullock (Official Receiver), the debtor stated that he had been in business about 12 years. He was formerly a newsagent and bookseller. Then he carried on a business as a photographer; and from 1899 until recently had been the proprietor of the "Crewe Advertiser." He admitted that he was insolvent 12 months ago, but he was hoping to pay off his liabilities. He had traded in the name of "Thomas Moore and Co.," "Crewe and District Advertising, Photographic, Publishing, etc., Company."—The Official Receiver: "Was there anyone besides yourself?"—"No."—"Then why did you adopt this grand name?"—"Well, the bigger the name the bigger the show."—(Laughter.)—The Official Receiver: "And the bigger the failure."—(Laughter.)—The debtor added that his paper did not pay because the advertisements fell off. Advertisers lost faith in his paper. He borrowed money at 10 per cent., and lent it out at 20 per cent. In cross-examination by Mr. Kinsey, however, the debtor was shown a document in which he had £25 from a private lady, agreeing to pay 20 per cent. for it. The debtor now said he really thought he was borrowing it at 10 per cent. He had lent out that money to others at interest. Mr. Kinsey said this was the money of a poor widow, whose husband, a steeplejack, was killed. This was the compensation she received for his loss.—Mr. Kinsey: "When this lady came to see you did you take her money, and say she had been sent to you by God?"—The debtor: "I might have said so."—"Did you go on your knees before her, with your hands clasped, in an attitude of expectation?"—"I might have done so."—(Laughter.)—In reply to the Official Receiver, the debtor said he owed this lady £17 10s., but he had received back his loans. The examination was adjourned for an amended account.

The seventeenth ordinary general meeting of the London Stereoscopic and Photographic Company, Limited, was held on Wednesday last week, at 106 and 108, Regent Street, W., under the presidency of Mr. R. W. Kennard.—The chairman said: "Before moving the adoption of the report which you have before you, I should like to say that the lower dividend we are this year paying is entirely due to the shrinkage of trade, owing to the long and severe strain which we, along with others, have borne through the South African War. Our chief customers are amongst the Army officers, the majority of whom have gone to the front, and in a business like ours, dealing with luxuries, such as photographs, cameras, and fancy goods, we are amongst the first to feel the effect of the financial pressure, and the decreased spending power of our customers. We have had no such period of depression since the death of the Duke of Clarence. It is to be hoped that we are now nearing the end of the war, and, in looking forward to His Majesty's Coronation, we may reasonably expect a revival of trade from the large influx of visitors, whose requirements we are preparing to meet in various directions. We have now relinquished the cycle department, which for some years has been a helpful addition to our business; but times have changed, and amongst our clients the higher-class cycle has gone out. This, however, has given us the opportunity of providing more accommodation for the most important branch of our West End business—namely, the amateur photographic apparatus department, for which a handsome new showroom is now provided, as well as a finely-equipped instruction and dark-room, fitted with the latest appliances for giving lessons in elementary and advanced photography and optical projection. In view of the visit of many thousands of amateur photographers, who will visit London for the Coronation, we have provided in the adjoining premises a new department for the rapid developing, printing, and enlarging of their negatives. With such special facilities, we are in a position to meet the great desideratum of all amateurs—namely, speedy results, and submit proofs from their negatives within 24 hours, if necessary. The further arrangement of our departments has enabled us to add a second studio, affording facilities for conducting the portrait business here, which will materially assist us. I now beg to move: 'That the directors' report and accounts be approved and adopted, and that a dividend at the rate of 2½ per cent. per annum be declared.'"—Mr. William Clarke seconded the motion, which was unanimously agreed to. Mr. Clarke proposed the re-election of the retiring director (Mr. Kennard). He referred to the energy which the chairman devoted to the interests of the company, and expressed the hope that there would be better results of the company's operations in the current year. Mr. Albert S. Hicks seconded the motion, which was agreed to. Mr. Cuthbertson moved the re-election of Messrs. W. B. Peat and Co. as auditors, which was seconded by Mr. Alfred Trieb and carried. Mr. Butler Humphreys moved a vote of thanks to the chairman and directors for their services during the past year. Having been connected with the company for 18 years, until recently, he felt he was well qualified to testify to the interest and energy which those gentlemen directed to the affairs of the company. Mr. William Stanbury seconded the motion, which was unanimously carried. The chairman thanked the shareholders for the vote they had passed. He remarked that the management had had an uphill time during the past year, but there was every reason to hope for a better state of things in the future. It was with regret that the board had accepted the resignation of Mr. Humphreys, who had rendered good service to the company in the past. The proceedings then terminated.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

May.	Name of Society.	Subject.
.....	Brentford Photographic	Oxshott and Abrook Common.
5.....	Camera Club.....	*Pekin after the Siege.* Mr. Stafford Ransome.
6.....	Camera Club.....	Ladies' Night.
6.....	Rotherham Photographic	*Hints on Hand Camera Work.* Mr. C. G. Emery.
6.....	Thornton Heath Polytechnic...	Open Night.
7.....	Edinburgh Photographic	*Difficulties of Picture-making by Photography.* Illustrated. (Short papers by various members.) Nomination of Office-bearers and Councillors.
7.....	North Middlesex Photographic	Fourth Lantern Slide Competition.
7.....	Borough Polytechnic.....	*Sanderson Camera Demonstration.* Mr. F. H. Sanderson.
7.....	Croydon Camera Club	Discussion.
8.....	Liverpool Amateur.....	Excursion to Hodnet, for Hawkstone Park. Leader, Mr. J. Sirett Brown.
8.....	Camera Club.....	Annual Dinner.
8.....	London and Provincial.....	Open Night.
9.....	West London Photographic ...	Discussion on Outdoor Work. Arrangement of Summer Programme.

THE "ADON" TELEPHOTO SYSTEM.

At the last ordinary meeting of the Royal Photographic Society the president, Mr. Thomas R. Dallmeyer, F.R.A.S., read a short paper on a new lens system (Adon) for attaining magnification of image without loss of rapidity. It was hardly necessary, he observed, to point out that the chief objection to the present telephotographic systems was the rapid diminution of the intensity of the system for increasing magnification. The initial intensity of the positive element was reduced in direct proportion to the linear magnification. The problem of obviating this defect within practical limits led to the construction of the "Adon" system. To maintain the initial intensity of the photographic lens for any degree of magnification at its focal plane, the parallel emergent pencil from the magnifying system (Adon) must be at least as large as the effective aperture of the ordinary lens system to which it is applied, and the effective aperture of the positive element of the enlarging system must be as many times greater in diameter than the emergent pencil as the degree of lineal magnification desired. To take a concrete example. Assuming that we have a lens of 5½ inches focal length, working at f/8, its effective aperture being 7-10in., in order that its intensity may be maintained at the focal plane the parallel emergent pencil from the "Adon" must be 7-10in. in diameter, and this determines the minimum diameter of negative element of the system. For a linear magnification equal to 2, the positive element of the system must be at least ½in. in diameter, and twice the focal length of the negative element. The author of the paper discusses the theoretical requirements of the "Adon" system, the optical construction of which is such as not to interfere with either the spherical or chromatic corrections of the lens to which it is applied. The "Adon" system may also be used by itself as a telephoto lens. It is expected that a practical demonstration of its capabilities will be given at some future meeting.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

April 24th.—Mr. R. P. Drage in the chair.

Mr. P. Everitt sketched and described an apparatus devised to facilitate the measuring of definite quantities of liquids from stock bottles. It consisted of an inverted measure affixed to a glass cup by its edges, the cup being supported on a tube which passed through a cork or stopper into the bottle. It is desired to take from the bottle a definite quantity of the contents, the quantity, of course, being dependent upon the size of the measure. The bottle is completely turned over; nothing runs out, but the measure fills. The bottle is then turned back and again inverted, when the measure discharges its contents through a tube or spout. As a means of measuring precise quantities of chemical solutions he thought the device was worthy of notice.

Combined Toning and Fixing.

The chairman in re-opening the discussion on this matter said that Mr. Human had advised the washing of the prints before putting them in the combined bath. That being so, the chairman felt that he must dissociate himself from Mr. Human, as he looked upon the combined bath as a time-saving formula. It seemed to him that if one had to wash his prints before using the combined bath one of the arguments in its favour was destroyed, and one might just as well revert to the separate bath method. Everybody who used the combined bath, so far as his own knowledge went, put the prints dry into the bath.

Mr. R. Beckett said he had used the combined bath for years, and as might therefore be supposed, with success. His plan was, however, to use a bath once and then discard it, or at least to add fresh solution, say, two parts of new to one part of the old bath. Undoubtedly the best way was to compose the bath so that it just sufficed for a given batch of prints. The further use of the bath was detrimental to the tones, and usually spelt improper fixing, yellowing of the whites, blotches, and fading. The combined bath seemed to him to be particularly applicable to collodion papers, where there was less likelihood of the locking up of chemicals, as was the case with gelatine papers. He made his baths for use with dry prints.

Mr. Everitt remarked that there had been complaints that collodion papers, unless fresh, did not give the best results. The collodion became horny with age, and the solutions did not so readily penetrate. Collodion papers had been condemned on that ground, and particularly in cases of the use of combined baths.

Mr. Beckett said that if a bath worked too quickly it was faulty. Ten to fifteen minutes was a good time, and prints that took that time to tone and fix would generally be all right.

The chairman said that combined baths were often sold in coloured bottles, the idea being that these were necessary for the preservation of the solution. In his experience they were unnecessary.

Mr. W. T. Wilkinson said that the chemist got coloured bottles cheaper than white ones, and he thought that this fact and the idea that coloured bottles looked more photographic than others, explained their use. He knew of no real advantage of the coloured bottle. He always made his own combined baths.

Mr. Everitt could not understand how it was that the chairman objected to the preliminary washing of the prints with combined baths. It was true that it added one more operation, but even so, the combined bath then had the advantage that it saved one operation. In the case of separate toning and fixing there was the preliminary washing, the toning, the fixing, and the final washing. In the case of the combined bath there would be the preliminary washing, the toning and fixing together, and the final washing. Mr. Everitt added that he always used the separate baths, first washing and salting the prints.

Mr. Ernest Human, who introduced this discussion two weeks ago, made some comments upon the remarks of the speakers then and now. He would guard against one of the dangers of combined baths—that of sulphur toning—by thoroughly washing the prints before treatment. This would remove any free acid in the paper, which was an element of great danger in this respect. He would then compose the bath according to the number of prints to be toned, allowing two grains of gold per sheet of paper. The bath, once used, would be put into the residue tub. The bath should be free of acid or anything, such as alum, that would render it acid. His own bath was composed of hypo, gold, ammonium, sulphocyanide, sodium, phosphate, and chalk sufficient to neutralise the whole. To guard against insufficient fixing he would follow with a five minutes' immersion in 10 per cent. hypo. Mr. Human then referred to a combined bath recommended by Mr. A. L. Henderson, in the British Journal Almanac of 1899. This was a formate bath, containing also lead, nitrate, and alum, which, in the speaker's opinion, involved the production of sulphur, which one could not be too careful to exclude. He went further, however, and said that at a moderate temperature, the print, even if not toned in three minutes, would at least be fixed. Mr. Human, however, disagreed, and said he did not think so short a time would see fixing completed. As regards the coloured bottles, he thought their use was to prevent the deposition of gold. The question of saving of time had been raised. If he were sure that any prints were not going to be permanent with five minutes' treatment he would be prepared to spend five hours to secure permanence. On the other hand, if he were sure that the shorter period was sufficient to ensure permanence, naturally he would elect to save the rest of the time. He thought, however, that with no combined bath could one be sure of a permanent result. In his experience the beginner wanted as much for his money as he could get, and he wished to reduce operations at any cost. He had been often asked how many prints a certain quantity of combined bath would tone, and if he told the truth, and specified a small number, then he was met with a statement that some other bath would last a lifetime, and cost no more. He was of opinion that, if one threw away a bath after use, and that bath were one in which no alum, no lead, and no acid was present, there was a possibility that the prints would stand The class of bath in question was, however, only just being introduced, and one could not tell whether the beginner would take it up. The safest plan was to abjure the combined bath altogether, and to use, at the cost of a little extra time and trouble, the separate bath, whose capabilities one knew.

Mr. Wilkinson said that his combined bath of hypo, sulphocyanide, chalk, and gold would not tone after the gold was exhausted. It took ten to fifteen minutes to finish the print, and he was better pleased when it took longer. He did not wash before toning.

PHOTOGRAPHIC CLUB.

April 23rd.—Mr. T. W. Derrington in the chair.

Mr. Barralet gave a description of

"Synthol,"

the new developer. It was, he said, an up-hill task nowadays to emphasise the good points of a new developer, all the present developers being so good. He was not there to urge that Synthol was the best developer in the world; its greatest feature was perhaps that it was of British manufacture and invention. As the inventor of the developer, he might add that it was quite a new compound, and, unlike the foreign developers, which were derived from coal tar, Synthol was derived from a botanical plant—a lichen, and was allied to amidol. The accelerator was sulphite of soda, which also served as preservative. Not being a photographer himself, he had been beset with many difficulties in undertaking the demonstration of the developer's capabilities. Of course, he might have exposed a plate, divided and developed it part in standard pyro and part in Synthol, taking the pyro plate out before the proper time, and leaving the Synthol plate to do its best, and then let the Synthol negative speak for itself. It had been suggested to him, however, that the Chapman-Jones Plate Tester would tell him more about a developer in three hours than pictorial slides would in as many weeks. As regards the

choice of plate, he noticed that the dealers all favoured a particular brand, from which he deduced the fact that the discount on them was very good. However, he selected a plate, and made a number of experiments, varying the constituents of the developing solution, with a view to showing the effect of different conditions, the action of bromide, of hyposulphite, etc. Twenty-one backed plates were exposed in the tester, each for one minute, at a foot from a standard Parliamentary candle. These plates were divided into three sets of seven each. Seven different developing solutions were made. The first or normal solution was composed of water 10 ounces, sulphite of soda 300 grains, synthol 30 grains, and potassium bromide 5 grains. No. 2 solution had only 75 grains of sulphite. No. 3 solution had only 1 grain of bromide. No. 4 solution had an addition of 50 grains of hyposulphite. No. 5 solution was diluted to half strength. No. 6 solution had 60 grains of Synthol. No. 7 solution had 30 grains of bromide. The plates were developed, one in each of these solutions; the first batch of seven for 50 seconds, the second batch for 100 seconds, and the third batch for 150 seconds. The interpretation of the results of these experiments Mr. Barralet left to the meeting; the negatives being projected on the screen. Mr. Barralet also showed a large number of lantern slides developed with Synthol and made from Synthol negatives. In some cases the bromide of potassium had been replaced by nitrate of potassium. The colours of the slides were very pleasing. The Watkins development factor was stated as 30 for Synthol prints on bromide paper; Velox and S.C.P. were also shown. In this case metabisulphite was introduced in the proportion of two parts to one of Synthol, the addition bringing about great improvement. The omission of the bromide allowed one to get better blacks on bromide paper.

Mr. Mackie said that the plate that had been developed with the solution containing hyposulphite had attracted his attention. The hypo seemed to have the power of much improving the gradation.

CAMERA CLUB.

April 4th.—The art of making pictures, with the living human skin as the sensitive surface, otherwise known as "tatooing," formed, last week, the subject of an interesting lecture by Mr. S. Macdonald. He spoke first of the great antiquity of this art, and of its widespread practice among nearly all nations. Its origin is indeed lost in the mists of antiquity, but there is reason to believe that it was widely known in prehistoric times, and in some countries at least was regarded as a religious rite. In New Zealand a well-tatooed face is the mark of nobility, and it is easy to understand that scars received in battle would be regarded as honourable marks, and in due time it became the custom to imitate them by artificial means. That tatooing was practised in Egypt many centuries before the Christian Era is proved by the examination of a mummy, which showed extensive ornamentation of this character over a considerable portion of the skin surface. Among certain barbarous tribes it was the custom to tatoo the forehead of a murderer—a veritable mark of Cain.

The Japanese stand ahead of all nations in the extreme beauty of their tatooing. The highest art has been expended upon this curious way of ornamenting the skin, but for some reason the practice was declared illegal many years ago. The Japanese artists employed clusters of needles in executing the work, the colours being confined to Indian ink, vermilion, and brown.

The Burmese also practice the art, but in a much coarser manner, while the long needle or spike employed is productive of great agony. A Burmese youth before coming of age has a pair of breeches tatooed on his legs, and while the operation is in progress his relations stand around and laugh at his groans. The pain is most severe, and as no antiseptics are used, the operation is not infrequently followed by death. In India very little tatooing is done, and that chiefly by women. It is quite rough, and has no claim to artistic consideration. The same may be said of Abyssinia.

In New Zealand tatooing has for years taken a very important place in the native customs, but the marks take the form of scars rather than needle pricks. The face is the principal part ornamented and after death the head of a chief thus adorned will be smoke-dried and preserved as a precious relic by his family. Several of these dried heads may be seen in the British and other museums, and at one time there was such a demand for them among European institutions of the kind that they became quite scarce. The lecturer went so far as to assert that at this time a man's head in New Zealand would form the subject of a bargain while he was yet alive, and when that bargain was concluded he was killed, and his head smoked for export in the most callous manner. The tatooing in New Zealand is performed with a piece of sharpened bone, which is driven into the flesh by means of a small mallet. The operation is often followed by inflammation of the eyes, which causes temporary blindness, and a closing of the mouth, which renders the administration of food difficult. The present value of a well tatooed and smoked head is about fifty pounds sterling.

The rest of Mr. Macdonald's lecture dealt with modern tatooing as practised by him, for he has, since he left the Army, taken up this work as a profession. Instead of using needles, he employs an electric piercer, which gives little or no pain, for the skin is first of all treated with a local anæsthetic—cocaine. He uses several colours, and showed many excellent specimens of his work, being photographs from life of various clients who bore on arm, leg, breast, or back, the representation of dragons, serpents, and other fearful wild fowl. Unfortunately these lantern slides were in monochrome, and were not of the best quality. It would surely be worth while to repeat them, if the subjects are available, in the three-colour process, for such pictures, the first of their kind, would be most interesting.

The lecturer alluded to the fact that deserters from the Army were at one time marked with distinguishing letters, and several of these men had come to him to have the tell-tale indications obliterated. It is possible to eradicate such marks when they are small, but when large they are best hidden by effacing them with a more elaborate design. Lord Roberts, long ago, suggested that soldiers should be tatooed with a crown or regimental crest, as a mark of honour, and his own son, killed in South Africa, was so tatooed by Mr. Macdonald. Tatooing on one occasion saved an officer's life. During the Matabele War this officer had the misfortune to fall into the hands of the enemy, and they discovered on his breast an enormous, and very terrible-looking tatooed dragon. Upon asking the meaning of this, the officer told them that the dragon was his own private devil, and that if they killed him they would be haunted by it all their lives. They did not half believe this story, but thought that there might be something in it, and spared his life.

Many interesting anecdotes were interspersed in this very interesting lecture, and when Mr. C. H. Bothamley, the chairman, moved the usual vote of thanks, there was much applause.

PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

A meeting of the P.P.A. Edinburgh Branch was held at 38, Castle Street, on Friday, April 18th, 1902. Mr. W. Crooke occupied the chair. There was a good attendance.

The following subjects were discussed:—

(1) Fire Insurance Rates.
(2) The Apprentice System in Studios.
(3) The Amendment of Copyright Act.
(4) The P.P.A.'s Position towards the Photographers' Copyright Union.

Fire Insurance.

Rates were compared, and they were found to range between 3s. 7d. and 5s. 1d. per cent. The lowest rate being for a studio in the suburbs. The general rate was 4s. 6d. to 5s. per cent. The conclusion come to by the meeting was that it should do everything in its power to back up the London Association in their endeavour to secure more favourable rates all round.

The Apprentice System in Studios.

Three members were in favour of charging a premium and giving a small salary. On a vote being taken, the majority decided in favour of non-premium apprentices.

The Amendment of the Copyright Act.

After discussing the above, the meeting came to the conclusion that photographers should have a copyright in every negative they take as regards the Illustrated Press.

The P.P.A.'s Position to the Photographic Copyright Union.

The chairman urged all who are interested in copyright photographs to be members of the Copyright Union. He was of opinion that it should be developed into a very much larger body than it was at present, and not left to a few, who are naturally inclined to look after their own interests.

The meeting came to the conclusion that it was the duty of every photographer to join the Copyright Union, and help to look after the new Bill which is now in course of preparation by Lord Monkswell. This was carried unanimously.

LONGTON AND DISTRICT PHOTOGRAPHIC SOCIETY.

The following are extracts from the 8th annual report:—The first meeting of the session was a demonstration of the platinotype process by the Rev. C. F. L. Barnwell, and those who were fortunate enough to be present will, I think, bear me out when I say it was one of the most lucid, complete, and successful demonstrations ever given before our members, and Mr. Barnwell richly merited the warm vote of thanks accorded him. The subject of opening meeting of the winter session was the technical lantern lecture by G. P. Goerz, entitled "How a Lens is Made," and considering the nature of the subject, was well received. Following this, we had a capital demonstration by Mr. W. D. Welford on "Pictorial and Technical Photography," at which many new and useful hints were given, and specimens of work done on Warwick plates, and lantern slides, and Austin Edward's films were exhibited. We now come to a more recent event, or rather the event of the year, viz., the splendid lecture delivered in the Town Hall by Mr. R. Child Bayley, F.R.P.S., Editor of "Photography," entitled "A Trip to the Alhambra with a Hand Camera," at which a collection was taken up on behalf of the local Patriotic Fund. The total proceeds of £12 were handed to the Ex-Mayor (treasurer of the fund), same night. Mr. Bayley so fully sympathised with the object for which the collection was made, that he absolutely refused to accept any payment whatever, not even permitting us to refund him his hotel expenses or train fare, therefore a sum about equivalent to his out-of-pocket expenses were included in the collection named as a donation from the Longton and District Photographic Society. Needless to say, Mr. Bayley was heartily thanked for his lecture and generosity, the vote being carried with acclamation, and a unanimous invitation for another lecture given on the spot to, and accepted by, Mr. Bayley, thoroughly delighted the 500 people present. The thanks of the society are also due and hereby tendered to Messrs. Hawley, Brough, Webberley, and Bloor, for so willingly supplying the musical portion of the evening's entertainment, and also to Mr. E. H. Bloor for the use of a piano free of charge. The last meeting of the session was another admirable lantern lecture by Mr. F. O. Bynoe, entitled "Photographic Facts." This was a very racy, instructive, and entertaining

lecture, interesting to everybody alike, being well illustrated with a splendid selection of lantern slides and a number of elaborate diagrams, which had been prepared specially for the lecture. Locally, at the present time, we hear on every side the pros and cons of the federation question. One of the reasons assigned why the federation should take place is that to be united in one authority would effect a great saving in administration, together with increased efficiency, influence, and importance. Now, fully believing in this aspect of the question, I venture to think the same principle applied to the pursuit of photography in this district would be to the mutual advantage of photographers in general. It is sometimes helpful for the future to have a view of the past, and in glancing back over the eight years of our society's existence, I find much to encourage us. We commenced in 1894 with 14 members, and at the close of the year we had 18 on the books. During the second year we increased to 31, the third year to 45, the fourth year to 47, the fifth year to 50, the sixth year to 56, the seventh year to 76, and to-day at the close of the eighth and the beginning of the ninth year we have a total of 95, and here I should just like to remind you that during the past year two other societies have been formed in the district, and being uncertain to what extent this would affect us, it was thought desirable in arranging last year's programme for once in a way to make a little change from the usual subjects and substitute some popular lantern lectures, such as would be of interest to the increasing number of non-photographic members, and to which friends could be invited. The result of this policy speaks for itself, for in face of disappointments, much inconvenience, and influences which have not been in our favour, we have actually passed the high-water mark of last year, and in addition, at our last committee meeting no fewer than 17 members were elected (including the mayor, ex-mayor, magistrates, councillor, doctors, solicitor, etc.), and I have since had other names sent to me to be submitted at the next committee meeting. This is the largest increase at one time since the formation of the society, therefore the outlook is most hopeful, and if members who sometimes may not see eye to eye, nor approve of every little detail, would only be generous enough to give credit for honesty of intention, and kindly acquaint any official with what they may consider wrong, and thus give the committee an opportunity of investigating the complaint, it would help to make pleasant what is at times a rather irksome duty.

MARPLE AND DISTRICT PHOTOGRAPHIC SOCIETY.

On Thursday week Mr. C. Taylor, the secretary, delivered to the members a short lecture, entitled "Elements of the Pictorial." He based his main argument upon the idea that fundamentally pictures were a form of human expression; he followed a close analogy between pictorial art and literature, the rules of pictorial composition being the grammar of the former, the analysis of that which had pleased humanity in the past. Photographs which had pictorial quality could not be produced by rules alone, it was necessary to study the public picture galleries and the best of contemporary illustrations in the magazines and other periodical publications, and thus to become familiar with a good standard both of style and subject. He mentioned the limitations of photography as a monochrome medium for the expression of thought and feeling, but claimed for it two qualities in which it was unrivalled, viz., in the representation of the most delicate gradations of light and shade, and in the rendering of textures.

Mr. Taylor illustrated many of his points by means of prints, which he had selected for the purpose.

NEWCASTLE-ON-TYNE AND NORTHERN COUNTIES PHOTOGRAPHIC ASSOCIATION.

At the last meeting, Mr. Walter Scott gave a lecture demonstration on platinotype printing. Mr. Scott described the whole process and illustrated his remarks by practical application, and allowing some of his audience to develop prints themselves, which were kindly supplied by the Platinotype Company. To keep the paper dry he places celluloid on the printing frame. Samples of prints and paper were supplied by various makers of platinum paper. At the conclusion of the lecture, Mr. Scott handed round some samples of his own work, which for artistic merit and technical excellence have seldom if ever been surpassed. An interesting discussion followed, in which several prominent platinotype printers took part, including Mr. Walter Corder, J.P., and Mr. Wm. Parry.

LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

This society held its fortnightly half-day excursion on Saturday. A party of about 30 members and friends (including some members of the Widnes Society), journeyed to Bidston, under the leadership of Mr. E. Simnett, the hon. secretary. A good deal of work was done in the woods, and also at the Old Hall, where a professional model was posed, thus enabling members to obtain some good figure studies on the terrace. After the photographic work was done an adjournment was made to the Old Hall for tea. The weather was fine, though rather too windy for the woodland studies.

NORTH MIDDLESEX PHOTOGRAPHIC SOCIETY.

April 23rd.—Mr. E. Marriage lectured on "Telephotography from a Pictorial Point of View."

The lecturer showed slides of scenes from the same standpoint, taken with a lens of moderate focus, and with a telephotographic lens; also architectural subjects and portraits. He claimed that the more proportionate size of, say, a horse and cart, as given by a more distant standpoint, rendered necessary by the use of this lens, gave a more artistic rendering of the subject.

In the discussion which took place, Mr. Mummery and others said that many of the views shown suffered from a want of foreground, which was fatal to pictorial effect. They thought it very useful for architectural work and subjects of a special nature.

Mr. MacIntosh thought that by the use of a screen the want of a foreground could be got over, by the screen cutting the haze, always present to a certain extent, and thus bringing into prominence some object in the middle distance which would serve the same purpose.

CROYDON CAMERA CLUB.

The president addressed the club on "Photographic Recording" on Wednesday, 23rd ult., and also read a short paper, specially written for the meeting, by Mr. George Scamell, hon. sec. of the National Photographic Record Association.

Mr. Hector Maclean explained to his hearers that in a more or less fitful fashion the club had for a long time past encouraged the obtaining of photographic records of local objects, etc. Last autumn he conferred with Mr. Jast, who asked him to interest the club in the recording of Croydon scenes, and in presenting suitable prints to the Croydon Library. He then promised Mr. Jast that he would in the spring of the present year bring forward propositions which he hoped the club would support. It was in fulfilment of this promise that he addressed them that night on the subject. Since his interviews with Mr. Jast they were, no doubt, all aware that Mr. H. D. Gower had brought forward certain suggestions with the aim of forming a county survey. This would, no doubt, claim their individual support, and perhaps also the club's support, should the proposed association come into existence. But having regard to the arrangements entered into before the announcement of the proposed county survey, and bearing in mind that probably the largest collection of interesting photographs of bygone Croydon are in the hands of members of this club, he should ask them to instruct their Council to prepare a detailed scheme inviting members of the club to send in for exhibition a collection of interesting topographical prints illustrating the borough of Croydon, such prints to be at the disposal of the club to present to any public body which it may in due course find best. This proposal, after careful debate, was adopted substantially as set forth. The club also selected Messrs. Salt and Wratten as delegates to attend the photographic survey meeting. The paper by Mr. Scamell proved, with its exhibits, both informative and interesting. Rules for methodical recording were read and discussed, and the points to aim at laid down. A useful cardboard folding scale was shown, which gives clear indication of the sizes of such objects as would otherwise not be easily measurable. The National Record pattern mount was shown, but members disapproved of it. Plain cartridge paper mounts were considered preferable. Mr. Rogers, however, objected to white mounts. Mr. W. H. Smith objected to any mount at all. Negatives should, he considered, be printed with a white margin, preferably on parchment paper, coated with his platinotype emulsion. A number of deeply interesting examples of historical houses, mainly London ones, were shown. Thus the wide old staircase of the Chelsea mansion, up which Charles II. rode his pony one day when he called on Nell Gwynne, was one. Rossetti's house and the little shanty in which Turner hid himself for some years were also shown, and Canonbury Tower, in one of the rooms of which Goldsmith finished "The Vicar," and from whence Dr. Johnson fetching the MSS., obtained its acceptance from the publishers. At the instance of Mr. W. H. Rogers, seconded by Mr. W. H. Smith, hearty votes of thanks were accorded to Mr. George Scamell and Mr. Hector Maclean. Councillor Noaks showed some interesting photographs of the lunar eclipse of Tuesday evening.

Alleged Extensive Frauds by a Photographer.—At the Wood Green Police Court, on Friday last, Stuart Robinson, 50, photographer, of 114, Morley Avenue, Wood Green, was charged, on remand, with obtaining by false pretences the following:—£3 from the proprietors of the Jolly Butchers; £61 5s. from William George Cornish, of Grand Parade, Harringay; £3 17s. 9d. and a silver watch value £ 1s. from George Snell, of 129, Tottenham Court Road; and £2 from Arthur George Cornell, of 156, High Road, Wood Green. The evidence of Joseph Webster, of the Joily Butchers, was to the effect that on February 15th prisoner brought a cheque purporting to have been drawn by "Florence Marshall" for £8 7s. on the Shaftesbury Avenue Branch of the London City and Midland Bank. Witness consented to pass it through his bank, and he advanced prisoner £3 on the amount. Subsequently the cheque was returned dishonoured. George Snell said the prisoner came to him on the 7th inst, and asked for the loan of 10s., saying that his business place was closed. On the 12th inst. the prisoner called again about one o'clock, and selected a silver watch, for which he tendered a cheque for £5 18s. 9d. Witness accepted the cheque, which was returned from the bank marked "No account." Arthur Cornell said the prisoner called at his grocery stores and bought goods to the extent of 15s. on Saturday, February 15th. Witness knew him as a customer, and had lent him 5s. the previous week. Prisoner now presented a cheque for £3 in the name of "A. Maynard." The cheque was accepted, and witness gave prisoner £2. It was returned dishonoured. Harry Walter Nix, manager at the Shaftesbury Avenue Branch, deposed that there was no account at his bank. The cheques were taken from the books of a former depositor named Harriet Lindley. It was stated that perhaps no fewer than thirty-three charges of a similar nature would be brought against the prisoner, including that of Mr. Cornell. The prisoner was remanded in custody.

Patent News.

THE following abridged description is specially drawn for the BRITISH JOURNAL OF PHOTOGRAPHY, by Messrs. Hughes and Young, patent agents, 55 and 56, Chancery Lane, London, W.C., who will give advice and assistance free to our readers on all patent matters:—

PATENT APPLICATIONS.—No. 8,770.—John Airs, Chancery Lane. "Improvements in photographic cameras."

No. 8,771.—Leonard Kingwell Job, Chancery Lane. "Improvements in or relating to the packing and manipulation of photographic plates and cut films or sheets."

No. 8,806.—David Henderson Houston, Chancery Lane. "Improvements in panoramic photographic cameras."

No. 8,807.—David Henderson Houston. "Improvements in panoramic photographic cameras."

No. 9,015.—Alfred William Stainton Sanderson and George Bagnall Bradshaw, 6, Bank Street, Manchester. "Improvements in apparatus for printing photographs, and other purposes."

No. 9,045.—Henry Barby, Chancery Lane. "Improvements in photographic shutters."

No. 9,146.—Andrew Ovens, 1, King's Cross Road. "An improved apparatus for the development and fixing of photographic negatives."

PATENTS ILLUSTRATED.—No. 7.—Photography.—Patentee: J. C. Harrison, The Poplars, Bowness-on-Windermere. Washing.

Relates to an apparatus for washing photographic prints and like articles. The prints are placed in a cage with openwork sides. Both sides of the prints are sprayed by jets from perforated pipes. The waste water flows out of the casing by an opening falling on to the buckets of a water-wheel, which rotates the cage on its axis by means of a belt and pulleys. Modified forms are described in which the cage is supported on rollers, and is open at both ends, or in which the cage is mounted on a vertical axis.

No. 114.—Photography.—Patentee: F. H. Sanderson, 17, Chesterton Road, Cambridge. Cameras.

Relates to a device for setting the front of a camera to any desired angle, and is an improvement on the invention described in specification No. 613, A.D. 1895. The front is supported at each side by a pair of slotted links pivoted to the slide. Pins with clamping-screws serve as trunnions for the front, which can thus be rotated through any required angle on a horizontal axis. To retain the front in a vertical position, the slots of the links are set to coincide, and spring bolts on the lower part of the front are sprung into the slots.

No. 297.—Photography.—Patentee: C. H. Watson, High Holborn. Cameras; enlarging.

Relates to an attachment to be fitted to a hand camera, as the Kodak, to adapt it for enlarging negatives. The attachment consists of a conical box fitted on the lens end of the Kodak camera. The paper is placed in the bottom of the detachable box and covered with a plate of glass. The negative is placed in a somewhat similar holder with glass on both sides (if it is a film negative).

News and Notes.

THE Flame Arc Lamp.—The following particulars of this lamp have been supplied to us by the Union Electric Company, Ltd., of 151, Queen Victoria Street, London, E.C.:—

The results of some tests upon the lamp, compared with an open arc lamp, and the comparison with an arc lamp of the enclosed type, are stated to be:—

Direct Current, Candle Power, mean (lower) hemispherical.

Flame Lamp.			Open Arc Lamp.			Enclosed Arc Lamp.			
Watts.	C.P.		Watts.	C.P.		Watts.	C.P.		
300	1,320	.....	287	610	.....	300	330	}	Inner
387	1,700	.....	400	895	.....	400	520	}	Cylinder
515	2,125	.....	503	1,365	.....	510	710	}	only.

Ratio in Candle Power of Flame to Enclosed Arc Lamp.

Watts.		Flame.		Enclosed.
300–300	.....	4	.....	1
387–400	.....	3·28	.....	1
515–510	.....	3	.....	1

The special features of the arc are its extraordinary length and its position in what may be regarded as a miniature reverberatory furnace, by which the temperature is maintained at a high value and the carbon vapour prevented from cooling. At the same time the "furnace" forms a reflector, which throws down a large proportion of light which would otherwise be expended above the horizontal plane through the arc, and therefore would, in most cases, be wasted. A curious phenomenon in this lamp is the fact that a crater is formed in the negative as well as in the positive carbon; in consequence of this, practically the whole of the globe surrounding the arc is brightly illuminated, and as the carbons are provided with cores containing certain salts, the light is of a pleasant yellowish-white quality. The small fire-clay cap or reflector, which is an important feature of the lamp, is fixed to a cross-bar, and has through it a hole but slightly larger in diameter than the upper carbon, the object of this being to enable a smaller carbon to be burnt. A secondary object is to obtain improved light-giving power by throwing the rays in a downward and horizontal direction, this effect being greatly assisted by the brilliant white powder formed in the burning of the special carbons. This lamp, like all others of the same manufacture, is constructed so that the lamp-rods and base-plate are securely insulated from the circuit by means of mica, and is additionally insulated by means of a porcelain ring, by which it is suspended.

LADY Photographer Sent to Gaol.—Isabella Fielding was again charged at the West London Police Court with obtaining money by pretending to take photographs of persons at the house where she carried on business in Hammersmith Road. The prisoner pleaded guilty, and was sentenced to three months' imprisonment.

LAST week a curious and an interesting case was heard in the Paris law courts. Briefly the question at issue was this—How far can a pupil imitate the work of his master without rendering himself liable at law? The story told was curious. M. Lagarde, an employee of the P.-L.-M. Railway Company, having a talent for art, spent his spare time painting pictures. Forming an acquaintance with the late M. Trouillebert, the well-known landscape painter, M. Lagarde became a faithful pupil, the master giving him every encouragement and teaching him his methods. So apt a disciple did M. Lagarde become that his work was mistaken for that of M. Trouillebert, and was praised in the newspapers and purchased by dealers. After the master's death his widow charged the railway official with forging her husband's pictures. Counsel for defence in his argument said "everything was in the intention." In order to make out an offence it was necessary to prove, not only that an imitation had been executed, but that the execution revealed a fraudulent intention, notably the desire to create in the mind of the public a confusion between the copy and the original. The law recognised as forgers those who signed their copies with the name or monogram of the master copied, or who traced or photographed their models. If the imitator employed none of these methods then he was not culpable. To punish such a man as a forger would be to discourage all beginners and render impossible all artistic study. The judge concurred with the advocate, and found that M. Lagarde had not been guilty of counterfeiting the landscapes of M. Trouillebert.—"The Morning Post."

"THE Watkins Manual of Exposure and Development," by Mr. Alfred Watkins, president of the Herefordshire Photographic Society, is in the Press. It will be published at Hereford, by The Watkins Meter Company, and in London by Messrs. George Houghton and Sons, 88, High Holborn. The publishers' note states that: "This will be the standard text-book of those time methods which have so largely influenced practical photography during the past few years. It is also designed to serve as a beginner's hand-book for those who have absolutely no knowledge of photography, and in the three important questions—How long to expose—How long to develop—How long (or how much) to tone. The plans given impart definite instruction, without need to add vague and helpless references to 'judgment' and 'brains.' The chapter on toning with gold and platinum imparts a method (not previously published) invaluable to beginners, which will prevent double or imperfect toning, and avoid waste. The following are the contents:—Outline for Beginners. Beginners' Chapter: The Plate; apparatus; what to buy; lens; camera; stand; plates; dark-room; a lesson with the camera; filling the dark slides. Exposure.—The Problem: The eye and the plate; limits of the plate; latitude of plate. Exposure Considerations: What influences exposure; light; clouds and atmosphere; physical obstructions; how to allow for light; speed of plate; diaphragm; calculating an exposure; variation for special subjects; selecting the meter. Practical Exposure: Distance of subject; shading in exposure; interior photography; portraits; copying; daylight enlarging; photographing small objects; artificial light; estimating density of negatives; simplification of enlarging methods; the test box plan; trial and error. Hand Camera Work: Table of minimum light; holding a hand camera; selection of plate; shutter speeds. Calculating Pinhole Exposures; To make a pinhole camera; colour plates and colour screens; artistic selection of subject; night scenes. Development.—The Mental Picture: Stages of contrast; a question of contrast; limits of contrast rule; fog; where developers vary; formulæ; when to stop development; the Eikronometer method. Practical Development: Washing the plate; drying the plate; the multiplying factor; what alters the factor; treatment for exposure; variations; the Eikronometer; the Sextuple method; development without dark-room light; exhausting a developer; film development; local development; temperature; heated development for under exposure; betwixt two stools; rocking the dish; halation. Intensification and Reduction: Judging over and under exposure; defects and their remedies. Constituents of the Developer: Alkali; sulphite; bromides; calculating factor with bromide. Stale Plates: Factor variations; summary. Printing and Toning,—P.O.P.—Gold toning; platinum toning. Appendix:—Standards of speed; the commercial difficulty; Watkins and Wynne standards; objections to actinometers; time development for bromide paper; time development for lantern slides."

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

THE BARBICAN FIRE.

To the Editors.

Gentlemen,—May I ask you to have the courtesy to inform your readers that I have secured new offices and warehouses at 33 and 34, Shoe Lane, E.C., as my old premises—2, New Zealand Avenue, E.C.—were entirely destroyed by the recent great fire in Barbican.—Thanking you in anticipation, I am, dear sir, yours faithfluly,

ALBERT HILDESHEIMER.

33 and 34, Shoe Lane, London, E.C.
April 24th, 1902.

COPYRIGHT IN ROYAL PHOTOGRAPHS.

To the Editors.

Gentlemen,—Many of your readers must have noticed with interest that at the last meeting of the Photographic Club the question of ownership of copyright of photographs of Royalty was discussed. Unfortunately, no member appeared to be in a position to give an authoritative reply to the questions asked. It is, of course, well known that photographs of members of the Royal Family have sold in large quantities, and one may assume that the reputation of the photographer, at any rate, in the commercial sense, is made after photographing a prominent member of the Royal Family. The question arises, if the photographer claims copyright in the photographs, as he no doubt does, what constitutes the "valuable consideration?" It is, of course, the personality of the sitter which primarily affects the sales of such photographs, and gives them their commercial value. The writer has always been of the opinion that, in respect of photographs of members of the Royal Family, a percentage of the profits, which are no doubt considerable, might very well be given to some charity, the Hospital Fund, for instance, in which His Majesty is particularly interested. This deduction might constitute the "valuable consideration" referred to in the Act.—Yours faithfully,

J. A. REID.

Bedford
April 26th, 1902.

THE CALIFORNIA CAMERA CLUB.

To the Editors.

Gentlemen,—Enclosed herewith it gives me pleasure to hand you a slip, showing the newly-elected officers of the California Camera Club, which, in spite of our great distance, I trust may be of some interest to you. It will afford me pleasure at any time to correspond with you regarding photographic matters from this end of the world.—Yours very truly,

CHARLES A. GOE,
Corresponding Secretary.

San Francisco, California.
April 11th, 1902.

President, W. B. Webster. First vice-president, H. B. Hosmer. Second vice-president, J. J. Lerman. Secretary, W. E. Palmer. Treasurer, E. G. Eisen. Librarian, I. O. Crosscup. Corresponding secretary, C. A. Goe. Directors, G. Knight White, F. C. Bangs, J. R. Gwynn, and H. L. Byrne.

RAILWAY RATES AND CHARGES.

To the Editors.

Gentlemen,—We have read with interest your articles on "Railway Rates and Charges," in recent issues of your Journal, and are in the main in agreement with your statements. We must, however, take exception to a sentence on page 325, of the issue of the 25th inst., which reads as follows:—"If he has his mounts invoiced as rough cardboard it will cost only about half the rates for 'mounts.'" We need hardly say that our experience in the despatch of photographic mounts is considerable, and in the light of such experience we consider the above statement very misleading. The railway companies, in the plenitude of their power, have laid it down that photographic mounts are not admissible as "cardboard," and if so declared, the declaration is false, and the sender is liable to have his goods stopped and highest rates enforced. The result of persistent false declarations lays the sender open to great inconveniences in the despatch of his goods, and, in the last resort, to a fine. We may add that some few years back we had a meeting with representatives of the leading railway companies, with a view to obtain more favourable rates on photographic goods for ourselves and customers. We must say they met us fairly, although the present state of things still leaves room for further amelioration.—We are, Gentlemen, yours faithfully,

MARION AND CO., LIMITED.

22 and 23, Soho Square, London, W.
April 28th, 1902.

PHOTOGRAPHY IN THE WAR DEPARTMENT.

To the Editors.

Gentlemen,—In your issue of the 17th inst. there is an account of a lecture by Captain Wheeler, at the Camera Club, in which he referred to the assistance that might be derived by the War Department from the use of photography in their Intelligence Division.

We should like to point out that we have recently supplied a complete photographic equipment for plates 20 by 16 and under, to the Intelligence Division of the War Office at Winchester House, St. James Square, and including all the necessary electric installation for lighting and motive purposes.

The apparatus has been installed under the immediate supervision of Major Hills, R.E., Director of Military Intelligence, and the work now being done there, we do not doubt, will compare favourably with that turned out by any other photographic establishment, everything being of the latest and most approved design.

We should be glad if you would kindly insert this in your next issue, and we remain, dear Sirs, yours faithfully,

W. WATSON AND SONS.

313, High Holborn, London, W.C.
April 29th, 1902.

VIOLET TONES ON COLLODIO-CHLORIDE.

To the Editors.

Gentlemen,—I noticed a query in your Correspondence Column, re "Violet Tones," and am sending in herewith a photo on collodio-chloride so toned. Sarony makes a speciality of them. The formula used is: 15 grains gold to 7 oz. water, stock solution.

TONING SOLUTION.

	oz.
Water	9
Gold stock solution	2½
Hydrochloric acid	3

Print, or rather over-print, till quite bronzed, wash, as usual, and take out of toning when the desired colour is obtained.

LEWIS P. MUIRHEAD.

Albany Chambers, Charing Cross, Glasgow.

"THE TYMA."

To the Editors.

Gentlemen,—We beg to inform you that we have arranged with Mr. Reichert to give demonstrations of the Tyma Trough (for the development, washing, and fixing of rollable films), at the address below, each Monday, Wednesday, and Friday, from 1.30 to 3.30.

Mr. Reichert will be glad if photographers will bring their own exposed spools, which he will be pleased to develop before them free of charge.—Yours truly,

G. HOUGHTON AND SON.

88 and 89, High Holborn, and Dean Street, London, W.C.
April 28th, 1902.

THE LATE ROGER FENTON'S PHOTOGRAPHS.

To the Editors.

Gentlemen,—With reference to the comments made by "Free Lance," in last week's issue of the BRITISH JOURNAL OF PHOTOGRAPHY, it may be of interest to state that there exists in the library of the Royal Photographic Society, an album of "Views, taken in the Crimea, during the spring and autumn of 1855, by Roger Fenton."

This album was published by Messrs. T. and A. Agnew, Manchester, 1859. One photograph, "The Valley of the Shadow of Death," depicts the historic valley thickly strewn with round shot.—Yours faithfully,

ERNEST C. FINCHAM.

36, Addison Road, Kensington, W.
April 28th, 1902.

*** NOTICE TO ADVERTISERS.—*A Revised Tariff for advertisements in the* JOURNAL *is now in force. Blocks and copy are received subject to the approval of the Publishers, and advertisements are inserted absolutely without condition, expressed or implied as to what appears in the text portion of the paper.*

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY, 24, *Wellington-street, Strand, London, W.C.*" *Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

PHOTOGRAPHS REGISTERED :—

J. B. Young, Wellington Street, Ballymena. *Photograph of the Rev. J. Anderson.*
T. E. Innes, 108, Wellington Road, Heaton Chapel. *Two photographs of the Rev. W. Simister.*
F. Ward, 22, Museum Street, Ipswich. *Photograph of three pike. Photograph of young pike.*
J. Dickinson, Brighton House, Newcastle-on-Tyne. *Photograph of J. Oliver.*
Miss M. Shelley, Avington, Alresford, Hants. *Photograph entitled "The Evening of Life." Photograph entitled "Reflections."*
W. G. Honey, 102, Patrick Street, Cork. *Two photographs of the Executive Committee of the Cork Exhibition.*

ERRATUM.—In our last issue, page 323, seventh line from bottom of second column, for "30,000" read 300.

DRY PLATES.—We have no knowledge of the matter, although it has long been the subject of general rumour.

COPYRIGHT IN OLD ENGRAVING.—T. TOMLINSON says: "A friend of mine has an engraving of old London Bridge, more than a century old, which he will lend me to copy. I should like to make some lantern slides of it, many of which I could sell. Should I be infringing any copyright in doing so?"—In reply: No, as the print is so old there can now be no copyright in it.

"THE BROMIDE MONTHLY."—H. J. LEWIS writes: "In a late issue of yours you make mention of the publication of a new journal or periodical called "Bromides," I believe. Not having a copy by me, could you kindly assist me by naming the publishers, as I wish to subscribe?"—In reply: "The Bromide Monthly" is published by the Rotary Photographic Company, 14, New Union Street, Moorfields, E.C.

COPYRIGHT QUERY.—"COPYRIGHT" says: "I hold the copyright of negatives of an old document, but the negatives are scratched, so I have got permission and made fresh ones from same document. Shall I have to make these fresh negatives copyright, or does the former registration cover? —In reply: As fresh copies have to be made, the copyright in them should be registered. The copyright in the old ones will not cover that in the new ones.

LENS FOR STUDIO WORK.—"BURTON" writes: "Can you kindly recommend a good cheap lens for studio work, similar to Dallmeyer's 3B?"—In reply: So far as we are aware, there is no lens on the market similar to Dallmeyer's No. 3B Patent; that is, with the diffusion of focus arangement. Lenses of similar foci and aperture are supplied by other makers. Better get their catalogues, as it is against our rule to recommend any particular maker's goods.

REPAIRING A SINK.—"SINK" writes: "Can you tell me how to practically make a leaky, but otherwise very good, wooden sink watertight?"—In reply: The only way we can suggest is to fill up the cracks with pitch or marine glue. Probably the best thing to do will be to coat the whole of the inside with pitch, to which a little tallow has been added when it is melted. The tallow should be well mixed with the pitch.

DISCOLOURED NITRATE OF SILVER.—A. MCKENSIE says: "Amongst a lot of photo chemicals which I bought as a 'job lot' is a bottle of nitrate of silver. The crystals are much discoloured, probably through exposure to light. Will the silver do for making a bath for the wet collodion process, as I am desirous of trying that?"—In reply: Yes, the silver will do quite well; indeed, at one time it was said by some that such crystals were preferable for the purpose to those which were colourless.

STAINS ON BROMIDE PRINTS.—J. F. writes: "(1) Will you kindly tell me how I can either remove or prevent the stain on bromide prints ocasioned by the use of a solution of Schlippes' Salt? Is my solution too strong, viz.: 1 part in 160 of water? (2) Please say is Schlippes' Salt and sulphantimoniate of sodium the same thing? If not, what is the former?"—In reply: (1) As the stains are there they cannot be successfully removed. They may be avoided in future by more care in fixing and washing the prints before the solution is applied. (2) One and the same thing.

HISTORICAL QUESTIONS.—J. RISDON writes: "May I take the liberty of asking you to inform me when the process of printing photographs from negatives on prepared paper was discovered, and by whom? Also, in what year cartes-de-visite were first introduced? I have had a discussion on the subject, and shall feel obliged if you can assist me to settle the matter."—In reply: The first negative process was the Calotype of Fox-Talbot, first published in 1839. The carte-de-visite was introduced about 1859—perhaps a year or so before—in Paris.

CLEANING OIL PAINTINGS.—"SHOWERS" writes: "Having a few oil paintings, I should esteem it a great favour if you could inform me how to clean the above, as they have got dirty, and are beginning to crack?"—In reply: Cleaning or restoring oil paintings in the way that picture-restorers do the work is not well within the hands of a novice. As the work is in no way photographic, it does not come within the scope of answers in this column. The method of doing the work, however, is fully described in the "Carver and Gilder's Guide," published by Kent and Co.

NEGATIVE EFFECT IN A POSITIVE PRINT.—W. EMARY writes: "I should be obliged if you could give me some explanation of the peculiar negative effect to be seen on the enclosed photo. It was taken on a —— plate, with about six seconds' exposure at f/8. The light was from a window behind the camera, and although this might appear to be rather long eight other photographs which I took in the same building under similar circumstances have no sign of the same effect."—In reply: The negative seems to have been "light-struck" during the development, and thus a reversed action of light has been brought about.

THE SALE OF POISONS.—"PHOTOGRAPHER" writes: "(1) Being a photographer, and not a chemist, can I sell to my customers 'Sulphocyanide of ammonia'? (2) If not, would I be in any way rendering myself liable if I give it away to my regular customers? (3) Can I sell oxalate potash, (4) ammonia 880., (5) acetate of lead? I may add I have read the Poisons Act in British Journal Almanac, but am not sure whether sulphocyanide is one of the metallic cyanides there mentioned."—In reply: (1) In Ireland, where the Poisons Act is different from what it is here, it has been ruled that sulphocyanide of ammonium comes within the law, but it does not here. (2) That would be a colourable infringement of the law, if that included the sulphocyanide. (3) Yes, in England, not in Ireland. (4) Yes. (5) Yes, but the parcel should be labelled "Poison."

DUPLICATED IMAGE.—MISS ELSLEY writes: "Will you please tell me the cause of the head and music being repeated at the bottom of enclosed print. The photograph was taken in a room with the windows veiled, the lens being away from the windows. The exposure was six seconds, with f/8, Dallmeyer RR lens, and an ordinary bellows camera. The camera did not slip, and two exposures were not given. I have recently had the lens fitted to a Bullard shutter, and wonder if that was the cause, as I have had several pictures with the same defect."—In reply: The secondary image is caused by a minute hole somewhere in the camera, or its bellows, which has played the part of a pin-hole camera. To find the hole, remove the focussing screen and examine the camera in sunlight, from the inside, having the head covered with the focussing cloth the while. It will then be located.

ENLARGING.—"MINUS CONDENSER" writes: "I want to fit up an arrangement for enlarging from 1-1 and 12 by 10 negatives without condenser and by artificial light. I have an electric supply in the house, pressure 200 volts. Do you advise electric arc or incandescent lamp, and of what candle power? What is the best plan for diffusing the light and for equally illuminating the 12 by 10 negative to be enlarged? Where can I see a sketch plan of such an apparatus, showing its parts in detail, enabling an amateur to construct such a camera?"—In reply: As you cannot have a condenser we should recommend you to abandon the idea of using artificial light and to employ daylight. If you must use artificial light, incandescent light will be best, say six or eight for the larger size negative, diffusing it by interposing two or three thickness of ground glass, an inch or so apart, between the lights and the negative. We have an idea that a sketch of some similar arrangement has appeared in one of the old almanacs, but none is necessary to construct one such as just suggested. Again we would suggest the employment of daylight.

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*** *The Editor can only be seen by appointment.*

*** *We do not undertake to answer letters by post.*

EX CATHEDRA.

A Daguerrean Note. In an article in "Nature" on the Heidelberg Physical Laboratory, which is virtually an "appreciation" of Professor Quincke, its principal, the doyen of German physicists, there is an interesting Daguerrean reminiscence. Professor Quincke's best-known work has been in connection with capillarity, and referring to the angle of contact of water and glass and other surfaces, the writer of the article says: "By this principle of the curvature of the angle of contact, and consequently of the size and appearance, of small drops of liquid (water, mercury) deposited on a surface, different parts of which are in imperceptibly different conditions, he has explained the curious 'breath figures,' and of Daguerreotype photographs. Daguerre discovered these through the accident of having left some of his silver iodide plates, which he had until then been unable to make permanent, in a cupboard where some mercury had been spilt. The vapour deposited itself in different sized droplets on the different parts of the plate, and gave a picture which could be made permanent."

* * *

A Cheap Optical Bench. When a student takes up a book on photographic or other optics, he soon comes across a reference to an "optical bench," and if he turns to an apparatus catalogue to ascertain the cost of such a piece of apparatus so useful to anyone who wishes readily to make a few calculations and estimations of lens foci, for example, he would usually find the price to range from four or five guineas upwards. To the ordinary student such a price is a prohibitive one, as the article itself is unnecessary, so long as he can obtain a smooth board and a cheap paper or cardboard graduated scale, which can be obtained perfectly accurate for a copper or two. We are led to make these remarks by a reference, in the article we have just quoted, to Professor Quincke's course of practical physics: "Here one may see an optical bench which, though chiefly made of a half-metre scale and some cork, sealing-wax, and glass strips, yet enables the student to make all the usual measurements with mirrors and lenses, without dark room, and with an accuracy equal to that obtainable with apparatus many times larger and more expensive."

* * *

A Simple Mode of Producing Oxygen. Recently Professor Dewar was explaining how it was anticipated that oxygen could be obtained from air by selective evaporation from liquid air, an excellent idea, no doubt, but not practicable on a small scale except at a great expense. But at the Paris Academy of Sciences M. G. F. Jaubert explained a method he had devised for obtaining oxygen in an exceedingly simple manner. The peroxides of sodium or potassium are compressed with the theoretical quantity of either a soluble permanganate or hypochlorite or a trace of a nickel or copper salt. Oxygen is produced from these cubes in the cold by the action of water. If they are likely to be put on the market at a reasonable price these oxygen cubes should have a useful future, for there can be no doubt of the usefulness for many photographic purposes of a means of obtaining oxygen without costly apparatus or the need for a furnace. It may be noted, however, that the alkaline peroxides are classed by the railway companies amongst the dangerous or explosive goods, and they could only be sent by rail under special conditions.

* * *

Persulphuric Acid. The important position in a short time attained by the persulphate of ammonia by reason of its special action where used for reducing negatives is remarkable, and the persulphuric acid itself has great attractions for the scientific man; indeed, what persulphuric acid actually is remains still a disputed point, and recently Messrs. Henry Armstrong, V.P.R.S., and Dr. T. Martin Lowry have been investigating the matter, the results of their work being embodied in a paper read before the Royal Society on the twentieth of March last. The details of all their experiments could not be fitly recorded in these pages; suffice it to say these experimenters find that "we now feel not only that it is justifiable, but that

we are compelled to postulate the existence of at least *three* persulphuric acids, viz., 'pertetra sulphuric acid,' 'perdisulphuric acid,' and 'peranhydrosulphuric acid.' Details are not given of any attempt to predicate the qualities of alkaline salts obtained from these acids, but there can be no doubt that it would be an excellent thing if we knew a little more about them, as light might be thrown upon the cause of some of the irregular actions reported in connection with the use of the alkaline persulphates.

* * *

The New Radio-Active Gas. A pendant to our recent remarks upon the "perpetual motion" idea in connection with the newly-discovered elements—radium, polonium, etc.—is to be found in an article in the current number of the "Chemical News" upon a "New Gas from Radium," and it is an abstract from "The Transactions of the Royal Society of Canada," of a paper by Professor Rutherford, M.A.D.Sc., and Miss H. T. Brooks, M.A. They started their work in the endeavour to discover what it was that, enamating from thorium, etc., possessed the power of acting upon photographic plates and causing other substances exposed to the emanation to have similar photographic power, a power that persisted for weeks. "The question now arose if any physical experiments could be devised to settle the problem as to whether the emanation was in reality a radio-active gas, driven off from the substance, or a vapour of the substance, or a material emission of particles much larger than molecules. On the whole the experimenters say, "We must therefore come to the conclusion that the emanation is in reality a heavy radio-active vapour or gas." "The physical properties of those emanations or gases are most remarkable. The radium emanation not only contrives for long intervals to be a source of radiation which is apparently similar in character to easily-absorbed Röntgen rays, but in some way manufactures from itself a positively charged substance, which travels to the negative electrode and becomes a source of secondary radio-activity."

* * *

Sulpho-Cyanide Toning. The London and Provincial Photographic Association recently devoted two evenings to the discussion on the combined toning and fixing bath for gelatino-chloride papers. As the reports that have appeared in our columns show, few had a good word to say for it, except when it was employed with judgment, and under conditions that involved as much, or nearly as much, trouble as is necessary when the separate toning and fixing method is adopted. The combined bath, it has always been admitted, is capable of yielding excellent tones on all P.O.P.'s, and on some better than can be obtained by the separate system; it is only on the score of the stability of the picture that doubt exists. At the meeting nothing beyond what has many times been discussed was brought forward as regards the combined bath. But one of the members, however, Mr. Haddon, is reported to have spoken against the use of sulpho-cyanide for any toning formula. Now, the sulpho-cyanide-gold bath has been on its trial longer than many of our readers may be aware—nearly forty years. When the collodio-chloride process was first introduced by the late G. Wharton Simpson, about 1865, the sulpho-cyanide toning bath was the one recommended for the paper, and the prints made with it at that time have proved to be amongst the most permanent of silver pictures, and it is the one that has been employed for it ever since, and hitherto without comment. When gelatine printing-out papers were introduced it was the toning bath almost, if not quite, universally recommended for them and adopted without question, because of the results it gave. It would be interesting to know something more of the grounds of objection raised against the sulpho-cyanide toning bath than is given in the report of the meeting in question.

* * *

Photographing Sound-Waves. We are familiar with Professor Boys' wonderful photographs of flying bullets and their accompanying waves of compressed air, and we have now to record some experiments by Mr. H. S. Allen, described by him before the Royal Philosophical Society of Glasgow under the title, "The Photography of Sound-Waves and Other Disturbances in Air." The principle of his apparatus is simple. He places a light almost directly over the lens and reflects its rays by a concave mirror some distance in front of the lens so that the image of the light is focussed on to the anterior surface of the lens. This surface is half covered with an opaque screen, one edge of the opacity being coincident with the diameter of the front surface and the image of light half-way overlapping this edge. We have then on the screen of the camera an illuminated half and a dark half with the image of the light at its edge. When the air is rarefied or condensed in half the path of the reflected beams the image changes its position according to the extent and intensity of the altered density, and by starting the light a brief moment after the wave begins Mr. Allen was able to produce photographs representing the air-wave through the displacement of the image as explained. The reflector used had a diameter of half a yard and a focus of ten yards. A number of photographs were taken illustrating the reflection of a sound-wave at surfaces of various forms, and the effect of a diffraction grating. The original negatives were three-quarters of an inch diameter, and were enlarged three times to make lantern-slides of. Attempts were made to obtain photographs of series of waves, but unsuccessfully. Among the air photographs taken were some showing the mode of formation of a vortex ring of heated air. It is stated that these show a marked resemblance to the published photographs of the nebulæ of the heavens. The whole article is highly interesting, and a full abstract appears in "Nature" for April 17th, and is accompanied by a number of reproductions of the photographs.

* * *

The Value of Silver. Although every process of photography is dependent upon silver, inasmuch as a negative must first be obtained, and the production of that is a silver process—the larger proportion of prints produced from them are also by silver processes—yet photographers, as a rule, are in no way directly interested in the price of the metal, except, perhaps, those who work the collodion process, and who sensitise their own albumen paper, and they are few indeed at the present time. Still, it is interesting to note that silver is now lower in price than it has ever been before. For some time past it has been fluctuating at under 2s. an ounce for the standard metal. About a fortnight back it beat the record, and dropped to 23 5-16d. per ounce. This is the lowest price which the metal has ever touched. The last occasion on which silver fell below 24d. was in September, 1897, when it fell to 23¾d. On Saturday last it was quoted at 23⅜d. the troy ounce. Now, a half-a-crown weighs 220 grains, and it will be seen that the silver in it is worth less than 11d. Some years ago the silver was worth nearly face value of the coin. About 30 years ago the metal was quoted as high as 62d. an ounce—a wide difference between then and now. We have just remarked that photographers now are but little interested, directly, in

the price of silver. Some are, however, in the matter of the returns they get for their residues. Correspondents sometimes complain of the small returns made by refiners for the large amount of residues sent them, and some have gone so far as to doubt their integrity, without any justification whatever. Dry plates contain really very little silver, and the commercial bromide papers and "P.O.P.'s" do not contain so very much beyond what is required to form the image; consequently the ash from the latter, though very heavy from the sulphate of baryta with which the paper is surfaced, can contain but little metal to be recovered. When it is considered that, when the silver is recovered, if it be of the standard quality—and that from photographic wastes rarely is—it is worth less than 2s. an ounce, the disappointment often met with is fully accounted for.

* * *

Quartz Lenses. Our readers may remember the interest created by Mr. W. A. Thewstone's experiments in the building up of quartz by means of the oxyhydrogen flame into tubes which possessed many remarkable properties as compared with glass, the most striking being their power of resisting extreme and sudden changes of temperature without cracking. A further development of the idea has been carried out by Mr. R. S. Hutton, M.Sc., who brought before the Manchester Literary and Philosophical Society early this year the results of his experiments, which were carried out in the physical laboratory of Owens College. Hitherto the oxyhydrogen blowpipe has been the chief means adopted for the softening of the quartz, but Mr. Hutton, with Mr. Morisson's experiments with the electric arc upon quartz in view, was led to use electrical, instead of gaseous, heating, the former being capable of, not only melting, but volatilizing, silica, quartz being, as we need scarcely state, a form of silica or oxide of silicon. Mr. Hutton found that the danger of reducing the silica, solid or liquid, to silicon was easily obviated by allowing a small current of air to pass through the electric furnace while the quartz was being subjected to the current. At the 1900 Paris Exhibition Messrs. Zeiss exhibited small lenses of "crystal de roche fondu," but gave no description of the process by which they were produced. Mr. Hutton has fully described his methods, and his paper states that with a little practice it is hoped that masses suitable for lenses can be made. His plan for making tubes is to bring into the arc flame small pieces of quartz, placed in a groove in a piece of carbon, of as pure as possible a quality; while for making lens-shaped discs he employed a small carbon crucible. If it turn out to be feasible to make quartz lenses in this way, it is possible that their valuable optical properties may be utilised considerably for photographic lenses, as the preliminary moulding into shape would materially reduce the cost of the grinding, which, in the case of so hard a material as quartz, must be greatly in excess of that for glass grinding. Of course, there is the possibility of unequal refraction in the various parts of the mass which would be fatal to lens work; but there is sufficient promise to cause further experiments to be anticipated with interest.

* * *

Seeing by Telephone. The discovery of a means of seeing distant things through the medium of an electric wire has been a favourite canard ever since electrical communication became possible, and an alleged invention for rendering the matter practicable crops up almost as regularly as does the discovery of photography in colours. It is one of the most lamentable characteristics of modern journalism that these stories are accepted with avidity by responsible editors simply because of their sensational character, and apparently without any regard to truth. The last report of the kind was published just six months ago in a Leeds paper, and out of curiosity we cut out the notice in order to see what might come of it. The statement occupies nearly a column, and purports to be an interview between "our own correspondent" and Dr. Sylvestre, an American dentist settled in Paris. According to this account, anyone having command of a telephone circuit can add the necessary visual apparatus at nominal cost. "I cannot work my apparatus for you yet," said Dr. Sylvestre to his interviewer, "because I am in treaty with the French post-office people, and the method is so simple that if I showed it to you, you yourself could go away and make an apparatus just like it." With this simple apparatus the doctor declared that he has, whilst listening through the telephone to the words of M. Mougeot, the French post master general, seen that official's surroundings, and "watched his astonishment as I described his appearance, clothes, and office to him as we talked. There was a good deal of dust on the head of the statue of The Republic in his room, I noticed, and I told him so. He got up and verified it, and it was quite true." We also learn that this wonderful machine is no mere toy—it will do away with telegrams. "Certainly. Put a written communication in front of a looking-glass at the London end of the wire, and your correspondent in Paris will see it quite distinctly at his end. Telegrams will be quite unnecessary." These statements, introducing as they do names of persons and places, are certainly definite enough, but six months have elapsed since they were put into type, and made public under the ægis of a well-known provincial journal, and nothing more is heard of the discovery, which, if true, would revolutionise our methods of intercommunication. Is it all a hoax? Is there a dentist of the name of Sylvestre practising in Paris, or is he a myth? Has the correspondent of the Leeds newspaper been imposed upon, or is this a specimen of his ingenuity in manufacturing sensational "copy"? We think that, for the credit of British journalism, these questions should elicit some reply. There are, unfortunately, numbers of good people who are ready to swallow anything to which the magic word "electricity" is appended, and newspaper science is only too ready to pander to their appetites. Too often such a report as that detailed is only the prelude to company promotion, but the case before us seems to be merely a piece of pure fabrication, and a very stupid one at that.

* * *

The Water Rate. Every now and then an attempt is made by some water company to charge amateur photographers something extra for the amount of liquid used in prosecuting their hobby. This attempted impost is a most short-sighted policy, for it at once raises the question of payment for the amount of water actually consumed, and this is a principle against which the companies have always steadily set their faces, for it would, if adopted, very materially reduce their income. But that it is a right principle no fair-minded person can doubt, nor can anyone for a moment believe that, whilst it is possible to measure such a volatile thing as gas, or such an intangibility as electricity, it is beyond the power of the mechanician to construct an efficient automatic measurer for a liquid of the density of water. Yet the apologists for the ways of water companies would have us believe that a satisfactory water-meter for domestic use has yet to be devised, and that the companies are obliged, in self defence, to base their charges on the rateable value of the premises in which the pipes are tapped. This may have been the case when the

water works were first started, but it is not so now. The way in which the present system works out is almost ludicrous. Thus A may have a house in the suburbs of London, for which he pays, say, £75 a year rental. It is furnished with a bath-room, the usual offices, a scullery, copper, in which the family linen may be washed, and it has a garden. B occupies an office in the City, to which water is laid on for sanitary purposes, besides which it is used by B and his clerk for washing their hands. At the utmost five gallons a day would represent B's average daily consumption of water, while A will use more than ten times that quantity for his morning ablutions, to say nothing of the claims of the other members of his family in the same direction. And yet A and B are charged at the same rate by the companies which supply them with water. Now, seeing that the companies are monopolists, and are allowed by the legislature to charge according to a system quite unknown to any other industry, and can go on exacting those charges even if there is a drought and the supply ceases, it seems only fair that the poor consumers should have some consideration shown to them. For every amateur photographer who uses a hundred extra gallons of water for washing his plates and prints there are thousands of men holding offices in the City who are paying for water almost the price of beer, and the companies ought to take the rough with the smooth. We may reasonably hope that in the near future, when the companies have handed over their property to a Government Board of Control, that the anomalies under which water consumers at present suffer will be put straight. Water must be, like gas and electricity, supplied by meter. That is the only fair system, and until it is adopted these vexatious attempts to charge extra for certain occupations will continue to crop up. It is a public scandal that the supply of the first necessary of life has been so long in the hands of private companies, who have hitherto shown little regard to the requirements of those who are their enforced customers.

Cloud Formations.—Commander D. Wilson Barker writes in the May number of "Knowledge" on the observation of clouds, various forms of which are illustrated from his own carefully-selected photographs. "Each cloud," he says, "has its history fraught with meaning; its open secret is writ on its face, and may be read by anyone who will give himself a little trouble, nor need he go deeply into the study in order to make observations interesting to himself, and perhaps of great use in the furthering and perfecting of weather lore. To the ancients, the sky was doubtless an object of constant remark and interest, and possibly their intuitive knowledge of weather forecasting was much more accurate than ours. The dwellers in our modern cities see little of the sky, clouds have no interest for them beyond the personal consideration as to the advisability of taking out an umbrella or not. But farmers, fishermen, sailors and others following open-air avocations are dependent on the weather, and to be wise in its forecast is of importance to them. To these, especially, cloud study should appeal; it cannot fail to be profitable to them in their personal work, and they have all the opportunity, if the will be there, to forward the general knowledge of the subject by careful painstaking observations, which they may transmit to those scientifically engaged in dealing with weather laws, and thus assist in the elucidation of questions on which we are at present but very imperfectly formed." And after describing the various cloud formations, he ends: "Whoever wishes to be weather wise, and who has time to study the weather charts published daily, may easily acquire such knowledge of local characteristics as will enable him to forecast fairly accurately. Cirrus clouds, as a rule—at any rate in England—are reliable guides; they form, as we have said, in parallel threads, from the position and movements of which forecasts may be made. Should the threads appear on, and parallel to, the west horizon, and moving from a northerly point, a depression is approaching from the west, but, although causing some bad weather, it will probably pass to the north of the observer. Should the lines appear parallel to the south-west or south-south-west horizon, and be moving from a north-westerly point, the depression will very likely pass over the observer and occasion very bad weather. These are two of many possible prognostics. Weather forecasting is much helped by a study of the daily weather charts. Again, weather is often very local, and to predict with fair accuracy a knowledge of local conditions is necessary. It is hoped that enough has been said in this article to attract more than a passing attention to clouds. If an observer be a photographer as well, he will find open to him in Cloudland a fascinating field for study and a limitless variety of subject for his art."

"A NEW AND LUCRATIVE PROFESSION."

Not a day passes without bringing us evidence as indubitable as it is painful that the ranks of professional photographers are being increased by heedless and foolish persons who thus make one of the few irreparable mistakes of life, that of choosing the wrong vocation. The illiterate communications, the pathetically bad prints, and the indications of almost invincible ignorance of the rudiments of photographic technology and technique that each morning's post has sent in melancholy procession under our eyes these score of years past keeps us constantly in that frame of mind to which the celebrated surgeon Abernethy gave expression on a famous occasion. Entering his lecture theatre one morning, he paused, pered at his expectant pupils, and then burst out: "I wonder what will become of you all!" From a far less exalted pinnacle of observation, but in circumstances of a parallel kind, some such reflection has often occurred to us when reading or listening to the aspirations of would-be photographers upon whom neither nature nor education has bestowed the necessary qualifications for the work, and to whom therefore no amount of assiduity or strenuousness of aim and effort can possibly bring success. One glance at these despairing dupes of self-delusion, two or three questions, a rapid analysis of their theoretical or practical knowledge are sufficient to tell us that, in the common phrase, they "have missed their turning." Unfortunately they cannot be made to realise their mistake until they have wrought lasting injury to themselves and the whole of professional photography by producing bad work at low prices, and thus fatally degrading a beautiful method of graphic expression in the estimation of the public, to the edge of whose faculty of appreciation in such matters the grindstone of knowledge imparts day by day additional keenness.

Although improving conditions are slowly but gradually asserting themselves in professional photography, thanks, amongst other things, to the operation of the merciful law of the survival of the fittest, it is as true to-day as at any time these fifty years that the "black art" is one of the "last resorts of the destitute"—those who have failed in other kinds of work. The apparent ease and simplicity of modern processes, and the small amount of intellectual and monetary capital seemingly required, make the path to independence of effort beautifully smooth. We doubt if any other business can be started so easily as professional photography—upon so little money, brains, knowledge, or education, and we also know none in which, with all the advantages that skill, capital, enterprise, and hard work can confer, it is so difficult, nowadays, to make money, or even a good living. These are demonstrable facts, and if they needed support a great weight of knowledge and experience is available for the purpose. This being so, it is not without a shudder that we have received a reminder that the natural draft of unsuitable recruits into the photographic army is in danger of enlargement by the addition of artificially-produced smatterers from a more or less mechanically-controlled forcing house. This information comes to us in a letter, printed in our correspondence columns this week, from the well-known photographer, Mr. H. Walter Barnett, whose authoritative knowledge of his subject and whose claims to be heard in all matters affecting the interests of professional photography must be conceded without question. Mr. Barnett, it will be seen, draws attention to an advertisement appearing in a popular magazine circulating in America and this country by the hundred thousand, which emanates from a photographic college, where the "new and lucrative profession of photography" may be learnt "in all its branches in three to six months" (*sic*). "The remarks of our correspondent on

the "amazing nature of this advertisement" are very properly emphatic and to the point; and we conceive it to be our duty, in the interests of a painfully overcrowded profession, as well as in those of would-be pupils of the college, to associate ourselves with the sentiments of protest and warning contained in Mr. Barnett's letter.

A year or two ago, when the prospectus of the Illinois College of Photography was first brought to our knowledge directly and through the American Press, we gave a qualified commendation to the scheme. The college appealed, if we remember aright, to a purely photographic public and the facilities for study as set forth struck us as being fairly complete. There are so few opportunities for gaining a thorough practical knowledge of photography for commercial purposes by a course of residential study that the Illinois College system deserved, in our judgment, support as a move in the right direction. But a new situation is created when the directors of the college step outside a perfectly legitimate area of operations and compete with quack-medicine vendors and the like in trusting to the compound ignorance of an uninformed public for a degree of patronage sufficiently remunerative to justify considerable advertising enterprise. The statements contained in the advertisement sent us by Mr. Barnett are best answered point by point:—

". . . photography offers to-day a greater opportunity for early distinction and wealth than law or medicine."	This is a ludicrous exaggeration, calculated to mislead and deceive the ignorant.
"It is a dignified, fascinating, instructive, and lucrative calling."	Taking the first three advantages for granted, the fourth must be placed very much in the air. Nowadays the professional photographer who simply makes a living and pays his way is accounted fortunate.
"In attending this college you learn the art-science of photography in all its branches in three to six months, *fitting you to open a studio of your own, or to take charge of any photographic department of the National Government, that of any newspaper or mercantile establishment.*"	A tissue of dangerous rubbish which to every reader of these pages carries its own refutation on the face of it. For the benefit of those unversed in such matters, however, into whose hands we hope this article will fall, let us merely say that if "art science of photography in all its branches" is learnt in seven years it is very quick work indeed. The italicised sentences would make us smile if we could remain unconscious of the grave mischief they are capable of causing amongst the readers of them.

The other parts of the advertisement speak for themselves.

A real service to the cause of professional photography all the world over will have been rendered if the utmost publicity be given to the denial of the probability that the payment of a few pounds and two or three months' desultory work at an American college, except, perhaps, in very rare cases indeed, can result in the production of photographers endowed with knowledge of appreciable commercial value. Judged by modern tests, we should expect nothing but smatterers and superficial plate-spoilers to come out of Illinois. There are too many of these already. Well-trained assistants are few and far between, and the ability to properly control a studio or direct any other branch of the business is none too common. Here in England the polytechnics and other institutions where photography is taught send out numbers of completed pupils year by year, and yet the market does not seem overstocked with ability of a very high order. Given the vocation, a good, sound, practical training of several years' duration would appear to be the best equipment for qualifying one to take up business photography. It is in this way that the able men mentioned by Mr. Barnett have arrived at their present positions. Class-room knowledge may supplement that obtained in the work-room, but can never wholly replace it. The essential qualifications of the finished photographer are many and varied, and to suggest, as the Illinois advertisers unmistakably do, that all or any of these may be mastered by anybody with a few pounds in his (or her) pocket and the artfully-stimulated ambition to become master (or mistress) of a new, lucrative, fascinating profession in three or four months is so obviously trading on ignorance, so conducive to disappointment and disaster, and so calculated to have harmful effects upon one of the most troublous and exacting callings of the day that we think the Illinois advertisement deserves to be severely condemned and its dangerous and misleading teachings exposed with the utmost amount of publicity.

JOTTINGS.

The sudden decease of that elegant publication, "The Traveller," is to be regretted on many grounds, and chiefly, perhaps, because it was the only weekly journal that appealed to the increasing class which derives its principal pleasure in life from foreign travel. The literary contents were always of a high order, and the well chosen photographs which formed the staple part of its illustrative contents were invariably reproduced in a faultless manner. Amongst the mass of periodical literature that is regularly heaped upon the bookstalls two such excellent features are not, in the majority of cases, to be found going hand in hand. Some of the very best amateur and professional work found its way into the pages of "The Traveller," and the disappearance of the paper will no doubt be regretted by many photographers. It was, besides, edited with tact, care, and discretion—no mean characteristics in the present state of journalism, when the frothy and superficial *flaneur* and the aggressive young woman from Suburbia, whose views of life are generally obtained by constant attendance at the Aerated Bread Company's cafés, are so often allowed to flaunt their "readable twaddle" in the accommodating pages of carelessly conducted magazines. The principal features of "The Traveller" have been taken over by "The Candid Friend," and a few days since the name of the former publication cropped up in the daily cause list at the Royal Courts of Justice. Beside its own immediate mission, "The Traveller" carried out in an admirable way another praiseworthy object. It gave stay-at-homes a very graphic idea of what "furrin" parts were like. To the few only can it fall to see all the picturesque beauties of the world—the extent and limits of my own ambitions are India and Japan—but had "The Traveller" gone on its useful way it would in time have formed a beautiful and complete guide book to the best of what is on this tiny globe of ours. But, alas! it has flown to that bourne whence no traveller returns. Farewell!

I have to thank a confrère for a curiosity of which I have long been in search. And that is a genuine "dead body on the battle field" photograph. This one unmistakably shows a number of slaughtered Dervishes lying on the field of Omdurman, shot down by Kitchener's soldiers, as a reward for that magnificent desert fanaticism which knew no fear of death. Only two other genuine dead-body-on-the-battlefield photographs have come before my eyes; one, that of a solitary Boer in a trench; the other that of a soldier fallen in one of the battlefields of the American Civil War. Photographs of this nature are fortunately rare, and to me are interesting for no other reason than that they illustrate one special use of the lens and the camera, the recording of a fact, albeit the melancholy horror of war. Amongst a series

of photographic illustrations of the earlier stages of the South African struggle, I have a number of extremely realistic-looking battle-pieces, showing the dead, the dying, the falling, and the wounded. For a long time I marvelled at the intrepidity of the photographer in casting himself into the very jaws of death in order to obtain such results; but I marvel now no longer, for I am assured that he did no such thing. A number of plastic and histrionically endowed "Tommies" were induced to pose on these inhospitable looking African "kopjes," and that is how the very harrowing-looking representations of the war god's work were made. The photographs are probably not now in circulation, otherwise a less tender protest than this would be called for. But I will keep my eyes open. Absolute fearlessness and disregard of danger were, however, really exhibited by Mr. Hemmant, the well-known American photographer, during the Spanish-American war. My informant, Dr. E. C. Titus, of New York, tells me that this brave knight of the camera coolly made exposures with shells falling and bursting round about him, and thought nothing of penetrating to the shattered Spanish iron-clads, going below and making exposures on the dying sailors. In China, too, during the recent Boxer troubles and the after events, Hemmant secured negatives of the falling heads and bodies of decapitated criminals. But it is not a nice subject. If such photographs are in existence a thousand years hence, may civilisation have so far advanced that our descendants will doubt their authenticity.

Prize-hunting photographers will find a rich harvest awaiting them this year. No less than seven manufacturing firms are holding competitions, which will be decided between now and next January. In round figures these are the total amounts of the prizes severally offered in cash: £500, £300, £300, £300, £100, £100, £100; say, in all, £1,700. This handsome sum is offered in competition to the users of specified plates, films, papers, cameras, card-mounts, and lenses. Competitions of the kind are invariably successful, but such a large number have never hitherto been held in one year, and probably I have not mentioned all that are in contemplation. The prizes are so large and tempting that it is conceivable the pursuit of them may have an adverse effect upon the autumn exhibitions. There is something very tangible about a ten pound note as a reward for a good photograph. I doubt if the most intense mourner at the present pictorial stagnation would not prefer it to the barren "honour" of being "hung" in a small back room or subjected to the unavoidable vagaries of an incohesive selecting committee. But this is to be seen. The prize boom is coincident with the introduction to the market of hand cameras and material in numbers and quantities so vast that one asks in all seriousness where the buyers are to be found. The starting of new manufacturing concerns, the enlargement of old ones, and the tremendously large shipments of Continental and American photographic goods are also events of the moment. It is to be hoped that there will be no fingers burnt over the business; but a market glutted with cameras and the like qualitatively so poor that they take rank with the ordinary contents of a toy shop or an ironmonger's, hardly inspires one with a profound faith in the longevity of the photographic trade. On the unimpeachable authority of one of my daily papers, I learn, too, that a factory employing 800 hands has been started in England for the purpose of manufacturing hand cameras. Of course, one does not lose sight of the fact that the home markets will not absorb all these productions. Still, at the same time, the signs plainly point to a boom which may not be far from its bursting point. Anything in the nature of the "cycle crash" in photography would be deplorable, but I by no means scout its probability.

As one of the purchasers of "The Times" issue of the "Encyclopædia Britannica" a year or two ago, I have received the voluminous prospectus of the Supplement which is now in course of preparation. This Prospectus is a handsome volume in itself, and it gives you, page by page, the most tantalising extracts from a few of the 10,000 articles which are to fill the eleven volumes of the Supplement. The latter should equal, if not exceed in value, the twenty-six volumes of the original issue, for by all indications they will constitute a complete record of human progress during the last quarter of a century—a truly brilliant chapter in the world's history. The Supplement, it is to be remarked, relies upon half-tone engraving in monochrome and three colours for many of its illustrations—the first time that photography has been put in such close association with so great a book as the "Encyclopædia." In the last edition the article on "Photography" was the sole work of Sir William Abney; but in the Supplement he has the collaboration of Major-General Waterhouse, whose competence for historical work of the kind is unquestioned. Moreover, the pictorial side of photography is dealt with by Mr. Horsley Hinton, who in the little extract printed in the Prospectus treats of the work and influence of the late H. P. Robinson, and gives a quotation from the writings of Dr. P. H. Emerson that bears upon the subject. I cannot resist the opportunity of remarking that Hinton quoting Emerson on Robinson is one of those sublime and magnificent pieces of irony which is too good for preservation in the ephemeral literature of photography, and is deservedly enshrined in such a literary Valhalla as the "Encyclopædia." One of the illustrations is a half-tone reproduction of Robinson's "Carolling," which occupies a full page. It will be some months, I suppose, before the volume of the Supplement containing the article on "Photography" will reach the subscribers; meantime it is satisfactory to note that the Editors of the "Encyclopædia" attach so much importance to this subject, that the work of dealing with it has been divided amongst three writers.

As I am touching upon matters of historical interest, I may take the opportunity of including the following interesting extract amongst these Jottings. It occupies the place of honour in the April number of "Wilson's Photographic Magazine":—"Photographs admitted to the Paris Salon: An epoch-making decision. The honour secured by an American photographer. As we close this issue for press the following dispatch is published in the 'New York Herald,' March 30th: 'Paris, March 29th.—for the first time in the history of Paris art exhibitions photographs have been received as exhibits at the annual Salon. The photographs were submitted by Mr. Eduard J. Steichen, a young New Yorker, and are regarded as a great triumph. The decision to admit photographs almost caused a split in the jury. The pictures were, therefore, entered under the title of engravings, although really they are nothing but remarkable photographs.' Presuming the facts to be as stated, the announcement records the highest honour given to photography since Arago announced the invention of the daguerreotype in Paris, in 1839. We felicitate the artists forming the Salon jury and Mr. Eduard J. Steichen upon their achievement. Surely March 29th should be marked as a red-letter day in the annals of American photography." The eagle-screaming indulged in by the usually sedate and academic "Wilson" is quite excusable in the circumstances, of course; but I take the liberty of doubting if the distinction that has been accorded to Mr. Steichen reflects any particular honour upon American photography, or that of any other nation. His results—or those of them that I have seen—are remarkable enough in all conscience, but it is greatly straining a point to call them photographs. Evidently, the Paris jury were similarly sceptical, for they have classified them as engravings. The work produced by Mr. Steichen and other clever people of his class is so entirely deficient in the

characteristic beauties and delicacies which photography is capable of rendering, that I often wonder why he and they go to the trouble of using a lens, a camera, and a dry plate. Surely these things should be superfluous in the hands of the trained artist, as I believe Mr. Steichen to be?

"The Morning Post" of Tuesday last contained a trenchant attack upon the Royal Academy and its policy, from the pen of Mr. Harry Quilter—*the* Quilter, not the admirable photographic Quilter, of Leicester. Certainly, a considerable amount of ponderous drivel was talked at the Academy banquet—I wonder how long it will be before Mr. Eduard Steichen is honoured with an invitation to that impressive function?—and the Burlington House authorities are never friendly towards unconventionality of style in painting—but these things will not deter the public from paying its shillings to see Sargent's "Duchess of Portland" and other notable productions. For ordinary photographers the Academy, in fact, can have no interest except as an educational agency. They are more concerned, perhaps, with the uses which painters make of photography, and what they say about this secretly-cultivated medium than with the finished exhibits in Piccadilly. And it is a singular thing that when Academicians and others talk or write about photography they seem unable to avoid floundering in a morass of nonsense. Here, for example, is Mr. Seymour Lucas, R.A., telling the good people of West Ham that "photography had had a bad effect upon art. It served to present things in a literal sense, rather than in a poetic sense." I wonder which Mr. Lucas would place first in order of importance—poetry or truth? Photography has taught artists how to correctly draw moving figures of persons and animals; and what size the moon should be in their pictures. I suppose Mr. Lucas *was* thinking of the photography of the best kind—such as the exquisite work of Mr. Henry Speyer now on view at the Camera and Alpine Clubs; that of Dr. Grindrod, at the former place; and the productions of such workers as Crooke, Croall, Craig Annan, Greatbach, Percy Lewis, and others I could name. How the "literality" of these men's photographs can react unfavourably on art passes my comprehension. Mr. Lucas's views on the productions of Mr. Steichen and his *confrères* of the American school would be interesting. The last thing you can say of these photographs is that they are "literal." Mention of the Camera Club reminds me that the exhibition of members' photographs is on view this week. Some specimens of a new method of colour photography are shown. Granting the process to be in the experimental stage, the effects are somewhat crude and unsatisfactory; but perhaps the inventor will show us something more convincing later on.

COSMOS.

RAILROAD Train Taking its own Photograph.—A passenger train on the Chicago, Burlington, and Quincy Railroad recently performed the rather remarkable feat of taking its own photograph. The electric current was employed to secure the picture in an ingenious manner. The camera was equipped with a very rapid shutter, estimated to move at a speed of 1-1,000 of a second in covering and exposing the lens. One of the rails over which the train was to pass was connected with the camera by an electric switch which operated the cylinder, furnishing the compressed air to move the shutter. The photographer who essayed to get the picture calculated that when the train was running at full speed it would pass over about 88 feet in one second, and made arrangements accordingly. The electric switch was placed in position about six feet back of the place where it was desired to catch the photograph, in order to allow for the movement of the electric current and release of the shutter, rapid as it was. With the electric device completed, the camera was set up and focussed at the portion of the track to be covered, and the shutter set for instantaneous exposure and connected with the switch. When the front wheels of the locomotive drawing the train touched the electrically connected rail, the shutter was released and an excellent picture taken, not even a blur showing on the negative after development. This automatic photograph was planned by Mr. Ayrault Green, of Chicago, and taken in the suburbs of the city.—"The Scientific American."

THE PLANAR WITH DIMINISHED SECONDARY SPECTRUM.

[Translated from the "Photographische Correspondenz."]

By the combination of two kinds of glass of the ordinary type in the construction of an achromatic lens, it is impossible to unite more than two colours completely. The colours, which are not united, form a colour fringe to the image, and this is called the secondary error of colour. The residuary error depends upon the fact that the dispersion of the two glasses is not proportional for the various regions of the spectrum. The secondary residuum of colour may be corrected by means of three kinds of glass with different range of dispersion, or by means of two or more kinds of glass with proportional range. In the construction of photographic lenses hitherto, the latter method in most cases is the only one which has been used with advantage. When Professor Abbe made known the new forms of microscope obectives in 1886, by a communication to the Jenaer Gesellschaft für Medicin und Naturwissenschaft, concerning the improvement of the microscope, by means of new kinds of optical glass (see Report of Transactions, July 8, 1886), he introduced a new nomenclature. These lenses, in which the secondary spectrum has been eliminated and the spherical aberration corrected for two colours, are now universally known as apochromats, or objectives perfectly corrected for achromatism.

So far as I am aware, apochromatic photographic lenses were first introduced by the firm of Carl Zeiss, and this was as early as 1890. The construction was planned by Professor Abbe, and the calculations were made by me. The lenses were called triplet apochromats, and are still valued by many amateur and professional photographers for their remarkable central definition. These and the achromatic triplets were regularly manufactured, and by request of Messrs. Kühl and Co., of Frankfort, some of larger size were made for copying. The same firm also used the triplet apochromat for some time for making negatives for three-colour printing, but the technical results did not come up to the expectations which had been entertained. Moreover, it was necessary to protect the flint glass, used in the triplet, from variations in temperature and from abnormal atmospheric conditions. The triplet apochromat thus fell into disuse. In 1896, however, I succeeded in constructing the planar, a lens pre-eminently suitable for copying purposes, and shortly afterwards the glass manufacturers, Schott und Genossen, produced pairs of glasses of satisfactory permanence, with diminished secondary spectrum, which could easily be used in the construction of the planar type. This induced me to return to the older experiments, and in the spring of 1899 I was enabled to place at the service of specialists in three-colour printing the apochromatic planar. The first specimen was tested by the Photographic Department of the Academy of Arts at Leipsic. The difficulty of manufacturing glass of suitable quality stood in the way of the lens being made generally known, but the firm of Carl Zeiss began by submitting special offers, in reply to enquiries for copying lenses that might be required for special purposes. Many apochromatic planars have been ordered and supplied in the interim, and the manufacture of the glass being apparently placed upon sure and regular lines, the firm of Carl Zeiss have now included in their catalogue, for general publication, this important lens for three-colour printing.

The advantages of the apochromatic planar for all kinds of copying are many. The achromatic planar was remarkable for its high degree of spherical and anastigmatic correction, as shown in Dr. von Rohr's article in Eder's Jahrbuch for 1898, p. 70. The spherical correction was accomplished with relatively very small intermediate errors (zones) for an aperture of *f*5, and the lens could be used with long focus and large aperture for

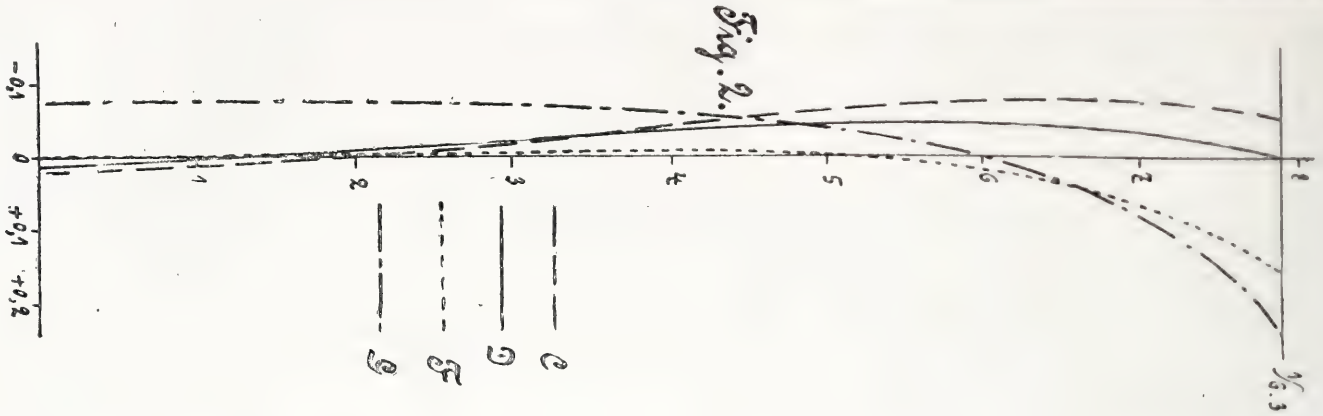


Fig. 2.

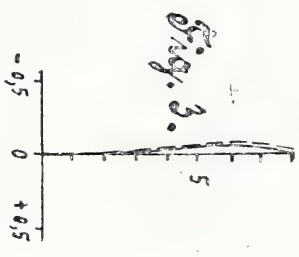


Fig. 3.

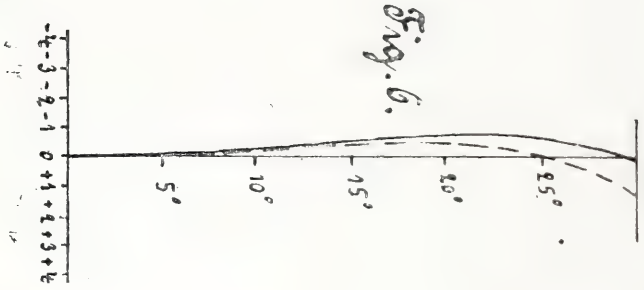


Fig. 6.

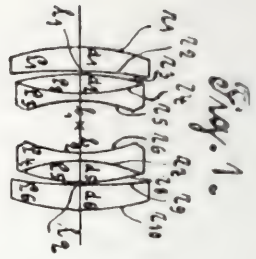


Fig. 1.

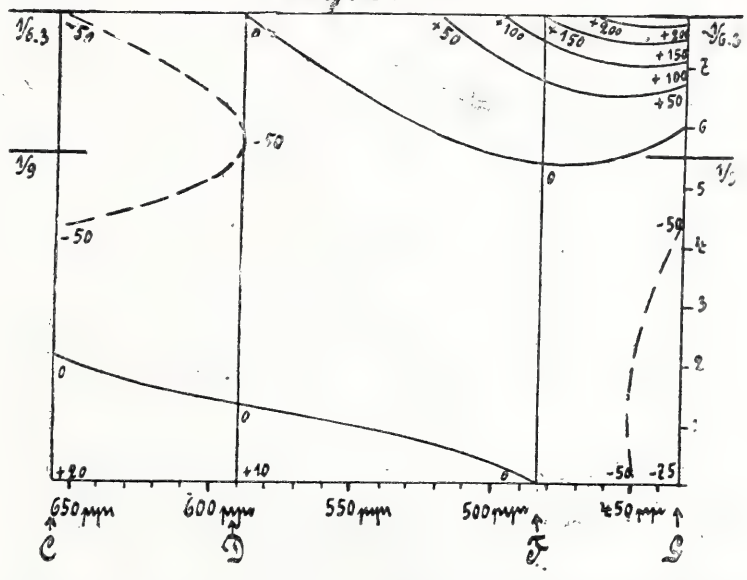


Fig. 4.

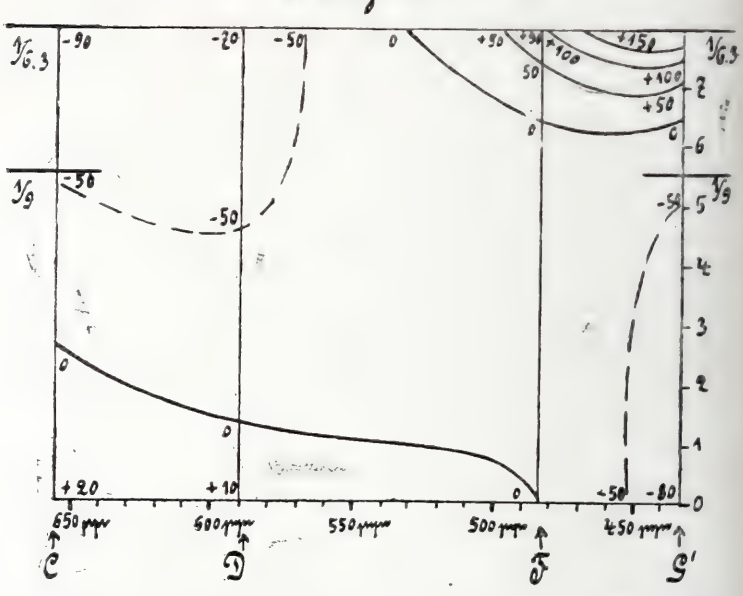


Fig. 5.

copying line subjects. The specimen prints which have been shown by the firm of Zeiss at various exhibitions demonstrate that a planar of 410 mm. focus and aperture *f*5, when stopped down to *f*7, will reproduce a line subject sharply upon a plate 30 by 40cm., and that a plate 40 by 50cm. can be sharply covered at *f*12.5. Every optician knows that the difficulty of producing a lens with fine definition increases considerably with the length of focus and the size of the plate. The planar was the first lens produced for line work that would give good definition at *f*18 for a plate 1 metre square or more. For this purpose a focus of 100 to 130cm. sufficed. Lenses of this description are regularly made by the firm of Carl Zeiss to order, and they have been favourably received by those who are engaged in work of this nature.

Now that crown and flint glass with approximate proportional range of dispersion can be had, their use in the construction of the planar has brought copying lenses to an appreciably higher state of perfection, through the introduction of the apochromatic planar. The apochromatic planar gives finer definition in consequence of better chromatic correction, and is therefore easier to work with. There is, however, special advantage in using it for three-colour printing, as the three primary colours are united by the apochromatic planar at almost the same distance, and have the same focus. The exposures may therefore be made for the three colours at one and the same focus, and thus there is no fear that the three negatives will differ in sharpness, or that there will be any difference in the size of the pictures.

If it be borne in mind that a lens merely corrected for achromatism must be focussed three times, under certain conditions, and that this difficulty is enormously increased by the fact that the three pictures have to be exactly the same size, it will be evident that the apochromatic correction of the lens must be an advantage.

But apochromats are of considerable importance for astrophotography, as well as copying. The circles of confusion are reduced to a minimum in the apochromatic planar. There must consequently be a more perfect concentration of the light at the focus than with achromats. It therefore follows that with an image of the nature of a point, which is the case in stellar photography, the points must possess greater intensity of illumination. The quantity of light is compressed into a

smaller area. It is therefore possible to reduce the exposure. This fact has already been recognised by those engaged in this branch of work, and the use of apochromats will conduce to progress in the domain of astronomical research.

In the autumn of 1900 Messrs. Voigtländer and Son, of Brunswick, brought out an apochromatically-corrected collinear for copying purposes. The nature of the correction of this lens was described by Dr. Harting in the "Photographische Correspondenz" (1901, p. 522). This collinear is well corrected for spherical aberration, and has a good anastigmatic field at *f*9, judged by the curves which are given. The secondary spectrum is satisfactorily eliminated. It may therefore be of interest to give the curves of the apochromatic planar. The data of construction relating to this lens are also given below. The spherical correction is almost free from zonal error for an aperture of *f*6.3, and anastigmatic flatness of field is attained, with almost imperceptible intermediate errors, for a field of about 60 deg. The secondary spectrum is very small for the entire aperture of the objective, *f*6.3.

Table I. gives the radii (r), the lens thicknesses (d), the separation of the lenses (l), and the distance of the stop from the lens surfaces (b).

TABLE I.

Radii, Thicknesses, and Separations for the Apochromatic Planar $\frac{f}{6\cdot3}$, focus = 100 mm.

$r_1 = +24\cdot77$	$r_6 = -17\cdot35$	$d_1 = d_6 = 3\cdot22$
$r_2 = +61\cdot27$	$r_7 = +22\cdot58$	$d_2 = d_5 = 2\cdot58$
$r_3 = +30\cdot32$	$r_8 = -27\cdot09$	$d_3 = d_4 = 0\cdot97$
$r_4 = -22\cdot58$	$r_9 = -57\cdot41$	$l = l' = 0\cdot065$
$r_5 = +17\cdot35$	$r_{10} = -25\cdot67$	$b = b = 3\cdot55$

Table II. gives the figures indicating the kinds of glass used in the construction of the lens. The figures, under the headings $n_F - n_D$ and $n_{G'} - n_F$, represent the values of the quotients of $\frac{nF - nD}{nF - nC}$ and $\frac{nG' - nF}{nF - nC}$. The curves given in Fig. 2 show that the small divergence in the three values $\frac{nG' - nF}{nF - nC}$ has scarcely any perceptible influence upon the final result.

For each of the colours of the spectrum, C, D, F, and G', the path of a ray parallel to, and infinitely near the axis, was calculated by means of logarithms carried to six decimal places. This was repeated for rays parallel to the axis, taken at three different distances from the centre. By the last distance of intersection, we understand the space between the back surface of the lens and the point where the axis is cut by a ray of the colour λ, and height of incidence h, after its passage through the lens. This is denoted by $s_{\lambda,b}$. The values $s_{\lambda,h} - s_{F,O}$, that is to say, the aberrations of the distances of intersection, from that of the intersection of the green axial ray, are multiplied 100 times, and used as the abscissæ in Fig. 2, whilst the ordinates represent heights of incidence multiplied 20 times.

TABLE II.

Kinds of Glass used in the Apochromatic Planar $\frac{f}{6\cdot3}$, focus = 100 mm.

KIND OF GLASS.	n_D	$n_F - n_C$	$\frac{n_D - 1}{n_F - n_C} = v$	$n_F - n_D$	$n_{G'} - n_F$
L_1 and L_6, Heaviest Baryta Crown.	1·61023	0·01088	55·8	0·00768 0·706	0·00622 0·572
L_2 and L_5, Silicate Crown.	1·53008	0·00877	60·1	0·00618 0·705	0·00497 0·567
L_3 and L_4, Telescope Flint.	1·52352	0·01022	50·9	0·00721 0·705	0·00576 0·563

The curves in Fig. 2 show the following facts. The foci of the paraxial rays, comprised within the entire visible spectrum, are brought together within a space of 0.1 mm. This space, or the location of all the foci, diminishes as the height of incidence increases, until a minimum of 0.05 mm. is reached, at 4.5 mm. height of incidence, where they begin to diverge slowly. At 6 mm. height of incidence the space widens once more to 0.1 mm., and it is situate exactly above the space of equal size, including the foci of the rays at the axis. Up to this point all four curves may be enclosed by a rectangle with the space to which we refer, as base. This means that for 6 mm. height of incidence, or relative aperture of *f*8.3, the incident rays parallel to the axis, for all colours of the visible spectrum, are united in such a manner, after refraction by the lens, that their intersection with the axis is comprised within a space of 0.1 mm. This space of course increases more rapidly for larger apertures, but at *f*6.3, or 8 mm. height of incidence, it only amounts to 0.3 mm. Such a result can only be attained by correcting the spherical aberration very carefully for each colour. Spherical correction, as undestood in von Rohr's "History of the Photographic Lens," is attained for yellow sodium light (D line) at an aperture of *f*6.3, and the remaining zonal errors are as small as in the best corrected lenses of the same aperture, which do not possess an anastigmatic flat field. This may be clearly seen by comparing Fig. 3 with the curves of the corresponding older lenses given in von Rohr's book, according to the same scale. The dotted curve in Fig. 3 represents, as in von Rohr's work, the aberration of focus for the various zones.

By means of Fig. 2 we are able to construct Table III., showing the amount of spherical aberration.

TABLE III.

Comparison of the differences of intersection at the axis $s_{\lambda,h} - s_{F,O}$ expressed in millimetres. Apochromatic planar $\frac{f}{6\cdot3}$, focus = 100 mm.

Height of Incidence, *h*, in mm.	$s_C - s_{F,O}$.	$s_D - s_{F,O}$.	$s_F - s_{F,O}$.	$s_{G'} - s_{F,O}$.
0·0	+ 0·02	+ 0·01	0·00	- 0·08
1·0	+ 0·01	0·00	0·00	- 0·08
2·0	0·00	- 0·01	0·00	- 0·075
3·0	- 0·02	- 0·02	- 0·005	- 0·07
4·0	- 0·045	- 0·04	- 0·01	- 0·06
5·0	0·065	- 0·045	0·005	- 0·04
6·0	- 0·075	- 0·05	+ 0·02	0·00
7·0	- 0·075	- 0·035	- 0·065	+ 0·08
8·0	- 0·055	- 0·00	- 0·16	+ 0·18

Fig. 2 represents the spherical aberration in the various zones for four definite colours of the spectrum. It can easily be seen that this method is not suitable for showing the condition of the correction for any number of individual colours of the spectrum. To show this graphically, we may turn to the method adopted by Dr. von Rohr in his book "Theorie und Geschichte des Photographischen Objectivs," Berlin, 1899, p. 66, who was the first, so far as I am aware, to apply it to optics.

The wave-lengths λ, determining the colour of the light, are used as abscissæ, and an interval of 89 mm. is selected for that part of the spectrum between the red C line ($\lambda = 656\ \mu\mu$ = 0.000,656 mm.) and the blue G' line ($\lambda = 434\ \mu\mu$). The ordinates show the height of incidence of the ray multiplied eight times. In this way each point in the drawing represents two values (λ and h), and *vice versa*, each two values (λ and h) are shown by a point.

Fig. 2 was examined, and for each of the four curves the points were found, which are—5 mm., 0 mm., + 10 mm., + 15 mm., and + 20 mm., from the perpendicular axis erected upon the zero point. The corresponding heights of incidence

were noted. As stated above, rays falling upon the lens, parallel to the axis, at these heights of incidence, show a difference of intersection with the axis, measured from the back surface of the lens of $s_{C,h} - s_{F,O}$; $s_{D,h} - s_{F,O}$; $s_{F,h} - s_{F,O}$; $s_{G',h} - s_{F,O}$, or -0.050, 0.000, $+0.050$, $+0.100$, $+0.150$, and $+0.200$ mm., when p ured with the green ray at zero. The heights of incidence (h) were marked upon the perpendiculars erected upon the points C, D, F, G', in Fig. 4, and the values of $s_{C,h} - s_{F,O}$, &c., were added in units of 1 μ. Finally, the points bearing the same numbers were united by means of curves.

The values of $s_{C,O} - s_{F,O}$ &c., were taken from Fig. 2, or the first line of Table III., and written against the points C, D, F, and G'.

Fig. 4, constructed in this manner, serves the same purpose as Fig. 2, as the latter can be constructed from the former; but it is more useful. We can say with a degree of certainty, which is only qualified by the slight inexactitude of the form of the curves, that the same value, $s_{\lambda,h} - s_{F,O}$, which is placed against the curve, belongs to each point (h, λ) on the given curve. In other words, rays parallel to the axis, incident upon the lens at the height h, with light of the wave-length λ, cut the axis at the same point, after passing through the lens, if the two values belonging to them (h, λ), in Fig. 4, determine points lying upon the same curve, and the value of the curve shows how many thousandths of a millimetre the point of intersection is distant from the focus of the paraxial green rays. For example, this focal point is cut by the incident green rays, parallel to the axis, of wave-length $\lambda = 530$ $\mu\mu$ and 6 mm. height of incidence. The point upon the drawing, corresponding to the pair of values, $\lambda = 530$ $\mu\mu$ and $h = 6$ mm., will be found upon the curve for which $s_{\lambda,h} - s_{F,O} = 0$. Fig. 4 also serves for another convenient representation upon a large scale, resembling that used by persons in the study of maps of ocean depths and mountain altitude. According to the same method, they indicate by latitude and longitude the inclination of depth below, or height above, the sea level of two constantly changing critical localities.

Let us suppose that the curves in Fig. 4 are as much below (— sign), or as much above (+ sign), the plane of delineation as the figures which are given indicate. Between the curves in the drawing suppose a continuous surface. In the present case it would resemble a mountain saddle. The depression would be situate near the centre of the drawing. The ground would rise towards the right at the top, and towards the left at the bottom. It would fall towards the left at the top, and towards the right at the bottom.

The distance of any point at the surface from the plane of representation thus gives the aberration of the distance of axial intersection, as compared with the axial green ray for the wave-length λ (abeissa), and the height of incidence h (ordinate), determined by the point on the surface.

The large field in the middle of the drawing, bounded by the curves 0 and —50, represents all the incident rays (h, λ) parallel to the axis, whose points of axial intersection are compressed within 0.05 mm., measured in the direction of the lens from the focal point of the green axial ray. The size of this field shows that these rays form the bulk of those constituting the white light transmitted at full aperture, and that excellent central definition is attained.

Fig. 5 is a similar representation of the focal differences $f_{\lambda,h} - f_{F,O}$. The great similarity of this collection of curves with that for the differences of intersection shown in Fig. 4, is a guarantee for the sharp definition of points in the object, which are outside the axis. The evenness of the good correction of the focal aberrations for the various colours (λ) implies that there are practically no differences of magnification.

In conclusion, we draw attention to Fig. 6, which represents the correction for astigmatism for yellow sodium light, according to the method which has become familiar through von Rohr's work. The quantities given in Table IV. are taken from this drawing.

TABLE IV.

Correction for astigmatism and curvature of field.

Apochromatic Planar $\frac{f}{6{\cdot}3}$, focus = 100 mm.

Front Angle w	△ eq.	△ merid.	△ me − △ eq.	½(△ mi + △ eq)
0°	0·0	0·0	0·0	0·0
5°	−0·1	−0·1	0·0	−0·1
10°	−0·3	−0·25	+0·05	−0·28
15°	−0·5	−0·4	+0·1	−0·45
20°	−0·8	−0·5	+0·3	−0·65
25°	−0·6	0·0	+0·6	−0·3
30°	+0·2	+1·2	+1·0	+0·7

The values, △ eq., give the differences of focus for the equatorial pencils, and the values △ merid., those for the meridional pencils compared with the ideal focal plane. The values △ merid. − △ eq. are the corresponding astigmatic differences, and the values ½ (△ eq. + △ merid.) the measure of the mean curvature of field.

DR. RUDOLPH, Jena.

ON A NEW PRINTING PAPER, "GLYCIA."

ANOTHER new paper has just been put upon the market by Messrs. J. J. Griffin and Sons, Limited, under the name of "Glycia." It is a printing-out paper, manufactured at their Photographic Works, East Molesey, and I have found, after extended experiments with it, that it possesses advantages in many respects over any other of this type that has come under my notice. One is that it yields plucky, vigorous results. This does not mean that it is in any way unsuitable for good average negatives, for such indeed are necessary, in order to secure the finest attainable results on Glycia. The vigour seems to be produced by an increase of richness in the shadows, and, in consequence, even with strong negatives, all the finest detail in the high lights is reproduced with delicate accuracy. This I proved when trying the paper on some very strong collodion negatives that I keep specially for test purposes. Although the prints had great vigour, and were toned to a deep purple, the delicate details in the lights were perfect. For this reason it is a great acquisition, for we all know that at times, when a negative has, perforce, to be taken, it is not always possible to get all one desires; therefore, one has to put up with what is obtained, which, too often, is one lacking in brilliancy. With Glycia, however, it is possible to secure tolerably "plucky" prints from such negatives. Of course, it is not claimed that really plucky prints are to be had on this paper from negatives of a mere phantom character; but I say that it will give even with them more vigorous ones than on any other that has come under my observation.

Here is another advantage with Glycia that may be referred to, which is that it lends itself particularly to development. If the image is but a third or half-printed, it can be brought up to full strength, and of a good colour, by development. This, of course, means that double, three, or more times the number of prints can be got from a negative in a given time than would be possible if they had to be fully printed out in the ordinary way. This is not all, however, for by development printing we have the means of securing still further enhanced contrasts.

As the paper is really a printing-out one, I will first deal with

it as such. I have found it very quick in printing, and it takes a deep purple colour in the frame. After printing, it is washed in the usual way, when it assumes a redder colour. Glycia contains a large proportion of free silver, and to this fact is probably in great measure due its "brilliant" qualities. It is well with this, as with all P.O.P.'s, to get rid of this silver as quickly as possible after the prints are put into the washing-water. They should be kept turning about—especially for the first few minutes—then they may be left in running water for eight or ten minutes longer. They are then ready for toning. Two formulæ for toning baths are given, the sulpho-cyanide and the borax baths, and both, in my hands, yield excellent results. The former stands thus:—

Sulpho-cyanide Bath.

Gold chloride	1gr.
Sulpho-cyanide of ammonia	15gr.
Water	10oz.

For the convenience of workers on a small scale, Messrs. Griffin put up the ingredients in "cartols," which only require to be dissolved in water, according to the directions upon them, and the bath is ready for use. Each cartol makes 8oz. of toning solution. Professional workers will, no doubt, prefer to make the solutions for themselves, and I have found no difference in the working between the baths made according to the above formula and those made with the cartols. The borax bath formula is as under:

Gold chloride	1gr.
Borax	6gr.
Water	10oz.

This bath is recommended for the warmer tones, and the former for purple ones. But I have found that very much the same tones may be obtained with either. The prints tone quickly, but not so rapidly as the Carbona paper by the same firm, and this will be found an advantage by some, as the toning is more under control, and more prints can be dealt with at a time. The prints should be removed from the bath while they are still lighter than they are desired to be when finished, as they dry colder than they appear while in the solution. If a warm sepia is desired, the toning should be stopped soon after they lose the brick-red tint. If a dark chocolate, when they have assumed a sepia tone when the prints are looked upon, and, for a rich prints have received some preliminary washing, destroys all shadows when the prints are looked through. The prints are then rinsed in water, and fixed for ten minutes in the following:—

Hypo	1oz.
Water	10oz.

That is the strength recommended with the paper, but I prefer to have it a little stronger, say 8oz. of water, instead of 10oz. The prints are washed to remove the hypo in the usual way. The time of washing depends upon the way in which it is done. With frequent changes of water, or if the prints are kept in motion in running water, an hour or an hour-and-a-half will be sufficient. The time of washing, however, may be greatly curtailed by the use of "Hypax," a hypo-eliminator recently introduced by Messrs. Griffin and Sons. It is in the form of lozenges or tablets. One or two put into the washing-water, after the prints have received some preliminary washing, destroys all traces of the hypo, and a brief after-washing only is necessary.

Glycia yields excellent colours when toned in the combined toning and fixing bath. The formula for it, issued by the makers of the paper, is as under:—

Lead acetate	1 drachm	or	6 gm.
Sodium acetate	20 grains	,,	2 ,,
Hypo	2 oz.	,,	90 ,,
Sodium carbonate	20 grains	,,	2 ,,
Powdered alum	1 drachm	,,	6 ,,
Gold chloride	2 grains	,,	0.2 ,,
Water up to	16 oz.	,,	700 c.c.

Mix in the order stated, and filter. The bath may be used at once, but works better if allowed to stand for twenty-four hours.

The ingredients for the combined bath are supplied in cartol form; the contents of one, dissolved in 4oz. of water, forms the bath. Personally, I am no advocate of the combined bath, but I know that it is used by many amateurs, so I have quoted it here. When the combined bath is used, I would suggest that the prints be washed, to remove the acid and free silver from the paper before they are put into the solution. The prints on Glycia then tone a little slower than without the washing, but the colour is the same in the end. I make this suggestion on theoretical grounds, and it applies to all papers when toned in the combined bath.

Just now I alluded to the fact that Glycia lends itself admirably to development printing. If the paper be printed to about one-third—say until the lights are just to be seen—it may, with an acid developer, be developed into a vigorous print. The following is the developer recommended in the instructions:—

Developing Bath for Partly-Printed Proofs.

Metol	5 grains.
Pyro	5 ,,
Acetic acid glacial	2 drachms.
Water	10 oz.

With this solution a good chocolate or sepia colour is obtained. If the metol be omitted, and the pyro increased to 20 grains, to the 10oz. of solution, the colour of the prints is warmer, very like what was known as the Payne-Jennings brown. The development may be conducted by immersing the prints in the solution, or by floating them upon it in the same way that platinotypes are developed. I prefer the latter method, if the image is rather strongly printed, and the former when it is but lightly printed. Although the term development is used, the action is rather one of intensification, it being somewhat analogous to the intensification of wet collodion negatives with pyro and silver—the silver in the paper is reduced by the pyro-metol, and deposited on the image. The development of the picture takes but two or three minutes, according to the depth of printing in the first instance.

The directions, after the development, are to put the prints direct, without washing, into the fixing bath, same strength as used for printed-out pictures. When the prints are first put into the solution, they should be kept moving about, especially the first part of the time, as the acetic acid of the developer makes the surface of the paper very repellent at first, and unless this point is attended to, I have found a tendency to a yellowing of the lights, particularly after the solution has become milky looking. This may, however, be avoided by making the fixing solution alkaline with a little bicarbonate of soda—say ¼oz. or less to the pint. This, however, renders the prints somewhat redder in colour. I have just mentioned that I am not an advocate of the combined bath. Still less am I an advocate of putting the developed prints into the fixing bath without previous washing—this also on theoretical grounds, as a sulphuretting action is set up in the prints, and it may impair their stability.

The developed prints can be toned either before or after they are dried, if darker tones are desired than those given by development alone. When they are taken from the fixing bath, they can be put direct into the combined bath, without washing, where they will tone to a purple. Or the sulpho-cyanide bath may be employed; in this case the prints must be thoroughly freed from the hypo first, therefore I would suggest that they should be treated with Hypax, to ensure that they are. By varying the depth of printing in the first instance, a great variety of brown and sepia colours may be secured, and these again can, if desired, be further modified by after-toning, so that almost any photographic colour may be obtained on Glycia.

E. W. Foxlee.

PHOTOGRAPHERS AND THE FORTHCOMING CORONATION.

THE gasfitters have already fitted many weird devices, which will in due season blossom into fiery expressions of loyalty, loads of timber are being dumped ready for the erection of stands for visitors, distinguished or otherwise, and even the cake and bun manufacturers are entreating the public to place their orders early enough to ensure a supply of edibles on the two eventful days at the end of next month, which will be devoted to Coronation festivities. Surely in all this there is a note of warning to the photographer, be he professional or amateur, to be prepared to do justice to the occasion after his manner, and to avoid the fate of the foolish virgins, whom we may take as prototypes of the procrastinating amateur, who finds, about June 24th, that his particular size and brand of film is sold out. It is difficult to realise that the coming Coronation is the first in this country at which photography will play a part, but it is nevertheless true. Two years of the last reign had passed before Daguerre and Fox Talbot published their discoveries, and it was not until the opening of the Great Exhibition of 1851, that a successful record of a great public function was obtained in the camera. Since then every year has added its quota to the facilities for such work. First, the bromized silver plate, next collodion growing more and more rapid, then improved lenses, later the gelatine plate, with its steady but still astonishing increase of rapidity, and lastly the advent of the modern anastigmat and the flexible film, have combined to render possible such a record of events of national interest that our posterity shall not find wanting in the smallest detail.

Our present object is not to indulge in an historical retrospect, but rather to suggest to our brethren the advisability of overhauling their apparatus and making such repairs, additions, and improvements to it as necessity or fancy may dictate in good time. There is only a limited number of workers available for this class of work at any time, and May and June are their busiest seasons, and with the best of intentions your camera-maker or dealer cannot supply more than a limited number of extra slides, roll holders, telephoto attachments, and the like, beyond those he has a regular demand for. This week is the time when one should say: Is my camera light-tight? Shall I have a roll-holder or extra slides? Do I want an additional lens, or perhaps a telephoto attachment? Or a flashlight outfit for the local banquet? And forthwith to put the desired work in hand.

But beyond this there is the all-important question of plates and films, which only those who had to cater for photographers at the two Jubilees of Her late Majesty can appreciate at its true value. Hundreds who delayed ordering their supplies until a day or two before they were required were disappointed, and in these days of universal "snapping," the hundreds will become thousands. Therefore, be in time; give your dealer time to get his order in to the manufacturer, that he in turn may know how far he has to strain his resources to meet the demand. It would be a graceful tribute from the photographers of Great and Greater Britain if an album of pictures representing Coronation festivities and ceremonies in all parts of this great Empire could be made, and presented to their Majesties, who are both patrons of the Royal Photographic Society, and we commend the idea to the Committee of the National Photographic Record Society, who, we think, would not lose such a grand opportunity of adding to the collection they are making for the nation.

MR. E. RUSSELL CLARKE, a recently elected member of the Camera Club, is the inventor of a new process of colour photography for producing prints on paper. The process is still in the experimental stage, but visitors to the exhibition will have an opportunity of judging of its promise by one or two specimens of Mr. Clarke's pioneer work.—"Camera Club Journal."

Exhibitions.

MONKLANDS PHOTOGRAPHIC SOCIETY.

This is one of the Scottish societies, that has permanent headquarters. Let us whisper, we believe it is the best housed society across the Tweed. It has a studio, containing a studio-camera by Ross, London, and a rather fine fitment for the production of artistic portraiture, in addition to the usual dark room, changing room, and enlarging room, and its accompanying apparatus. The first exhibition of the society since they got their quarters was opened on Saturday last, May 3rd, by Mrs. Wilson, of Airdrie House, and will remain open till Saturday, May 17th, every afternoon, from 3 to 5, and every evening, from 7 to 9. Admission is free, and the large attendance of visitors is an exceedingly pleasing feature, giving evidence of the increased interest now taken in photography by all classes. The hanging of the pictures denotes a distinct desire on the part of the gentlemen responsible for this particular portion of the work—viz., Messrs. W. D. Gray, J. W. Eadie, and W. B. Hossack—to depart from the conventional methods. Each picture has been hung so that it may be seen to the best advantage, and still all the exhibits are tastefully and effectively placed. The exhibition, as a whole, presents no very striking features, but let us say at once that, as all the work sent in is hung, it is indirect praise to say that there is very few of the pictures hung that can be termed poor. Then, again, the framing and mounting leaves little to be desired, with some few exceptions. A feature of the exhibition is the total absence of medals or prizes of any description, and the freedom from classification. This goes to give this collection of work a unique character, as compared with its contemporaries, and we think that, while it is a bold step, yet it is one of wisdom, and one which we sincerely trust will have a wholesome influence on the future.

The work on the walls, contributed by Mr. J. W. Eadie, marks him at once as being one of the best workers of the society. Every one of his pictures has the stamp of very much care and attention to the pictorial side of the art. "Spring Sunshine," the result of a pinhole exposure, we believe, is a good thing. The treatment, while broad, is pleasing, and points to many possibilities for this method of working. The colour is very felicitous, and to it the work owes much. "The Clearing" represents a group of peasants "clearing," by burning the ground of old branches, etc. This is a somewhat unconventional subject, well composed. The lighting and general arrangement is well carried out, and the whole of the graduations have been well kept in hand. "After the Storm" is a thoroughly satisfactory bit of technical work, and as such, reflects credit on T. A. Deas. "The Smithy," by J. and G. Jack, is rather unconvincing. "Blue and Gold" is, without a doubt, a fine reminiscence of the illuminations at Glasgow's 1901 Exhibition. The title is apt. "Rhama" looks like a gum-bichromatie print, and will come as a surprise to those unacquainted with the newer printing processes. The mounting of this print is also worthy of notice. "Canoe Race, Loch Lomond," a carbon print of small size and pleasing quality, gives us a fine interpretation of water. Moreover, the grouping of the boats and their reflections are capital. Mr. F. Robertson's "Ebb Tide" does not satisfy the spectator as it should, and seems to have been accomplished without any particular aim. The carbon print, No. 37, "A Caucasian," is a remarkably fine portrait of a gentleman of that particular nationality, and runs "Rhama" very closely for the honour of best work on the walls. "Feeding Her Pets" is a satisfactory little genre work, by the energetic secretary, Mr. Jos. Higginson. The little damsel really looks interested in her pets, and the interest is so well held that the onlooker really feels himself taking part in the "feeding" of the pets. Mr. McGovern's "Winter" is, so far as the composition is concerned, perfectly effective; it is only when we look at his technique that we feel somewhat disappointed. Hand work at any time, unless it is so well done as to pass unnoticed, is to be deprecated. Among the work of other exhibitors, that of Messrs. Hogg, junr., Hossack, and McFarlane should be noticed. Lantern slides, to the number of 88, were on view. Mr. J. W. Eadie had a large number of the Glasgow Exhibition series, while Messrs. Hossack, Gray, McFarlane, Hugginson, and Deas contributed a number of local interest. We specially noticed "After Dinner," by Jos. Hugginson, and "Daffodils," by J. W. Eadie, as being much above the ordinary quality.

In concluding this notice, a word of praise may be given to the gentlemen who are responsible for the production of the catalogue. This is very well printed. Let us hope, also, that when the time for the next exhibition comes round, the executive will look about for some outside stimulus for new endeavour. Let them bring a loan collection together, so that the members may see the works of others, who have been longer on the road of pictorial photography, and have advanced further, not to imitate them, but to rouse them to the fact that there are still higher levels to be reached, and to suggest the way and direction.

PLYMOUTH PHOTOGRAPHIC SOCIETY.

This exhibition—the seventh—was opened at the Athenæum, Plymouth, on Wednesday, April 29th, and was continued to Saturday, May 3rd. The opening was performed by the Mayor, Mr. J. A. Bellamy, and the attendance was very good. He was introduced by Mr. C. H. Dymond, the president of the society, who has done much by precept and example to raise the society to its present position.

Plymouth Photographic Society may be heartily complimented upon its rise in the photographic scale, for the present exhibition is the best it has held, and the advance in all directions is most marked. The work of the members is characterised by an evident desire to do something worth while, and to thoughtfully proceed to that end. The response by members has been good, the number of their exhibits is beyond that of any previous show, and there is an absence of the striving after detail, and showing results that have before now been seen. Outside competitors are not so largely represented as last year, but, as a whole, the exhibition is numerically satisfactory, and the quality throughout is of a high and even standard. This characteristic has led to a considerable number of awards—more than is usual in an equal number of works, but we suppose there are many who will feel not dissatisfied with this.

The exhibition consisted of a number of classes, perhaps too many, but until photographic exhibitions are held wholly without classification, probably no other scheme would have found favour. A selection committee might have reduced the numbers, and have kept out a few prints, but there are not many but have deserved hanging, having some interest.

Members' landscape and seascape (Class A), is a full one of 140 exhibits, and highly creditable throughout. "Evening Calm" (8), Captain E. H. Haig, a seascape, with fishing boats is Certificated, but a Chinese white moon, which shows no reflections upon the still water below, is a blot upon a good subject, otherwise admirably treated. W. Clayden's "The Barbican" (17), a study of shipping and boats, is excellently handled, the values being very well rendered. The district is very enticing, as J. Trouern Trend's subject, "A Barbican Scene" (16), shows. He has dealt with so prosaic a subject as a steamer in a picturesque way. The same worker's "Mirrowed in the Silent Stream" (37), in which trees and their reflections play important parts, is well selected. A toning down of the water of the foreground and a more judicious mounting would have helped it. F. C. Bowtell's "Harvesting" (45), a well-chosen subject, does not quite evince the life of such a scene, and is not full enough of light. It is Certificated. Edgar Dudley's "A Swiss Village" (59), silver medal, is in many respects admirable, though somewhat topographical. W. H. Mayne's "Autumn" (71), Certificated, is a charming study of a woodland scene, of a warm brown tint. W. Clayden's "A Misty Morning" (84), bronze medal, a fishing boat study, deserves commendation. A very striking print is Captain E. H. Haig's "Landing a Catch" (90), silver medal, a quayside picture full of life and energy, and eminently pictorial. C. H. Dymond's "A Devonshire Trout Stream" (116), is a well chosen bit, representing a woodland through which the stream tumbles over rocks on its way. There are all the makings of a picture in "Village Street, Polperro" (32), by Captain Haig, but the washed-out character of the print is very unpleasing.

F. C. Bowtell's "Resting" (20), a group of field workers, is pictorially interesting, but a bit hard, and there is a suggestion of a hill that is not distinct enough and yet too distinct. C. H. Dymond's "Woodland Idyll" (22), a study of ferns and foliage, has much to commend it. His "Haunt of the Heron" (42), is a sweet little picture. "A Woodland Stream" (40), by W. H. Mayne, is attractive, despite a certain coldness. W. Anning's "Ye Olde Street, Polperro" (52), is a delightful study. There is a quiet calm, and much charm in H. S. Hill's "Remote from Towns" (56), in which meadow and stream, and mansion take part. A. B. Fellowes Prynne has found a good subject in "Cliffs, Newquay" (112), but the choice of exposure, when a surf breaks at a spot against the base of the cliff, does not tend to pictorial balance. A good thing, enjoyable from all points, is the "Path Through the Forest" (124), by W. H. Mayne.

Class B, portraiture, figure studies, still life, etc.—An ordinary class of considerable variety. There is a point which strikes the eye at once, easily the best thing in the estimation of many, in the class. A very pleasing portrait study of "Our Boys" (174), by W. Grist, three merry-faced young lads in a row, the perfection of naturalness. The very slight blemish of similarity of pose is, after all, not strong enough to mar the general good effect. A bronze medal is awarded, though a higher distinction was deserved. Captain Haig's "In Contemplative Fashion" (190), a study of a head, happily posed, and in a very sketchy style, is certainly deserving of recognition. A silver medal has been awarded. Edgar Dudley's "Idle Moments" (181), two damsels in a punt on a placid stream, beneath a branching stream, the whole well arranged and thought out, and excellent in technique, has not won recognition. The reason may be it is sharp and shiny, but this suits the subject and its size. A clever study of a dog is C. H. Dymond's "Who Said Cats?" (178). F. C. Botwell's "Cutting the Oats" (188), is ordinary arrangement and hard. It has secured a silver medal. "Fisherman Mending Nets" (176), by D. Adair, would have had more quality by a little change of position of the figure. F. Johnson's "Cattle at Valiecoucis Abbey" (177), is exact to title, but the absence of the cattle would have increased the value of the picture.

Class C, members' architecture.—A very nice class of 30 exhibits, of even quality. Up to the present this subject has not been so much pursued by the members, and now the examples do not illustrate local subjects. No higher award than a bronze medal has been given, and this has gone to W. C. Johns, for "Wells Cathedral, Passage to the Undercroft" (202), but we much prefer his rendering of "In Wells Cathedral" (212), in which a strong light against dark surroundings has been admirably rendered. His "Stairway to the Chapter House, Wells" (196), is a very creditable piece of work. J. T. Trend's "Doorway, St. Michael's Mount" (201), is broad in treatment and well rendered in every way. The same worker's "Doorway, Tintern Abbey" (220), is very fine, soft, and delicate, yet with plenty of force. W. H. Mayne's "Across the Presbytery, Tintern" (211), is one of the happiest points of view of this subject we remember to have seen, though possibly the print is a little too dark.

Class D, members' lantern slides.—A class that really has much good quality and great variety. The judges had trouble in placing the competitors, but they were not niggardly in recognising merit.

Class E, open landscape and seascape.—An interesting lot of about 40 entries, of average merit, in which are several good things. Chas. E. Walmsley's "The Torrent" (237), is an exquisite rendering of a waterfall, the froth and tumble of which is beautifully rendered, set off, as they are, against deep shadows. However, the judges passed it by. The same worker's "Summer's Increase" (245), a harvest scene, is full of sunshine, without hardness. C. F. Grindrod's "Ploughing on the Upland" (253), is a pleasantly arranged subject, but by no means, it seems to us, up to the silver medal standard it has secured. It is the most "diffused" print but one in the exhibition; the one that excels it in this respect is "Venetian Fruit Seller" (260), a canal scene in Venice, by Percy Lewis, for which a silver medal has been secured. C. J. King's "Rock Thwarted" (258), is a very fine study of breaking surf

Class F, open portraiture, figure studies, animals, and still life.—The class is widely diverse, but excellent. The best thing in it is "Evening of Life" (276), a portrait study of an old lady, by Miss Maud Shelley. The values are splendidly rendered, and the picture is most admirably mounted. A silver medal has been awarded, a thoroughly deserved honour. Another exquisite study of a head is Mrs. R. M. King's "A Normandy Cap" (287), the half tones well rendered, the pose natural and easy; but a circular opening, with a white paper mount, does the print injustice. Yet, despite this, we think it deserved a higher distinction than it secured, a bronze medal. W. Illingworth's "A Philosopher" (294), is a very fine study of a head, a fine model, and naturally posed. C. J. King's "Narcissi, Double White" (305), is deserving a good word, for its fine rendering of half tones. There is an awful example of how not to mount in "The Jewel Casket" (322), by Mrs. R. M. King, a very creditable figure arrangement, with excellent technique, the good impression spoiled by an imitation oak cut-out mount.

Class G, open architecture.—A very small class, the best example in which is W. A. Clark's "North Choir Aisle, Beverley" (324), which is deservedly Certificated. The same worker's "Evening, Southwell" (325), is an interior, strong in contrasts, but good in technique.

Class H., open class for lantern slides.—This is meritorious and full of good things, and the judges have recognised the talent displayed by a considerable number of awards.

Class I, stereoscopic work.—Prints and transparencies constituted this class, and were a capital lot.

Class J, not for competition.—The contributors to this were few and mostly members, but there was quality in the exhibits. Captain Haig's "Barbican, a Study" (142), was a strong, sketchy subject, broadly treated—figures playing a considerable part in it. H. J. Hissett has a number of good things, the best of which were: "On the Fowey River" (146), "Stafford's Tomb, Exeter Cathedral" (147), and "Transept, Exeter Cathedral" (153). Messrs. Heath and Co. were very successful in a portrait of Mr. J. A. Bellamy (154) (Mayor of Plymouth), and "Portrait of His Majesty the King" (155).

The judges were Dr. P. H. Emerson, B.A., V.P.R.P.S., Mr. Baragwanath King, and Mr. F. Shelley. The former judged at the last preceding show, and is very much pleased at the advance made by the members. The following are the awards:—

MEMBERS' CLASSES.

A.—Landscape and seasape.—Silver medals—59, "A Swiss Village." Edgar Dudley; 90, "Landing a Catch," Captain E. H. Haig, R.E. Bronze medals—20, "Resting," F. C. Bowtell; *115, "A Misty Morning," Captain Haig; 133, "The Last Ferry," A. J. Anderson. Certificates—29, "The Old Homestead," J. Trouern Trend; 36, "The Harbour Light," A. F. Jewers; *45, "Harvesting," F. C. Bowtell; 55, "On the Tiddy," C. H. Dymond; 65, "O, Happy Harvest," A. J. Anderson; 71, "Autumn," W. H. Mayne; *76, "Shrimpers," Captain Haig; *82, "Launching the Boat," C. H. Dymond; 96, "Furzetor," Wilfred Grist; *106, "Scene on the Barbican," J. Trouern Trend; *124, "The Path Through the Forest," W. H. Mayne; 84, "A Misty Morn-

ing," W. Clayden; *94, "Barbican," Captain Haig; 8, "Evening Calm," Captain Haig.

B.—Portraiture, figure studies, still life.—Silver medal—160, "A Quiet Corner," Captain E. H. Haig. Bronze medals—174, "Our Boys," W. Grist; 185, "Cutting Oats," F. E. Bowtell. Certificate—162, "The Ghost," F. H. Pearse; 176, "Mending the Nets," D. Adair; 179, "Cattle at Valle Crucis Abbey," Frederick Johnson; 180, "Figure Study," W. Grist; *190, "In Contemplative Fashion," Captain Haig.

C.—Architecture.—Bronze medal—202, "Wells Cathedral," William C. Johns. Certificates—*212, "In Wells Cathedral," W. C. Johns; 220, "Doorway, Tintern Abbey," J. Trouern Trend; *222, "Wells Cathedral," W. C. Johns.

D.—Lantern slides.—Silver medals—"A Misty Morning," W. Clayden; 342, "Evening," A. W. Hicks; 348, "After the Storm," F. C. Bowtell; 350, "Undercroft, Wells," W. C. Johns; 352, "On the Mawdack," Frederick Johnson. Bronze medals—"Seascape, St. Breage," J. T. Trend; *339, "The Ever Restless Sea," J. T. Trend; *345, "Early Spring," F. C. Bowtell; *351, "Cattle at Valle Crucis Abbey," F. Johnson; 353, "Sea and Sky," F. Johnson. Certificates—344, "After the Storm," C. H. Dymond; *347, "The Ferry," F. C. Bowtell; *349, "Snow Scene," F. C. Bowtell.

OPEN CLASSES.

E.—Landscape and seascape.—Silver medals—253, "Ploughing on the Upland," C. F. Grinrod; 260, "Venetian Fruit Sellers," Percy Lewis. Bronze medals—240, "Feeding Sheep," Chas. E. Walmsley; *261, "Yonder Lonely Mouldering Pile," Graystone Bird. Certificates—228, "An Autumn Dip," G. F. Capper; 230, "A November Day," W. Andrews; *236, "Hauling Timber," C. F. Grinrod; 239, "The Rivers," E. A. Price; 246, "Reflections," Miss Maud Shelley; 250, "Calm Evening," W. F. Slater; 251, "Creek up St. Germans River," A. J. Anderson; 259, "The Norrard Slip," V. A. Paul; *256, "Chioggia, The Quay Side," P. Lewis.

F.—Portraiture, figure studies, animals, and still life.—Silver medals—276, "Evening of Life," Miss Maud Shelley. Bronze medals—287, "A Normandy Cap," Mrs. R. M. King. Certificates—266, "Evening," G. H. Capper; 271, "Memories," R. B. Moss; 274, "Home from the Front," W. M. Lean; 299, "A Portrait," Miss M. C. Hackett; 305, "Narcissi," C. J. King.

G.—Architecture.—Certificate—324, "North Choir, Beverley," W. A. Clark.

H.—Lantern slides.—Silver medals—357, "Spring Time," Harold Hill; 359, "Mont Mallet," R. W. Harvey; 360, "Winter," T. Wright; *358, "A Lapland Maiden," R. W. Harvey. Bronze medals—356, "Clearing," W. Mitchell; 361, "Pæonies," Dr. G .B. Ferguson; 360, "Undercroft, Wells," W. A. Clarke; 369, "In an Orchard," Grayston Bird; *370, "The Nave, Southwell," T. Wright. Certificate—354, "Waiting," G. Cleland; 363, "Sunset, Ilfracombe," J. Stabb.

I.—Open.—Stereoscopic work.—Silver medals—383, "Thrush Feeding Young," A. W. Westrop. Bronze medals—374, "Cloister Arch," C. Williams; 377, "Nest of Robin," E. B. Green. Certificates—382, "Primulas," Rev. J. Seagar; 395, "Winter," T. Wright.

The asterisk denotes that these awards are withheld, under the rule prohibiting an exhibitor from taking more than one medal or certificate in one class.

The exhibition has been very popular, and a number of the works have been sold. The society's conversazione was held on Friday evening, and was very largely attended. The musical portion of the programme was arranged by Mr. G. F. Treleaven. This year's exhibition has created a wider spread interest in photography than before, and all who have helped in its success are to be congratulated upon this fact.

THE "NEW AND LUCRATIVE PROFESSION" IN AUSTRALIA.

The appended advertisements are taken from a recent issue of the "Sydney Morning Herald" (N.S.W.):—

ARTISTIC
FAMILY
PORTRAITS.

EDEN,
The Leading Photographer,
Sydney and Melbourne.

Photography nowadays is of various types—firstly, there is the flashy or theatrical, where likeness is not considered; next there comes the caricature, or attempt at good photography; and, lastly, but ahead of them all, is the good family portrait executed by practical artists, with an ease and character of pose suggestive of a natural home life; and it is to the production of these latter that Mr. Eden, of the "Eden Photo Studios," has directed his energies, and thus it is that clergymen, doctors, and professional men alike send their families to the Eden Photo Studios with a confidence that a portrait will be produced that will prove a valuable and lasting adjunct to the family possessions. Visitors from the country swear by the Eden Photo Studios, while wedding parties invariably entrust their orders to Mr. Eden. This newspaper could be literally filled with eloquent testimonials received during the last quarter, all testifying to the writers' appreciation of some portraits received; while the moderate price astonishes all—twelve enamelled cabinets and a large framed portrait for fifteen shillings.

Note the Address:
EDEN PHOTO STUDIOS,
George Street,
Opposite Anthony Hordern and Sons.

A SPECIAL OFFER
TO ADVERTISE OUR
NEW PREMISES.

As a means to advertise our new premises, 448, George Street (one door from Market Street), we are making the following most astounding offer for a short season only:—

A Good Business Ruined.

Observant citizens can remember many a good business which has been completely ruined through the mistake of the proprietors thinking that the public would be sure to follow them to their new and improved premises. The fact is, the public are so engrossed with their own affairs that they do not trouble about the other fellow, and at the moment when they need him they forget where he has gone to. But we do not mean to let people forget where we have removed to; therefore, to make a most decided impression, we are making the following

Astounding Offer,
And we mean to give such a startler that
It Must Catch On.

Here it is:—To every sitter for one dozen cabinets or one dozen Paris panels we will present a charming miniature portrait of themselves, painted in water colours or oils—

Twelve cabinets, in any process, and a £3 3s. miniature for ... ... £1 1s.
Twelve Paris panels and a £5 5s. miniature for ... £1 10s.

We cannot keep this offer open for long, so you had better take advantage of it while you may.

To meet the wish of those who would like a painted miniature from a much-prized photo which they have of some dear one, we will copy the photo and supply the miniature at these prices, and will suitably mount it in a handsome setting in lieu of the cabinets or panels.

What We Expect in Return.

Everyone must know that this cannot pay us, therefore we ask that those who take advantage of this most exceptional offer will kindly tell as many as possible of their friends of our removal, and so help to advertise our new premises.

This is Our Aim and Object.

Please understand that the work, both in the photographs and the miniature, will be absolutely the

Best That Money Can Buy.

Independent of the above offer, we are still supplying cabinets, Paris panels, and enlargements at our usual prices.

THE CROWN STUDIOS.

The purse of the most opulent cannot purchase higher art or better finish.

THE CROWN STUDIOS.

One door from Market Street (next to Roberts' Hotel), 448, George Street, Sydney. Opposite Lassetter's.

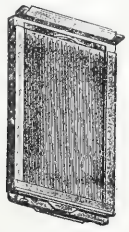
Royal Photographic Society.—Ordinary meeting, Tuesday, May 13th; Mr. Fritz Knollmorgen will read a paper on "A New Apochromatic Form of Zeiss Planar Lens." The exhibition of photographs by Mr. C. Yarnall Abbott closes on May 10th, and Mr. W. Smedley Aston will open an exhibition of his photographs on May 20th. Visitors are admitted on presentation of visiting cards.

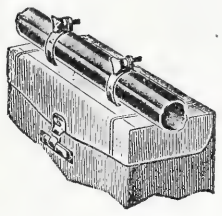
A Yellow Dye from Photographic Chemicals.—The addition of another yellow colour to the available resources of the photographer will be greeted with satisfaction, as whether for dark-room windows or screens for isochromatic work, the greater the range of colour the greater the power placed in workers' hands. We learn from a foreign source that when ammonium persulphate is added gradually to a solution of ammonium thiocyanate (more commonly termed by photographers sulphocyanide), contained in an open dish, pure canarin is readily formed. When a woollen fabric is dipped in a solution of ammonium persulphate and then in ammonium thiocyanate, and the operations repeated several times, the fabric becomes dyed intensely with canarin.

New Apparatus, &c.

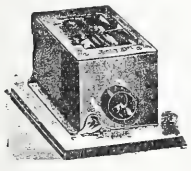
"The No. 5 Cycle Poco Camera." Agents: John J. Griffin and Sons, Limited, 20-26, Sardinia Street, Lincoln's Inn Fields, London, W.C.

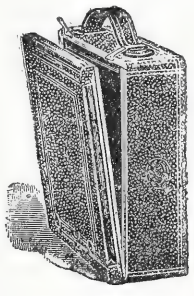
In sending us one of these cameras for examination, Messrs. Griffin also draw our attention to its distinctive features:—"The No. 5 Cycle Poco Camera sells at three guineas for the ¼-plate and 5in. by 4in. sizes, and £4 7s. 6d. for the ½-plate size. The instrument is covered in leather, has a leather bellows, and the woodwork is made from polished mahogany





dovetailed together. The metal work is polished and lacquered brass. The camera is fitted with the Unicum lens and shutter, and has a double extension, view finder, and reversing back. This is the first series of Poco cameras sold at a popular price having a reversing back. It also has a focussing scale, and bush for tripod. The following features are also embodied in the camera:—Dark slides: A simple method of loading the plates is secured by means of a hinged flap at the bottom of the slide, there being no springs or catches in the slides whatever. Combined view finder and level: This camera is fitted with the device of a small metal ball running on the top of the view finder. The camera is also adapted for cyclists, as it packs in a finished leather case, which is included in the price, and may be fixed to any cycle by means of the cycle camera carrier sold for that purpose." The form of the camera is now tolerably familiar to our readers, so that it will suffice to say that the instru-





ment before us is compact and well finished. It appeals to us as a strong and serviceable little machine. By the way, if we could persuade the American manufacturers to abolish double slides, and use only thin, but strongly constructed, single slides, we think they would be greatly appreciated. We have used single slides for outdoor work for eight years, and the convenience is so great that we should not care to return to double slides.

"The Aldis Lens." Manufactured and sold by Aldis Bros., 13, Old Grange Road, Sparkhill, Birmingham.

On the 3rd August, 1900, we published in these columns a paper read before the Royal Photographic Society by Mr. H. L. Aldis on lens construction. In it was foreshadowed the outline of a new lens of more simple construction, and the instrument now placed upon the market by the firm of Aldis Bros., appears to be the concrete embodiment of these ideas. According to the patent specification, one component is a cemented combination of long focus (either slightly positive or slightly negative), formed of a converging lens cemented to a diverging lens of slightly higher refractive index. The second component is formed of one double convex lens, and the radius of curvature of each of the two faces is greater than the radius of curvature of any face of the first component. The radius of curvature of the outer face of the second component is greater than that of its inner face. From this it follows that there are only three elements constituting the lens. Messrs. Aldis have sent us a specimen of Series II., No. 2, for trial. As it is specially designed for rapid hand-camera work, it should be judged by its suitability for that purpose. The aperture is f/6 and the focal length 5¾ inches. At full aperture it is recommended for quarter-plate size. The central definition is excellent, but we observe some falling off at the margin of the plate. Probably the desire to obtain as large an area of definition as possible has been the reason for adopting 5¾ inches as the focus for a quarter plate, but with the large aperture of f/6 the depth of definition is reduced. On the other hand, the angle of view is diminished and the lens in this respect will meet the taste of those who prefer the perspective of narrower angle lenses. If we take the three essentials for a good hand-camera lens, rapidity, fine definition, and covering power for the specified plate, we think the lens will commend itself as a satisfactory compromise. The construction of a doublet formed of three lenses, without an air space in either combination, has been accomplished by more than one optician in the past, but it is a distinct advance to arrive at this result with an aperture of f/6. Nevertheless, we think there is room for further improvement in the area of fine definition, as compared with the focal length of the lens. Mr. Hugh L. Aldis furnishes us with the following notes relating to the lens:—"The 'Aldis Lens' consists of a front cemented combination and a back simple lens. We have therefore secured only four open reflecting surfaces, and consequent freedom from any tendency to ghosts or flare spots. We claim entire freedom from these defects, and at the same time have reduced the liability to mechanical errors to a minimum. The correct centring for such a doublet lens can be carried out without any mechanical complications of screw adjustments, etc., which are very liable to go wrong. As regards the nature of the glass used in these lenses, we should be glad if you would kindly note this important and interesting fact. Both Messrs. Zeiss and Goerz, in their patent specifications, have declared that it is impossible to produce an anastigmatically corrected doublet lens without introducing at least one cemented combination in which the cemented surface is such that the rays are converged in passing across it. This practically amounts to stating (considering the nature of the optical glasses at present obtainable) that such an astigmatically-corrected lens must contain the glass known as 'Heavy Baryta Crown.' As you may be aware, it has been found impossible to produce this glass free from small bubbles, which mar its undoubted optical value. We have succeeded in producing in the 'Aldis' lens an anastigmatically-corrected doublet in which only 'Light Baryta Flint' glass is used, the cemented surface having a divergent effect upon the rays, and consequently, of course, we have been able to keep the lens entirely free from any small imperfections, such as bubbles, etc."

"The Lothian 'Combined' Frame." Sold by Andrew H. Baird, 33-39, Lothian Street, Edinburgh.

It is not easy nowadays to impart novelty of use or construction to a photographic printing frame, but in the little piece of apparatus before us Mr. Baird has quite succeeded in doing so. The "Combined" frame, in fact, is both decorative and useful. Made of dark moulded wood, the half plate before us looks superficially like a frame used for mounting purposes. So neat is it that this purpose may readily be availed of. But it has a variety of uses, as the following notes of instruction will show:—"Use the frame in the usual manner when required for printing purposes. For framing purposes proceed as follows: (1) Remove the back of frame and insert a piece of plain glass (the glass of a disused negative will do). (2) Trim the print according to your judgment; cut it perfectly rectangular. (3) From the larger pieces of paper backing select a suitable colour by placing the print against the most likely ones. (4) Now put the print with the paper backing on the top, against the glass in the frame and replace the back. The framing is thus immediately completed (5) For framing purposes most exquisite results are obtained by using ½-plate prints in 1-1-plate frames, and ¼-plate prints in ½-plate frames, etc. By employing the larger frame the marginal (smaller) papers can be used with very much effect. (6) By slipping a cord under the springs the frame may be hung against a wall in the ordinary way. For storing sensitive paper an old negative or glass plate is first placed in the frame as a support, and then a mount or a piece of thin cardboard to protect the paper from the light. The sensitive paper is now inserted and covered up with another mount or piece of nonactinic paper. Finally the back is replaced. Prints and film negatives are satisfactorily stored in a similar manner." A "Combined" frame, ½-plate size, costs 1s. 9d., and its variety and economy of purpose make it cheap at the price.

THE incorporation of the Carbutt Dry Plate and Film Company, under the laws of Delaware, on April 2nd, with a capital stock of $150,000, was an important step toward the perpetuation of one of Philadelphia's best known industries. The corporation was formed to acquire the business so long conducted by John Carbutt under his own name, and also that his sons might hereafter have an active interest in the enterprise. The new company came into possession of the property on April 4th, and a permanent organisation has been effected by the election of Messrs. John Carbutt, president; J. E. Carbutt, vice-president and treasurer, and R. F. Carbutt, secretary. As a manufacturer of dry plates, celluloid films and photographic specialties, John Carbutt enjoys an international reputation. He was the pioneer in this line in the United States, and first commenced business in 1878 at Ninth and Arch Streets. His trade continued to develop to such an extent, however, that in 1884 he built the present "Keystone Dry Plate Works" at Wayne Junction, where he has been located ever since. He has been compelled to add improvements from time to time, however, and his establishment to-day is one of the largest and best equipped plants of the kind in this country. As an evidence of the high merits of the goods turned out at these works it may be cited that the United States Geological Survey was several years ago equipped with a full line of Mr. Carbutt's photographic appurtenances, as was also the Greely Expedition to the North Pole in 1880. The output of these works are too well known and too highly appreciated by the trade at large to require any enumeration at our hands, and their merits are too strongly established to require more than passing comment. The fact that these photographic specialities are to-day in satisfactory use throughout the world is in itself the highest proof of their superiority. As president of the Carbutt Dry Plate and Film Company, Mr. Carbutt will continue to manifest an active personal interest in the business which has attained such large proportions under his able and progressive management of affairs, and the enterprise will continue to be conducted along the same lines which brought such a marked degree of success in the past.—"The Mercantile and Financial Times" (Philadelphia).

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

May.	Name of Society.	Subject.
10.....	Ashton-under-Lyne Photo.	Ramble to Miller's Dale. Leader, Mr. Tulloch Cheyne.
10.....	Liverpool Amateur.....	Excursion to Hawarden and District.
10.....	Camera Club.....	Ramble—Kingdon Gardens, Smokey Lane. 2.45.
10.....	Croydon Natural History...	Excursion—Photographic Section.
13.....	Ashton-under-Lyne Photo.	Ramble to Grindleford. Leader, Mr. Alfred Shaw.
13.....	Croydon Natural History.....	Geological.
13.....	Birmingham Photographic	*A Demonstration of Development.* Mr. E. S. Barralet.
14.....	Birmingham Photographic	Half-Day Excursion to the "Leasowes." Leader, Mr. E. Johnson.
14.....	Croydon Camera Club	*Chromatype.* Mr. J. R. Gotz.
14.....	North Middlesex Photographic	*A Trip to the Moon* (fully illustrated). Dr. E. J. Spitta.
15.....	Richmond Camera Club	Annual General Meeting.
15.....	Croydon Natural History.....	Excursion—Botanical.
15.....	Sunderland Photographic	*What can be Done with a Hand Camera.* By Messrs. C. P. Goerz & Co.
15.....	London and Provincial.....	Novelties in Apparatus, &c.

ROYAL PHOTOGRAPHIC SOCIETY.—THE PROCEEDINGS OF COUNCIL.

[Reprinted from the Society's Journal for April.]

Revision of Articles.—The Council have to announce that they have appointed a committee to consider whether and in what directions the society's articles of association require revision. The committee have also been instructed to consider and report upon the question of proxy voting as affecting members of the society. The committee, which will present its report early in the next session, is composed of the following members:—Mr. Leslie E. Clift, Dr. E. C. Fincham, Mr. Francis Ince, Mr. John Sterry.

An Annual Dinner.—The Council, acting upon a suggestion that the society should institute an annual dinner, have appointed a committee to consider and report upon the matter. The committee, upon which the following gentlemen have been appointed, will meet at an early date to prepare a report:—Mr. Frank Bishop, Mr. Alfred Ellis, Dr. Ernest C. Fincham, Mr. T. E. Freshwater, and Mr. Martin Jacolette.

Affiliated Funds.—The Council have decided to separate the funds of the Affiliation from those of the Royal Photographic Society, in whose books and banking account they have hitherto been included. The subscriptions will be received by the society, which will deduct one-third for working expenses, as at present, and will pay the balance to the credit of a separate affiliation account every quarter.

The Museum.—The Council are pleased to announce that an addition has been made to the technical exhibits in the Society's museum by the acceptance of the following apparatus which has been lent by Mr. Hugh L. P. Lowe, of Chepstow:—

A portable wet plate box camera (12in. by 10in.), with baths, etc., made by Negretti about 1852.

A dry plate magazine stereoscopic camera, made by Dancer nearly fifty years ago.

A magazine stereoscope invented by the exhibitor's father about 1356.

The following additional committees have been appointed:—

Library Committee.—Dr. P. H. Emerson, Mr. A. Haddon, Professor R. Meldola, Mr. H. Snowden Ward, and Sir H. Trueman Wood.

Exhibition Organising Committee.—Mr. Frank Bishop, Mr. John Gunston, Mr. Martin Jacolette, Mr. J. C. S. Mummery, and Mr. E. Sanger Shepherd.

Selecting and Hanging Committees (to serve with those who were elected by the society, see p. 64):—Pictorial Section: Mr. John Gunston, Mr. Martin Jacolette, Dr. Llewellyn Morgan, Mr. Eustace Young. Technical Section: Mr. Arthur C. Beard, Mr. Charles P. Butler, Dr. Vaughan Cornish, Mr. W. Gamble, Captain D. Wilson-Barker, R.N.

Mr. J. S. Bergheim has been appointed a member of the Lectures Committee.

The following have been appointed the society's delegates upon the Affiliation Committee:—Mr. Douglas English, Dr. E. C. Fincham, Mr. John Sterry.

The following additional standing orders have been adopted:—

(12) The selection of photographs at the annual exhibitions for the permanent collection shall be entrusted to the judges, whose selection shall be subject to the approval of the Council.

(13) The expenses of carriage incurred by those contributing to the house exhibitions shall be borne by the society.

(14) Smoking shall not be permitted at any meeting of the society, other than those of an informal character held on the first Tuesday in each month.

(15) There shall be a repairs reserve fund in respect of the premises at 66, Russell Square, and a sum of £50 shall be placed annually to the credit of the fund.

(16) The subscriptions received from the affiliated societies shall be apportioned as follows:—One-third to the Royal Photographic Society for secretarial, clerical, and general expenses, and two-thirds to the affiliation for expenditure as the committee may decide.

(17) Cheques upon the society's bankers shall be signed by the honorary treasurer and the secretary of the society.

Any doubts that the new informal meetings of the Royal Photographic Society would be a success were dispelled on Tuesday, May 6th, when the inauguration of the scheme for opening the house at 66 Russell Square daily from 10 a.m. until 10 p.m., and the first of the informal meetings, took place. It was unfortunate that the council, who have arranged to provide this extra opportunity of meeting to the members, were detained over their business and prevented from lending to the function their support. The chair was taken by Mr. Leslie E. Clift, who, in a few introductory remarks, bore testimony to the increasing energy displayed by the House Committee in their efforts to complete the decoration of the three new rooms that are now thrown open. These rooms comprise commodious and well-lighted apartments for the accommodation of the growing permanent collection of photographs and the extensive collection of examples of the applications of photography in its more technical aspects. There is also a large enlarging room fitted with sink, lantern, and easel, that will no doubt be duly appreciated.

Mr. S. Herbert Fry, as a member of the House Committee, said that in getting the rooms into trim they had endeavoured to show that they were not a committee of "say something," but a committee of "try to do something." At the same time, he assured the members that their criticism of the provisions they had made would be welcomed. The House Committee sought such criticisms in the belief that they were invaluable as a means of arriving at exactly what was required.

After some eulogistic remarks and some suggestions had been made, the chairman alluded to the importance of maintaining the workrooms in an efficient state. He was sure that the members, who were now responsible, would not fail to preserve as far as possible the good condition of the apparatus, and in fact treat it in every way as they would their own.

A member remarked that he had understood that the cost of installing the electric light in the lantern was somewhat high, and that the expense of running the helical-focus lamp, such as is installed in the new lantern, was considerable. He also gathered that there was some uncertainty about its work.

Mr. Kenneth Mees said that, while the arc lamp (which can also be employed) was undoubtedly the best illuminant from the point of view of definition, to take but one, it was not easy to manipulate without experience. He supported the adoption of the existing illuminant.

Mr. John H. Gear dissented from this speaker's remarks as to the difficulty of working the electric arc lamp and its liability to go out. It was the fault of the operator if any trouble occurred.

In reply to a question as to the earliest date by which the enlarging room would be ready, Mr. Fry suggested that if the speaker wished he was able to commence operations at once; he would find everything ready.

The meeting broke up after a very pleasant discussion, in which it was manifest that the members were satisfied with the progress that had been made and pleased with the idea of the informal meetings. The suggestion that an opportunity might be made to introduce one member to another is one that will commend itself.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

May 1st, 1902.—Mr. Thomas Bedding in the chair.

Mr. P. Everitt showed the bottle (described by him at a recent meeting) constructed to pour off measured quantities of solution without outside interference. The hon. sec. having read a short paper descriptive of certain printing-out paper, a discussion took place upon some of the points that were raised.

The chairman thought it open to debate, if not contention, that nine-tenths of the exposures made in these days were instantaneous. The common definition of such an exposure was "something less than a second," and he was inclined to question the accuracy of the suggestion that longer exposures were in so small a proportion. As regards the battle of the developers, it was thought that metol and other of the newer developers were more extensively used than anything else, but he had an idea that pyrogallol was still very largely employed. On the question of the development of gelatino-chloride papers, it would be interesting to know whether uniformity of colour and depth were easily attainable.

Mr. W. T. Wilkinson said that some nine years ago he had considerable experience with developed p.o.p. prints, and the results in his hands were just as good as those obtained by printing out. He was doing three hundred prints a day in the winter months with facility. Certainly one could not pick up the process quickly; experience alone made one capable of securing uniformity of result.

Mr. Everitt said that he had seen the process worked by Liesgang was summer time, and evidently some advantage was seen in the method.

Mr. Fry thought that nobody would choose to work by the development method if he could print-out instead. He thought that the method demonstrated by Mr. Hodd some time ago was a good, simple, and reliable process, but that the development process was not the cheapest way of working p.o.p.

Mr. R. Beckett said he was one of those who regarded pyro as still having a strong hold on photographers. He knew of people who had come back to its use after trying other agents and finding them inferior.

Mr. Welford thought that pyro would be found a long way in arrear if the dealers were asked about it. Of course, he was expressing no opinion about its merits.

Mr. Fry said that pyro might be more used than ever, and yet have

a smaller proportion of adherents than formerly, due to the great increase in the ranks of photographers.

The discussion was continued on other matters of general interest.

CAMERA CLUB.

THURSDAY, April 23rd, was devoted to a lecture by the Rev. F. C. Lambert upon "The Toning of Bromide Prints." Previous to the lecture, Mr. Wallace Godfrey, who has resumed the duties of hon. sec. pro tem., informed the members that he was wishful, if possible, to carry on the weekly lectures all through the month of May. It had been customary to close down the lecture season at the end of April, but many members had expressed a wish that the enlarged period should be tried experimentally, and he, as hon. sec., would undertake to find good lecturers, if the members generally would do their part by finding audiences. After these few remarks, the chairman of the evening, Mr. T. C. Hepworth, called upon the Rev. F. C. Lambert to commence his lecture.

Mr. Lambert explained that he had not prepared a formal written lecture, but that his discourse would take the form of a number of notes which he had made during a series of experiments. And these notes related to the pictures which were exhibited on the walls of the room, a series of prints, mostly from the same negative, but toned with different agents, and exhibiting all manner of colours, from bright yellow to violet-blue. The lecturer called attention to the important circumstance that the colours of these prints were very different by daylight, and he said that he himself was much struck by this fact when he unpacked the pictures in the club room. One print especially, a rich butter-cup yellow by daylight, appeared by the light of the electric glow lamps in the room a washed-out ochre, which altogether falsified the real tint.

Mr. Lambert explained that he was indebted to Mr. Wellington, of Elstree, for a quantity of machine-made prints, which had all been exposed and developed under precisely the same conditions. He considered that this circumstance was a great advantage in experimental work such as that in which he had been engaged, in giving him a sure foundation to deal with.

The pictures on the walls were divisible into two series. (1) A portrait study, upon which he had commenced working more than a year ago, the prints from which had been tossing about in the dust and dirt of his workroom ever since; and (2) a series of prints prepared during the last few days; for he followed the usual practice of lecturers in postponing the needful things for illustration until the last possible moment. These prints, he would ask his hearers to understand, were records of experiments up to a certain stage. Some gave good results, and some gave tones which they would all endeavour to avoid. He trusted that others would take up the work, and that his experiments would enable them to avoid the blind alleys which he had traversed.

The work generally of toning bromide prints was much the same as that involved in toning lantern slides, and he might, in passing, refer his hearers to his own book upon that subject. It must be remembered that many of the solutions used for toning prints acted at the same time as intensifiers, or reducers—mostly as intensifiers; it therefore became necessary not to attempt to tone prints which were too fully exposed or developed, or the finished result would be very disappointing. On the other hand, an under-exposed print was generally much improved in appearance by the operation. He had hung his specimen pictures on the wall in preference to handing them round to the members, as was often done, and his reason was that, in the handing-round method, members would often be looking at pictures to which the lecturer's remarks, at the moment, did not apply. Each specimen was numbered, so that he could read from his notes, and the picture with the results attained could be at once identified.

Mr. Lambert then explained how each experimental print had been toned; but, except in one or two cases, he did not give exact formulæ, merely mentioning the agents used, without specifying exact quantities.

It is to be hoped that later on he will see fit to supply this omission, for without such measurements a tabulated list of the experiments is not of much use. It was, however, interesting to note how the colour of a print can, after toning, be varied sometimes by an additional agent in very dilute form. It is also noteworthy that in some of these experiments the toning action was continued for several hours. Another important factor is found in the temperature at which the solutions were employed. Thus, in the case of the well-known hypo and alum bath, which is commonly employed at a high temperature, it was found that it would act in the cold, if the immersion of the print was continued for some hours. With regard to Uranium toning, the lecturer pointed out that if a print so toned were placed under the tap for washing, most of the colour would be quickly discharged, the impact of the water seeming to have a mechanical action. Such prints should be put, for washing, in a dish face downwards, and the washing water should be acidulated with acetic acid. A great variety of tints were procurable by following the usual Uranium solution by various chemicals.

The discussion was opened, at the invitation of the chairman, by Mr. Inwards, who spoke rather disparagingly of the prints shown, submitting that most of the tones were disagreeable in hue. He preferred a bromide print of the usual black, untoned, to many of the pictures exhibited. He considered that all photographers were indebted to Mr. Lambert for these interesting researches, and he trusted that they would result in the discovery of a good, permanent, sepia tone for bromide prints. Mr. Lambert agreed that the question of permanency was a most important one. Many of the colours shown must be regarded with the gravest suspicion, but he thought that the blue, produced by much the same agents as painters' pigments, ought to be as permanent as water-colour of the same tint.

The chairman suggested that, if possible, a selection of the pictures exhibited that evening should be framed and kept in the club for purposes of reference, it would then be seen whether the tints were quickly fugitive or whether they retained their beauty. He also thought that a point worth considering was the method of development adopted in producing these prints, for it seemed natural that the particular developer employed should affect the toning operation. The lecturer could give no information as to the developer employed.

A hearty vote of thanks to the Rev. F. C. Lambert for the pains he had taken in carrying out a most tedious, but highly useful series of experiments, concluded the proceedings.

APRIL 28TH, 1902.—Mr. A. W. Rimington, whose collection of water-colour drawings at the Fine Art Gallery, Bond Street, is delighting many visitors, appeared at the club last week in the role of lecturer, and he chose for the title of a most able discourse "The Principles of Painting Applied to Photography."

The members of the Camera Club have, from time to time, had so many papers dealing with the art side of photography, that they have been almost surfeited with that description of fare. The same members have over and over again joined in the same kind of discussion which follows every such paper, and everyone in the room knows exactly what each is going to say. Mr. Rimington had, however, something new to tell, and he told it most eloquently. He had no cheap sneers for the despised photographer, but welcomed him as the exponent of a sister art to his own. He did not dogmatise, but with kindly suggestion sought to point out that there were many things which the photographer might learn from the painter in the same way that the painter was able to pick up much useful knowledge from photography.

For a long time photography stood aloof as quite a separate and minor branch of picture making, but of late years men had aimed at something higher, and the photographer had begun to trench upon the same field as the painter. In many ways the sun artist had cut the ground from under the feet of the worker with brush and pencil. This was abundantly seen in book and newspaper illustration, and more lately in colour work, from which very great results were likely to accrue. Someone had said that photography was "a raw slice of nature, while painting was a cooked one." He did not agree with this definition, and was quite willing to admit that photography was an art, and not merely a science.

There were certain principles of art which it would, he thought, be useful for a photographer to consider, and with these he would severally deal, drawing illustrations from the various pictures, autotype reproductions, of well-known works which had been hung for that purpose on the walls around them.

There were two great currents by which the stream of art was divided in the present day, and their names were Realism and Decorativeness.

Fifty years ago, when a man put his brush to canvas, it was merely necessary for him to produce something pretty, or something which would tell a story. Then there stepped in realism, and a great change came over the world of art. Men went to nature, from which all principles are derived either directly or indirectly. The first principle with which he would deal was concentration, or simplicity, which they would find to be a dominant note in all great art. There must be in a picture one main idea, to which all else was subservient; in other words, the artist's efforts should not be frittered away in fulness of details. (Here the lecturer pointed out how, in various examples hung upon the walls of the room, this principle was rigidly followed by some of the first masters). Many photographs are displeasing to painters because in their wealth of detail they suffer so much loss of breadth and general effect. He believed that this could be obviated by adopting certain devices in the taking and in the printing of a photograph.

His next principle was involved in the word "Line." All painters gave great attention to line. It was a very important thing in a picture to have leading lines, for they helped the perspective and bound the composition together. In studies of the nude and in foliage they had lines of high curvature, and these lines should be grouped. Another characteristic of line is "radiation," i.e., the tendency of lines to radiate more or less from one point. All trees show a natural radiative system. It may be asked, How does all this apply to photography? Let us suppose that the camera bearer is on a heath with a road winding across it. It will be in his power to select a spot on that heath where the road will form good lines in preference to faulty ones.

Another principle is "Texture," which plays a great part in nature, as it does in painting. We may have a smooth, granular, or reticulated surface, or a combination of them. There is nothing more unpleasant than a painting where everything is smooth. A photographer has the power of controlling texture to a great extent, and he depends mainly for this power upon the lighting of the subject, a side light on a tree trunk, for example, giving a rough texture, which is quite absent when the light is from the front.

The lecturer next dealt with the subject of "Balance," and remarked that the Japanese were masters of this principle, and that the greatest of all landscape painters—Turner, understood it thoroughly Balance was worthy of study by all photographers. So also was a principle which he would call "Interchange," by which he meant the carrying over of a small portion of light into a mass of shadow, or vice versa. We had many examples of this device in the works of Rembrandt.

With regard to what is called "Value," both painter and photographer found themselves in a difficulty, for the scale of luminosity in nature was so much greater than that at their command that there must be a compromise; their scale must be at fault somewhere or other. In photography value means difference of tone, and speaking generally, a photograph in this respect is very contrary to nature.

The lecturer next insisted upon the importance in a picture of "Essential Forms." These were indicated by patches of light and shade, or

colour patches—thus, in one sense, the shadow cast by a clump of trees might be of more importance to the composition than the trees themselves. Both Turner and Rembrandt knew the importance of these essential forms. The latter would introduce features into his pictures which were in themselves positively ugly, but these were overshadowed by the essential forms. In photography these forms are of the highest importance, and it was within the power of the camera user to watch the changes which affected them, and to take advantage of the right moment for making his exposure. Art generally will make a great step forward when these essential forms are more fully studied. Another point to which photographers would do well to pay heed is "the sacrifice of minor to major truths." Thus, in many cases the details of distance must be suppressed, so as to add to the general effect of a picture. He knew that there was now a general tendency among photographers to suppress detail, but they must be careful not to abuse this power. They might upset the nervous system of the camera, and beget a nightmare. In art there was room for the Pre-Raphaelite, as there was for the Impressionist.

Much had been said and written about individuality, or the personal element in art. An artist who felt strongly about the work under his hand, as every artist should do, must impress his painting with some of his own individuality; but, of course, there is a limit, which overstepped would tend to self-advertisement. Some persons have said that there can be no poetry in photography, but he himself had seen many photographs which were full of poetry.

Lastly, he believed that photography had a great future before it. Certainly it has been, and will be, a great help to painters. It has in the past shown them possibilities which otherwise they would hardly have realised, and with regard to the future there were signs that photography was doing for painting what the printing press did for literature. It was sending reproductions of painters' work to the four corners of the globe. He believed that in colour work photography had a wonderful mission before it; he would refer them to a marvellous book lately published which contained a number of pictures in colour which were reproductions of pictures by Mr. Mortimer Menpes.

A discussion, in which several members joined, and in which a distinguished visitor, Lord Alwyne Compton, Bishop of Ely, took part, followed the lecture, which was given entirely without notes. Everyone spoke in a highly appreciative manner of Mr. Rimington's discourse, and expressed the hope that he would address the club on a future occasion. Mr. Middleton, who occupied the chair, intimated that he was giving up the post of hon, secretary. This announcement met with many expressions of regret, which, however, were tempered by the news that Mr. W. Godfrey, the former occupant of the post, had consented to resume the duties connected with the office.

PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

Report of the Edinburgh Branch.

This branch was formed on September 30th, 1901. A circular was issued to all professional photographers in Edinburgh, Leith, and Portobello, inviting them to assist in forming an Edinburgh branch of the P.P.A. This was responded to by 17 photographers. As the result of this meeting, all the gentlemen present joined the association, and the branch was formed, with Mr. Crooke president, Mr. Balmain treasurer, and Mr. Moffat secretary. It was decided to hold five meetings in the year, four of which have now been held, at which the following subjects were discussed:—

(1) What Constitutes a Dealer?
(2) Benevolent Fund.
(3) The Amendment of Copyright Act.
(4) Photographers as Dealers.
(5) Fire Insurance Rates.
(6) The Apprentice System in Studios.
(7) The P.P.A.'s Position to the Photographers' Copyright Union.

The London Association was advised of the decisions come to on the above, and these were duly reported in the photographic Press.

There are in this district 29 bona-fide professional photographers, 21 of whom have joined the association. Three others have promised to join, but have not yet filled in the application forms. We hope they will do so, however, before the end of the year.

Report of the Hull Branch.

April 9th.—Present: The Chairman; hon. secretary, W. Fussey; A. J. Wellsted, J. Osbourne, C. Delf, G. E. Thompson, W. Hancock, E. Cooper, C. Jones, W. H. Duncan.

Prior to this meeting of the local branch of the P.P.A., meetings had been held by several photographers chiefly interested in the "cutting of prices" for certain out-door work in Hull and district. The matter was now brought before the association in due form, and as a basis for agreement a minimum scale of charges was put before the meeting.

Mr. W. H. Duncan proposed and Mr. W. Hancock seconded a resolution "That a circular letter be addressed to Hull and district members of the P.P.A. asking agreement to this list of charges as the absolute minimum at which out-door work in the district shall be undertaken by any photographer in the association."

In the discussion which followed, although it was fortunately clear that most of the members were able to command much better fees than these suggested minimum rates, yet the opinion of the meeting was that something should be done to ameliorate those more severe conditions of competition prevailing between some of the local photographers, and which might result not only prejudicially to themselves, but to the general membership of photographers. The hon. secretary promised to issue the letters and report on the result at the next meeting.

HOVE CAMERA CLUB.

The following are extracts from the annual report:—During the past year the club has shown increased activity, and several new features have been introduced. The new rule passed at the last annual meeting admitting country members at half subscription has worked well. The committee, acting on the suggestion of several members, have started since Christmas a series of afternoon meetings for the benefit of those unable to attend the ordinary evening meetings. This experiment has proved a great success, and the committee have no hesitation in continuing the same during the next winter session. A postal portfolio section has also been formed, and the committee hope that the good support given to the initial number which is now in circulation will be continued. An attractive syllabus was provided for the ordinary evening meetings. Two or three of these call for special mention. Mr. E. F. Grun, of Southwick, described, before a large audience, his invention, the new fluid lens, and showed on the screen a unique series of lantern slides and animated photographs taken in various theatres. Mr. E. J. Bedford, of Eastbourne, also gave the club a delightful lecture, illustrated with a fine set of slides, entitled "Bird Architecture." Mr. W. Jago, F.I.C., F.C.S., on another evening, ably dealt with the "Chemistry of Photography." The annual exhibition was held in November, and the committee consider that the results were very gratifying. The quality of the pictures in the open classes was above the average, while the number of exhibitors and the receipts from all sources show a substantial increase. The exhibition was opened by the president, Alderman J. Colman, Mayor of Hove. The prize slides and some examples of colour photography by the Sanger Shepherd process were exhibited at intervals, and two illustrated lectures were given, one by Dr. Cavendish Molson, entitled "A Town in the Levant," and the other by Mr. Douglas English, entitled "Camera Notes by an Amateur Field Naturalist." Both these lectures were much enjoyed by large audiences, and the club is specially indebted to these gentlemen for their kindness. Both the number and quality of the pictures in the club classes showed a decided improvement, and the committee were very glad to see some excellent work from new members.

SOUTHAMPTON CAMERA CLUB.

The members of the above club held the concluding meeting of their winter programme, at the Philharmonic Hall, on the 28th ult., under the presidency of Mr. G. Vivian, when Mr. M. O'Connor gave a most instructive lecture, entitled "The Chemistry of Light and Pyro-Soda Developer."

He first explained the nature of light and the action of coloured waves of light on the sensitive film of the dry plate, and gave detailed descriptions of the different silvers composing such films. Valuable information was given respecting the cause of the photographer's enemy, called halation, and as to solarisation, or the changing of a negative image to a positive. He also showed, by means of an ingenious diagram, how all the colours of the spectrum, combined in harmonious proportions, produced white.

Passing on to the pyro-soda developer, he showed how the latent image in the sensitive film is formed by the action of the reflected light from the object on which the lens is focussed. The lecturer explained that the light partially decomposed the silver salts in the emulsion, but not sufficiently to make the image apparent, and that decomposition of the silver was continued by the pyro-gallic acid during development, whereby the decomposed silver image becomes darkened and hence visible. The pyro alone is too slow in its action to accomplish this with satisfaction, and is, therefore, assisted and accelerated by alkalies, such as ammonia or sodium carbonate, and the process is completed by the hypo-sulphite of soda, which entirely decomposes the remaining silver on the plate, which has not been acted on by the light.

He ably described the composition of the various chemicals, and showed how the excess of one was counterbalanced by the simultaneous action of the others, clearly proving the necessity for the inclusion of all.

The fixing solution was next reviewed, showing how the hypo-sulphite decomposed the remaining particles of silver haloid. Mr. O'Connor mentioned that this valuable agent was discovered by Chassier in 1799, but Daguerre was the first to use it as a fixing agent. Fox-Talbot was, however, the first to discover the fixing of the negative, about 1835, using a strong solution of common salt in connection with his paper negatives.

Many most elaborate and instructive diagrams were exhibited during the discourse, and greatly assisted to explain the various technicalities.

At the conclusion a vote of thanks was proposed by the chairman, and was heartily accorded by the audience.

The lecture, although necessarily very technical, was considered of great value to amateur photographers.

Mr. O'Connor, in briefly returning thanks, said that he hoped what had been heard would encourage the members to study the technical portion of photography with more persistent energy.

Hackney Photographic Society.—On April 29th a lecture and demonstration on the gum-bichromate process was given by Mr. J. O. Grant.

West Surrey Photographic Society's Exhibition.—The 21 sets of lantern slides which were entered for competition at the above exhibition, held last week, were, last Wednesday evening, judged at the usual weekly gathering by Mr. Mackie. It being an exceedingly strong class, two medals of equal value were awarded, instead of the one offered, for the best slide in the best set of four, the one going to Mr. F. G. Tryhorn (4 architecture) for "South Choir Aisle, Norwich,' and the other (4 Zoo studies) for "Wild Bull's Head."

News and Notes.

MESSRS. HOLMES BROS., of Manchester, have taken new premises at Princes Buildings, 22, Oxford Street, Manchester.

MESSRS. AUTY, LTD., of 20 and 21, Front Street, Tynemouth have sold the negatives and stock of their view department to Mr. Godfrey Hastings of Whitley Bay, Northumberland.

AT the Vicarage Parish Room, Vicarage Gate, Kensington, an illustrated lecture, entitled "What I saw with the Allies in Pekin," will be given by Mr. C. Pilkington (Special Correspondent for "Black and White"), on Monday, May 12th, 1902. The chair will be taken at 8.30 p.m. by the Vicar. Tickets, 1s. each, can be obtained from the Rev. H. M. Schroder, 28, Gordon Place; the Rev. R. Holmes, 5, Lorton Terrace; the Rev. E T. R. Johnston, 30, Campden Grove; Mr. R. H. W. Curtis, 23, Pembroke Square, W.; J. Lucking, 73, Church Street; and at the Parish Church Vestry. The following is a brief syllabus of the lecture, which will be illustrated by upwards of 100 lantern views from photographs taken and coloured by the lecturer:—New York, Montreal, The Rockies, Japan, Ta-ku, Tient-sin, The Peiho, Pekin, and about it. The proceeds will be devoted to the Aston Clinton Holiday Home Building Fund.

ROYAL Institution.—The annual meeting of the members of the Royal Institution was held on Thursday afternoon (the 1st of May), Sir James Crichton-Browne in the chair. The annual report of the Committee of Visitors for the year 1901, testifying to the continued prosperity and efficient management of the institution, was read and adopted, and the report on the Davy-Faraday research laboratory of the Royal Institution, which accompanied it, was also read. Forty-four new members were elected in 1901. Sixty-three lectures and 17 evening discourses were delivered in 1901. The books and pamphlets presented in 1901 amounted to about 253 volumes, making, with 722 volumes (including periodicals bound) purchased by the managers, a total of 975 volumes added to the library in the year. Thanks were voted to the president, treasurer, and the honorary secretary, to the committees of managers and visitors, and to the professors, for their valuable services to the institution during the past year. The following gentlemen were unanimously elected as officers for the ensuing year:—President, the Duke of Northumberland; treasurer, Sir James Crichton-Browne; secretary, Sir William Crookes; managers, the Right Hon. Lord Alverstone, Sir James Blyth, Bart., Sir Frederick Bramwell, Bart., Dr. Thomas Buzzard, Dr. Donald Hood, Sir Francis Laking, Mr. George Matthey, Dr. Ludwig Mond, Dr. Hugo Muller, Mr. Edward Pollock, Sir Owen Roberts, Sir Felix Semon, The Right Hon. Sir James Stirling, Mr. John I. Thornycroft, and Mr. James Wimshurst; visitors: Dr. Henry E. Armstrong, Dr. Charles Edward Beevor, Mr. John B. Broun-Morison, Mr. Francis Elgar, Mr. Francis Gaskell, Dr. Dundas Grant, Lord Greenock, Mr. Maures Horner, Sir Henry Irving, Mr. Wilson Noble, Mr. W. R. Pidgeon, Mr. Arthur Rigg, Mr. W. S. Squire, Mr. Harold Swithinbank, and Mr. Charles Wightman.

A monthly meeting was held on Monday afternoon (the 5th instant), the Duke of Northumberland, president, in the chair. Dr. Alfred Hillier, Mr. Sydney Lupton, Mr. Carl F. von Siemens, and Mrs. C. F. von Siemens were elected members. The special thanks of the members were returned to Sir Thomas Sanderson, G.C.B., K.C.M.G., for a donation of £5 5s. to the fund for the promotion of experimental research at low temperatures. The chairman announced that His Grace the President had nominated the following vice-presidents for the ensuing year:—The Right Hon. Lord Alverstone, Sir Frederick Bramwell, Dr. Donald Hood, Mr. George Matthey, Dr. Ludwig Mond, the Right Hon. Sir James Stirling, Sir James Crichton-Browne, and Sir William Crookes.

THE National Gallery.—The Director of the National Gallery, in his Report for the year 1901, states that the Gallery in Trafalgar Square was visited by 478,346 persons on the free days during the year, showing a daily average attendance on such days (204 in number) of 2,345. In addition to the above number 35,704 persons visited the Gallery on the 30 Sunday afternoons on which it was opened during 1901, showing a daily average attendance of 1,190. On students' days (Thursdays and Fridays) 42,177 persons were admitted between January 1st and December 31st, 1901, the admission fees (at 6d. each) amounting to £1,054 8s. 6d., as compared with £1,179 1s. 6d. received in 1900. The National Gallery of British Art, at Millbank, was visited by 185,434 persons on the free days during the year, showing a daily average attendance on such days (206 in number) of 900. In addition to the above number, 42,015 persons visited the Gallery on the 30 Sunday afternoons on which it was opened during 1901, showing a daily average attendance of 1,400. On students' days (Thursdays and Fridays) 25,821 persons were admitted between January 1st and December 31st, 1901; the admission fees amounting to £645 10s. 6d., as compared with £678 9s. received in 1900. The amount annually realised by admission fees at both establishments is devoted as an "Appropriation in Aid" of the Parliamentary Vote to the National Gallery. The total number of students' attendances at the Gallery in Trafalgar Square on Thursdays and Fridays throughout the year was 14,866. Independently of partial studies, 629 oil-colour copies of pictures were made, viz., 358 from the works of 98 Old Masters and 271 from the works of 40 Modern Painters. Four pictures were purchased during the year, viz.:—"The Adoration of the Magi," by Benedetto Bonfigli; "The Coronation of the Virgin, with attendant Saints," by Luca Signorelli; "Portrait of a Young Man," by Abraham Raguineau; and "The Nativity," by Jacopo Pacchiarotto. Ten others were bequeathed or presented, as well as a bust of Mr. John Ruskin. The four following pictures were purchased for the nation by the President and Council of the Royal Academy of Arts under the terms of the Chantrey Bequest:—"Morning," by Arnesby Brown; "Val d'Arno: Evening," by M. Ridley Corbet; "Ali Baba and the Forty Thieves," by Albert Goodwin; "The Flower Girl," by J. J. Shannon, A.R.A. The "Portrait of Sir Arthur Sullivan," painted by Sir J. E. Millais, P.R.A., and lent by the executors of the late Sir Arthur Sullivan, has been temporarily placed in the National Gallery of British Art, and is now hung in Room 3 until it becomes eligible for acceptance by the National Portrait Gallery. "Isaiah," the cartoon for the mosaic on a spandrel under the dome of St. Paul's Cathedral, by Alfred Stevens, presented to the nation by the late Mr. Cyrus J. Knowles in 1897, has been lined and restored. It is now hung in Room 8 at the National Gallery of British Art.—"Standard."

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

COLLODION POSITIVES.

To the Editors.

Gentlemen,—Permit me to supplement your article on copying collodion positives with a caution. Many of these productions, in order to avoid reversal and dispense with a cover-glass, had the black varnish applied to the film side, the picture being viewed through the glass. With those so treated it would be a very difficult, if not impossible, operation, to remove the varnish without injury to the delicate collodion film.—Yours, etc., J. TILFOR.

251, Elgin Avenue, Maida Vale, W.
May 3rd, 1902.

PHOTOGRAPHY AND THE HOLY SHROUD.

To the Editors.

Gentlemen,—Allow me, re the photographs of Holy Shroud and "the wounds produced by the thorns and marks of the blood-drops," to refer your readers to the 20th chapter, 6th verse, of St. John. Simon Peter, it is stated, "entered into the tomb; and he beholdeth the linen cloths lying, and the napkin, that was upon His head, not lying with the linen cloths, but rolled up in a place by itself" (New Version).

Is there not some discrepancy, set aside the said destruction of the original shroud?—Yours truly, M. D.

May 6th, 1902.

"A NEW AND LUCRATIVE PROFESSION."

To the Editors.

Gentlemen,—I have just had my attention called to an advertisement in "Munsey's Magazine," which seems to me to call for some comment in the pages of the official organ of photography in this country. The advertisement I refer to is adorned by the picture of an "elegant villa residence," and is headed in large letters of leaded type, "A New and Lucrative Profession—Art Photography," which interesting preliminaries are followed by what is, I think, the most egregious paragraph I have ever read.

Mr. Gladstone is reported to have said that he considered the advertisements in American magazines the most interesting and instructive reading in the world, and while never opposed to the opinion of so eminent an authority, I admit I was never wholly converted to it until now.

The building heading the advertisement appears to call itself a "Photographic College," where (and here I am quoting verbatim) "you learn the Art Science of Modern Photography in all its branches in from three to six months." The name of this wonderful institution is the "Illinois College of Photography," and its local habitation is at 944, Wabash Ave., Effingham, Illinois.

Could any more perfect illustration be conceived of the imaginative interest of American advertisements? But, also, alas! could anything be conceived more calculated to mislead and deceive the general public or—but this is really a minor matter—more insulting to the profession to which I have the honour to belong?

Even in the infancy of photography such artists as D. O. Hill and Julia Cameron would have read such an advertisement with a sense of amused disgust, but when one thinks of men like William Crooke, Hollyer, Mendelssohn, Craig Annan, and in the United States such workers as Strauss and Falk, to mention only a few of the eminent men whose names readily occur to one—men who have made a life-long study of the "Art-science" which the college in Wabash Ave., Illinois, professes to teach "in all its branches in from three to six months"—men who would, every one of them, admit that, after all their long years of working experience they are still learners, that no week nor day goes by without their adding something to their knowledge of the Art and Science of their profession—one realises at its full value the amazing nature of such an advertisement.

But, after all, such men are more than able to take care of themselves. My object in writing this letter is neither to defend what the founders of the Illinois College call "the dignified, fascinating,

instructive, and lucrative calling of photography," nor its best known exponents, but to warn those who do not know the facts against the delusions which such advertisements foster.

There is no royal road to excellence in any profession, as all parents who have sons to start in the world know to their cost, and the more strongly it is asserted and the more widely such an assertion is circulated that photography is no exception to this rule, the better it will be for everybody concerned.—I am, Sir, your obedient servant,

H. WALTER BARNETT.

1, Park Side, Hyde Park Corner, S.W.,
May 4th, 1902.

[The advertisement referred to by Mr. Barnett is as follows:—

"A New and Lucrative Profession.

"ART PHOTOGRAPHY.

"The profession of Art-Photography offers to-day a greater opportunity for early distinction and wealth than law or medicine. It is a dignified, fascinating, instructive, and lucrative calling. Law and medicine require three to five years' study and a tuition fee of $300. In attending this College you learn the Art-Science of Modern Photography in all its branches in three to six months, fitting you to open a studio of your own, or to take charge of any photographic department of the national government, that of any newspaper or mercantile establishment. Full course (life scholarship), $100. Room and board, $3 to $10 per week.

"This is the original and only exclusive Photographic College in the world, and has students from all over the globe.

"Every modern equipment known to science. Good positions secured for graduates.

"Write for handsomely-illustrated catalogue, showing engravings of our buildings and equipment, with full information as to cost and terms, mailed free upon request.

"Address:

"ILLINOIS COLLEGE OF PHOTOGRAPHY,

"944, Wabash Avenue, Effingham, Illinois."

An article on the subject appears elsewhere in this week's JOURNAL.
—EDS., B. J. P.]

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY, 24, *Wellington-street, Strand, London, W.C.*" *Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

PHOTOGRAPHS REGISTERED:—

J. A. Horsburgh, 4, W. Maitland Street, Edinburgh. *Photograph of late Professor W. Williams.*

H. B. Collis, Westgate Studio, Canterbury. *Photograph copy of Document in Latin.*

W. G. Honey, 102, Patrick Street, Cork. *Three photographs of opening Ceremony Cork International Exhibition.*

ADDRESS WANTED.—"ARTIST" writes: "Would you kindly give price and publisher of 'The Studio, and what to do in it,' by H. P. Robinson?"—In reply: Price 2s. 6d. Publishers: Sampson Low and Co., St. Dunstan's House, Fetter Lane, E.C.

FRENCH JOURNAL.—"BRITTON" asks: "Which is the best paper to advertise in to obtain an engagement in France as photographic artist?"—In reply: The "Moniteur de la Photographie," published at 55, Quai des Grands Augustins, Paris.

ALABASTRINE PHOTOGRAPHS.—S. HOPKINS asks: "What are alabastrine photographs?"—In reply: What used to be called alabastrine pictures were glass positives whitened with bichloride of mercury. At one time an "alabastrine solution" used to be sold; this gave a more pearly whiteness to the lights than the bichloride alone did. Its composition was treated as a secret.

OPINION ON SPECIMENS.—"PROFESSOR" writes: "I should be greatly obliged if you would state what wage I am worth as (1) head operator, (2) assistant operator and retoucher? The specimens herewith, I may mention, are absolutely my own work.—In reply: (1 and 2) We consider you might obtain a salary ranging between two and four pounds per week. The work is of medium quality.

SEPIA PLATINOTYPES.—"'ARRY" asks: "(1) How are sepia platinotypes obtained? (2) What chemical or process to obtain the sepia colour? (3) Are they as permanent as the ordinary platinotype?"—In reply: (1) The platinotype Company supply a paper made specially for sepia tones. (2) With the paper instructions are given for its working. (3) We should say they were.

LENS QUERY.—F. V. writes: "The enclosed picture was taken by a rectilinear lens. Would you kindly inform me how I can find out what angle it is, as I wish to buy a view lens of the same angle of view as it is? The lens I have is about 7in. focus."—In reply: A single view lens of the same focus as the rectilinear will include the same angle of view. Buy one of exactly the same focus.

SQUEEGEEING PRINTS.—A. L. A. writes: "Could you kindly tell me the cause of the enclosed print sticking to the ferrotype plate? It was cleaned well, and afterwards rubbed with benzine."—In reply: We should recommend you to try French chalk in place of benzine, rubbing it well on to the plates, and then lightly dusting it off. If the prints are alumed, after they are washed, you will find they will have less tendency to stick than without this treatment.

RETOUCHING.—"AJAX" writes: "Kindly give me your opinion of the enclosed proofs. I have been retouching six months. Do you think I shall ever make a retoucher?"—In reply: We see no reason why you should not become a good retoucher, although the examples are not satisfactory. Too much work has been done, and that not skilfully. Much of the modelling in the faces has been destroyed, with loss of likeness. We should advise you to get a few practical lessons from a skilful retoucher; they will help you much.

COLOURING FERROTYPES.—J. CLEGG writes: "Can you tell me how ferrotypes can be coloured? I recently saw a couple of old glass positives which were very nicely tinted, and the colour did not look like ordinary water-colour. I do ferrotypes, and should like to colour them."—In reply: The old glass positives were coloured with powder colours in the same way that Daguerreotypes were coloured. We are not sure that the colours are to be had now. The most likely place to get them would be Newman's, Soho Square. At one time this firm made a speciality of them.

STAINED NEGATIVES AND VARNISHING.—S. SUTTON says: "Many of our negatives, after printing from and being stored away for a year or so, become stained with silver, though they showed no sign of that when put away. We are sure that they were well washed. We have heard that some photographers varnish their negatives. Do you think if we were to varnish ours the stains would be avoided? And, if so, what varnish should be used?"—In reply: If the negatives are properly fixed and washed, and are varnished before they are printed from, stains such as those described will be avoided. Any good negative varnish may be employed.

PRINTING DIFFICULTIES.—M. U. writes: "Should be extremely pleased if you could enlighten me on a subject in which I seem to fail. I am only an amateur, and do photography as a hobby. I have some very good negatives, but when printed and toned the faces come out dark. Can you tell me how to whiten or clear on ordinary P.O.P. and platino matt?"—In reply: If the negatives are good, the faces should not come out dark, unless they are over-printed. Possibly, too much light has been used in the washing and toning of the prints, and that has darkened the paper; or, may be, they were exposed too long to light when examining them while printing. There is no satisfactory way of whitening the faces now.

DISCOLOURED PRINTS.—"PERPLEXED" writes: "Could you inform me the cause of my prints going such a nasty yellow colour round the edges, as per enclosed print? I use the ——— paper. They seem to go a splendid colour at first, but after they have been in the bath a few minutes they don't tone any more, but go this yellow tinge. I am told it's because I put too much gold in, but I don't put so much as formula gives; and as the majority of our customers prefer a blue print to a red one (which I cannot get without colour complained of), I should esteem it a favour if you could give me a little advice on the matter."—In reply: You do not mention what toning bath you employ. If it is the sulpho-cyanide, we are inclined to the opinion that too large a proportion of the salt has been used. Try with less, and see the effect. If then you do not succeed, try another brand of paper.

*** NOTICE TO ADVERTISERS.—*A Revised Tariff for advertisements in the* JOURNAL *is now in force. Blocks and copy are received subject to the approval of the Publishers, and advertisements are inserted absolutely without condition, expressed or implied as to what appears in the text portion of the paper.*

*** NOTICE TO THE TRADE, WHOLESALE AGENTS AND BOOKSELLERS.—*A Contents Bill is issued with each number of the* JOURNAL, *and copies may be had on application to the Publishers.*

The British Journal of Photography.

The Oldest Photographic Journal in the World.

ESTABLISHED 1854. **PUBLISHED EVERY FRIDAY.** **PRICE TWOPENCE.**

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It may also be obtained from all Booksellers, Photographic Dealers, and Railway Bookstalls.

THE BRITISH

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*** *The Editor can only be seen by appointment.*

*** *We do not undertake to answer letters by post.*

EX CATHEDRA.

The Panoramic Camera. In our issue of the 4th April we gave a description of a panoramic camera for photogrammetric purposes, which was the invention of Porro, the well-known Italian optician. The date of the construction of this instrument may be fixed between 1855 and 1858. The "Photographische Correspondenz" contains a letter from Franz Ritter von Reisinger concerning a claim, which has been circulated, attributing the invention of the first panoramic apparatus to Martens, of Paris. Martens constructed a panoramic camera for Daguerreotype plates shaped to the segment of a circle, and this was chronicled in the "Wiener Allgemeine Theater Zeitung" of the 12th May, 1846. The lens was rotated by a mechanical contrivance. The announcement quickly elicited a reply from Wenzel Prokesch, who wrote that Herr Puchberger, of Retz, had obtained an Austrian patent three years earlier for a panoramic camera, by means of which photographs could be taken upon curved plates. The plates were 19 to 24 inches long and the lens of 8 inches focal length and 15 lines aperture. Herr Puchberger made photographs of the St. Stephen's Church, Vienna, including the entire elevation to the top of the cross, with this instrument. He also used it for other kinds of outdoor work, such as public squares, barracks, and masses of troops. Ritter von Reisinger is of opinion that this was the first panoramic camera used for photography.

* * *

New Lenses. The impetus given to the invention of new combinations of lenses for photographic purposes, by the manufacture of the new types of glass at Jena, seems to be far from exhausted. "La Photographie Française" gives a description of two new lenses made by M. Lacour Our readers may form an idea of their construction by taking as type the well-known Goerz lens, which has been a favourite for many years. Both of M. Lacour's lenses bear a certain resemblance to it. The first, however, instead of being symmetrical in its construction, has a rather thicker front lens, with a back surface of shorter radius, than that of the front surface. The component, nevertheless, is positive. The second of M. Lacour's new lenses also resembles the Goerz lens, but a small meniscus air space is introduced into each component between the front crossed positive and the middle crossed negative elements. The front component of the lens also has a shorter radius for the back surface than for the front. Briefly stated, the difference of construction between both of these new lenses is the introduction of an air space into both components. The lenses have an aperture of $f.5$. By departing from symmetry of construction, it is said that certain residual aberrations have been eliminated, and the lens can be used at a larger aperture.

* * *

The Ammonium Persulphate Reducer. The peculiarity of ammonium persulphate as a reducer, which attacks the high lights in preference to the shadows, has excited much curiosity and speculation. Some light appears to be thrown upon its action by another anomaly observed by Bernhoeft, who finds that negatives, which have been treated with alum or formalin, are not amenable to reduction in the same manner. In drawing attention to this fact, the editor of the "Photographisches Wochenblatt" points out that it gives additional confirmation to the experiments of Dr. Lüppo-Cramer. This experimentalist found that there was a notable increase in temperature accompanying the action of persulphate upon silver, and when the quantity of metal present was large the heat was sufficient to dissolve the gelatine. In the half-tones, where there is much gelatine and little silver, the heat generated is insufficient to dissolve the film, and no marked reduction takes place. The fact that the melting of the gelatine plays a part in the process is demonstrated by the formation of a relief. Proof of the theory would be afforded by hindrance of the process of reduction through elevation of the melting point of the gelatine. This is adduced by Bernhoeft's experiments, as

the tanning of the gelatine by alum or formalin raises the melting point.

* * *

German Sweating. We have, from time to time, drawn attention to the keen competition in Germany in the photographic profession, and we place before our readers another proof of the low financial status of the art in that country. Photography is being utilised in Germany by certain retail stores as a means of advertising their business, and some firms have special photographic departments. The "Photographische Chronik" publishes this month an appeal, from the head of the Union of German Photographic Assistants, for help to stop the sweating practised by one of these retail stores. The photographic assistants at this establishment earn an average wage of twenty-four shillings per week, and the retouchers have been informed that they must retouch 60 to 80 negatives daily, or expect notice to leave. The Union protests against such business methods, which can only lead to slovenly, mechanical work and the degradation of the assistants' skill. The Union appeals, and, we trust, not in vain, to every photographic journal, to make these facts known, and warn assistants against accepting an engagement with any firm of this character. They have, themselves, decided to close the doors of their employment bureau to the firm in question, and as a caution they point out that the firm in question has recently dismissed from its three establishments no less than forty assistants. Again, we say, there can be no wonder that German photographers take the first opportunity to leave the land of their birth.

* * *

Fading of the Latent Image. A communication from Gustav Kopmann to the "Photographische Correspondenz" records a singular experience with glossy bromide paper, which seems to be due to an abnormal or faulty condition of the emulsion. Early in December last about 70 sheets of paper were exposed, but as the prints were not required for immediate delivery they were not developed until a fortnight after exposure. The prints showed unmistakable signs of under exposure, although a trial print had been previously developed and found correct. The undeveloped sheets were left in the dark-room, which was rather damp, and it was found that they gave weaker prints the longer they were kept, until at last only the trace of an image could be obtained by forced development. Fresh exposures were made upon some of the same sheets of paper, but upon development no traces of the previous exposure were found, whilst the second exposure gave as good a print, although fresh paper had been used. The sensitiveness appeared to have remained unaffected. As the paper smelt strongly of carbolic acid, the defect may be due to it, and likewise to the dampness of the dark-room. We believe Eder has recommended the addition of an alcoholic solution of carbolic acid for preserving gelatine emulsion from decomposition in hot weather. In conjunction with salt it has also been used as a cure for blisters in printing upon albumenised paper. Probably the manufacturers of the gelatine paper used too much carbolic acid in making the emulsion. In the circumstances it would be a hasty inference to conclude that the latent image, under normal conditions, fades.

* * *

Portraits of the Insane. If one branch of science can claim photography as its handmaid more than another it is surely that of medicine. In our hospitals most of the students take up the art as a ready means of illustrating all that comes under their notice, whether it be a skilfully-prepared, but perishable, dissection, or a microscopic slide; a skin disease, or some abnormal deformity. But in one large group of cases portraiture is called for, and such pictures, if taken with ordinary intelligence, may prove to be of immense value for purposes of study and comparison. In all the varied forms of mental disease the doctor must be guided in his diagnosis, to a very great extent, by the expression of his patients' features, and as facial changes are often of the most evanescent nature, a ready means of preserving records of them, such as photography affords, is of extreme importance both to the student and the expert. Writers on mental disease have not been slow to recognise the ready help which the camera affords in delineating the different forms which these terribly obscure maladies will take, so far as they can be illustrated by the expression of the victims. And we may instance among the volumes thus illustrated the clinical manual published not long ago from the accomplished pen of Dr. A. Campbell Clark, who holds the position of medical superintendent of a large asylum in the north. Such a post affords ample opportunity for the study of mental vagaries in all their varied forms, and without any great difficulty means can be employed for portrait illustrations by means of a concealed camera. In any other cause such procedure would not be justifiable, but lunatics are often so cunning that if they were made aware of what was going forward they would probably do their best to defeat the end in view. In Dr. Clark's book already referred to are many such portraits, some illustrative of that terrible form of insanity known as melancholia, while other pictures deal with alcoholic dementia, imbecility, and idiocy. Terrible are most of these pictures to look at, for they present to us countenances which are full of trouble, and although we know that in many cases the trouble is only the sport of a diseased brain, it is none the less real to the unfortunate victim. It is sad to know that many of these mental ailments are hereditary, and have come to their unfortunate tenants by the action of the inexorable natural law which condemns the child to suffer for the sin of the parent. Anything that can be done to mitigate the sufferings of the unfortunate victims of lunacy should not be left untried, and we are happy to think that photography is contributing its share towards the work of studying the phenomena by which it is surrounded. A century ago lunatics were treated like wild beasts; to-day we are more humane, and do our best to win them back to the society of their fellow men.

* * *

Earthquakes and Volcanoes. The recent volcanic outburst in the West Indies will probably prove to be one of the most awful known. Until the advent of photography, pictures of earthquake desolation, and the results of volcanic eruption, were of the highly-coloured variety, but no one can say that they were overdrawn, for it is impossible to exaggerate the effects caused by phenomena so stupendous and awful. It is curious to find that at a date so early as 1857, when the neighbourhood of Naples was shaken by an earthquake by which more than ten thousand lives were lost, the camera was employed to furnish records of the destruction wrought in the many villages which were involved in the general ruin. These photographs, probably the first of the kind ever produced, were taken by Robert Mallet, whose volume upon the earthquake in question was long regarded as a text book. Those who have access to the library of the Royal Society will find a copy of the volume there which is of exceptional interest, for it is interleaved with a number of silver prints from the original negatives. If we remember rightly, an apologetical note is attached, to the effect that there was

unfortunately no method known by which photographs could be reproduced at a rate cheap enough to justify the insertion of the pictures in the other volumes which comprised the edition issued to the public. These pictures have a terrible sameness about them, for they show the parts of various villages which were reduced to heaps of rubbish. One might get much the same effects by taking a camera into the neighbourhood of the Strand just now, where demolitions for the new thoroughfare are so conspicuous. Speaking of the dreadful death-roll caused by the calamity, Mallet says that almost the whole of it would have been preventible by the exercise of proper care in the choice of methods of construction of the houses in a region noted for earthquakes. A very fine photograph of the eruption of Vesuvius—the mountain crowned with a cloud of vapour about six miles in height—was published in Naples about ten years ago. But the finest pictures illustrative of the effects of a volcanic outburst which we have seen were taken by a New Zealand photographer in 1885, just after the terrible catastrophe in which the famous pink and white terraces were destroyed. Some of these pictures showed the volcanoes, steam holes, and the other phenomena commonly seen near an active volcano. But the most impressive scenes were those which showed how a once fertile country had been covered with a thick mantle of volcanic dust, the trees broken off short and sticking up like clothes props above the smothered soil. According to the meagre information at present to hand, the West Indian disaster seems to have been attended by an avalanche of red-hot stones, mud, and ashes. In this respect it resembles the outbreak in New Zealand to which we have just adverted.

* * *

Eye Movements

It might be thought that there was little to learn with regard to the organ vision, beyond what can be found in the text books. And photographers, especially, pride themselves upon a knowledge of that beautiful piece of natural apparatus which in principle so closely resembles the machine with which they are continually taking pictures. But if there is little that is fresh to learn concerning the anatomy of the eye, we are certainly ignorant respecting its movements. At least, so must everyone admit who reads the article entitled "The Act of Vision" which appears in the current number of "Harper's Magazine." The article in question is by Dr. Raymond Dodge, who is Associate Professor of Psychology in the Wesleyan University, U.S.A., and he brings some facts before us, together with proofs of their reality, which are as interesting as they are new. He takes as his text the statements that a short time ago it was demonstrated that during the time that the eyes are in movement, and as we look from one point to another in an ordinary complex field of view, we can distinguish none of the impressions which the eyes receive. In other words, we are practically blind during such movements, just as a cinematographic film in the camera is shut off from all light access while it moves between the taking of every picture. We are no more conscious of this blindness than we are sensible of darkness each time we wink, and it may be that in each case "persistence" comes to our aid. If we sweep the eye from one side of a printed page to the other no words can be read between those two extremes, and it is certain that no man looking in a mirror has ever been able to see his eye in movement. One would imagine that by moving the eyes across a page slowly the intermediate words could be read; but, as a matter of fact, such slow movement is an illusion. They cannot move slowly. Anyone watching our attempt to make a slow sweeping movement of the eyes will note that they move in a series of jerks, with stops between. Indeed, the velocity of the eye movements is very imperfectly under the control of the will, and many of the sleight of hand tricks which cause us infinite wonder whilst watching a good conjurer, depend for their success on the inability of the spectators to follow unexpected movements of the performer's hands and fingers. Dr. Dodge uses a skilfully-devised machine to analyse such movements, and its principal parts consist of a photographic camera and a head rest. The camera is focussed on the eye to be examined, and the image passes through a narrow horizontal slit to the sensitive plate, which moves vertically. So long as the eye remains still a vertical record is traced on the plate, but all lateral movements of the eyeball are translated into oblique lines. Incidentally the author points out that the habit of looking out of railway and tram-car windows causes serious strain to the muscles of the eye, and he cautions his readers against a practice which may tend to grave mischief.

* * *

Spring Hints.

We have now reached the middle of May, when we ought to be enjoying all the beauties of spring, but, owing to climatic influences, things are backward in most parts of the country. There is one thing we are experiencing, which is the improved actinic quality of the light, and this has led many inexperienced amateurs to vastly over-expose their negatives. It should be borne in mind by them that the light between spring showers, as a rule, is highly actinic, and unless this be taken into consideration over-exposed and flat negatives are the result. There is another thing that it may be well to call attention to in connection with the improvement in the light, which is that it will, at times, find out imperfections in the apparatus that were little suspected, and were unnoticeable when the light was of poorer quality. Some of the more portable of the cheaper forms of apparatus are not absolutely light-tight when they are used in a highly actinic light, with ultra rapid plates. They are not always constructed of the best seasoned wood, in which case cracks may occur when long exposed to the heat of the sun. The bellows of some of the cheap cameras are not above suspicion, even when they are free from cracks or pinholes. We have seen some that we should not care to trust with extra rapid plates in the open, in the spring light, unless they were protected with the focussing cloth during the exposure. The same may be said of some dark slides, the shutters being so thin, in order to secure extra lightness, that, if long exposed to strong sunshine, the plates become affected. Many flat, or slightly fogged, negatives may be accounted for in this way, though the actual cause is not suspected. There is another matter that it may be worth while to direct attention to, namely, that just now good pictures of some subjects may be obtained which at any other time of the year would be impossible. For example, there are many buildings—country churches, old ruins, and the like—which are almost entirely hidden by trees, in some cases quite so, from any point at which the camera can be placed, when they are in full foliage. If, then, such subjects are photographed when the trees are bare, although the buildings may be shown, the picture has a barren and weird look. But if the same subjects be dealt with in the early spring, while the foliage is yet young and small, good views of the buildings will be secured, while at the same time the picture will be bright and cheerful-looking. This reminder may be useful to those photographers who make a speciality of local views for publication, as the opportunity lost now will have to be waited for till next year. The same remarks apply to many glades and glens. When the trees and shrubs have put on their full summer garb it is next to impossible to obtain good pictures of

them, owing to the density of the foliage. Yet if they be taken in the early spring, when the leaves are young and to the present light tints charming pictures may be secured without difficulty, though they would be impossible in summer, owing to the density of the foliage.

AN ARTIST'S ADVICE TO PHOTOGRAPHERS.

In the leading article of our issue of April 25th, 1902, we commented on the correspondence between Col. John A. Ockerson, chief of the Departments Liberal Arts of the St. Louis Exposition, 1903, and Mr. J. C. Strauss, of St. Louis, U.S.A., with reference to a public recognition of "Art Photography" at this exposition, by the erection of a special building for the display of such work by the photographers of America and other countries. Adopting this correspondence as our basis, we gave, for the benefit of our readers, the detailed remarks by an artist friend on this very subject, and it is pleasant to know that this has been appreciated by several good men, and we do not doubt that, could we but ascertain the opinions of others who have read the article, we should find that there had been "a hit home" in many cases. On the other hand, we are aware that the ideas therein expressed have been scoffed at by many superior persons, who, we venture to say, should know better. It is our fortunate privilege to be in a position where we learn the views of every section of the public with regard to photographs, and the criticisms thus expressed are not by any means always flattering to the photographer. The production of portraits in this country by photographic agency is, except in the case of a few amateurs, entirely a matter of commerce, and is regarded as such by the workers themselves. Everything is subordinated to this principle, and the amount of "Art" which is manifested in the production will invariably be found to be proportioned to the intelligence of the immediate community. Thus in the West-End of this great city it is not a difficult matter to find several studios that turn out work of a very high-class order, expressive of the individuality of the operator and of striking testimony to his knowledge of the craft. But comparing these few houses with the general mass of public photographic portraitists, we shall undoubtedly find that the majority on the other side is of overwhelming proportions, and yet, notwithstanding this, these few studios are the leaders of the art whose work is publicly displayed in the weekly periodicals, and to whom those prominent in the various phases of our life resort to have their portraits taken. This fact is very striking testimony to the appreciation of ability by the more discerning members of society, and in proportion as the skill of the photographer is apparent, so do we find a corresponding appreciation by those whose tastes and education have fitted them for accurate and thoughtful judgment.

But the appreciation of art is by no means in the hands of so few as it is supposed to be, as witness the large attendance at our public galleries, but it is not the fault of the people if they still put up with the ordinary type of work—they can only buy what is offered to them. It will probably be stated that the production of such work as we have referred to entails a cost which would show no margin of profit if it were adopted. This is, however, a somewhat erroneous idea. It is true that more time would have to be expended by the operator, in many cases, to obtain a suitable elegance in the result, but, in the hands of the practical man, this is a matter which can be easily made to adjust itself. The extra cost of materials would invariably be found to be easily covered by the additional shilling or two which would be charged. In the districts where every penny is of importance, it is not feasible, perhaps, to contemplate such work, and, on the principles of equality, it is not possible for those whose residence is in Park Lane to be of the same calibre as those who live in Deptford. We are convinced, however, that in many districts more artistic work would not only be appreciated, but could also be turned into a source of profit. We now turn to the question of how this greater proficiency can be cultivated, and in doing so our thoughts naturally incline towards the younger members of the profession. The older men, who have for years practised photography, and still find the old silver print and G.B.E. mount the popular favourite, will not feel inclined to commence to operate in new fields or to study at a business they consider themselves experts at; but to the younger men, many of whom have a real love for their profession, we can give a few hints. Turn then, first of all, to the leader we have referred to, and you will find that our artist friend is decrying the lack of knowledge of the principles of expression. "You have given you a very good but simple example of the use of this knowledge of artistic anatomy and the philosophy of expression. Do you not think that this knowledge would be of use to you? We think so. You would find that, though you would never be called on to use it to the same extent as the painter, you would, nevertheless, be conscious of a reserve force within you, which would give you a grip over your subject which years of ordinary work in the studio will never do. You will unconsciously find yourself analytically examining your sitters' faces, you will quickly realise their good points and their weak ones, and the application of this knowledge will be a matter of pleasure to you, if you have the proper spirit in you.

"Learn, therefore, as much artistic anatomy as you can, make a careful study of the human figure, and try to understand the philosophy of expression. The subject is large, but not difficult, if you are the right man, but it is not the slightest good having this knowledge as a parrot has knowledge of human utterances. You must feel the force of it running through you, and influencing your life and work. You will find that it will immensely increase the pleasure of your work, and that improvement will quickly manifest itself. Mediums of expression will be found which you have overlooked before, and greater variety will be introduced into your work, and this fact will be recognised by your clients. This country is rich now in galleries of Fine Art, and a more liberal spirit has in many cases prompted the authorities to throw them open on Sunday. You can well employ some spare hours in the study of their contents, but it is worse than useless if you go there out of idle curiosity. Find out the good points and the defects of the pictures you see, and assimilate this knowledge, make a critical study of any particular portrait

that attracts you, and be content to contemplate it alone rather than expend your energy over half-a-dozen pictures. There is no reason for you to imagine that photography is a subject, the knowledge of which you can treat as an inborn property; on the contrary you must learn everything that you know in it. Years of study are spent by those skilled in other learned professions, and it should not be imagined that a photographer will rise to a premier position in his calling without hard work. There are scattered over the provinces many technical schools where the practical work of the studio may be supplemented in many useful ways, and the fees charged at these excellent institutes are so low that they cannot rank as an impediment to the ambitious apprentice. But with regard to the subject to which we have directed special attention, this knowledge will have to be acquired by studying from art manuals, supplemented by careful observation. It is true that a course through an art school would fully cover the ground, but we think it would rather overdo it, and in assimilating the principles of the painter, the limited application of them to pure photography would be lost sight of. It is a pity that there is no college of photography where such a thorough knowledge might be acquired, but the general spread of public appreciation for higher class work may soon warrant such an establishment being founded. Meanwhile the younger men need not be discouraged, for, provided that the knowledge they acquire be sound, the fact of it being self-taught will only make it more valuable, and it should never be lost sight of that the public will quickly recognise a good thing when they see it; but let our friend beware lest, in his efforts to reach the goal of Art, he does not surpass himself, and degenerate from the sublime to the ridiculous, as so many are doing at the present moment."

WATER COMPANIES AND WASHING WATER.

A CORRESPONDENT points out to us that there is an aspect of the water rate question involved in the celebrated Stockport case which has been overlooked. As a matter of "practical politics" the fact remains, he urges, that water companies throughout the land claim the power to charge for water by meter if the ordinary conditions of usage are exceeded, and they very frequently do put their powers into force in the case of the professional photographer. "Why," he asks, "should one professional be charged by meter, and another in the same town not so charged, thus handicapping the former, who, when rated by meter, is tempted to use an insufficient quantity to save expense, and so put himself at a disadvantage as compared with the latter? Similarly with an amateur, who, if he washes in the way most commonly adopted, the continuous stream, will waste as much water in treating a dozen or two prints as the professional would in washing a hundred or two." We think this shows a rather needless jealousy of the amateur, though our correspondent points out that he has suffered from the so-called amateur who takes views and portraits for a very low price, and practically makes a small business out of it, leaving a margin of profit still, though issuing prints at "cutting prices." This latter is one of those "vexed questions" that can be treated from so many aspects as to need an article by itself to do justice to the subject, so that we will not at this stage discuss it. We would rather point out that the use of running water is a very wasteful way of washing, though the waste is rendered less important if the intermittent siphon action, as often described in these pages, be employed. MM. Lumière and Seyewetz have recently published some statistics as to the advantage of the method of washing by individual handling and changing into repeated fresh supplies of water, squeegeeing the prints after each change. This method is one we have always advocated as being the best, but the treatment of a large number of prints would involve more time than the average photographer would consider he had to spare. There is danger of the experiments referred to being looked upon as embodying a novel idea, but really, apart from our own advocacy for years past, we would point out that Mr. Haddon some time since performed a number of experiments in the same direction, and showed how a very small quantity of water sufficed by the individual handling system. He made analyses of the washing waters to show the virtual complete removal of the hypo in a comparatively short time. Many would-be authorities recommend the use of "hypo eliminators" for getting rid of the last trace of the salt, forgetful or ignorant of the fact that it is not so much the presence of hypo as of the unstable silver salt it contains that creates the danger of fading. The hypo can be eliminated by the use of this chemical and converted into innoxious sulphate, but that does not get rid of the silver present, which will bear, practically, the same proportion to the hypo, whatever the dilution. We would lay the greatest stress upon this point, which is so generally ignored. An excellent instructive experiment is to write or paint a design upon a silver print by pen or brush charged with a comparatively weak solution of hypo. The slight effect only that the hypo produces will conclusively show that the fading of a photograph is not necessarily owing to the presence of hypo.

It will not, of course, be assumed from these observations that we deem the entire removal of the hypo superfluous; far from it, we would use every possible care to get rid of the silvered hypo, the commonest method, as we have pointed out, being the use of a continuous current of water. With regard to this, there is, beyond the reducing of expense, another very important advantage in keeping the amount to a minimum. Notwithstanding the very thorough filtration to which most main-supply water is subjected, there usually remains a quantity of insoluble matter held in suspension, and when negatives are being washed, especially when a few in number only are being treated, and they are simply placed in a flat dish and the tap "turned on," there takes place a gradual deposition of fine particles upon the surface of the plate which renders them like a piece of sandpaper when dry. To retouch a negative under such conditions is very difficult and troublesome. It is better when two series of taps are available, namely, from the main direct or from an intermediary reservoir, to choose the latter, as then the bulk of these particles are deposited in the cistern before arriving on the plate. Perhaps the best plan is to secure a filter of some sort to the tap, and thus automatically clear the issuing stream. It is astonishing to note the amount of dust that collects in a very short time on the surface of these filters, thus giving ocular proof of the existence of the dirt in what looks like a pure and limpid fluid. It will be found that these filters in consequence require repeated renewal, and this need forms a danger of itself, as it is apt to be neglected. We have had put before us difficulties produced from this cause where the filter took the form of a bag of flannel tied over the tap; a continuous series of surface-roughened

plates being traced to the overflow, as it were, from this bag, bringing over the accumulation of dirt particles. The simplest filter of the kind is the make which has reversible ends, the filter thus being made to cleanse itself by putting it on the tap first one end and then the other. This form of filter, too, is very useful when the water issues from the tap at high pressure; it kills the force of the stream (which is always dangerous when there is a tendency to blister or frill) and causes it to fall in a gentle stream, no matter what the orginal pressure. Indeed, so important is this point that there are small attachments made for the express purpose of breaking the force of the current. This usefulness would scarcely be believed unless the simple attachment were seen in action. This little apparatus has a kind of diaphragm which acts as a rough filter, though that is a mere incidental advantage.

We will conclude these somewhat desultory notes by a recommendation which may sometimes be of importance. The varieties of tap-water are legion, and when the water employed is very hard through the presence of lime held in solution by carbonic acid, or through what is termed permanent hardness, it will be found that upon drying the negatives will have a sandy surface owing to the precipitation of the insoluble matter. The remedy is a final soaking in distilled water. The trouble is well repaid by the instant improvement which is noticeable in the surface of negatives so treated, an improvement that is the more important in view of the universality of the system of retouching which now obtains.

NOTES ON PARAMIDOPHENOL.

Most of us are tempted sooner or later to abandon pyro, and try some of the newer developers that are continually being brought out. After a while, we drift back again to pyro, not because the other developer is less satisfactory than pyro, but because it is not more so. For, when we have grown well acquainted with a developer, we can coax any desired result with it, and there is no developer more adaptable than pyro to extreme differences of exposure, or capable of yielding more perfect negatives.

But there is no one developer that combines all the good points of the others, and there are conditions under which some of the newer developers are useful as supplements to pyro. One would expect that in tropical climates alkaline developers must cause gelatine plates to frill, and that amidol would be very useful; and where an under-exposure is more than an occasional occurrence the so-called rapid developers enable us to avoid the tediously prolonged development that is necessary in order to produce the best possible results with pyro.

Among these rapid developers none has become more universally popular than paramidophenol, in the form of the ready-made single solution called Rodinal. For snapshots and under-exposures in general it is a universal favourite, recommended by the authors of text-books, used by all one's friends, and always to be found at the dealers' (together with some secret concoction of their own), which is weighty evidence of its popularity here in Germany, where the dealers seem never to have anything you ask for. But although paramidophenol is one of the most popular of developers in the form of Rodinal, it appears to be otherwise used the least of them all. It is sold by the makers of Rodinal in a solid form, as the soluble hydrochlorate, and being a definite and simple compound is listed by all the general manufacturing chemists. The former give two formulæ for making it up; one as a two-solution developer, with carbonate of potash; the other as a single solution, with caustic soda, presumably similar to Rodinal, but somewhat less concentrated.

I procured recently 100 grams of paramidophenol-hydrochlorate from a manufacturing chemist to experiment with these formulæ, and to compare them with Rodinal. The 100 grams cost me here in Germany about a penny over two shillings retail, as against seven shillings and sixpence charged by the makers of Rodinal, who, I believe, have patented the right to use paramidophenol as a photographic developer. This excessive charge is, however, not so unjust as it appears, for the makers sell other developers at this same uniform price that are much more expensive to prepare.

The carbonate of potash formula proved to be slow working, and rather less effective than pyro in bringing out detail; certainly far less than Rodinal. With the alkaline carbonates paramidophenol seems to be less active than pyro. It certainly requires more alkali, for the Aniline Company's formula has 4 grams of carbonate of potash in 100 cc., and Dr. Eder's has 8 grams of soda, which is more than is necessary with pyro. The much more active Rodinal is stated to contain only enough caustic alkali to dissolve the paramidophenol as a phenolate. Replacing, therefore, the 4 grams of potash with this amount of caustic alkali should cause a great increase in the developing power. To test this I made up a solution of four parts of paramidophenol-hydrochlorate and two parts of acid sulphite of potash, and another solution containing some pure neutral sulphite and 3 grams of caustic soda. This amount of caustic soda is sufficient theoretically to neutralise the acid sulphite and the hydrochloric acid combined with the base, and to redissolve this base, which in not too weak solutions is at first precipitated, as a soluble phenolate. This proved to be the case practically, and the resulting solution was diluted to a concentration of 0.4 gram paramidophenol in 100 cc., to correspond approximately to normally diluted Rodinal. It then contained only 0.3 gram of caustic soda, part of which was used up by the acid sulphite, against 4 grams of carbonate of potash and $\frac{2}{3}$ gram of paramidophenol in the two-solution developer, and it did not seem probable that it would show a very considerable increase in developing power. And in fact it did not, the resulting developer being rather less energetic if anything, and decidedly less than Rodinal 1.25. I then doubled the amount of caustic soda, and obtained a very powerful, quick-working developer that out-rodinated Rodinal, and was the most efficient developer I had ever tried for bringing out detail in a short time, without harmful fog or excessive density. As an all-round developer, however, it was evident that a little less alkali and some bromide would improve it, and give about the effect of Rodinal 1.20 or 1.25.

These tests seemed to indicate that more caustic alkali was necessary than was sufficient to re-dissolve the paramidophenol. I had made up a single solution caustic soda developer according to the ingenious directions of the Aniline Company, and now tested this, together with Rodinal, for excess of caustic alkali. A single drop of hydrochloric acid sp. gr. 1.06, the officinal dilute acid of the German Pharmacopœia, produced a permanent precipitate in 5 cc. of the former, while about nine to twelve drops were necessary (according to the source of the acid) with the same amount of Rodinal. This indicates a small excess of 1 to 1.5 grams of caustic alkali per 100 cc. of original Rodinal.

This excess, though small, appears to be not without some influence upon the properties of the developer. To confirm this I developed each of two fully and equally exposed plates with 5 cc. Rodinal, diluted to 75 cc., adding seven drops of hydrochloric acid to one. The acid had a decided effect upon the result, holding back the shadows and half-tones, but not the high lights, so that by slightly prolonging the development a more brilliant negative resulted. Possibly this may be a convenient means of increasing the usefulness of Rodinal for full exposures, although it does not appear to be capable of correcting decided over-exposures. Hydrochloric acid is sold in dropping bottles by all apothecaries, in a form very convenient for this purpose. The amount to be added can be easily found by dropping the acid

into the desired amount of undiluted Rodinal, until a permanent precipitate is formed, which dissolves when the Rodinal is diluted. More acid may be added, but it seems to be better to add rather less than more than this amount.

Tested with "regular" Velox paper, the self-prepared caustic and carbonate developers produced not merely a fog but a black deposit on unexposed paper. The same effect was produced by a developer said to be that recommended by the makers, but without bromide. The addition of four drops of ten per cent. bromide in 100 cc. completely prevented this reduction, thus affording a good test for the presence of bromide. Rodinal did not give this fog.

The following is a convenient formula for experimenting with a two-solution caustic-soda paramidophenol developer :—

No. 1.

Paramidophenol-hydrochlorate	8 grams.
Acid sulphite of potash (crystals)	4 ,,
Water	500 cc.

No. 2.

Caustic soda (pure)	12 grams.
Sulphite crystals	50-100 ,,
Water up to	500 cc.

For under-exposures try one part each and two parts water, and some bromide. This is equal to 0.4 gram paramidophenol and 0.6 gram of caustic soda per 100 cc. For normal exposures one might try reducing the proportion of alkali to a limit of one-half, either by reducing No. 2 to a minimum of one-half part or by increasing No. 1 to a maximum of two parts, according to the density required. The equivalent of Rodinal lies between the two proportions. In addition, the developer may, of course, be diluted as a whole, and bromide be added, as with Rodinal.

The solid paramidophenol-hydrochlorate, like many other organic compounds, turns dark with time. The coloured oxidation product is rather insoluble, and remains behind on the filter, yielding a light, straw-coloured filtrate that keeps well when it contains acid sulphite. Without the latter I have found that it grows dark in a few days, even in well-filled bottles kept from the light. This two-solution developer naturally keeps longer than Rodinal in partly emptied bottles, and is much cheaper, the cost of the ingredients of the above formula, according to the list prices of the German manufacturing chemists, being about twopence halfpenny, or about seven pence with the patented paramidophenol.

W. S. Davenport.

WOREL'S PROCESS OF PHOTOGRAPHY IN NATURAL COLOURS.

The ideal process of photography in natural colours is that which will either give us colours direct in the camera or a negative of such a description that when printed on special paper, the colours would be correctly rendered. Neither the interference process of Lippmann nor the trichromatic process satisfy these requirements.

In 1896 Prof. Otto Wiener (Eder's "Jahrbuch," pp. 55 and 93) suggested the idea of utilising "Körperfarben," and the possibility of finding organic dyes, a mixture of which should give the true colours of a subject. To attain this it was necessary to find dyes which, when decomposed by light, should give a colourless residue, and which should not interact one with another so as to destroy original colours. In 1897 Vallot followed up this idea, and coated paper with a mixture of aniline purple, Turmeric, and Victoria blue, and obtained some fairly successful results.

Last November Herr Wörel exhibited at the Amateur Photographic Club, at Graz, a collection of prints produced by his process, and also some camera exposures.

In January this year Dr. Neuhauss published in the "Photographische Rundschau" an account of his researches in the same direction, a translation of which has already appeared in these columns.

The theory of these processes is that light of any particular colour causes all the dyes to fade except that of the same colour. For instance, assuming that we have a mixture of red, yellow, and blue dyes, red light causes the yellow and blue to fade, blue light would bleach yellow and red, and so on.

Herr Wörel gave a description of his process to the K.K. Akademie der Wissenschaften (Akad, Anzeiger No. 8), and exhibited specimens, and the following extract gives a concise sketch of the process :—

Pure paper, free from wood pulp, is immersed in a bath of alcoholic solutions of primrose, Victoria blue, cyanide, curcumin, and auramin, with the addition of anethol. The proof as to the correct composition of the bath is shown by exposing a strip of the paper under strips of yellow, red, green, and blue glass, and if correct, an exposure to direct sunlight will give all the colours.

The bath must have a temperature of 20 deg. C. The paper must be hung up to dry at the same temperature.

As soon as surface dry, it must be exposed either under a coloured glass picture or a transfer or coloured transparency, in the printing frame. Any loss of time lowers the light sensitiveness of the paper, and so much so that after the lapse of about an hour the paper becomes considerably insensitive to light.

The exposure should be made in absolutely clear sunlight falling direct on the frame, and the duration of the same depends upon the transparency of the subject, the strength, and the proportion of anethol in the same, and the intensity of the sunlight. I have, under favourable conditions, obtained good prints even in five minutes.

If the picture appears clear in all its colours, then the exposure is stopped, and the print is placed in pure benzine for about an hour, and dried at 40 deg. C. If there is still any smell of anethol after this, the benzine bath must be repeated. Any trace of anethol lessens the permanency of the prints.

The print is now placed in a concentrated solution of sulphate of copper, and left therein for two or three hours, then washed and dried, and then mounted.

Direct sunlight soon bleaches such prints, indirect diffused light in some weeks; if only exposed to light occasionally, or kept in a portfolio, they remain for a year unchanged.

By the use of less concentrated baths, and the addition of a good quantity of anethol, pictures of artificial flowers were made with a rapid objective in the camera.

In direct sunlight I exposed about two hours. The colours appeared weak, but were distinctly recognisable up to green.

Obviously, the process can be used on collodion or gelatine coated glass instead of paper, but the results are not so good as on paper.

Hackney Photographic Society.—On the 6th inst. a lecture and demonstration was given by Mr. A. Mackie, under the title of "A Few Practical Hints." Among other things, some difficulties of every-day photographic work were dealt with, and practical remedies suggested.

The Proposed Photographic Camp.—Sufficient support has been forthcoming to decide Mr. Walter D. Welford to proceed with the scheme, and he will shortly issue a circular giving full details, programme, etc. The camp will commence the second week in July, and last 10 days, and will be pitched at some spot on the Avon. He does not expect the cost to exceed £4 for the whole time per camper. Arrangements will be made for ladies, and a fair-size dark-room; and other items are a regatta, Venetian fete, visitors' day, sports, etc. Excursions will be made by boats to Evesham, Tewkesbury, Stratford, Broadway, and other places. Prizes will be offered for best-decorated tents, medals for best photographs taken during the camp, etc. Mr. Welford is still desirous of hearing from those willing to join. His address is Warwick Lodge, 166, Romford Road, London, E.

OPTO-TECHNICS. *

[A lecture delivered at the Society of Arts.]

II.

If it be assumed that by a small improvement in the optical equipment of the science schools throughout the country and in the optical information of the science teachers, the above requirements should be fulfilled, then a suitable foundation will be available. But what more is required than this for the teaching of the future optician? Obviously, there remains a considerable technical field, over which even the ordinary optician must extend his mastery. He has yet to acquire much specialised knowledge in relation to spectacles and to instruments. He has yet to study the optical properties of the eye. He will have to master such technical matters as the properties of cylinder - lenses, the properties of spherocylinders, the transpositions of lenses, the properties of the combinations of prisms and lenses, the effects of decentering, all the mysteries of spectacle fitting, and many another technicality of the spectacle trade. All that part he will learn, if he is diligent, in the trade itself, provided the scientific foundation has been properly laid. But if he would make rapid progress, even in spectacle technics, he must study —and this time not Cambridge text-books, but handbooks written by opticians for opticians.

But if this course of training suits the average optician in trade, what about the further requirements in the scientific and technical training of the optical manufacturer? For him a much further and more specialised course of instruction is needed. He must not only be able to grind and polish a lens, but to know how to compute it. Where is he to learn these things? The optical factory will train him in the practical part; but divorced from theory, that training will leave him merely a skilled workman. He will have in the factory to use proof-glasses, with their exquisite optical test, by the coloured interference rings and bands, of the perfection of the surfaces. The study of interference, diffraction, polarization, secondary spectrum, absorption coefficients, aberrations—all these things which enter into his daily work ought to be at his finger ends. Where is he to acquire these higher studies in optics? There are books, but how sadly inefficient are even the best books to teach, if the instrumental appliances are not at hand. There are lectures in higher optics at the universities: but it is obvious that few of these who are going to enter optical factories can attend the university. Even if they did, they would find university lectures in optics sadly unreal—beautiful, but inefficient for their purpose. Where, then, can the needed training in advanced optical studies be obtained?

This query brings me to the main point of the present paper. I suggest, as the proper solution, the creation of a special technical college, an *Optotechnical Institute*, devoted to the interests of optical science. It would be the counterpart of those colleges, or departments of colleges, devoted to electrical engineering, to which allusion has already been made. This suggestion, which presently I will further explain, does not, however, stand alone. No such educational step is successful without proper preparation of the way. Before any such institute can be carried on with success, much must be done outside; and existing means of preliminary education must be much more fully utilised before such an institute can discharge its proper functions. Every young optician ought now to be preparing for the work of his life by studying mathematics, geometrical drawing, and physics, in the secondary schools and the science schools which exist under the Board of Education. Or, if he has satisfactorily followed such preliminary work, he ought to be studying in special optical classes organised in the technical schools and colleges. Unfortunately, very few such technical schools or colleges have made preparation to hold special optical classes. Even in the larger municipal technical schools, and in the local university colleges, the equipment for teaching optics is very deficient—far in arrear of that provided for the teaching of electricity, or chemisty, or heat. Perhaps the answer of the managers of such schools or technical colleges to such a criticism is that the demand, down to the present, for direct teaching in optics is not such as to warrant them in spending money on the equipment, or in engaging teachers in optics who are possessed of the special qualifications. To teach chemistry or electrical engineering they engage special teachers trained up to their respective professions; and for them they provide apparatus and laboratories. Then why not for optics? One reason is that under the present educational system, or want of system, only those subjects are pushed and fostered which "pay" from the examination point of view. The examination curse, here as everywhere, warps and blights the educational growth.

What, for example, has South Kensington done in the past for the teaching of optics? It has, of course, included optics amongst the branches of physics taught in the Royal College of Science. As a former student of the Royal College of Science, I, for one, can never be too grateful for the teaching in experimental optics there given as a part of the physics course. But it has never entrusted the subject to a special lecturer in optics. It has a special professor of metallurgy, and another of astronomical physics, but none of optics as such. It has further included "light," along with sound and heat, as a part of Subject VIII., amongst the subjects for the May examinations. For the past thirty years, therefore, sound, light, and heat have been taught together, all over the country, in science classes, for the elementary, advanced, and honours stages. So far, so good. But has this met the need for the teaching of young opticians? Let the men in the optical trades answer.

By the kindness of Sir William Abney, the principal assistant-secretary of the Board of Education, I am able to give here the statistics of the classes held during the last ten years in this triple subject of sound, heat, and light, and of the subject of light in the advanced and honours stages. Originally, the triple subject used to be kept up into the honours stage as a triple subject. This, however, was altered, partly, I believe, in consequence of some strictures of mine, a year or two before the period under consideration.

From the figures of Table I., it would appear that the number of candidates in the elementary (triple subject) stage has decreased from 5,162 in 1892, to 949 in 1901. The number who passed has decreased from 3,939 in 1892, to 649 in 1901. It must be remembered that these numbers do not include candidates in training colleges. In the single subject of light, the number of candidates in 1892, in the advanced and honours stages taken together was 418, of whom 264 passed. In 1901, the number of candidates was 299, of whom 199 passed. Judged by these statistics, it would appear that there is a serious diminution in candidates in the advanced study of light, and a startling diminution in the number of candidates in the elementary stage of sound, heat, and light.

In Table II. we have the statistics, not of examinations, but of classes and students. From these it would appear also that the number of students in attendance dropped from 7,430 in 1892, to 4,596 in 1899, in the elementary subject, while in the advanced subject of light the numbers dropped from 721 in 1892-3, to 251 in 1899. Nor is this the worst feature, for the numbers of classes held in different centres also dropped from 251 to 173 in the elementary (triple) subject, and from 65 to 22 in the single subject of light; and has dropped to about 20 in the present year. I do not mention these statistical facts to blame

* Concluded from page 349.

the South Kensington administration. Surely, if there is one man competent to understand what technical knowledge in optics means, that man is Sir William Abney. Furthermore, the years of this decrease are precisely those during which the control over, and maintenance of these science classes has passed from the control of South Kensington to that of the local municipal bodies, or their technical education boards.

What is the meaning of this reduction? If in 1892 there were 65 classes in advanced light being held in the United Kingdom, why should that number now have fallen to 20? Are there fewer persons desiring instruction in optics now than in 1892? Is less money being spent on science teaching now than in 1892? The very question is absurd. Think of all the technical education grants out of the beer-money now at the disposal of the County Councils; of all the new technical institutes that have been opened; of the new physics laboratories that have been equipped. No; the cause must be sought for elsewhere. In spite of the great revival in experimental optics since 1896, in spite of the immense spread of popular photography and all the incentives to study optics that have resulted from the forward movement in the optical trades now in full progress, we have a diminution of classes, of students, of candidates steadily going on.

TABLE I.—Table Giving Details of the Successes, &c., in the Subjects of Sound, Light, and Heat, and of Light (advanced), at the Annual Science Examinations (Board of Education), 1892-1901. (Exclusive of Training Colleges.)

Year.	Honours.				Advanced Stage.				Elementary Stage.			
	1st Class.	2nd Class.	Failures.	Total.	1st Class.	2nd Class.	Failures.	Total.	1st Class.	2nd Class.	Failures.	Total.
1892.												
Sound, Light, and Heat (Elementary)	...	...	...	...	...	...	...	...	1,545	2,394	1,223	5,162
VIII*b*. Light	4	2	16	22	71	187	138	396	...	...	...	...
1893.									Under Old Rules.			
Sound, Light, and Heat (Elementary)	...	...	...	...	...	...	...	...	36	239	143	411
									Passes.		Failures.	Total.
VIII*b*. Light	1	6	18	25	59	174	233	466	943	...	2,831	3,774
1894.									Passes.	Fair.	Failures.	Total.
Sound, Light, and Heat (Elementary)	...	...	...	...	...	...	...	...	962	1,569	1,110	3,641
VIII*b*. Light	6	11	13	30	52	159	178	389	...	...	...	...
1895.												
Sound, Light, and Heat (Elementary)	...	...	...	...	...	...	...	...	1,207	1,318	1,522	4,047
VIII*b*. Light	2	9	25	36	49	146	204	399	...	...	...	...
1896.												
Sound, Light, and Heat (Elementary)	..	...	...	...	...	...	...	...	962	570	642	2,174
VIII*b*. Light	4	9	26	39	78	137	102	317	...	...	...	...
1897.												
Sound, Light, and Heat	...	...	...	...	...	...	...	...	857	677	1,047	2,581
VIII*b*. Light	2	3	18	23	38	118	90	246	...	...	...	...

TABLE I. (*Continued*):—

	Honours (divided).							Advanced Stage.				Elementary Stage.			
	Part II.				Part I.										
	1st Class.	2nd Class.	Failures.	Total.	Passes.	Failures.	Total.	1st Class.	2nd Class.	Failures.	Total.	Passes.	Fair.	Failures.	Total.
1898.															
Sound, Light, and Heat	...	...	...	...	...	...	...	...	...	...	...	520	663	903	2,086
VIII*b*. Light	...	...	...	...	6	18	24	43	113	107	263	...	...	...	...
1899.															
Sound, Light, and Heat	...	...	...	...	...	...	...	...	...	...	...	529	624	1,064	2,217
VIII*b*. Light	...	1	...	1	4	14	18	71	155	86	312	...	...	...	...
1900.															
Sound, Light, and Heat	...	...	...	...	...	...	...	...	...	...	...	414	574	1,124	2,112
VIII*b*. Light	1	...	...	1	23	17	40	15	103	153	271	...	...	...	...
1901.															
Sound, Light, and Heat	...	...	...	...	...	...	...	...	...	...	...	305	344	300	949
VIII*b*. Light	...	1	1	2	2	7	9	51	145	92	288	...	...	...	...

Is not the inference obvious that these classes on "Light," and on "Sound, Heat, and Light" (where light comes in only third!), do not meet the wants of real students of optics; do not suffice to afford to the young men in the optical industry the training they need, and are, therefore, not attended by such men?

TABLE II.

Number of Classes and Students Under Instruction in Sound, Light, and Heat (Exclusive of Training Colleges.)

Session.	Subject VIII. Sound, Light, and Heat. (Elementary Stage.)		Subject VIII*b*. Light. (Advanced Stage and Honours.)	
	Classes.	Students.	Classes.	Students.
1891—1892	251	7,430	†	—
1892—1893	282	6,602	65	721
1893—1894	264	6,635	70	893
1894—1895	263	7,186	56	834
1895—1896	240	5,881	41	578
1896—1897	241	5,425	47	680
1897—1898	210	5,636	32	363
*1898—1839	173	4,596	22	251
‡1899—1900	—	—	—	—
‡1900—1901				

I say unhesitatingly, that until the classes in optics are taught by men who have had optical experience, and who teach from a technical instead of an academic standpoint, the decrease here noted is bound to continue.

I specially appeal to the managers, principals, and committees of the local technical schools and colleges on this point. Do opticians attend their classes on light? If not, why not? Has the teacher in charge of the class himself any knowledge of the technics of optics? If not, why was he put there in a false position? A technical subject demands a technically-trained man.

Further, I appeal for the creation of proper optical labora-

* The figures for this Session are exclusive of those for Scotland.

† These classes are in addition to those held in Schools of Science since 1896. The number of these classes rose from 1896, from about 20 to 220 this year (1902), so that in the year 1898 at least 180 classes in all were held on "Light." The total number this year is probably about 250 respectively.

‡ The figures for these two Sessions are not available.

tories in the science schools, that the teacher may have a fair chance of training his students.

Perhaps you will say to me, why make these criticisms and this appeal, before setting our own house in order? The City and Guilds of London Institute for technical education took the lead twenty years ago. It built the first two technical colleges —the oldest one at Finsbury, and the largest and best equipped one at Kensington. It, from the first, made large and generous provision for the teaching of *electro-technics;* why has it not made provision for *opto-technics* also? There are certain reasons why these things have not been done, but for these I disclaim all responsibility. So far back as 1886, I made a formal proposition to establish, under the City and Guilds' Institute, an optical laboratory, which was indeed to be opto-technical, since it was to be equipped, not only with optical measuring instruments such as I have mentioned above, for the optical testing of prisms, lenses, plane-surfaces, and optical instruments, but also with experimental optical tools for grinding and polishing. The suggestion was considered, and put aside, for reasons doubtless sufficient to the governing body of that date, the main reason being that the building at Finsbury was already acknowledged to be too small for the purposes of chemistry, engineering, and electro-technics, for which it was built. Two years later, when the Charity Commissioners were considering the establishment of educational institutes out of the funds of the City Parochial Charities, I renewed my suggestion. I sent to the Commissioners a proposition to found in London, preferably in Clerkenwell, an optical institute, specialised for the optical industries, and with laboratory equipment as before. My idea was that this should perform for the optical industries the same kind of function as the electro-technical laboratories at Finsbury were performing for the electrical industries in London. Again my proposals were put aside. The Commissioners were at that time strongly holden by what I hope I may without offence call polytechnic fever. Their one idea was that all these institutes (except the City of London College) should be made as mixed as possible, recreation and miscellaneous, non-literary instruction being organised in all without distinction. In vain did I point to the unwisdom of this course, and to the preferable course of concentrating the technical teaching in special centres of industry, instead of teaching everywhere smatterings of everything. Instead of *Polytechnics,* I wished to see *Monotechnics*; for engineering at Battersea; for building trades in Islington; for printing trades in Fleet Street; for plumbing and tanning in Bermondsey; and for optics in Clerkenwell. I was not listened to; and the polytechnic idea prevailed. I had the honour of reading a paper on this topic in this very room on June 17th, 1897, when I expounded the monotechnic idea. Since that date much has happened. The beer-money added to the funds of the City Parochial Charities has enabled the Technical Education Board of the London County Council to build their twelve Polytechnics, with the work of which you are familiar. That work, admirable as it is in so many ways, has, I am convinced, not been of one-half the value it would have been to the community had these Institutes been organised on a more rational plan. Of all of them, the one which has been, so far as I am able to judge, the most successful is that in Bolt Court, Fleet Street, which differs from all the others in being a monotechnic for the printing trades. Can any other one show an equal influence on any trade? I do not forget how the Borough Road Polytechnic has specialised itself in tanning, in connection with the Herold's foundation, nor how engineering has been developed in Battersea; nor, least of all, do I overlook the circumstance that the Northampton Institute, in Clerkenwell, has now for some years considerably specialised its work, and has organised *inter alia* an admirable course of teaching in real optics, and equipped a laboratory therefor. It has, indeed, gone some way toward realising my suggestion for the creation of an Optotechnical Institute. The value of its work is not yet half appreciated; every year will see its reputation increase. Success in each of these cases has resulted from concentration of effort on a definite technical aim. In fact, it is not too much to say of the London polytechnics, that the less they have had of *poly,* and the more of *technic,* just so far have they benefited the industries.

But while these numerous technical institutes have been growing up in the provinces, as well as in London, another movement has arisen. The opticians themselves have begun to organise themselves in three separate ways for the improvement of the scientific qualifications of their own trade. In historic order these are as follows: (1) Examination and certification of opticians by the British Optical Association; (2) examination and certification of opticians, by the ancient guild known as the Spectacle Makers' Company; (3) the foundation of the Optical Society. As I have had the honour of being associated from the first with the Spectacle Makers' Company, I will merely say that its aim has been to stimulate opticians to acquire proficiency in the technics of their craft by offering a diploma and fellowship in the company to those who succeed in passing their examinations. The subjects comprised are elementary mathematics, general elementary knowledge about light and heat, simple geometrical optics, mainly with application to lens problems and to the eye as an optical instrument, errors in the refraction of the eye and the use of spectacles, spectacle fitting, together with a proficiency in some special branch, such as microscope, camera, optical lantern, or sextant, &c. For masters and assistants of many years' standing, a modified examination that does not include mathematics or special instruments has been adopted. During the four years that this examination system has been at work, 318 such diplomas in optics have been granted by the company on examination, in addition to 46 honorary diplomas issued by agreement to certain others who had previously been examined by the British Optical Association. Four years' experience with the examinations of the Spectacle Makers' Company has shown me that while the stimulus of the work has been of great benefit in the optical trades in inciting the younger members to read up some of the principles of optics, yet the organisation for the training in laboratory and class-room of these young opticians is very unsatisfactory. To few of the candidates—and they come not only from London, but from all principal towns—does it seem ever to have occurred even to inquire whether mathematics and optics were taught at the nearest technical school or science school. Of the London candidates, hardly any come from any of the technical institutes, the Northampton Institute being the one exception. Many of them seem to think that six months' cram ought to provide all that they require in the way of preparation, their knowledge of theoretical and experimental optics being in many cases of no longer date. Of course, amongst such candidates, there is much disappointment, and happily there are good candidates as well as bad. But the good candidates are often self-taught or privately taught, and owe little or nothing to any public educational institution: the science schools and the municipal technical schools have not been of the slightest help to them. It is for the leaders in the optical industries to inquire why the great expenditure of money on technical education does little or nothing to benefit them, or why the younger men in the industry do not avail themselves of that which exists. The optical industries of Germany have profited enormously by the scientific training in endowed laboratories of physics of the men who are now the heads of departments and managers of their optical factories. Think only of the advanced state of certain branches of optics in Germany, revealed by that most remarkable cata-

logue of the collective exhibit at the Paris Exhibition of the opticians and instrument makers of Germany. Not that we are to take German methods and copy them. England has to work out its own problem in its own way; but at present, save for the classes at the Northampton Institute, its educational systems are not being used to help the opticians.

This brings me back to the vital suggestion of my paper, the creation—whether at the Northampton Institute, in Clerkenwell, or elsewhere—of a real *Optotechnical Institute*. It will need buildings, equipments, a staff, and an adequate income for maintenance. I think its curriculum ought to be somewhat as follows:—

(*a*) *Entrance Examinations.*—Computation (including logarithms, slide-rule, and use of trigonometric tables), geometrical drawing, German.

(*b*) *First Year.*—Physics, mechanics, algebra and trigonometry, projective geometry, drawing, laboratory work in simple optics, with lens grinding and prism grinding.—*Certificate of Preliminary Studies.*

(*c*) *Second Year.*—Calculus, higher optics (including aberrations), mechanical drawing of optical instruments, machine design as applied to instruments, laboratory measurements.—*Certificate of Further Studies.*

(*d*) *Advanced Course.*—Applications of calculus, higher geometry, theoretical optics, computation of lenses, optical design, higher optical measurements, and optical research.—*Honours Certificate.*

The staff ought to be picked men, who have liberty to practise as consulting opticians, that is to say, as consulting optical engineers. The aim ought to be to attract a few really good students rather than a crowd of mediocre ones. Every facility ought to be given for a student who can only afford a year's course as a day-student to continue his training in the evening, the laboratories being opened certain evenings during the week. The institute ought to make a speciality of having a perfect optical library, with collections of models and of detailed drawings. Finally, the members of the staff ought to be encouraged to write optical monographs on some consistent plan, to replace the academic text-books of the past. It ought also to bring out a respectable optical journal, with technical papers in optics well illustrated, not interlarded with trade advertisements, feeble jokes, or silly personal recriminations.

Not one of our poor optical journals can be named in the same breath as the *Zeitschrift für Instrumentenkunde*. In the English language we have no technical books to set beside the "Handbuch der Angewandten Optik" of Steinheil and Voit, or the "Theorie der Optischen Instrumente" of Czapski.

Scientific books, elementary and advanced, written by opticians for opticians, are, for the moment, the thing most urgently needed for the furtherance of optotechnics.

SILVANUS P. THOMPSON, D.Sc., F.R.S.

KODAK, LIMITED, and Reduced.—The Court having made an order sanctioning the reduction of the company's capital in accordance with the resolutions of the company passed November 11th last, the transfer books of the company will be closed from the 17th day of May, instant, in order to prepare for the issue of new shares in the Eastman Kodak Company, of New Jersey, in exchange for shares in this company.

LIVERPOOL Amateur Photographic Association.—A half-day excursion was held on Saturday, when a party of members journeyed to Rossett under the leadership of Mr. H. Holt, the honorary excursion secretary. The charming village was looking its best, as it always does in the early spring. A good deal of photography was done, principally consisting of river scenery, in which class of work Rossett excels. After tea at the Trevor Arms, Marford, the party returned to Liverpool, well satisfied with the day's outing. A whole day excursion also took place on Thursday last, the place visited being Hodnet, for Hawkstone Park. The outing was under the leadership of Mr. J. Sirett Brown, a past president of the society, a party of about eight to ten making the journey.

THE RADIO-ACTIVITY OF VARIOUS PAPERS AND CARDBOARDS.

CERTAIN peculiar phenomena which occurred while I was investigating the radiographic action of commercial uranium nitrate and various pitchblends, upon the sensitive photographic plate, induced me to carry out a series of radio experiments in another direction, the results of which are, I consider, of some importance to photographers in general.

In carrying out the experiments with commercial uranium nitrate and pitchblend, various substances were placed between these radio-active bodies and the sensitive photographic plate; such materal as thin sheets of iron, steel, copper, tinfoil, lead, zinc, vulcanite, platinum, glass screens of various tints, cloth, linen, silk, wood, cardboard, various kinds of paper, both plain, printed, and written upon, being employed. As might readily be expected, the employment of materials so diverse in character produced many peculiar and instructive results, those obtained by the various cardboards and papers proving of such interest as to induce me to carry out a series of experiments with them alone; as I found that, although the peculiar action of certain papers has already been observed by other workers in this field, the subject had received but little attention from a photographic point of view.

From what I had observed during my experiments with the uranium salt, it was evident that various kinds of cardboard, papers, printing and writing inks, possessed peculiar radiographic properties of their own, and with a view to satisfactorily proving the truth of this theory, I collected together as many different kinds of cardboard, paper, etc., as I could obtain. As far as possible, the material from which the papers and cardboards had been manufactured was ascertained so that the experiments might be conducted with accuracy in all their details. The materials employed in the manufacture of paper and cardboard are cotton fibre, esparto, flax, hemp, mechanical wood pulp, straw celluloses, and wood celluloses, various earthy matters, different kinds of size, etc.

The first set of experiments was carried out with printed papers, portions cut from the "British Journal of Photography," "Daily Graphic," "Daily Mail," "Evening News," "The Times," "Nature," "Gardener's Magazine," "Pearson's Monthly," and the "Board of Agriculture," being employed. The strips cut from these papers were taken into the dark-room, and placed in contact with the sensitive surface of a series of photographic plates. In no case was any pressure whatever employed, the pieces of paper being simply lightly placed upon the surface of each plate, and allowed to remain undisturbed in that position in the dark-room for twenty-four hours. The temperature of the dark-room averaged about 55 deg. Fahr., and the plates employed were Imperial Special Rapid, developed with Messrs. B. J. Edward's pyro-soda formula. After the twenty-four hours' exposure to the influence of the strips of paper, the plates were developed, and the following results obtained:—"British Journal of Photography," moderate image of the whole surface; "Daily Mail," strong image of the whole surface; "Evening News," strong image of whole surface; "Daily Graphic," no image; "Nature," faint image of whole surface; "Times," very faint image of whole surface; "Gardener's Magazine," only image of cut edges and a fold mark on the surface; "Pearson's Monthly," only image of cut edges and of a scratch made accidentally with the point of the scissors across the surface of the paper; "Journal of Board of Agriculture," image of cut edges only.

From these and similar experiments, it was proved that, while flax, mechanical wood pulp, and size containing rosin, have a very strong radiographic action on the photographic plate, cotton and hemp have no action. Bleaching the radio-active materials

tended to somewhat lessen the action, but only in a few cases, after very thorough and prolonged bleaching, was the power entirely destroyed.

It will have been noticed that in the cases of "Pearson's Monthly," the "Gardener's Magazine," and the "Journal of the Board of Agriculture," only the images of the freshly-cut edges, a folded mark, and a scratch were recorded on the photographic plate, while with one exception, the "Daily Graphic," all the other papers left upon the plates records of their entire surface. Now, "Pearson's Monthly," the "Gardener's Magazine," and the "Journal of the Board of Agriculture," are all printed on fairly stout, clay-faced paper, eminently suited for the production of process-block illustrations. The peculiar record left by these papers upon the photographic plate certainly proved that, though the highly-polished clay surface had no radiographic activity, the thin layer beneath the surface did possess it in a very marked degree.

Similar experiments were carried out with various cardboards, particular attention being paid to photographic mounts. The ordinary commercial photographic mount, such as is used for C.D.V. and cabinet portraits, yielded some interesting results. Provided the glossy surface remained absolutely intact, these mounts made no radiographic impression upon the photographic plate, but whenever this surface was displaced, either by scratches, cuts, or by washing away with a damp sponge, then a vivid impression of the area from which the clay facing had been removed was recorded on the plate. This radio-activity of the inner portion of the cardboard mount is certainly a very interesting phenomenon, deserving some closer attention from experts in photographic chemistry, and I think might be found to throw some light on the vexed question of the rapid discolouration and deterioration of P.O.P. prints of to-day. Compare the cards on which photographs taken thirty years ago were mounted with those of the present day; the cards then employed were often less than half the thickness of those now in general use, and a large proportion of them were pure white, and free from glaze—in fact, they very closely resembled the best thin Bristol board. Yet many of the photographs pasted on those thin mounts twenty or thirty years ago are as fresh and pure in tone to-day as when they were sent home from the photographic studio. Granted the prints were made on good sound albumenised paper, and possibly attached to the mounts with a pure starch paste, it is nevertheless very doubtful if they would have kept their freshness all these years had they been mounted upon the modern commercial mount, with its radio-active interior.

Practically all the photographic mounts experimented with were more or less radio-active, as were also the inner parts of the thick white cardboards purchased from stationers for mounting enlargements, water-colour drawings, etc.

To the manufacturer of photographic plates and sensitised papers this is a question of considerable—I may say vital—importance, for should the plates or paper be packed in contact with radio-active paper or cardboard, they will run the risk of being spoilt and unjustly stigmatised of inferior quality; and I hope that the subject will be more fully investigated by those who have the time and means at their disposal to carry out the necessary experiments.

F. Martin Duncan.

The German Emperor, according to the "Standard's" Berlin Correspondent, is evidently not in favour of Secessionist artists, for we were told, one day last week, that during his visit yesterday to the Berlin Art Exhibition, the Emperor William, when conversing with one of the sculptors whose works were represented, expressed his particular dislike of the Berlin Secessionist artists, speaking in terms, it is said, which left no doubt about the strength of his aversion. His Majesty is also reported to have given instructions that no Government Representative is to be present at the opening of any Secessionist Exhibition."

ON THE ELIMINATION, BY WASHING IN WATER, OF HYPO RETAINED BY PHOTOGRAPHIC PLATES AND PAPERS.

By MM. Lumiere freres and Seyewetz.

A.—ELIMINATION OF HYPO FROM PAPERS.

The elimination of hypo retained by prints on paper, after fixing, is generally attained by allowing water to flow through a receptacle containing the prints. If prints on paper (gelatino chloride or gelatino bromide of silver) are submitted to prolonged washing in this manner, very large quantities of water are used, and it will be found that there still remains, even after the protracted washing, a trace of hypo. This is easily shown by adding a crystal of silver nitrate to the last drops of moisture obtained by placing the paper under pressure. We are therefore either obliged to allow this trace of hypo to remain, or to submit the prints to washing of such duration that we run a grave risk of spoiling the prints. We have experimented as to the possibility of more rational washing, that is to say, the employment of a volume of water more proportionate to the quantity of hypo to be eliminated. To this end we have employed several methods by which prints can be washed, and have used, in all cases for our experiments, Lumière citrate paper. A single print, 13 by 18 cm., was submitted to a series of washings, in the first series 500cc. of water being used for each washing, and afterwards 100cc., this being the quantity of water strictly necessary to fully cover the print. In both cases comparative tests were made, allowing periods of five, ten, twenty, and thirty minutes respectively for each washing, and the quantity of hypo eliminated being determined by the use of a solution of iodine and potassium iodide. These standard tests have shown:—

1. That the quantity of hypo eliminated by each washing is the same if either 100cc. or 500cc. of water be used.

2. That the quantity of hypo found in each washing water is much the same after periods of five minutes, ten minutes, fifteen minutes, or thirty minutes.

These conclusions will be best understood by giving the results of one series of washings, which will serve to illustrate all cases. A 13 by 18 print was allowed to remain for periods of five minutes in 100cc. of water, and 80cc. of liquid was taken to make the tests with solution of iodine and starch. Before toning, the print was washed sufficiently to eliminate the excess silver nitrate and the citric acid, so that these substances should not affect the tests. The following results were obtained, using a solution of iodine of 1-200 normal:—

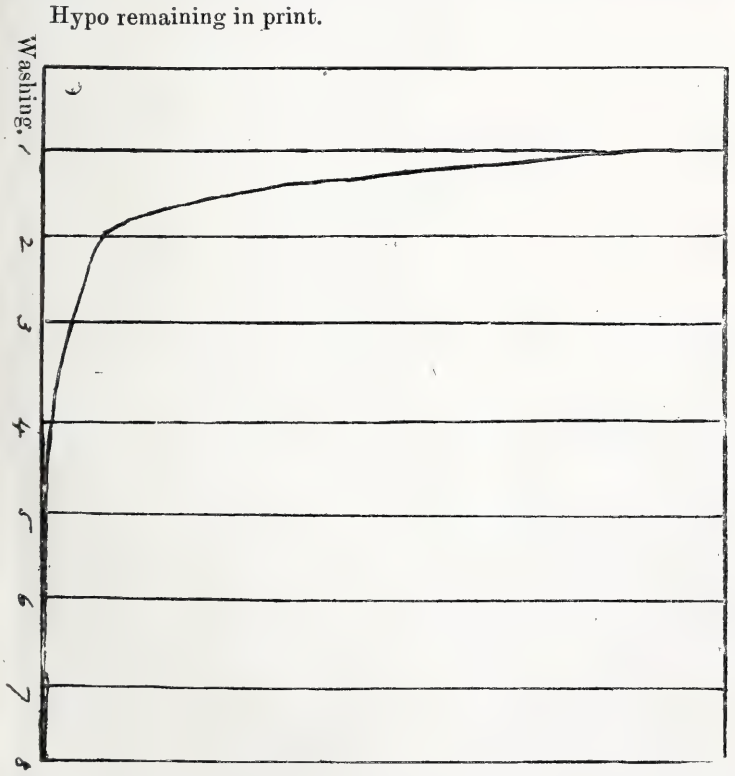
Washings each in 100 c.c. Water.	Quantity of solution of Iodine for each 100 c.c. of Washing Water.		Quantity of Hypo corresponding to the Iodine employed found in the 100 c.c. Washing Water.		
	Print roughly blotted.	Print simply drained.	Print roughly blotted.	Print simply drained.	
1	355·	450·	0·440	0·588	Hypo per 100 c.c.
2	18·	40·	0 0223	0 0496	,,
3	3 9	6·	0 0048	0·0074	,,
4	1·6	1 8	0·00198	0·0022	,,
5	·62	1 25	0·00075	0·0015	,,
6	·5	·5	0·00062	0 0006	,,
7	·25	·25	0·00031	0·00031	,,
8	·125	·125	0 00016	0 00016	,,

The first numbers show that the quantity of hypo remaining in the print roughly blotted, is about twenty times less before the second washing than before the first. Afterwards, this quantity markedly diminishes by the second and third washing, and is practically negligible after the seventh washing. In the case of the print simply drained, the elimination is less rapid at first, but at about the fourth washing, is nearly equal to that of the print roughly blotted. By experiment we find that the results are practically identical if the print is only partly washed before toning, and also if not submitted to any previous washing. If the washings are of one minute duration instead of five minutes, the elimination of hypo is much less complete, and after the eighth washing, 0.0013 gramme of hypo is still found in 100cc. of water. These experiments show that washings of about five minutes' duration are amply sufficient to obtain the maximum of elimination possible by this means. The preceding experiments have been made repeatedly, with practically the same results. Afterwards, instead of using for observation one print of 13 by 18 cm., ten prints

were employed, using ten times the quantity of water, i.e., one litre. The prints were washed in dishes 24 by 30cm., and kept constantly in motion, being simply drained between washings.

Number of Washing.	Quantity of Solution of Iodine for 100 c.c. Washing Water.	Quantity of Hydro remaining in 100 c.c. Washing Water.
1	302	0·375
2	22·5	0·0279
3	2·9	0·00359
4	0·87	0·00107
5	0·75	0·00093
6	0·5	0·00062
7	0·25	0·00031
8	0·125	0·00015

These results seem to prove that sufficient elimination of hypo can be obtained after eight washings, each of five minutes' duration, using 100cc. water for each print of 13 by 18cm., dishes, of course, being rinsed after each washing. We also compared with the elimination by diffusion, the method of washing a print for twenty minutes under a tap, passing about 7½ litres per minute, i.e., consuming 150 litres of water, afterwards allowing the print to remain for five minutes in 100cc. of water, and then testing for hypo. Under these conditions we find 1.1 of solution of ... normal of liquid iodine is necessary, that is to say, about the same quantity as after the fifth washing in the previous method. We repeated the same experiment by changing the dishes after ten minutes, in order to see if the small quantity of hypo remaining at the bottom of the dish hindered the diffusion. The results of the test were practically identical with those in which the washing was uninterrupted. Another comparative test was made by washing the print on the back of a dish for twenty minutes, leaving the print for ten minutes on one face, and ten on the other, with identical results.. The results arrived at by the washing of a single print for periods of five minutes in eight changes of 100cc. of water can be



shown by a curve. The diagram shows at the bottom the number of washings, and by the height of the curve the quantity of hypo present after each successive wash, and it will be seen that the quantity eliminated by the first two washings is some 90 per cent.

THE DIFFICULTIES OF ELIMINATING THE LAST TRACES OF HYPO.

We considered originally that complete elimination of all hypo contained in the print could be arrived at by the employment of one or other of the methods previously mentioned, and we took endless trouble to reach a point at which a complete absence of all reaction to nitrate of silver or solution of iodine would be shown in the last washing water. We found, however, by the presence of these reactions that distinct traces of hypo remained, and it only needed the application of hand pressure to the print to cause moisture to be expelled which contained hypo, therefore we made a series of experiments to find out by what means it was possible to eliminate these last traces. By submitting the prints to pressure after each washing, we noticed that the quantity of hypo present became less, and was more rapidly eliminated. Elsewhere, this peculiarity has been already verified with different substances, notably with textile fibres impregnated with salts soluble in water. The elimination of these salts is easily procured by wringing. We had various methods of applying pressure. Some drained prints were placed in a pile in a 13 by 18 dish, then pressed, another series of prints after each washing, were placed alongside between sheets of blotting-paper, then pressed. Again, we tried combining the two processes, and have verified that it is possible quickly and completely to eliminate all hypo. Care should always be taken, after having pressed all water from the prints by pressing in a heap in the dish, to moisten again before pressing between blotting-paper. However, if the prints are pressed heavily, one beside another between sheets of blotting-paper, one can succeed, after seven successive treatments, by 100cc. of water for each print, in eliminating all traces of hypo, and in obtaining no reaction with silver nitrate. We are struck with the efficacy of this treatment, in comparing it with ordinary methods of proceeding. With simple washing in running water, by floating the prints in a dish, we have washed ten prints 13 by 18 in a dish 24 by 30 for five hours, with a tap passing 7½ litres per minute, or 2,250 litres in the five hours. We can show by pressing the prints that the resulting liquid gives a reaction with silver nitrate, still making evident the presence of hypo. These conditions, also, are not appreciably improved if the dishes be changed every quarter of an hour in order to get rid of the hypo remaining at the bottom; but, on the other hand, they are appreciably benefited by heavy pressing of the prints in the dish, and by draining away the liquid so expelled before placing again in the water.

TRIAL OF WASHING UNDER RUNNING WATER.

In the manner usually employed, hypo collects on the bottom of the dish. By washing the print on a plain surface, the back of a dish, for instance, this trouble is avoided. If moisture be pressed from a print washed for two hours on the back of a dish (under a tap passing 450 litres of water per hour), it will be found to contain a marked proportion of hypo, and this is even found to be the case with a print washed for 24 hours in running water.

NOTE --The difficulty of eliminating hypo is easily shown by pouring a small pool of water on a print which is placed, gelatine face downwards, on a porous brick, when the print will be found to retain the water on its surface, allowing but the slightest penetration, even if left for a long period of time.

CONCLUSIONS.

The result of the preceding experiments shows that in the usual methods employed for washing prints, the bulk of the water used is consumed uselessly. To effectually wash a batch of ten prints, the following method is recommended, as, by its use, a more complete elimination of hypo is obtained. Wash for five minutes in seven successive changes of water, using a 30 by 40 dish, and one litre of water for each change, keeping prints in motion to avoid them sticking together. Between each washing put the prints under pressure, and drain off the water expelled, then moisten prints in clean water, and place side by side between sheets of blotting.

ELIMINATION OF HYPO FROM PLATES.

The perfect washing of plates is a matter of comparatively less importance than in the case of photographic papers. The matter of the greatest importance is to avoid the formation of crystalline markings on the dried plate, as there is less cause to fear the alteration of the image than when dealing with prints on paper. On the observations we have made regarding the washing of papers we have determined the minimum of water necessary to obtain, at the end of a period of time relatively short, an elimination practically sufficient. We have made our tests with solution of iodine as to how hypo can be eliminated by washing the plate in consecutive changes of small quantities of water (100cc. water for periods of five minutes, using a 13 by 18 plate).

Washings each with 100 c.c. of Water for Five Minutes.	Quantity of Solution of Iodine 1/200 normal used for each 100 c.c. Washing Water.	Quantity of *Hypo* Crystals in 100 c.c. Washing Water.
1	268· c.c.	0·332
2	30·	0·0372
3	7·	0·00868
4	2·	0·00248
5	1·25	0·00155
6	1·1	0·00136
7	0·6	0·00074
8	0·6	0·00074

We thus see that plates, like paper, contain hypo, which cannot be eliminated but by pressure. We have, after the last washing, stripped the gelatine from the plate, and have pressed it in a bag of linen. The liquid expelled by the pressure treated with silver nitrate has given us no visible reaction. This result shows that in photographic papers it is the constitution of the paper or its coating that retains the hypo, and not the emulsion.

COMPARISON OF THE QUANTITIES OF HYPO UNELIMINATED FROM PLATES BY DIFFERENT METHODS OF WASHING.

We have compared the quantities of hypo remaining uneliminated in plates, after employing various methods of washing.

Case 1. The plate (13 by 18cm.) is placed on the back of a dish under a tap, the water running directly on to the gelatine surface, in this case the hypo solution is eliminated in proportion to the dimensions, and the plate is not immersed in the solution already expelled.

Case 2. The plate (13 by 18cm.) is placed under a tap, as in Case 1, but immersed in a dish, and so surrounded by solution containing a percentage of eliminated hypo.

In these two cases the plates have only been in contact with the water for five minutes, yet 37 litres of water are consumed.

Case 3. The plate (13 by 18cm.) is immersed in five successive baths of 200cc. water, for periods each of five minutes.

In this case only 1 litre of water is consumed.

After each of these three methods of washing the plates were immersed for half an hour in 200cc. of water, of which 100cc. was treated with a solution of iodine 1-200 normal.

The following results were shown:—

—	Quantity of Solution of Iodine 1/200 Required for 200 c.c. Washing Water.	Quantity of Crystal Hypo corresponding to the Iodine.
Washing on the back of a dish for five minutes, using 37 litres water	2·2	0·00272
Washing on a dish for five minutes, using 37 litres of water	4·4	0·00544
Five washings in changes of one litre of water each for five minutes	0·4	0·005

CONCLUSIONS.

1. That the washing of plates under a current of water, though using a large quantity, is less complete than in a method where, less water being employed, the plate comes in contact with the water containing hypo.

2. That the most effectual method of plate washing, and one which at the same time consumes far less water, is to immerse it in successive baths, allowing 200cc. water for each 13 by 18 plate.

In a future article we propose to deal with the method of hypo elimination by the use of various substances.

A PHOTOGRAPHER Committed for Trial.—At the Wood Green Petty Sessions, on Friday last, Stuart Robson, 50, photographer, of 114, Morely Avenue, Wood Green, was again brought up charged on remand with obtaining by false pretences £3 from Mr. Joseph Webster, proprietor of the Jolly Butchers' Hotel; £2 from Arthur George Cornell, of High Road, Wood Green; £3 17s. 9d. and a silver watch from George Snell, of Tottenham Court Road, and £41 5s. and two cheques from William George Cornish, estate agent and auctioneer, of the Grand Parade, Harringay. Prisoner was now further charged with obtaining upwards of £50 by credit from Mr. Cornish, without informing him that he was an undischarged bankrupt. Mr. Rowe prosecuted for the Treasury. Mr. Charles M. Dent, advertisement manager at the Strand Theatre, proved that no communication had ever been made to witness about a "Periphone." Henry Havelock Jackson, clerk in the Patent Office, said the prisoner obtained a patent in 1892 for improvements in itinerant advertising. The prisoner had subsequently lodged applications for patents for improvements in itinerant advertising and lighting vehicles by electricity, but these were abandoned. William George Beadlestone, a messenger in the Bankruptcy Department, High Court of Justice, produced a file relating to prisoner's bankruptcy in April, 1895. Mr. B. Knight, examiner in the Chief Official Receiver's department, identified prisoner as a person whom he examined in bankruptcy. The assets included a patent, which the bankrupt said had been sold to the Acme Advertising Company for £1,000. Witness estimated the value as being nil. Prisoner had not received his discharge. Mr. Robert Newman Appleyard, solicitor, of 275, High Holborn, said the prisoner had never instructed him to prepare deeds for the transfer to a syndicate of the "Periphone" and the "Camsyke," or the "Alexandra Park Concession." Witness had never heard of such matters. Mr. Rowe read letters which prisoner had sent to Mr. Cornish representing that witness was acting for him. The witness said the letters were not written by him or by his authority. The prisoner was committed for trial.

THE PHOTOGRAPHERS' CHURCH PARADE AT ST. MICHAEL'S, FOLKESTONE.

THE inauguration of the Photographers' Church Parade will take place in the above church on Whit Sunday, May 18, 1902, at three p.m., terminating about four. Recital on the great orchestral organ and address by the Rev. E. Husband, anthem by the full choir of the church.

COLLECTS.

HYMN 168 ... ... ("Hymns Ancient and Modern.")
"There is a book, who runs may read,
Which heavenly truth imparts;
And all the lore its scholars need,
Pure eyes and Christian hearts."

ORGAN SOLO "Grand Commemoration March" ...*Scotson Clark*

ORGAN SOLO

ORGAN SOLO *a* ... ..."May Dew"... ... *Sterndale Bennett*
b ... ... "Spring" ... ...*Gounod*

ANTHEM ... "The marvellous work behold amazed, the glorious hierarchy of heaven; and to the ethereal vaults resound the praise of God."
From Haydn's Oratorio "Creation."

SUNG BY ST. MICHAEL'S CHOIR.

ORGAN SOLO (1st time) Impromptu, "Light!" *E. Husband*
(Specially composed for this service.)

ADDRESS.

SUBJECT:—"The Connection between Photography and Religion."

OFFERTORY HYMN 573 ... ... ("Hymns Ancient and Modern.")
"All things bright and beautiful,
All creatures great and small,
All things wise and wonderful,
The Lord God made them all."

ORGAN SOLO (by desire) Descriptive Piece, "The Storm" *E. Husband*

THE BLESSING.

Exhibitions.

THE ALPINE CLUB.

After examining the admirable collection of photographs, the work of the members of the Alpine Club, which is now on exhibition at the hall of the club, 23, Savile Row, W., the conclusion is forced upon us that Alpine photography, as usually produced, is a branch of photographic work which requires a technical knowledge of mountains and mountaineering to understand and to appreciate. To the ordinary observer many of the greatest triumps, say, of photo-microscopy will appear to be very ordinary specimens of photography, and it is quite common to hear criticisms of them, evidently based upon the assumption that there is no very great difference between photographing an infinitesimally small portion of matter and photographing a haystack. The microscopist takes his view from an entirely different standpoint; to him the aim of the photomicrograph is obvious, and the success is measured by the extent to which it fulfils its aim, irrespective of whether or not every detail, unimportant in itself, is perfect. It seems to us that they who make mountaineering their pursuit must view such photographs as those which are here collected much in the same way that the microscopist views photographs which illustrate the subjects with which he is accustomed to deal, and that in many cases the precise object of the photograph, and, in the technical sense, its merit, lies in details which do not appeal to the ordinary observer, the primary intention having been not so much to give a broad impression as a map-like record.

While we recognise that modern photographic conveniences and methods of working have done much to improve Alpine photography, and, indeed, to make it possible under circumstances when formerly it would have been impossible, we cannot help feeling that the results are generally very disappointing. The scenery, viewed by the eye, is awe-inspiring in its immensity, but rarely does the lens and plate record anything to give such an impression. A vast peak, whose grandeur requires a poet's pen to express in words, becomes too frequently in a photograph but a commonplace rock, and the same amount of imagination that would be required to invest it with its real dignity, exercised the other way, might reduce it to a representation of a

lump of coal, with some salt sprinkled on it. We are, of course, aware that the atmospheric conditions of high altitudes are not favourable for impressionistic photography, that the clearness of the air is apt to annihilate all sense of distance, and that the absence of reflected light exaggerates contrasts of light and shade, but these are difficulties which sometimes occur in ordinary landscape work, and the skilful photographer finds methods of overcoming them. We cannot help thinking that by adopting some of the methods of producing effects which are constantly used in pictorial photography, better suggestions of the real aspect of the mighty peaks and chasms might be given.

But while we think that Alpine photography generally awaits the advent of a new method of treatment, we are bound to recognise that the work of the members of the Alpine Club had made a great advance during the past few years, and, judging the photographs now exhibited by the standard of the best work of the kind that has been produced, the average quality is a very high one indeed.

It is worth noticing about the exhibition that nearly all the photographs are of considerable size. That is a good point, but, unfortunately, the trade enlarger—and his handiwork is much in evidence—generally manages to destroy whatever individuality there may be in the original, and in that way the exhibition is rendered, as a whole, certainly less interesting than it might have been.

It is the fact that Alpine and similar views show to the greatest advantage as lantern slides. There are several sets of lantern slides which, as far as we could judge without seeing them on the screen, are really admirable.

Patent News.

A LOCAL INVENTION.

The following abridged description is specially drawn for The British Journal of Photography by Messrs. Hughes and Young, patent agents, 55 and 56, Chancery Lane, London, who will give advice and assistance free to our readers on all patent matters:—

Patent Applications.—No. 9,782.—Henry Edward Newton, Chancery Lane. "Improvements in photography."

No. 9,842.—George Gerlach, 62, St. Vincent Street, Glasgow. "Process and apparatus for treating in liquor baths photographs copied on endless sheets."

No. 9,992.—York Schwartz, Chancery Lane. "Process of preparing paper for photographic purposes."

No. 9,993.—York Schwartz. "A new and improved photographic emulsion."

No. 10,016.—Hugh Lancelot Aldis, Chancery Lane. "Improvements in lenses for photographic and other purposes."

No 10,199.—Frederick Mackenzie and George Wishart, 96, Buchanan Street, Glasgow. "Improvements in and relating to means for packing, carrying, and exposing in the camera photographic dry plates or films."

No. 10,260.—Arthur Freemore Spooner, High Holborn. "Improvements in and relating to magazines for photographic plates."

Patents Illustrated.—No. 1,035.—Hinges for photograph and like stands.—Patentee: R. Mander, Branston Street, Birmingham.

Relates to a hinged joint for the back leg or support to photograph picture and other frames or stands. The hinge consists of a metal loop attached to the back support by passing the tongue through the support and turning it down like a paper-fastener. The bracket to which the pin is attached, is also fastened to the frame or stand by tongues. A modified form is described in which there are three short tongues on the loop which do not pass quite through the support.

No. 1,101.—Photography.—Patentee: A. A. Brooks and G. A. Watson, both of 23, Tower Buildings, Liverpool. Change-boxes.

Relates to a change-box chiefly adapted for films, and consists of improvements on the invention described in Specification No. 17,986, A.D. 1900. In the apparatus described in the said specification the films are contained in a kind of drawer, by the first withdrawal of which from the outer casing a film from the back of the pack is retained in the outer casing, by the first return it is forced forward into the exposure frame, and by the second withdrawal and return after exposure the film is returned to the front of the pack.

No. 1,109.—Photography.—Patentees: J. Ashford, 179, Aston Road, and H. E. Newey, 54, Victoria Street, both in Birmingham. Dark slides.

Relates to a dark slide for films or plates. It consists of a central frame with a thin central plate against which the two films lie and are retained in position by marginal flaps. The frame with its two films is pushed into an envelope, the open end of which makes light-tight connection with the top bar of the frame. The envelope, with its contents, is now placed in inverted position in the outer casing of the dark slide.

Commercial & Legal Intelligence.

Photo-Stone Syndicate, Limited.—The above-named company has been registered with a capital of £22,500, in 17,500 "A" and 5,000 "B" shares of £1 each. The objects of the company are to acquire any patents relating to printing and any apparatus therefore, particularly from G. F. Wetherman and G. Holzhausen, of Enfield, Middlesex; to adopt a certain agreement with the above mentioned, and, generally, to carry on in all or any of their branches the businesses of printers, lithographers, photographic printers, and photo-lithographers, engravers, designers, draughtsmen, and any other business which can be conveniently carried on in connection with the same; proprietors and publishers of books, newspapers, and magazines; to undertake and transact all kinds of agency business; to erect any machinery, etc. No initial public issue. The directors are G. H. Pollen, R. H. Schmittau, and G. F. Wetherman. Registered office: 189, Fleet Street, London.

The first meeting of the creditors of William James Grey, photographer, of 12, Cornwall Street, and 8, Alexandra Place, Mutley, Plymouth, was fixed to be held on Friday last at the office of the Official Receiver. In the absence of Mr. T. H. Greake, the meeting was presided over by Mr. F. Coombes, chief clerk, but as there was only one creditor in attendance, the proceedings were only of a formal character. Mr. J. G. Jackson appeared for the debtor, whose statement of affairs showed gross liabilities amounting to £130 14s. 5d., of which £106 3s. 8d. due to 37 unsecured creditors is expected to rank for dividend. Assets are estimated to produce £74 18s. 11d., from which £24 10s. 9d. has to be deducted for preferential claims, leaving a deficiency of £55 15s. 6d. The causes of insolvency alleged by debtor are sickness of self and family and bad trade. From the printed observations of the Official Receiver, it appears that debtor commenced business as a photographer in January, 1895, without any capital. Until a few weeks since, he resided at 12, Cornwall Street, but recently removed to 8, Alexandra Road, Mutley. Debtor had been sued by several creditors lately, and at the date of the receiving order the High Bailiff of the East Stonehouse Court was in possession under two executions. He had a lease of the premises for 14 years, of which nearly 13 are still unexpired. Debtor had underlet a portion of the premises. Debtor had only kept an order book and day book, but the latter contained also an account of cash receipts. He states that he became aware of his insolvency three months ago. There are only two creditors over £10, but there are 34 whose debts do not exceed £5. The liabilities comprise £22 11s. 8d. for trade outfit, and £15 4s. 6d. for medical attendance. The remainder is made up of small accounts due to local tradespeople. Owing to the absence of the Official Receiver, debtor's public examination was adjourned by Mr. Registrar McCrea, sitting at the Stonehouse Bankruptcy Court. Mr. J. W. Bickle appeared for a creditor.

At the last sitting of the Kingston Bankruptcy Court, before the Deputy Registrar (Mr. F. L. Bell), the public examination was continued of the Rev. A. A. Barratt, Vicar of Claygate, the petitioning creditor being Lord Foley, who was represented by Mr. Cooper Willis. Mr. T. W. J. Britten appeared for the Official Receiver, and Mr. F. B. Harper (Messrs. Lumley and Lumley) represented the debtor. Previous examinations of the bankrupt showed that he had taken a prominent part during the last few years in the promotion of various public companies now in liquidation. Mr. Cooper Willis now said that the a/c furnished by the debtor in regard to Photo, Limited, showed that out of his own moneys he had paid £2,497 in excess of what he received, whereas he (counsel) should show that he received more than he ever did pay. The debtor, he said, obtained a loan of £3,400 on the London and County Bank, on the guarantee of Lord Foley, and sums of £250, £500, and £400 were as a matter of fact borrowed on that guarantee of Lord Foley's. Debtor said that this was not correct, as the bank allowed him an overdraught.—Counsel: "Yes, in anticipation of Lord Foley's guarantee. What you say in your account is that you were the loser of £2,497, which could not be the case."—Debtor: "I cannot help what the account says, sir; I did the best I could, and that was very difficult."—Counsel said that out of the total of £5,105 mentioned in the account, at least £3,175 was either guaranteed by Lord Foley or by moneys paid by his lordship to the debtor, so that instead of there being a credit balance of £2,497, there was really a debit balance of £579. Debtor admitted that this was substantially correct. Asked who received the pew rents, debtor said that very often the cheques went to Lord Foley, and his lordship would then send him one of his own cheques for the full amount —Mr. Cooper Willis: "You stated here on the last occasion that a petition had been got up by your parishioners, and presented to the Bishop, asking that you should not be deprived of the living. Is that true?"—Debtor: "If I did say that, I did not intend to do so. I meant that the Bishop was to be asked that I should not be made bankrupt."—Mr. Cooper Willis: "Was not the petition sent to the Bishop, asking him to use his influence with Lord Foley that you should not be made bankrupt?"—Debtor: "That is so."—Mr. Cooper Willis: "Your son or daughter or gardener took round the petition, didn't they? It was all done at your instigation, was it not?"—Debtor: "Well, there was no time to be lost. We had only a day or two."—Counsel next referred to the Cresco-Fylma Company, and Mr. Cooper Willis observed that out of £3,400 guaranteed by Lord Foley, £400 was used by debtor for his own purposes; in fact, it was appropriated by him.—Debtor: "I deny that, sir, entirely; it was lent to me."—The examination was concluded

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

May	Name of Society.	Subject.
16	Liverpool Amateur	Excursion to York.
19	Camera Club	Ramble—(Bank Holiday.) Lynton.
19	Woolwich Photographic	Ely (Cambs.). Leaders, W. H. Dawson and J. B. Panting, F.R.P.S.
19	Brentford Photographic	Guildford.
19	Croydon Natural History	Whit Monday Excursion.
21	North Middlesex Photographic	*Home Portraiture.* A. Herbert Lisett.
21	Borough Polytechnic	Monthly Outings Competition.
21	Croydon Camera Club	*The Use and Value of Light Filters for Negatives.*
2	London and Provincial	*Round the Societies.* Mr. Walter D. Welford.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

May 8th.—Mr. J. A. Sinclair in the chair.

Mr. W. D. Welford said he had been giving attention during the past year to the keeping qualities of carbon tissue. He had succeeded in keeping the tissue for nearly twelve months in good condition. It was on July 5th, last year, that the experiment began. Prints were made on the tissue as removed from the tin, others after the tissue had got damp and limp, and the latter were bound to be over-printed. Other prints were made on tissue that had been removed from and put back into the tin six times in the interval, each time being allowed to get perfectly limp before being returned to the calcium box.

The prints, which were shown as transparencies on celluloid, were all remarkably good and similar in appearance and quality. It was reasonable to suppose that tissue could be kept for years without loss of quality. The only difference Mr. Welford had noticed was that the back of the tissue, which was originally bright yellow, had become almost white.

Mr. W. T. Wilkinson showed some prints on citro-chloride emulsion paper, and gave some working details.

Mr. J. R. Gotz demonstrated the development of

CHROMATYPE,

a gum-bichromate pigment paper, which was shown to be capable of yielding some very fine prints. The paper, which is supplied either sensitised or unsensitised, may be had bearing black, red, and sepia pigments. There is no transfer or reversal, as in the ordinary carbon process, and the paper is simple in manipulation. The paper is best kept on end in a dry place. It keeps for any length of time, if proper precautions are taken. The sensitising bath is a solution of 4 ounces of bichromate of potassium in 80 ounces of distilled water, with the addition of 10 minims of ammonia. The pigmented paper is immersed face upward and drawn through the solution several times, the latter precaution being adopted to dispel any air-bubbles that may form on the surface. The paper is dried in the dark, in a place free from dust and damp. This drying should take place as quickly as possible, without recourse to artificial heating. When sensitised and dried the paper should be stored in a calcium tube. The exposure of the paper is gauged by means of a photometer, with the usual trials in carbon printing. The development of the print, or etching, as the demonstrator preferred to style it, is the removal of the unaffected pigmented matter by means of a copious flow of hot water, aided by the frictional effects of willow sawdust held in suspension by the water. The prints are first soaked in cold or tepid water, and the development is carried on over a deep tank of good dimensions, containing the hot water and sawdust. A small gas flame or spirit lamp serves to keep the water at the proper temperature. The black and red tissues should be treated with water at from 95 deg. to 105 deg. Fahr., and the sepia paper at 110 deg. to 115 deg. These temperatures may be increased to 120 deg. for the black and to 140 deg. for the sepia, according to the result desired or the state of the exposed paper. The print is supported on a slab, and the hot water is poured over it until the high lights are well out. After rinsing in cold water, the remaining traces of bichromate salt are removed by a 5 per cent. solution of bisulphate of soda. When the whites are perfectly clear, the operations are complete, and the print may be allowed to dry. Mr. Gotz remarked that his aim had been to preserve photographic truth and character in the examples that he showed and developed. Nevertheless, the paper lent itself to the artistic instincts of those who worked upon the surface of their prints. In reply to questions, he said he had developed prints a month after printing successfully, but for the best results three or four days was the limit. The first sign of the image should appear in two or three minutes. The paper kept indefinitely unsensitised. The sawdust should not be so plentiful as to make the water thick, as in the Artique process. Mr. Gotz then showed how, with a soft brush, the high lights might be picked out, while the print was under water. For adding details it is best to use the unsensitised pigmented paper itself, taking the colour on a brush, and applying it to the parts requiring additional strength.

Mr. W. Thomas questioned whether it would be best to modify the result by brush work on the print or by preparation of the negative before printing. The disturbance by physical force of the delicate layer of pigment was not to be embarked upon lightly, in his opinion, as the effect could not possibly be identical with that produced by the alternative method. He also asked whether the paper could be worked by soaking in warm water and friction in a cold bath of sawdust and water.

Mr. Gotz replied that it was largely a matter of taste how one proceeded, or to what extent the result were influenced by hand work or other faking. He thought, however, that it would be very difficult to detect the brush marks he had made that evening.

A discussion took place upon the necessity for the so-called "fixing" or washing out of the bichromate, some being for and others inclined to question the operation. In the meantime Mr. R. J. Kindon amply demonstrated that the process of development was easily picked up by developing a print brought up by Mr. Gotz.

CAMERA CLUB.

On Monday, the 5th inst., the club was both entertained and instructed by a lecture, entitled "Pekin after the Siege," by Mr. S. Ransome, a gentleman who acted as war correspondent for the "Morning Post" during a very eventful time. At the outset of his discourse, the lecturer pleaded for indulgence on behalf of his pictures, which he did not put forward as photographs worthy of admiration, but rather as snap shots taken under difficulties, and under exceptional circumstances. He was in Tokio when he first received instructions to go to China, and he travelled in a Japanese transport, which had much difficulty in making its way through the ice. Indeed, the ship would have stuck fast upon one occasion had it not been for the good offices of a man-of-war which ploughed a way through the floes in front of it.

China is such an enormous country that we in England are apt to get quite an erroneous idea of the difficulties involved in getting from place to place; but, by means of a rough sketch on the blackboard, Mr. Ransome showed the route taken by him in order to reach his objective point—Pekin. The railway terminates at what is known as the Temple of Heaven, the sacred place where the Emperor pays an annual visit in order to acknowledge the existence of a Supreme Being. The railway here was almost destroyed by the Boxers, and what the Boxers left the Russians made away with. Pekin covers a long parallelogram, with various entrances or gates, and many photographs were shown to indicate what desolation had been brought about by the late Boxer rebellion—the ruined buildings extending for many miles. One of the pictures showed the British Legation, where for so many weeks our representative and his faithful followers were shut up and besieged on all sides. It will be remembered that the report that all in the building had been massacred gained such credence in England that obituary notices of Sir Claud Macdonald and the other officers appeared in the various newspapers. Mr. Ransome is of opinion that the Chinese authorities would never have allowed matters to drift to such extremities; that there was a power behind the mob which would have stepped in, for it was known how terrible would be the reckoning if a massacre really took place. Unfortunately, the poor besieged had no notion of this, and their sufferings were extreme. A number of Chinese Christians were packed in a building hard by the British Legation, and the lives of these converts were saved by a Japanese officer and a handful of men, who acted with the greatest bravery under very trying circumstances.

Pekin at this time was divided up into districts, each one being under the control of a different nationality. Mr. Ransome showed a capital portrait of Li Hung Chang, with whom he had made acquaintance on a previous occasion, and he told some amusing anecdotes of that cunning statesman.

When the time came for settling up with China, a list of 13 officials was drawn up, who were condemned to death for their participation in the rebellion. Of these 13, only two could be found, and the lecturer saw them executed. These two men did not at all understand why they were selected for execution, but their heads were chopped off, and this put an effective end to the dispute.

The "Forbidden City" formed the subject of other pictures. This place was occupied at one end by the Japanese and at the other end by the Americans. The Japs knew where the treasury was situated, and they made direct for it, and looted it in quite a business-like manner. The Americans prided themselves upon paying for everything they took, but one of them confessed that payment was but nominal. "We have one price for everything," said he, "ten cents and a kick." The Germans gave two kicks for what they annexed, but parted with no money.

Some of the photographs of the Emperor's private apartments were of extreme interest. Side by side with curios of the most costly description were to be seen European nick-nacks of the most meretricious kind, including any amount of gaudy chromo-lithographs. The Emperor seems to have had a mania for musical instruments, including pianos, harmoniums, and musical boxes. Neither he, nor any of his entourage knew how to play upon them, but they strummed on the keys, sometimes in chorus, with a result which pleased them greatly.

One of the most interesting pictures shown was that of the ancient astronomical instruments which were looted partly by the French and partly by the Germans. The former had the grace to return them to China, but Germany's offer to do so was respectfully declined. The lecture terminated at such a late hour that discussion was impossible; but a hearty vote of thanks greeted Mr. Ransome at its close.

The following evening was appointed for the annual Lady's Night at the club, and the rooms wore a very gay aspect when the company had assembled. There was a good programme, including two solos on the much-talked-of Stroh violin. Unfortunately, the music, by some contretemps, began half an hour late, and there were long waits between the several items, which acted as a damper upon the proceedings. Otherwise there were all the conditions present for a very pleasant evening. A few lantern slides were shown in batches between the songs, and instrumental pieces, the coloured ones of Mr. Sanger Shepherd naturally arousing much interest on the part of the spectators.

COMPTON CAMERA CLUB.

Mr. E. Norton Collins, who was awarded the gold medal in the open class for the best picture in the exhibition held last February by the club, gave a demonstration of the "Venus" printing process (that being the one by which his medalled picture was printed), at the club rooms, on the 30th ult. The process is notable for its range of tones, and for the absence of double tones. Prints have a somewhat similar appearance to what is found with "plain salted" paper, although it is a distinctly different process.

CROYDON CAMERA CLUB.

The correct exposure for a negative furnished the topic on Wednesday, 7th inst., the president (Mr. Hector Maclean, F.R.P.S.) introducing the subject in a carefully-thought-out address. From a scientific standpoint, as Mr. Maclean pointed out, correct exposure was such as to properly translate the object photographed with a faithful scale of gradation, but this did not apply always, for in artistic work under or over-exposure might be deliberately sought to obtain special effects. Light was the predominant and uncertain factor, the others being easily calculated or allowed for. He did not believe in actinometers, if artificial aids were required; he preferred tables based on practical data.

Mr. Kenneth Mees defined correct exposure as being the middle point of the Hurter and Driffield curve, and dwelt especially on the wonderful latitude offered by some plates. Negatives were passed round taken on Wratten ordinary, which had received exposures varying from 32 to 1,024 candle metre seconds. In all cases good prints could have been obtained. This represents a latitude of over one in 30, and should furnish an object lesson to the tyro, to start with slow plates, for with an increase of speed, as Mr. Mees stated, the latitude decreased until it might approximate one in two only. He strongly advocated the use of an actinometer. Upon the latter point a verbal battle raged, some members (including the hon. sec.) found this instrument indispensable, whilst others emphatically declared them absolutely useless. Mr. Kough generally carried one about with him, but did not rely on its indications. Mr. Hicks pinned his faith on Howard Farmer's slide rule, Mr. Harpur on Marion's actinograph, Mr. J. Noaks on Dibdin's card, and Mr. Holland on Wormald's exposure book, whilst others, including Messrs. Smith and Rogers, believed in judging the appearance of the image on the focussing screen. An interesting fact was mentioned by Mr. Wratten, that in Croydon, when the wind was in the north, exposures should be increased about three times, the difference being attributable to the presence of smoke and dust in the air from the Metropolis.

DERWENT VALLEY PHOTOGRAPHIC SOCIETY.

As the result of the adjourned meeting held last (Friday) night in the Bridge Street Room, Cockermouth, a society was formed with this title, with the object of affording mutual help and advantages to photographers in the district. Mr. Jno. Cook presided, and the proposal to form the society was Mr. Youdale's. It will embrace Cockermouth, Workington, and intervening places, the suggestion to include Keswick being deemed impracticable. The annual subscription was fixed at 2s. 6d., and the society will be open to ladies and gentlemen who are bona-fide photographers. On the motion of the chairman, seconded by Mr. Youdale, it was resolved to invite Dr. Thornburn, Papcastle, to become president. Mr. Cook and Mr. W. L. Fletcher (Workington) were elected vice-presidents, and Mr. A. Inkpen was appointed hon. secretary and treasurer. On the committee Workington will be represented by Messrs. Hubble, H. B. Williams, and G. Muller, and Cockermouth by Messrs. W. H. Youdale, J. B. Wilson, and C. Armstrong, and meetings of the society will be held alternately at these two places. The committee was instructed to draft rules and prepare a list of excursions for the summer season to be submitted to a general meeting of members on Friday next. Between 20 and 30 photographers have given in their names for membership.

News and Notes.

The Photographic Survey of Surrey.—A meeting of delegates was held at the Lecture Room of the Central Library, Town Hall, Croydon (by permission of the Libraries' Committee), on Friday, March 9th, at 8 p.m., Mr. W. W. Whitaker, B.A., F.R.S., F.G.S., in the chair, to consider and set in motion a Photographic Survey of Surrey, when the following resolutions were made and carried:—"That a society be formed, to be called 'The Photographic Survey of Surrey.'" "That its object be to preserve a record in permanent photographs of buildings of interest, antiquities, scenery, geology, natural history, anthropology, etc., and of portraits of notable persons, representations of passing events of local or historical importance, etc., and of old records, rare books, prints, maps, etc., so as to give a comprehensive survey of what is valuable and representative in the county of Surrey." "That its affairs be managed by a president, vice-presidents, treasurer, curator, hon. secretary or secretaries, and council." "The council of this survey be composed of the provisional committee, plus two delegates from each of the societies willing to co-operate where such societies are not already represented on the provisional committee, and with power to add to their number." "That the chairman, hon. sec., and curator of the Provisional committee be requested to act for the Survey until the first meeting of the council, at which the permanent officers should be elected." The societies and clubs who were present represented:—The Croydon Natural History and Scientific Society, the Croydon Camera Club, the Redhill and District Camera Club, the Sutton Photographic Club, the South Norwood Photographic Society, the Thornton Heath Photographic Society, the Surrey Archæological Society, the British Archæological Association, the Royal Historical Society, the Anthropological Institute, the Haslemere Microscopical and Natural History Society, the Norwood Natural Science Society, the Clapham Junction Natural Science Circle, the Geologists' Association, the Selborne Society, the Croydon Antiquities Protection Committee, the South-Eastern Union of Scientific Societies, the Footpaths Preservation Society, the Croydon Libraries Committee of the Croydon County Council. Many societies sent letters of approval, including also many private individuals, in support of the scheme.

The Picture Season.—With May the picture season, like the photographic season, may be said to commence. The Royal Academy opened its doors last week, and the New Gallery its a few days before. The loan collection at the Guildhall is now on view, also that of the Borough Polytechnic, to say nothing of the minor shows advertised in the daily Press. The national collections of pictures at the National and Portrait Galleries and the Tate Galleries, as well as that at Bethnal Green, are now open for the season on Sundays; so is that of the pitcures at the Guildhall. This show this year is devoted to the works of English and French painters of the Eighteenth Century, and contains over a hundred and fifty exhibits of the best artists of the two countries, and include some fine examples of such men as Greuze, Watteau, Boucher, Sir Thomas Lawrence, Morland, Gainsborough, Romney, Sir Joshua Reynolds, etc., etc. The pictures by the last named artists should be of special interest to portrait photographers, as illustrating the method of treatment of their sitters by them. In the Royal Academy this year there are no really very sensational works, otherwise it may be considered a good average show. One thing must strike photographers on their visit is the brilliancy of the show, and the general absence of depressing subjects. A great contrast with some photographic exhibitions, where "Waning Days," "Dismal Swamps," "Falling Mists," "Mud Flats," and the like, printed in mud colours, yclept sepia, but lacking the transparency of that pigment, and without high lights or deep shadows. This class of photographers, if they were to visit the R.A., might get some new inspiration to help them out of the groove that so many have got into. It is noteworthy that all the loan exhibitions are open to the public free, and that the pictures shown in them are loaned from private collections and are not to be seen at any other time. That these exhibitions are duly appreciated by the general public is evidenced by the increasing numbers that visit them. For example, the first loan exhibition at the Guildhall was attended by a few over one hundred and nine thousand visitors, the last one was attended by over three hundred and five thousand. The question arises in our minds as to whether these annual picture exhibitions are visited by photographers to the extent one would surmise they should be? We question it. But not with regard to the highest class workers, but rather from the second rate downward—those indeed who are most open to profit by a study of the works shown. It would be interesting also to learn what proportion of photographers' assistants visit these exhibitions with a view to the improvement of their art knowledge. That the general public, even of the humbler classes, do appreciate art is shown by the numbers that visit the picture exhibitions held in the poorer neighbourhoods, and it might well be imagined that any photographer who could supply them with better pictures than are the rule in their localities, and at prices within their means, would get the greatest patronage from them. It is an unfortunate thing for the credit of photography that really artistic portraiture is confined to a comparatively very few workers, and these get their prices for them, and these are prohibitive, except to the more wealthy.

The Speed of Light.—To the natural man, it may seem as absurd to assign any finite speed to light as to attempt to limit the rapidity or the freedom of thought. As far as our unaided senses can tell us, both are practically instantaneous. No terrestrial experience can help us to gauge the velocity of light without the help of very delicate and refined apparatus. M. Cornu, who died in Paris a few days ago, made his chief reputation by the skill with which he devised such an apparatus, and therewith carried out experiments which finally settled the speed of light with an accuracy that later research has only confirmed. The story of the slowly-widening investigations which culminated in his work, with the lesson that they have taught us, is worth recalling. As far as we know, "starry Galileo, with his woes," was the first who tried to verify the suspicion—as old, perhaps, as Aristotle—that light was not really free from the conditions which trammel ordinary motion. From a very early time it was obvious that the closely-related phenomenon of sound was by no means instantaneous in its passage from place to place. The first man who watched one of his fellows chopping wood half a mile away must have noticed that the sound of each blow was by no means synchronous with its apparent time, as far as the eye could fix it. Often the woodman's axe is visibly poised over his head at the precise moment when the sound of his last blow reaches the onlooker. We cannot tell who was the first obscure philosopher to conceive that even light may take an appreciable time to travel to the observer. The earliest theory of sight, which regarded it as the result of a kind of intangible feeler reaching out from the eye, did not allow any consideration of speed; but the second theory, which held the field down to the beginning of the last century, and considered that light was a material emanation from all luminous bodies, at once involved the notion of the speed with which these "corpuscles" travelled. Galileo then first seriously tried to darken the speed of light. His principle was sound enough, but it was impossible for him to solve a problem of whose extreme minuteness he had no conception. He stationed two observers a couple of miles apart at night, each armed with a dark lantern. One of them suddenly

darkened his lantern, and the other was instructed to do the same the moment that the first light disappeared. Galileo reasoned that, if light really took a finite time to cross the distance it would be measured by half the interval between the darkening of the first observer's lantern and the disappearance of the second light from his gaze. It was a perfectly sound argument; but as the time in question was about one fifty-thousandth part of a second, it is no wonder that the observers failed to detect it. Yet it is on a quite similar plan that all the modern experimental determinations of the speed of light have been made. The first approximately correct guess at the velocity of light—so immensely surpassing any other speed with which mankind was familiar—was made by an astronomer in a quite different way. Romer, a Danish astronomer who had settled in Paris, was dreadfully perplexed in the second half of the 17th century by the inaccuraces in the motions of Jupiter's satellites. When the ascertainment of the longitude at sea was the chief object of astronomical ambition, a favourite method was to construct accurate tables of the eclipses of Jupiter's satellites. If the Greenwich time of any given eclipse be calculated in advance, the sailor who observes that eclipse in the centre of the Atlantic at once knows the difference of time—and, therefore, of longitude—between Greenwich and his own position. Romer set himself to calculate such tables, but he was puzzled by a constantly recurring inaccuracy in the apparent motions of the satellites. They seemed to be losing time at one part of their career and gaining it at another. After a time Romer made the happy discovery that the ingenious clock thus formed by Jupiter's system went fast or slow in accordance with the earth's annual revolution about the sun. When the earth was nearest to Jupiter, the eclipses were up to time; when it was at its farthest point away from the giant planet, they were as much as 22 minutes late—so, at least, Romer concluded from the rather imperfect observations which he had to depend upon. Suddenly he hit on a brilliant idea; the reason, he said, was simply that light took 22 minutes longer to come from Jupiter when he was farthest from the earth than when he was at his nearest—that it took, in short, 22 minutes to cross the earth's orbit. We now know that this was the true explanation, though the time which Romer had calculated was about 20 per cent. too large; when one begins to deal with distances of the order of the dimensions of even our trifling and inconsiderable system, light takes a quite appreciable time to cover them. It takes, for instance, just over 8¼ minutes to come to us from the sun—in other words, if the sun were to be utterly blotted out at this moment, the reader would still have time to finish this article before being plunged into eternal night.—"The Pilot."

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

THE LATE ROGER FENTON'S PHOTOGRAPHS.

To the Editors.

Gentlemen,—In your issue of the 25th ult., "Free Lance," in commenting on Captain Wheeler's remarks—that "Photography was recognised by the authorities at the time of the Crimea, but it was not on record that any serviceable pictures were produced"—opines that there were some excellent pictures taken by Roger Fenton. That is so. I shall be pleased to show anyone interested a very good print (on salted paper) of the camp at Sebastopol, taken from a 15-12 wet plate, 15secs., f/20, in May, 1855. The print is the same age. There must be a great many old prints in existence. They would make an instructive and interesting exhibition or permanent collection at the R.P.S.—Yours truly, CHARLES W. COE.

AFTER CIGARETTES AND SOAP—"SHREDDED WHEAT."

To the Editors.

Gentlemen,—I beg to enclose a slip of paper I took out of a magazine, re cheap enlargements for advertising purposes. I thought it might be of interest to you, seeing that you had got the Sunlight Soap Company to withdraw their offer, and others also. It is a shame that photography should be put to such a purpose as advertising other trades.—Yours respectfully, A READER.

May 5th, 1902.

A SPLENDID OFFER to Users of SHREDDED WHEAT.

A Fine Large Photograph Enlargement of Yourself, Relation, or Friend.

Send your photograph to the address below, with twenty heads of trademarks cut from the ends of ten Shredded Wheat packets, and 2s. 11d., together with your name and address, and we will return your photograph within about fifteen days, together with

A Superb Enlarger Portrait on India Tint Plate Sunk Mount, 20in. by 15½in., carriage paid.

Shredded Wheat, Department 1, 6-8, Eastcheap, London, E.C.

Cost of portraits without trademark, 10s. 6d.

Shredded Wheat—Obtainable at all high-class grocers.

PHOTOGRAPHY AT THE SEASIDE—AND OTHER MATTERS.

To the Editors.

Gentlemen,—I am now back from my expedition on the seashores of Southern England, and my provision amounts to a pretty fine collection of seventy-two architectural views of cottages, of which I will send you a copy as soon as I can print them in blue.

Now for experiences. My experience taking views of cottages at the seaside was rather indifferent. I found the people, even the children, very little trouble, most of them passing without even noticing my instrument. The changing of plates was very easily done at the chemist's store, and the charges very reasonable indeed—twopence. This is much more preferable than to go on begging the use of a dark-room from a photographer, more or less obliging, even if payment is offered. I would only call the attention of would-be users of dark-rooms at chemists' to the general insecurity of those rooms, where some operations may very well be conducted with perfect security, while the changing of plates may be ruinous to them and be conducive to fog, and the manufacturer of dry plates blamed for it. Considering my experience, I would think that there are few perfectly safe dark-rooms to be let at twopence each, and had I not taken particularly good care, dictated to me by long experience, I would have fared rather badly. The best advice I can give to would-be users of such dark-rooms is to be in no hurry in opening their plates, and, shutting themselves up in the dark-room, wait patiently for ten or even fifteen minutes before beginning work, and if at that time a good look around does not disclose any light, then the room is safe, provided the red light is safe also. For my sake, I always cover that red light up with my focussing-cloth, and go to work in the dark. Your BRITISH JOURNAL OF PHOTOGRAPHY cannot be expected to be read by all parties letting out such dark-rooms, but I think it would be the duty of manufacturers of dry plates, whose plates may be often blamed for fog on no other reason than these dark-rooms, to send out to such parties—dealers mostly—a circular, asking them to test their dark-rooms at least once in the year, at the beginning of the season. This is very easily done by shutting oneself up in the dark-room for ten minutes, and note the cracks there are there, and remedy them. But this must be done only after fifteen minutes' stay, watch in hand, as this going in, close the door, look around, and come out again is of no use at all. Changing of plates is not always done at the same spot where development is made, and therefore light which may fall on your back in this last operation and do no harm may do great harm when changing plates, as it may come sideways and right on the plates.

Now, I know, Mr. Editor, that you are perfectly impartial in your views and ideas; I therefore have no doubt that you will allow me an answer, however late, to "A National Trait" (page 202 of the BRITISH JOURNAL OF PHOTOGRAPHY). I might have answered it at once, but as I intended coming shortly to England I thought I would get some more information on the subject. I found there that this "trait," national or not, in England is to be met with very often in the streets, where I say it, viz., projecting teeth, but projecting, of course, more or less, and probably less, but certainly very often showing teeth through open lips, especially the upper lip. This "trait" was even confessed to me by a father as being the case with his daughter. Now, a caricaturist is always liable to enlarge a certain "trait"—hence Albion represented with large teeth, and sometimes projecting, to enforce the idea. I do not know if France is always represented as a perfect gentleman or beautiful lady when seen in illustrated papers published in England and given to caricature; but then the straw and the beam in the eye will answer for some of this. And now that I have answered this item, allow me to say a few words about the last sentence. Is French politeness, which is almost proverbial, only skin-deep? I do not know exactly, but I can say that in the majority of cases this politeness shows readily through the skin from the inside, and in such cases the skin is thin and very transparent, and that proverbiality is proven whenever a stranger or native travels in France. If I am to judge from my experience and my wife's experience during our three weeks travel in England, we have found the English skin fearfully thick and opaque, and very little politeness shining through it—photographically speaking, something like half-a-dozen thicknesses of red glass—and this specially about the middle class of people, lower being certainly more polite. Examples would be too many to enumerate, but here are a few:—Speaking to a lady, with pipe in their mouth, or cigarettes. Not removing same when entering the parlour-room. Not taking hat off. Living for a week or more at the same table, and talking freely, but never saying good morning or evening. Knocking against you in the streets or elsewhere without a word of excuse. Entering a railway-carriage, smoking, or opening windows without a word to former occupants. These, of course, are only private matters, and do not concern a nation as does this Albion picture in caricature. Here is something more general, and liable to strike all Frenchmen visiting England, and an answer to your inquiry, "Do Frenchmen always have a dislike to us?" when I said, "Tirez les premiers, Messieurs les Anglais." When thirty-five years ago I visited the Tussaud Museum of Wax

Figues I could see all of them, as well as the curiosities, for one and the same price. To-day it is not so. For one shilling one can see all the figures of present and past nobilities, but see how shabbily are dressed and posed the French Past Presidents, and how untrue their faces—if not done on purpose. It could be, certainly. See Louis XVI., with his short arms. Napoleon III., not at all like him; this, probably, to flatter French visitors, and make friends of them. And now let us pass to the crowning piece of delicacy and politeness: sixpence extra is asked to see relics of Napoleon I. and the Chamber of Horrors. How delicate this coupling: threepence for Napoleon, threepence for Chamber of Horrors! Why not put the Execution of Mary Stuart and Charles I. also in the Chamber of Horrors, or was that, perhaps, a gala ceremony?

I will finish this rather long letter by a little curiosity I was unable to understand, and you or some reader may explain. I went to the Wallace Exhibit in Manchester Square, with my wife and child (three-and-a-half years old), but was refused admission because my child was under eight years of age, and I refused to leave him in the cloak-room with umbrellas and canes.—Yours very truly,

ALBERT LEVY.

P.S.—Of course, you will understand that what I write above has nothing to do with our friendly intercourse, but is only written in a general way for discussion, if one chooses.

Asnières (Seine). May 9th, 1902.

IS THIS AN ART AGE IN ENGLAND?

To the Editors.

Gentlemen,—If a judgment could be formed by the extraordinary high prices that have recently been realised at auction sales for works of art, one would naturally say it was. For example, at Christie's within the last fortnight the sale of a little over a hundred pictures realised nearly £60,000, or an average of £600 a-piece. The highest price that any one of them fetched was a landscape by Hobbema, and it was knocked down for 9,200 guineas. Portraits of the two sons of David Monro Binning, by Sir H. Raeburn, made 6,500 guineas. These pictures were purchased by Messrs. Agnew, and, we may assume, with a view to a profit upon them. Another picture, by Raeburn, made 3,600 guineas, and one by Sir Thomas Lawrence 1,950 guineas. At the same sale-rooms, a week before, a Louis XV. marqueteria commode sold for no less than £4,100, and a Louis XVI. parqueteria side table made 850 guineas. A clock, made for Louis XVI., was sold for £3,255. At a sale at Sotheby's, on Thursday last week, about 180 lots of engravings fetched £1,783. An engraving "Mrs. Robinson," after G. Romney, by J. R. Smith, was knocked down for £116; "Lady Hamilton," by T. Cheeseman, after Romney, £132; and one of "Dedham Vale"—a spot not unknown to many photographers—by D. Lucas, after Constable, £140. The day after, at Christie's, nineteen terra cotta and marble statues realised a total of nearly £8,000, and a modelled figure, holding a fruit and bird in either hand, was knocked down for no less than 3,100 guineas. Whether this is an age of art in this country or not, it is clear that fabulous sums are just now being expended on works of art, and it is evident that money for the purpose is forthcoming, notwithstanding the complaint of "hard times."—I am, yours, etc.,

APELLES.

"A NEW AND LUCRATIVE PROFESSION."

To the Editors.

Sirs,—As no doubt a large number of the English readers of the BRITISH JOURNAL OF PHOTOGRAPHY, before reading your article in last week's issue, were quite unaware of the existence of such an institution as the Illinois College of Photography, would it not be as well, before condemning the advertisement referred to too freely—which, with not a few, would implicate condemnation of the college also—to wait until such time that you are able to produce an article written by a student, past or present, of the Illinois College, who might feel disposed to give us a little detailed account of his experience there?

The advertisement, I agree, might possibly, to a certain extent, mislead the young and especially those whose idea of photography is a vague one; but surely any individual with a little common sense could hardly be led to believe that to adopt the photographic profession and become a "fully-fledged artist" is merely a matter of from three to six months' class-room study, although I presume such a course, combined with knowledge obtained in a work-room, could scarcely be looked upon as being detrimental to a conscientious worker.

There is not the slightest doubt that many photographers, professional and otherwise, have found the Illinois College beneficial and helpful, seeing it appears to be complete, both in faculty and equipment, and adapted in every way for a thorough course of study in any of the different branches of photography.—I am, Sirs, yours very truly,

HARRY FOSTER.

London, W. May 12th, 1902.

PHOTOGRAPHERS AND THEIR WATER SUPPLY.

To the Editors.

Gentlemen,—In your penultimate issue, you gave a brief report of an appeal case, by the Mayor and Corporation of Stockport, against a decision of the local magistrates, who had decided that an amateur photographer should not be charged extra for the water he used in photography. The counsel for the appellants contended that in order to *clean* his plates the amateur used a large quantity of water. I have underlined the word clean. Now, to the lay mind, clean and wash may be synonymous terms, but in photography they are widely different. At the present time photographers have not to clean their plates, that is done by the makers of them before they are coated with the emulsion. At one time, when the collodion process was in vogue, the cleaning of the plate was a very important thing in the process, but then very little, if any, water, was used for the work. Now, all the photographer has to do is to wash the plates after they are fixed in order to get rid of the hypo. This is a very different thing from *cleaning* the plates. With regard to the freeing of the plates from the hypo, the Messrs. Lumière have shown that a plate may be more completely freed from hypo in a small quantity of water, if rightly used, than by long washing in running water. Thus, a plate 18 by 13cm., practically 7 by 5 inches, can be more effectively washed by soaking it in only 100cc. of water—roughly three and a half ounces—for five minutes with about half-a-dozen changes, the plate being well drained, or blotted off between each change. The major part of the hypo, it was found, was removed in the first two or three changes. It used to be customary in the calotype and wax-paper days, when the negative was taken from the fixing solution, to press it between blotty paper, to remove as much as possible of the moisture; then, after soaking for a short time, blot off again, and repeating the operations several times. This will in a great measure account for the performance of so many of the old paper negatives. In the evidence in the Stockport case, it came out that the amateur photographer complained to the water authorities of a deficient supply, and that brought about a visit from their representative and the extra charge. Moral: When the water supply is deficient don't complain to the company, particularly if they happen to be the Stockport water authorities.—I am, yours, etc.,

H.O.

May 5th, 1902.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY, 24, *Wellington-street, Strand, London, W.C.*" *Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

PHOTOGRAPHS REGISTERED:—

F. Jenkins, 94, High Street, Southwold. *Photograph of "Jack Smite the Clock."*

C. Gostellia, 60, Thomas Street, Limerick. *Two photographs of Rev. Father Tierney.*

E. W. H. Rutley, 117a, High Street, Croydon. *Photograph of Miss R. Merrick. Photograph of Miss N. Bowman.*

S. H. Bailey, "Oakdene," New Haw, Addlestone, Surrey. *Photograph of "The Plas," Dinas Mawddwy. Photograph of Dinas Mawddwy.*

SEPIA.—So far as we can judge from the print sent, the trouble arises from scum on the surface of the developing solution. If it is not due to this cause, we should advise you to send some examples to the makers of the paper for their opinion.

FILM LEAVING THE PLATE.—"ALUM" writes: "I should be greatly obliged if you would inform me as to the cause of the film springing from a plate when dry?"—In reply: We are sorry we cannot tell you, as we do not know what treatment the plates have received that would bring this trouble about; one we have never experienced ourselves with modern plates. Possibly over-aluming some plates might have this effect, but that is a mere speculation. Better give us fuller particulars.

IVORY MINIATURES.—M. VERNON writes: "I wish to paint some miniatures on ivory from negatives I have taken myself. Can I get the ivory ready sensitised for contact printing, and where and how should I proceed to print, tone and fix?"—In reply: No such thing is supplied. The best way to produce photographs on ivory is by the carbon process. If you are not familiar with its working, we should recommend you to send the negatives to one or other of the firms that make a speciality of carbon printing to make the prints for you.

OWNERSHIP OF NEGATIVES.—C. C. SMITH writes: "I am anxious to know what the law is as to the ownership of negatives of sitters. Can you tell me the dates and names of parties in which this point was settled? I have an idea that I have seen the reports of two cases in the columns of your paper, but it is a number of years ago now."—In reply: The negatives of portraits taken in the ordinary course of business are the property of the photographer, but he has no right to use them for any purpose of his own. For cases cited see page 738 of our volume for 1899.

STEEL DIES.—"INQUIRER" writes: "Could you kindly give me any information as to where I could get a steel die to use as a punch for photographic mounts, and the probable cost of same? There would be eleven letters in the name, and to be cut something after the style of an autograph."—In reply: Any die sinker would cut the dies for you, or any of the makers of embossing or stamping presses would supply them. So also, no doubt, would any of the houses that make a speciality of photographic mounts. We must refer you to them for the price, as we are ignorant of the charges for such things.

COMBINATION PRINTING.—H. M. writes: Would you inform me in the JOURNAL how to proceed to take a head out of a group and put it in another 'in the negatives?' What chemicals are required? The quantities to use, and how to go about it? I have seen some details in book, but not the quantities of chemicals, or how to stick the film on, etc., etc."—In reply: The subject is far too long a one to be dealt with in this column, therefore, we must refer you to an article which appears on page 819 of our last volume. That gives full working details of how to proceed in order to get what you desire.

SENSITISING POSTCARDS.— C. B. LUCE writes: "Can you let me know how to sensitise a small portion of card, so as to print on it and get a bromide or platinotype effect, to enable me to print a head and draw whatever I like on the rest of the card, as accompanying diagram? The sensitising to be done by painting the solution on the part of the card with a soft, broad brush, and the developing to be done in a similar manner. I enclose stamped envelope, in case you reply through the post."—In reply: Messrs. Marion and Co. supply a solution under the name of "Panak." That will probably answer your purpose.

LIGHT IN OPTICAL LANTERN.—"LANTERN" writes: "Could you kindly advise me in your answers to correspondents as to best arrangement for light in optical lantern? I have been using cylinder of oxygen and house gas; blow-through jet. For better light, can you recommend an ether saturator? If so, for safety and convenience, is the combined burner and saturator advisable, or would you advise separate saturator? Is the "Gridiron" saturator a good one?"—In reply: A better light will be obtained by using a mixed jet, with both gases under pressure, and good hard limes. A good light may be obtained with ether saturators, but they require using with care and judgment, and then the light is scarcely so good as the mixed jet when rightly managed.

TEETH.—E. GRAY writes: "A dental surgeon on three separate occasions brought one or two or three diseased teeth to photograph to exactly natural size, for purposes of lecturing and article for a book. My client himself making his own lantern slides from the negatives taken. Time: Including everything, about 10 hours. Plates: 15 exposed, etc., ¼ and ½ plates, all chromatic. Order: 9 negatives; to be client's property. Packing: Special; to go by rail with other goods in trunk. Spotting, or work on negatives: None; simply developed and dried. No prints ordered. My client considers £1 15s. an excessive charge. Kindly advise a fair charge for above."—In reply: We should consider the charge very moderate indeed, and are surprised that your customer should demur to it. The prints have been returned, as requested.

COLLODIO-CHLORIDE.—J. H. writes: "Can you tell me why collodio-chloride prints sometimes refuse to tone in spots and patches of irregular shape and size? These form reddish spots or patches in the finished print. I have tried various toning baths, old and new, gold and platinum, with the same result. If you can suggest the cause and a remedy I shall be obliged. I have also tried soaking in alcohol before toning without success."—In reply: Personally, we have met with no such trouble with any collodion papers we have worked with. Therefore, we can only speculate as to the cause in your case. It may be due to the prints not being kept in motion while toning; or, may be, from the surface of the collodion being contaminated by handling. It may even be due to the paper itself, in which case, if that be suspected, try another make.

OPINION ON RETOUCHING.— J. S. writes: "Should esteem it a favour if you would give me your opinion as regards my retouching. I retouched the enclosed specimen in three-quarters of an hour. Do you consider this slow, and do you think it good retouching? Since printing the enclosed I have removed the black patch noticeable in enclosed print. What wages do you think I could command as assistant operator and retoucher? I might say the enclosed is my own taking, as well as retouching."—IN reply: We cannot say we admire the retouching, as the face is made flat, as most of the modelling is destroyed. We should say that the untouched negative is by far the best likeness of the individual, and not the less pleasing picture. It is quite impossible for us to judge what salary you should command from seeing a single specimen of your work.

DYES FOR THREE-COLOUR FILTERS.—"COLOUR WORK" writes: "What dyes should be used in making light filters for three-colour photographs? I wish to make them after Engler's method, coating glass with plain collodion, followed by gelatine stained to the desired tint, and should be obliged if you would inform me as to what dyes to use for the red, green, and blue filters respectively; also could the same dyes be used to obtain the transparencies? Thanking you in anticipation."—In reply: Different dyes are recommended by different workers; but as you are, apparently, a novice in three-colour work, we should recommend you to purchase the filters, as then you will ensure getting the right tints, and of the proper depth of colour in relation to each other—a not unimportant point. The filters are not expensive, and may be had from Messrs. Sanger Shepherd and Co., Grays Inn Passage, Red Lion Street, Holborn.

EXHIBITION OF SPECIMENS.—"TROUBLED" writes: "Looking through last year's negatives for a suitable subject, which I purposed making a life-sized picture from, I selected one and completed from it a picture, finished in pastel. I exhibited same in my window for about two weeks. The other evening a gentleman called upon me, and in a very imperative manner ordered me to take it out of the window. I asked for an explanation, and his objection, which he gave, saying he was the subject's 'future,' etc. I complied with his request, though he would give me no definite objection to the picture being exhibited. I asked if I might hang it in my studio. Again he objected. Now, sir, the question is: As it is a valuable one—too valuable to destroy—what can I do with it (the picture)? The sitter was present at the interview, and although both considered it an 'excellent portrait,' I cannot understand why they should raise an objection to my exhibiting same."—In reply: You ask us what you can do with the picture, and we should say the best thing will be to destroy it, as it is of no use to you. You must not exhibit it, or the parties can get an injunction in Chancery against that being done, which would prove a costly matter to you, as it has done to others in similar cases. You had no right at all to make the enlargement without the sitter's consent.

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*** *The Editor can only be seen by appointment.*

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EX CATHEDRA.

A Scandalous Photograph. Not long ago we instanced a case in which a German officer obtained damages for the publication of his photograph, with that of a lady cyclist, upon a post-card. An appropriate rhyme was printed upon the card, which the officer thought highly offensive. Another case of a very interesting character is now before the Berlin law courts. A merchant married a young lady who was much admired for her beauty. He appears to have been of a very jealous disposition, and he watched his wife with the eye of an Argus. A young electrician was impressed by the lady's attractions, and took apartments on the opposite side of the road. Being an ardent amateur photographer, he seized the opportunity to photograph the lady one morning when she rushed to the window to see some troops march past. He placed a print in his writing-desk, and the husband was informed of the fact by an anonymous letter from a mischief-making friend. The husband immediately demanded the negative and the print, but the electrician declined to part with them on the ground that he was at liberty to photograph the lady in such costume as she might think fit to wear in public. The husband has now brought an action to recover damages and obtain a surrender of the negative and print.

Fresson Paper. From a report of the proceedings of the Vienna Photographic Society we gather that a modification of the Artigue process has been placed upon the market under the name of Fresson paper. It is evidently of French manufacture. Those who have seen prints by the Artigue process will remember the beautiful, soft, velvety appearance they have, but the process was not easy to work, and never became popular, owing to the difficulty in obtaining the paper and the number of failures in development. From the report, we understand that the new paper is not so difficult to manipulate. To sensitize the film, the paper has to be plunged in cold water until it becomes flat, and it is then transferred to a two per cent. bichromate bath for two minutes. The drying and exposure need no special remark, excepting that the film is highly sensitive to light. With a negative fairly clear in the shadows, one minute's exposure to diffused daylight on a bright day is sufficient. For development the paper is again dipped in water, placed upon a glass plate or a cork block, and treated with sawdust soup at about 23 deg. C., which is poured upon the print as in the Artigue process. Three or four applications suffice, and the development may be modified by lowering the temperature of the bath for a hard negative and increasing it for a soft one. Some prints were shown, and are described as of a matt, velvety character, and giving an excellent rendering of the negative. The paper is more suited to the wants of the amateur, as each print appears to require individuality of treatment.

* * *

The Status of Photography in Germany. The present is a critical period in the history of photography in Germany. A new protective law is projected dealing with photographic copyright, the organisation of photography as an industry, and other important interests. The gravity of the situation is such that the National Union of German Photographers has recently held a meeting in Berlin, which was attended by delegates from twenty-one associations of professional photographers. The Government was also represented at the meeting to ascertain the wishes of the profession. But in Germany the designation "professional photographer" will soon cease to have a meaning, and it will be an impertinence on the part of any photographer so to describe himself. Photography is to be reduced to the rank of an industry, and the so-called masters of the craft, who have posed as photographic artists and affected the idiosyncrasies of the painter's vocabulary, will be classified with tinkers, tailors, and other objectionable people. We see it even stated that it will be impossible for the son of any well-to-do photographer to aspire to the rank of an officer in the army. A bold stand has been made by some members of the German

photographic press against this degradation of the "art-science." But if it be assumed that it is the duty of the State to look after the industrial interests of its subjects and regulate their daily affairs, we do not see how any other conclusion could be arrived at logically from a comprehensive consideration of the work done by those who subsist by the various processes involved in photography. Whilst some strive to impart æsthetic character to their work, the great majority work in a mechanical manner, and the State has to consider majorities rather than minorities. It is true that we have bad artists and good photographers, but it is idle under such circumstances to pit the one against the other. Unfortunately, photography stands in an anomalous position. It has made such conquests, not only as a delineator in monochrome, but also in colour, that it seems a hardship and a degradation to place the men, to whom so much is due, on the level of the workman. The question is a political one, and German photographers who object to this treatment must turn their attention to the relations which should subsist between the State and the individual. Although we have made rapid strides of recent years upon the road to parental government, we have not yet reached such a state of things, fortunately for photography.

* * *

German Photographic Copyright. The new law will confer copyright in photographs for a period of fifteen years. Although the delegates protested emphatically against this limitation of the right of the photographer to his work, it was ultimately agreed to, as it seemed useless to offer further opposition. The representatives of the Government appeared to have made up their minds in advance, and the cold-water tap was mercilessly turned upon every proposal that tended to give photography a higher status. Were photographers entitled to longer protection than inventors? Such were the questions which had to be faced. The delegates were even told that the meeting had been called six weeks too late, as the projected law had already been printed, and the Government could not consequently give attention to their wishes. On the other hand, it was six weeks too soon to enter upon the discussion which would take place upon publication of the projected law. It is to be hoped, however, that some of the hardships of the present state of the law may be removed. We are not surprised that German photographers should regard it as an intolerable hardship that their photographs should be used for the decoration of tables, chairs, and other similar purposes, and that they should be scattered broadcast as post-cards, without remedy or compensation. This is a theft of other men's work, and should be prevented by heavy penalties. It will be seen from the period of copyright provided for in this projected law that English photographers stand in a much more favourable position than their German confrères. It also indicates that there is a movement in the direction of further limitation of the copyright in photographs. Photographers in this country should endeavour to enlist public opinion in their favour, and be on the alert to resist any change in the law to their disadvantage.

* * *

Precious Metals. The American reporter is so exceedingly prolific in the matter of startling rumours and sensational discoveries, and is so economical of veracity, that it is often difficult for the ordinary inquirer after truth to know whether he is being instructed or hoaxed. Two paragraphs, of American origin, have recently been going the round of the Press, and there is little doubt that they will meet with respectful attention by the majority of readers. The first one informs us that an ingenious chemist has made a claim that the human body is, from a chemical standpoint, a very valuable asset, on the ground that it contains three pounds, thirteen ounces of calcium, and calcium is worth, just now, 300 dols. per ounce. At this rate our poor human tenement is poor no longer, for it is worth a good deal more than its weight in gold. Arguing in the same way, we might appraise the value of London clay at untold millions, on account of the aluminium contained in it. The other Yankee statement also deals with a valuable metal contained within the human organism, but this is a far more definite and satisfactory story, as will presently be seen. It is a matter of common knowledge that the minute particles of gold which fly about any workroom where the precious metal is employed will insinuate themselves in woodwork in such a way that the flooring boards of a goldsmith's workshop will often be worth some hundreds of pounds. Now this is an undoubted fact, but the American reporter improves upon the story by asserting that the human body will assimilate gold in the same manner. But we will quote his own words. "It was recently discovered," writes he, "that miners absorb gold dust into their systems. A New York physician who treated some Alaskan prospectors for metal poisoning saved the drippings from the Turkish bath taken by the men, and recovered from 20 dollars to 30 dollars from each patient washed!" Now, we decline to vouch for the truth of this story, but, if it be true, we do not see any reason why photographers who have been at work all their lives, handling gold, silver, and platinum, should not at once retire into private life and live on the proceeds of the riches which they must have absorbed into their systems. Of course, the theory is open to doubt, but such doubt can easily be set at rest by a visit to the Turkish bath, when we can not only acquire cleanliness, but can collect our residues at the same time. Possibly all the rich deposit will not be yielded up at the first visit, and perhaps, by spending a certain time in each hot room, beginning at the coolest, the metals may separate themselves out by a process of fractional distillation. Experiment can alone decide this point.

* * *

A New Toning Bath. Monsieur A. Hélain, of the Société Française de Photographie, has recently experimented with sulphocarbamide as an addition to the toning bath. He recommends the following formula:—

2 per cent. solution of sulphocarbamide ...	40 c.c.
Tartaric acid...	½ gramme.
1 per cent. solution of chloride of gold ...	50 c.c.
Common salt...	20 grammes.
Water, according to toning quality of the paper	1 to 2 litres.

The tartaric acid must be dissolved in the solution of sulphocarbamide, and the gold solution should then be added slowly, stirring meanwhile with a glass rod. This gives a clear solution, to which the salt should be added, and finally the water for dilution of the bath to working strength. The bath gives good results, with all the usual varieties of gelatine P.O.P., but the time of toning varies somewhat with the nature of the paper. Collodio-chloride papers also tone easily with the bath, but although the results are good with albumen, this vehicle requires much more time. If the papers are fumed with ammonia, the ammoniacal salts of silver must be removed by suitable treatment previous to toning. It is claimed that the bath

has special peculiarities. The combination formed with the gold is not susceptible to reduction by organic matter, and will only deposit where there is silver. It follows that there can be no discolouration or staining of the print, even when the bath is used at a high temperature. The sulphocyanide bath also has this property, but it acts so rapidly upon the half tones, as compared with the shadows, that it is necessary to tone the print completely to obtain good results. The sulphocarbamide bath, on the other hand, tones the print equally, so that it is possible to stop the action at any desired shade of colour without fear of obtaining unpleasant double tones. Any of the usual photographic tones may be obtained with it.

* * *

Theatrical Scenery. Although there is a meritorious society whose province it is to produce the dramatic works of Shakespeare, Marlowe, and others, as they were acted in Elizabethan times, that is to say, without scenic accessories, most persons prefer to witness a play which is staged and mounted according to more modern ideas. That a very high degree of perfection has been reached in this branch of pictorial art no one can question any more than he can deny that many of our modern scene-painters are accomplished artists. Like all who handle pencil or brush, the scenic artist finds photography a useful ally, and we may feel quite sure that, even if he does not own a camera himself, he is a busy collector of photographic prints. Of all men, he must aim at truth in his work, for the critical audiences of to-day will not tolerate the incongruities which were allowed to pass muster in days gone by. At that time one scene did duty for palace and prison, and as for any attention to architectural accuracy with regard to time or place, no one troubled his head about such matters. The first theatrical manager to sweep aside the dusty cobwebs of theatrical tradition, and give quite a new aspect to the plays of Shakespeare, was Charles Kean, who, fifty years ago, at the Princess's Theatre did for the drama much the same excellent service that Sir Henry Irving has been doing since at the Lyceum. Those who would doubt this statement should visit the collection of water-colour drawings which has recently been placed on view at the Victoria and Albert Museum, South Kensington. The circumstances under which this interesting collection is exhibited are sufficiently indicated by the label attached to the pictures, which runs thus:—"Drawings of theatrical scenery and properties made for Charles Kean, F.S.A., actor (born 1811, died 1868) as a record of Shakespearean and other plays produced by him at the Princess's Theatre, London, from 1851 to 1859. Presented by F. M. Paget, Esq., and Mrs. F. M. Paget, niece of Mrs. Charles Kean." The collection consists of a series of beautiful water-colour drawings by Telbin, Grieve, Lloyds, Gordon, and other scenic artists of the period, together with careful representations of the banners, armour, furniture, etc., used in each Shakespearean revival, and it may be said to form a most valuable library of reference for all theatrical managers who aim at conscientious discharge of their duty to the public. There were few photographs to be had in the early fifties, and yet these pictures—those, for instance, illustrating the "Merchant of Venice"—are photographic in their accuracy. Here is a beautiful scene representing the columns of St. Mark, another of the Rialto Bridge and the Grand Canal, while Shylock's house, with the adjacent narrow canals and bridges, is a typical Venetian scene. As much praise must be awarded to the views of old London associated with the plays of Henry VIII., Henry V., and Richard III., while reality gives place to romance in the beautiful tableaux designed for "The Tempest" and the "Midsummer Night's Dream." The electric light has given the scene-painter of to-day advantages which were withheld from those employed by Charles Kean fifty years ago, but their artistic work will well bear comparison with the best that we have now.

* * *

Gorgeous Sunsets. There is perhaps nothing more easy to photograph than a sunset over the sea, and certainly there is nothing which so well repays the camera worker for his trouble. We do not mean that such pictures are particularly saleable, for they are not, the general taste being at a somewhat low ebb in these matters. But if the photographer be content with the happy feeling that he has produced something beautiful, he will be well satisfied with the transaction. We have said that these views of the sunlit sea are easy to produce, and so they are, but at the same time it is astonishing how seldom a sunset suitable for photographing presents itself. Even with an available window, looking west, over the boundless ocean, the opportunities for securing a good picture are rare. Of course, the mere tyro would be likely to expend a number of plates upon impossible skies, for he would be carried away by the charms of colour combinations which the experienced photographer would studiously avoid. But we may hope that, during the coming season, there may be many tri-colour cameras at work which will turn these hitherto neglected skies to photographic advantage. And it is noteworthy that some of the best transparencies yet produced by the Sanger Shepherd process are of sunset skies. If history repeats itself according to its wont there should be a plethora of sunset effects during the coming summer, and photographers would do well to bear this fact in mind. In the month of August, 1883, occurred a most awful volcanic outburst—similar in many respects to the visitation which has lately devastated Martinique and St. Vincent—at the Island of Krakatoa, in the Straits of Sunda. It is no exaggeration to say that a large portion of this island was suddenly blown into the air with a noise so stupendous that it was heard many hundreds of miles away. The particles of dust which were carried into the higher regions of the atmosphere must in the aggregate have amounted to thousands of tons, and while the coarser particles were deposited comparatively near the scene of the disturbance, the finer ones travelled over the entire globe. To the presence of this fine volcanic dust in the air was attributed the gorgeous sunsets which were observed in Britain and in other countries a few months after the terrible tragedy in the straits of Sunda. And there was one episode in connection with these atmospheric phenomena which has a curious photographic interest. While we in England were amazed at the glorious tints displayed on Nature's palette, the inhabitants of India sent word that they were witnessing the extraordinary appearance of a blue sun. Now, any photographer who has had to do with gelatine emulsion will at once be able to solve the mystery of this blue sun. A freshly-made emulsion, when examined by transmitted light, appears orange red, the particles of silver haloid being very fine under such conditions, but when, after further cooking, the emulsion gains rapidity, its particles are coarser, and the colour transmitted is blue. We may compare the dust particles in the air after the eruption of Krakatoa to the particles of silver suspended in the emulsion. Those which fell in India, comparatively close to their place of origin, were of the coarser kind, and, seen through the veil which they formed, the sun appeared blue. The particles which reached our more remote neighbourhood were exceedingly

fine, and the slight fogging of the atmosphere which they brought about was of the same consistence as that which commonly gives us a red sun towards evening.

* * *

Exposure in Relation to Subject.

As a matter of common sense, correct exposure is of first importance. Over-exposure, it is true, can be corrected in a measure by care in development, but, apart from the extra worry and trouble, the final result cannot turn out so well as that of correct exposure and normal development. Under-exposure, in our opinion, is hopelessly incurable, and the best thing that can be done with an under-exposed plate is to throw it away straight off. The difficulty is to estimate correct exposure. The factors that have to be considered in the process, the actinic quality of the light, distance of the object to be photographed, its lighting, the rapidity of the lens used, the stop, and speed of plate, have a varying value, and are hard to get hold of. Probably not one plate in ten thousand is exposed with absolute correctness. There is, fortunately, a working range on one side at least of this standard of absolute correctness, in which excellent technical work can be done. But the nearer to the correct theoretical top point that practice can find its way, the better the result. The likelihood of this is the more, the more closely the whole of the factors making up correct exposure are taken into consideration. In practice they do not all get the attention they should. The quality of the light is gauged by the worker with scientific instincts, wisely and more correctly, by the aid of the sensitized scrap of paper in an exposure meter; by the professional, as a rule, by a glance at the amounts of blue and white in the sky. The distance of the object, lens, stop, and speed of plate also enter more or less into the calculation in a hard and fast mathematical kind of way in the one case, in a sub-conscious way, probably, in the other. The results turn out as average, good, or very good, in proportion to the capacity shown in the calculating. There is one factor beyond these that is not given the attention it ought to have, viz., the lighting and colour of what is being photographed. All who have done general work must oftentimes have been struck by the disappointing way in which many of their pictures, or what they supposed would have been the best portions of them, have turned out upon developing, after a close estimation of all that goes to make up success, exposure included, had been made and acted upon. The desired detail in a piece of machinery has not shown up, the red tiles in an artistic roof are dull, so is the brick front of the old manor house; the swarthy face is under-exposed and the dark hair shows no detail; the fair face and auburn hair are over-exposed. The headings of the exposure scale, "dark," or "light," "object near," "outdoor portrait," and so on, were thought of, and entered into the calculation, but they were apparently too broad and general. There is a very wide range between "dark" and "light," and the not being able to find the correct place of the particular object in it led to an undue lengthening or shortening of exposure that affected the result on the wrong side. The amount of detail and its character was not mentioned in the scale directions, but as the detail must be got if character is to be shown, the exposure should have been longer and the stop smaller to have gained the best result. The successful worker must never forget that he is dealing with small and extremely delicate quantities and margins all round. The amount of silver in his thinly-coated plate is small; it is but a grain of pyrogallic acid that he uses in developing it, a fractional part of a grain of gold in toning his print, and so on. It is only reasonable on the same scale that a very small difference in length of exposure should make all the difference between a good and an indifferent result. He who can best calculate conditions all round in time values of fractions of a second is most likely to be successful. It is the more difficult because in ordinary life we do not trouble about such small portions of time. One must get outside of his ordinary, everyday mind, as it were, when engaged in photographic work. At the same time that this minute care should be exercised in all directions, believing that there is more scope for its action, as well as more liability to relax it, in the consideration of the texture, detail, lighting, and colour of what it is desired to photograph than in any other direction, attention is called to its particular importance. It could do nothing but good if the object, or general elements that are to go into the make-up of the picture, be taken as closely into consideration as affecting length of exposure as they are in being suitably placed or composed. The broad limits of a text-book, or the exposure scales published by many of the leading firms of plate-makers, may be held too broadly. But they are only approximate, as their publishers take fair care to state. Within their limits there is plenty of thinking room, and the closer the thinking that leads most closely to correctexposure, the better the result.

* * *

The Tripod.

The tripod roughly divides the more serious from the less serious photographic worker. We do not mean to state that good work has not been done with the hand-camera without the aid of the tripod. But it can be very safely stated that it is a small amount compared with that done by the stand-camera, and, also, that successful result forms a smaller percentage compared with total effort when the tripod is absent. In the case of the hand-camera, there would be a great gain, both in quality and amount, of result, if a light tripod were used wherever practicable. There is no question that even for a snap-shot a flat, rigid support is far preferable to the steadying squeeze against stomach, chest, or side. A stand would also very much enlarge the field of action, in permitting of a time exposure. A time exposure makes work practicable on dull days that are useless for a snap shot. Even on good days, the light that finds its way into many a narrow old-world court and cor ner that we would like to carry away records of, is oftentimes too poor for anything but a time exposure. Under favourable circumstances generally, detail and sharpness are lost, owing to the large stop that has to be used when exposure gets to be very short. What are the objections to a tripod? In some cases it is a dislike to the encumbrance of an extra item to carry and look after. In others it is a kind of psychological objection, a dislike to openly label the object of a walk, and to the publicity gained by the erection of a tripod. Both objections can be in some measure reduced by using a tripod that will fold and slide into the length and compass of a walking-stick. This article has a touch of the characteristic disadvantages of most things that aim at fulfilling totally different functions. It lacks rigidity and height as a tripod, and as a walking-stick is heavy and unwieldy. Aluminium as a material to make it of has helped it out a little, but in the case of aluminium, again, the disturbing element of a comparatively high cost comes in. There is nothing for it but to do the best with what we have got, and trust to inventive brains to better things. A

hand-camera worker earnest enough to wish for something of uniformity of quality in his pictures would be well advised in trying such a tripod as that referred to. If he do, it will probably lead to his giving up the hand-camera and taking to one he must use a tripod with—the so-called "stand" camera. It will be a gain. If his photography be no more than a pleasant hobby, he will get better value out of it. We would not reverse matters, and exalt the tripod above the camera more than we would a pair of legs over an appreciative soul they may have carried to the best point at which a good view can be enjoyed. But as a pair of good legs that can carry without giving rise to an ache that would detract from appreciation are a very desirable possession, so is a tripod well adapted to its particular functions. It pays a man to see to this. His tripod should fit him in make and comfort like his trousers; and as trousers vary in length, cut, and material, so should, and do, tripods. The point is to make a careful and suitable choice. There should be no difficulty in doing this, judging by the variety pictured in price lists. It is a safe enough way of judging, too. The tripod is so simple that, like a ladder or a wheelbarrow, it is hard to sophisticate its illustration. The chief things to satisfy are, the individual ideas held as to compactness when it is folded up, ease in erecting, and height when opened out into a sufficiently large triangle of base to be firm and safe. As to the first two, every one must suit his particular taste. One man prefers the small compass into which a four-fold tripod goes, whilst another does not object to the extra length of a three, or even two, fold article, particularly as it means a little less trouble in putting up. Besides, the extra length admits of its being used as a kind of packman's stick to carry the camera-case slung across the shoulder on, for the occasional ease of change along a country road. Over much fuss has been made as to the danger of vibration due to too slight tripods. A large, heavy camera on a light tripod is, of course, a mistake. But the great majority of cameras do not rise above half-plate size, which it does not require a heavy, cumbrous tripod to support. It may vibrate in a high wind, but very little work is done in a high wind. There is too much discomfort about it, too much movement of leaf and bough in the country, and too much dust in the town. Evolution has gone, naturally and consistently, towards the reasonably lightest tripod. The more advanced in civilisation man becomes, the more trouble does he take to lighten his physical load. All who have carried a load, photographic or otherwise, for a day will be ready to endorse the good sense of this. The mere extra half-pound of the start becomes a very different amount towards the finish. But the chief point about a tripod is, that it be of the proper height; practically, that it be high enough, for if too long, it can be easily lowered in an extra spread, or by means of a sliding leg, to suit one of the inches below the average. To work with a tripod a little too short is a misery, and certain to lead to a loss of quality in result. The composition of the scene, or the placing of the object, and the close and critical examination of both on the screen, cannot be properly done with an aching back and trembling knees. A tripod even a little too short is as bad as a hat a little too small. As the final result is dependent upon the amount and keenness of attention bestowed upon its making, and this naturally upon the physical comfort admitting of close attention, the tripod as a material factor in the making, or the unmaking, of the result is important. If change be necessary, it should be seen to now, at the beginning of the season. It is a job that will not recur, and past experience will readily indicate where a change may be desirable.

PHOTOGRAPHERS, PHARMACISTS, AND POISONS.

THERE are pharmaceutical chemists, and there are chemists and druggists, but as there is on the whole practically no difference betwen the two, and none at all so far as poison regulations and sales are concerned, we prefer to use the term "pharmacist" as being the better and more apt title for the semi-professional gentleman whose occupation concerns rather the art of healing and the preparation of drugs than the science of chemistry. It was to pharmacists as a body, therefore, that legislation assigned the sale of certain widely-used poisons. When "restrictions" are mentioned in connection with what may be termed the poison controversy, it must not be forgotten that these apply *every time* to the *seller* only. We have very intimate knowledge of regulations enacted in all good (but perhaps blind) faith for the *sale* of poisons, but we never heard of any kind of regulation or restriction which is to be binding upon the user! For a great many years pharmacists have had an intelligent appreciation of the poison danger. There has been the poison cupboard, where all dangerous articles have been stored, but essentially devoted to such poisons as are enumerated in Schedule 1—*i.e.*, cyanide of potassium, corrosive sublimate, etc. There has also been a liberal use of proper labels and of blue fluted bottles, "distinguishable by touch," also attempts made to distinguish by sound, as witness the occasional use of corks with bells attached. In one pharmacy there are fitted up various little devices for the purpose of attracting special attention to sales of sundry poisonous articles. By a simple electrical attachment a bell is made to ring every time the poison cupboard door is opened; by a similar simple contrivance, the chief features of which are a double shelf, the top one hinged at a distance of about half-an-inch above the other, a spring just strong enough (the weight of the bottle being removed) to enable the shelf to rise and make contact completing an electrical circuit, it was found practicable to place certain poisons in such positions that they could not be disturbed without the fact being notified to the staff, and by selecting bells of different tone it was possible to tell by sound only what poison was being sold. For many years carbolic acid has been sold only in blue fluted bottles, distinguishable by touch, at a reasonable price, taking in exchange whenever practicable the ordinary bottle usually brought by the customer. As a matter of fact, "the order in council" relative to the storage, dispensing, and sale of poisons was anticipated by many years in every well-regulated pharmacy. A correspondent, "Non-pharmacist," on page 278 of this JOURNAL, in a moment of inspiration, asks, "What further restrictions" (referring particularly to carbolic acid, but inferentially to other poisons) "are required if the chemists fulfil the conditions prescribed in its sale?" but, of course, being a non-pharmacist, altogether misses the point and moral of the situation, which is something of the nature of the "horse and the water." You may provide the customer with the bottle distinguishable by touch (though this is not required in every sale) and properly labelled, but you cannot ensure that he (the buyer) will retain it in that receptacle, and thus safeguard others. "A" sells "B," under the usual restrictions, a bottle of

scheduled poison—weed destroyer, toothache drops, rheumatic oils, mercurial intensifier *et hoc genus omne*. "B" lends a little of the article to a friend, "C," pouring a little out of his bottle into another, anything handy, in fact, which is not distinguishable by touch, or even properly labelled. "C," in his turn, uses the stuff, and leaves it, or probably, the pressing need having disappeared, forgets all about it. Then comes "D," who finds what he imagines to be a palatable drink (as in the case of the weed destroyer in the beer bottle), drinks it, and, to quote the comic-song writer, his funeral's to-morrow! As a rule, the coroner manages to bring in some caustic remarks about the sale of poisons and restrictions, but never thinks or says a word relative to the culpability of "B," who, himself safeguarded, and, no doubt, in all good faith, and with no evil intent, has placed the life of another person in peril. If, by law, something could be done to ensure that certain poisons must not only be sold, *but kept by the purchaser*, in bottles definitely labelled and distinguishable by touch, the restriction would be of value, and might save lives. The position is one of difficulty. When we, on sadly rare occasions, stay at the seaside, we take our medicine chest with us, and how can we, a case of need arising, refuse the relief to others which access to the same affords? But if we give a little away in a bottle which, under the circumstances, cannot be properly labelled, we should feel morally responsible should harm come of it. An extremely painful incident in our experience was the following, which occurred many years ago: An amateur photographer, taking advantage of a fine day, and moved by a sudden impulse, got out his wet-plate kit, and set it up in his back garden; bath and chemicals were hunted up, and some cyanide fixing solution was mixed in a *tumbler*, and the latter placed for use upon a table standing in the garden. One of the children playing about saw the glass, and, taking it to be water, drank some of the contents! The tale need not be continued; it is a needless harrowing of the feelings.

That other restrictions are required is not to be disputed, but how they are to be employed, to say nothing about *enforced*, is the difficulty. It seems to us a matter for—well, almost regret, that there has been for many years an indiscriminate use of the poison *label*, the word, and the distinctive colour, has been applied to many articles outside of the schedule, quite properly in many cases, but in others unnecessarily. A note of warning that the article requires *careful* usage would in many cases answer the purpose. "Familiarity breeds contempt" even (this we honestly believe) of the poison label, but then we may say that all drugs and most chemicals require care in their use, and, equally, of course, they are not all poisons.

But, after all, what interests the photographic fraternity more especially is the difficulty placed in the way of *amateurs* (rather than of professionals) who may require such articles as mercury bichloride for intensifying purposes. Upon the subject of "Poisons in France" our contemporary, the *British and Colonial Druggist*, had an interesting leader last week, from which we may quote certain sentences which directly interest the amateur photographer.

"It would seem, judging from the regulations promulgated as an appendix to the official pharmacopœia, the Codex, that the French legislature has apparently aimed at dividing poisonous substances into those currently used in medicines, and those whose principal or only application is industrial. Of course, the law having seen its jubilee, *there are omissions*, but the intention seems evident, and the principle underlying the enactments is a recognition of the pharmacist as to the exclusive seller of medicines, and not as a retailer of poisons, save in the form of medicines." In France all persons selling the substances scheduled have to declare their names and addresses to the Mayor. The scheduled articles may be sold by any person so registered, but are only to be delivered against a written order signed by the buyer. Every purchase and sale has to be duly chronicled in a special register which should be periodically signed by the Mayor, or Commissary of Police, and the record made immediately after such purchase—the kind and quantity of the substance, and name and address of the seller and buyer being the particulars entered. The duty of seeing that these rules are observed is that of the Mayor, or the Commissary," etc., etc., and there are penalties, but, says our contemporary, "how far the law is actually applied is another question, and the absence of reports of prosecutions in the French papers seems to indicate the policy of *laisser aller* is general."

"Photographic sundries can be obtained practically anywhere—at oil and colour shops, at the establishments of some pharmacists, at many general stores, and, of course, at special shops in large towns. Personally, we should doubt if the poison register is really kept in any serious manner, and if any apparently respectable person is ever asked for a written order, etc., and in this connection it must not be forgotten that these poison regulations date from days when amateur photography was unknown. The Paris Pharmaceutical Syndicate has, it may be added, a disciplinary chamber, whose special business it is to keep an eye on and check, as far as possible, any infringement of the privileges of the pharmacist. For instance, this body recently ascertained that some of the 'grands magasins" (large general shops for drapery and other goods like Whiteley's) were selling corrosive sublimate at their photographic counters in considerable quantities, especially to the ladies who form the majority of the customers at this class of shops. It appears that cyanide of potassium does not interest the average pharmacist. But corrosive sublimate does; it is largely used for injections, etc., and it seemed pretty evident that all these fair customers were not amateur photographers, popular though the camera may be in Paris as elsewhere. So the Pharmaceutical Syndicate simply pointed out to the stores in question that they were perfectly free to sell if they kept a register. Needless to say, nothing would be more irksome in such an establishment than the elaborate system just described, and as, after all, the profit on the total sales of sublimate was but a trifle, the shops found it simpler to withdraw it from the sale counters.

"We have, therefore, on the one hand a pretty clear proof that the text of the law is clear; on the other, a strong presumption that its non-observance is generally winked

at so long as the abuse has no inconvenient results. Probably the fact that in French suicides poison is seldom used has much to do with this toleration. A brazier of charcoal or a leap in the Seine is the usual Parisian mode of launching oneself into another world."

The difficulty, in this country, put in the way of prospective buyers of such poisons as corrosive sublimate is, of course, very real at times, and, from the users' point of view, extremely absurd. On the one side, that of the seller, it is enacted that the purchaser must be known to him or be introduced by a third person who is known to both parties. One experience of buyers of poisons is that, as often as not, they, when requiring to buy such a poison as that referred to, go to a shop where they are least known, repeatedly on asking say, where do you generally get this? The answer has been, "I usually deal with so and so." The remark, then, is to the stranger, "You will do best to go to so and so, who possibly knows you." What is the meaning of the term, "known to the seller." In any reply to this, every pharmacist will, of his own experience, give his answer; he has always somewhere in his mind's eye a vision of the coroner, and he knows of cases where, every restriction and condition of sale properly carried out, the seller has not escaped sometimes censure, or, at the least, the unpleasantness of the inquisitorial court. The coroner is, strangely enough, a man who knows apparently less about the poison regulations than any other professional man connected with law and medicine, and in his court it is not safe, if to be easily done, to put him right. A case has just occurred in our experience bearing on the same point: A pharmacist of our acquaintance sold, in entire good faith, some small quantity of strychnine for rat poisoning. There were said to be so many rats, and a sufficiency of poison was sold to meet the requirements, the book signed, and the sale witnessed. The buyer took some of the poison, an inquest was held, which our friend had to attend, forty miles from his home, a day at the least lost from business, which no witness fee would cover, and all the unpleasantness of seeing one's name in the papers—an altogether unsatisfactory result of a sale value sixpence gross! Is it any wonder that many pharmacists make all sorts of excuses when poisons of this kind are asked for? To them it looks plainly on one side a profit of about two pence, against the doubt and uncertainty as to the bona-fides of the purchaser, and all the unpleasant probabilities which may follow any indiscretion on his part. The photographer blames the chemist when he cannot buy his mercury bichloride as readily as his carbonate of soda, but, as a matter of fact, it is not the pharmacist who is the stumbling block; it is the mighty official beyond him. Buyers frequently resent the simplest inquiries which the seller is bound to make as a gross impertinence. Some of them are quite ready to "sign the book," as though "Alfred John Feverdrop, of Luxington Gardens" meant anything of value to the seller, who never heard of Feverdrop, and does not know if there is such a place as Luxington Gardens! Others, again, are of different stamp, and a few minutes' chat, or less, convinces you that the purchaser is all right; he knows so-and-so, of the London and Provincial Society, and met someone else whom you know at the Royal, and so on, and the result is that in a short time he is no stranger, but has what he wants, and, in addition, the run of your dark room. Sellers do not like ignorant buyers, innocent amateurs who have heard that mercury bichloride is good for intensifying negatives, and they would like to try it. It is easy to see that they know absolutely nothing of what they propose to do, and the case assumes, therefore, if it comes to a sale, the appearance of placing in the hands of an ignorant person a powerful instrument of mischief—which is what it practically is. If there were any potent restriction, other than moral, which only appeals to the intelligent and educated, *on the buyer*; if one could ensure that the poison sold in its bottle distinguishable by touch, and with all the symbols of warning suitably displayed, would be retained therein, and carefully used and restored after use, the pharmacist (the seller, that is) would feel more at liberty to dispose of the stuff, he would do so, at the least, with more comfort than at present. The seller has got into a suspicious frame of mind with regard to these poisons, and with very good reasons indeed. He sees no money inducement in the sale whatever, but, on the other hand, much possible trouble in the future if anything goes wrong.

A TALK ON FLEXIBLE FILM AS USED IN CAMERA AND CINEMATOGRAPH.

[A Paper read before the Edinburgh Photographic Society.]

WITHIN recent years, rollable film, and especially the daylight cartridge, has done what twenty-five years ago dry plates did for photography; public interest has been quickened. As dry plates induced many to try their hand at the new art, who would not have been troubled with the cumbrous wet process, so film photography has attracted thousands who would otherwise have considered it outside the possibility of their becoming their own picture makers. The discovery of gelatine bromide made it possible to use more compact forms of cameras and to carry a considerable number of plates at a time. This led to the introduction of hand cameras, and to the consequent spread of photography as a hobby. The number of photographers was thus greatly increased, but amongst these a class of amateur was created whose sole concern was to expose as many plates as he could, and you have only to turn to the pages of photographic journals a few years back to find the reports of Society outings, in which the number of plates exposed was recorded as the principal feature of the day's outing. It was a boast at this time of a well-known medal-hunter that he invariably exposed not less than 300 plates a week. Of this same pot-hunter a story is told that, when an amateur friend and picture-maker visited his house, and during the course of the visit was introduced to the dark-room, he found piles of spoilt negatives or spoilt plates standing some feet in height from the ground, and casually picking up one or two to look at, remarked as regards one, "My dear fellow, put a suitable cloud to that, and you have a perfect picture." The host was not slow to take the point, and the "perfect picture" thus produced was successful in carrying off many medals, for this was before the days of the conference of judges, and their excellent rules as to champion classes. It is greatly to this class, then, that we owe our thanks for the film photography of the present day, but I would remind you that the very first negatives that could be printed from were produced on a flexible support, and were the well-known calotypes or wax-paper negatives of Fox Talbot. It is true that these were not films as we now understand the word, and we may therefore dismiss for

like reason the negative bromide paper of Morgan and Kidd and others, which have lately been introduced. There are, however, two true films which must not be neglected—Vergara's and Froedman's. The former was the invention of Woodbury and Vergara, and consisted of gelatine impregnated with bichromate of potash, exposed to the light to make it insoluble, and then washed and subsequently coated with bromide emulsion. The Froedman was paper saturated with certain gums and resins at a high temperature, by means of which it was rendered transparent.

Another class of film, which I believe is now obsolete, was that in which paper was coated with gelatine, soluble in water at a low temperature, and then coated with a negative emulsion containing chrome alum. This, after fixing the negative image, could be stripped off by dissolving the soft gelatine coating in warm water. The disadvantage of this class of film was that the chrome alum in time penetrated the soft gelatine, thus rendering it quite insoluble, so that the negative would not strip. Another class of film, examples of which are at present on the market, is that in which paper is coated with gelatine, collodion, and indiarubber solutions in turn, and then with the negative emulsion. The most satisfactory film of this class, in my experience, is that made by Wellington and Ward. If makers' instructions are carefully followed, no one need have any difficulty in stripping the temporary supporting paper from the film, which is left with very little sign of grain. It is supplied in daylight spools for all cameras. All these, however, are stripping films, and I may say from experience that the present-day amateur has, as a class, an objection to take the slight trouble they involve. Undoubtedly, to George Eastman, of the Kodak Company, is due the credit of popularising film photography. He foresaw the great possibilities of the system, and through his enterprise and business ability has demonstrated this by building up the largest photographic business in the world. But this, of course, could not have been done without advantages and merit in the system itself, and briefly these are—that compared with plates they have no weight or bulk, and are not fragile, these advantages holding good both before and after exposure, and when indexing and storing away. A large store can be carried by the traveller or explorer into places where it would be impossible to take plates, and photo records thus secured that would otherwise have remained as vision memories only. Most roll films can be printed from either side, thus simplfying several printing processes. In the cartridge form the dark-room is entirely done away with, except when actually developing. Perhaps I should be a little more exact in my statement here, and include as part of dark-room work the opening up of the cartridge before development, for one beginner wrote that he had most carefully followed out directions, and yet failed to obtain anything but fogged results. It turned out that he had cut up his films in the daylight, and then carried the pieces into the dark-room to develop. This reminds me of another case where a lady also carefully divided the roll according to the numbers and markings, but attempted to develop the paper instead of the film, without, I am afraid, any more satisfactory result than the first-mentioned beginner. There is almost entire absence of halation in roll film, because halation is due to the reflection of the light from the back of the glass plate; the thicker the glass, the more the halation. Celluloid being so thin, halation is not caused, nor has the celluloid such reflective power as glass. In this connection I might mention a film which is quite unique in its preparation—Sandell's—examples of which, by the kindness of the manufacturers, I am able to show you. This is stated by the makers to consist solely of two negative emulsions—the one a slow and the other a rapid—so that one can, by only turning the film over, expose either the slow or rapid. Another special advantage claimed by this film is the absence of halation and the enormous latitude of exposure, as if the rapid emulsion be exposed, the high lights will penetrate right through this coating, and then affect the slow; so that instead of obtaining flat results with over-exposure, the high-lights, having impressed themselves on the slower film, will be of sufficient printing density. The film, being entirely of gelatine, is absolutely non-inflammable, and if toughened by soaking in a little formaline before development, it becomes practically impossible to injure it by rough usage afterwards, and the trouble of blistering or frilling even in warm temperatures cannot occur. I hope to have time to demonstrate this later. Another peculiarity is that, as the gelatine swells uniformly, the finished negative becomes a size larger than that taken in the camera—a quarter-plate, for instance, turns a five by four. The last variety of film to which I will direct your attention is that which, I venture to say, is the most popular—the ordinary celluloid film.

Celluloid, as you are all probably aware, is a mixture of pyroxylin and camphor dissolved in certain solvents, such as amyl acetate, wood naphtha, acetone, etc., and then by one means or another spread out into extremely thin long sheets. There are practically only three thicknesses used commercially—that for cartridge work, which varies from two to three-thousandth parts of an inch; that for cinematograph purposes, which is somewhat thicker, being five-thousandths; and that for cut sheet films, which is ten one-thousandth of an inch thick. The thin celluloid is generally prepared in one of two ways. I believe the Kodak Company use glass tables about eighty feet long. A box, with a fine opening at the bottom, filled with the celluloid mixture or "dope," as it is technically called, is run along the table, leaving behind it a thin coating of celluloid, which after drying is coated in the same way with emulsion, and when this is dry the whole is stripped from the table. Another method of preparing the celluloid is by passing an endless metal band underneath a trough with a fine V-shaped aperture at the bottom, through which the dope is dragged by the metal band. On receiving its coating, the band continues its course, passing into a dry, warm atmosphere, and before it returns to the coating point it is sufficiently set to be stripped off and conveyed to a drying chamber, where both sides of the celluloid can be thoroughly seasoned, or in other words, it is ensured that the whole of the solvents are dried out. This is the process adopted by the European Blair Company. For some time after the introduction of the celluloid films, a matt surface was used, which gave rise to the well-known tree-like markings on the negative. This defect was almost entirely due to the matt surface of the celluloid, and these markings are rarely met with now, as clear celluloid is entirely used, but where they do occur they are caused by extreme pressure and a rubbing action of some slightly rough surface against the coated celluloid. Against the advantage of celluloid must be put its cost. The price of the raw material is more than three times that of glass, and I do not think there will be any appreciable difference for some time to come, or that there is at present any prospect of a good substitute being obtained. There are one or two points regarding rollable film which I ought to mention. First, the comparative speed of its emulsion with that on plates. According to Watkins, the average speed of an extra rapid plate, such as Cadett, Imperial, or Ilford, is 180; that of Eastman film 130. One reason for this may be, as already mentioned, the want of halation or reflective action in celluloid. Captain Colson, of Paris, made some experiments two or three years ago, in which he found that by backing film with white paper it very materially increased the speed of the emulsion. Other experiments have led to the same conclusions, and that speed could be greatly accelerated by coating the back with something more reflective than white paper. Then as to the keeping qualities of the emulsion. Considerable advances have been made of late in this direction in two ways; first as regards the actual emul-

sion itself, and secondly in the protection of the sensitised surface from contact with the harmful action of wrapping paper as used in the daylight cartridges. Probably this action, and the setting off of numbers, is known to you all; at any rate, I pass round films thus marked. Films which have been exposed in damp, warm climates, especially in tropical countries, and not developed for some time afterwards, are frequently found to be full of spots and holes. These are due to the great absorbent qualities of gelatine, which, becoming damp, causes bacteria to breed in the gelatine. The reason why this does not occur in plates to the same extent is that in the process of coating film there is always a thicker layer of gelatine.

The European Blair Camera Company utilise as a protective medium a very pure white paper, in which the numbers of the exposures and the separating marks are perforated, and this alone comes in contact with the sensitive surface. There is no difficulty in seeing the numbers through the red window in the back of the camera. The makers state that the white paper thus used is as pure as that used for bromide paper, and therefore there seems no reason why this plan should not answer. I pass round one of these New Process Cartridges, as they are called. Messrs. Wellington and Ward, to get over the same difficulty, use a special kind of paper for their cartridges, in which the numbers are cut out, and then backed up with tinfoil. One of these cartridges I also pass round, also one of the Planchon Cartridges, in which a special enamel black paper is used to obviate the same difficulty. As regards manipulation of such films, there is little to be said. Some cut off each exposure and develop them separately, though a far quicker plan is to develop a whole spool at once, by passing backwards and forwards through the developer—an operation which is apparently difficult, but which becomes exceedingly easy with practice. There are several devices for developing roll-films, such as the Volvo, etc. Films, of course, require no different treatment as regards development, fixation, and washing, but as they have a tendency to curl, it is advisable to pass them after the final washing into a glycerine bath, which prevents this trouble.

I had originally intended to speak of films and their use in the cinematograph, but this has already been done so fully this session by other two members that I need say almost nothing on the subject. Ever since 1820, when Plateau produced an instrument in which the idea of motion was given by rapid rotation of drawings, experimenters such as Janssen, Muybridge, and Anschutz have used photography for the same purpose, but the mechanical difficulties of passing glass plates through a camera in sufficient numbers for the necessary negatives was insurmountable, and although paper negatives seem at first sight possible, paper positives would be quite impossible. Therefore cinematography was a practical impossibility till the introduction of celluloid, and even this is not available for photographic purposes till 1888, and then it could only be had in sheets. By the introduction of the long lengths of celluloid, and the increase in the rapdity of the gelatine emulsions, animated photography was made possible, and hence has arisen the enormous increase in the number of, and the more perfect construction of, the necessary machines, bringing before us in a more realistic, vivid manner than ever before living scenes from every part of the globe. To demonstrate the ease with which films can be handled, I will now proceed to develop a 6 exposure celluloid and a 6 exposure gelatine film in one dish, the exposures varying from 1-50 second to 30 seconds. As they are not so well-known, I have selected the Planchon and Sandell for this purpose.

For comparison's sake I would sum up the five makes of films we have considered as follows:—

The Kodak film may be regarded as a reliable standard spool, obtainable everywhere, and in all sizes to fit Universal film cameras and roll-holders. Twelve exposures, quarter-plate size, 3s.

The Planchon film is coated with the well-known and very fast and beautiful Lumiere emulsion, backed with a patent enamelled paper, giving a thorough protection to the film. Price of spools, same as Kodak, quarter-plate size, 3s.

The Blair films as now made are equal in speed to the above, and have the advantage of an extra protection of a pure white paper to the emulsion, while the price is ten per cent. cheaper than any other celluloid film. Twelve exposures, quarter-plate size, 2s. 8d.

Sandell film is unique in having no celluloid or paper support in contact with the film; the finished negative becomes twenty-five per cent. larger than the original. It is supplied like the others in daylight spools. Quarter-plate size, 2s. 3d.

The Wellington is an exceedingly good stripping film, thoroughly satisfactory to all who do not mind a little extra work when it means the saving of almost one-half the cost. Quarter-plate size, 1s. 9d.

THOMAS HADDOW.

THE DIFFICULTIES OF "JUDGING."

As we cursorily inspect the well-displayed walls of some photographic exhibition, looking with a mild interest for the small strips of paper bearing the word "Award," which indicate that the picture carrying one of them is the forunate winner of a medal for its producer, it is questionable how many, who have not themselves had the onus and difficulty thrust upon them of making the fated decisions, give any thought to the amount of hard thinking and patient detailed examination that has probably been expended in arriving at the necessary decision as to the superlative merits of the chosen pictures. It is very seldom that the judges receive any great credit for discernment, to go by the sum total of remarks passed by the average visitors and frequenters of exhibitions. Indeed, it is by no means unusual for extreme dissatisfaction to be expressed by many with some or all of the awards. That this should be so is not, after all, incomprehensible, when we consider how much individual taste and opinion must influence such matters. A short time ago, it may be remembered, one of our principal illustrated monthlies invited opinions from the leading artists of the day on the question of which was the world's greatest painting. The result was certainly as pleasing an instance of diversity of mind as could well be wished. Now, if the noble fraternity of R.A.'s cannot agree on such a point, or even remotely approach agreement, small wonder is it that awards at photographic exhibitions are not always greeted with unanimous approval.

It is interesting to place before one's mind the conditions that have to be fulfilled in our case, and the inherent difficulties and obstacles that have to be overcome or evaded. Here are, say, anything from fifty to five hundred photographs, of different subjects and styles of treatment, submitted to the inspection of some three or four gentlemen, generally highly qualified for the purpose, but not impossibly somewhat at variance in their artistic canons and ideals. The pictures may, or may not, be divided in classes, a practice which is certainly dying out by degrees, and which has the authoritative voice of the judges themselves against it. Now, out of this array of frames the arbiters have to select a small number, say some four or five, which are considered by virtue of special beauty of technique or artistic merit, or both, worthy of the distinction of a medal. The initial difficulty that most likely stares the worthy men in the face is the existence of a high level of excellence in the majority of the pictures. We see

an improvement every year in the general average of the work contributed to exhibitions, which tends increasingly to render the task of distinction perplexing. Formerly, it was a not unsatisfactory proceeding to take the list of pictures, and going through them one by one, to mark off all those which showed some slight technical or artistic fault, thus materially clearing the field of competitors. This plan cannot now be adopted to anything like the same extent, on account of the wonderful, all-round improvement that has taken place.

This improvement is, perhaps, not an unmixed blessing, as tending towards the growing monotony and tameness that so many have noticed, for while the rank and file have been climbing up, it cannot, on the whole, be said that the leaders have gone ahead correspondingly. Be this as it may, it appears, as a result of our preliminary considerations, that the judges are practically brought to the necessity of looking for the pictures that are original and striking, while at the same time equal or superior to their fellows in quality and technique. These two conditions are, unfortunately, very difficult to find united. There is much of originality that is lacking in technique, and still more of splendid technical merit that misses being original. And so it often happens that the judges, unable to unite the two excellences entirely to their satisfaction, are obliged to decide in favour of work which, while pleasingly fresh and new, has perhaps a few trifling flaws when looked at with a severely technical eye. It is difficult to see how else the Gordian knot should be cut, but from some points of view it is a pity, all the same.

Another obstacle that stands in the judges' way is the practically certain fact that they have individualities of their own, and cannot in all respects see exactly alike. The picture that to one judge may seem best in the show may not recommend itself very much to his colleagues. And so, in order to arrive at unanimity, a certain amount of compromise becomes necessary. This settling of difficulties on the basis of a mutual agreement may, indeed, lead to a verdict couched in a more catholic spirit than would otherwise be the case; it is fairly evident, nevertheless, that from an exhibitor's point of view it may have its disadvantages. The moral would seem to be that, where possible, judges should be selected whose opinions are known to run fairly in harmony. We are here put in mind, by a natural sequence of thought, of the great value it is to exhibitors to know beforehand the names of the judges, in order that they may, as far as they consistently can without any sacrifice of their own ideals and convictions, strive to render their work acceptable to the known fancies and preferences of the censors. This is by no means saying that most judges have not sufficient breadth of mind to admire and reward a clever and original picture which does not tally exactly with their own prepossessions. Quite the contrary, as may be seen every day. Still, it is only natural that a man should prefer work done according to the rules and canons which he himself has mentally given allegiance to.

Another qualification for an award, besides the two mentioned, originality and excellence of technique, may be found in difficulty of execution—that is to say, in a picture which has had to overcome some mechanical or artistic obstacles in order to be the success it is. Subjects that are awkward to render, effects that require patience and labour to obtain, or that are photographically hedged with thorns—such triumphs of the camera should obviously receive higher consideration than their merely pictorial and technical qualities are entitled to, although, of course, the latter must never be lost sight of.

It is curious to consider how largely local influences and current ideals may combine to affect and modify the awards. If we, for instance, try to keep in our mind's eye the display at any one exhibition and the pictures that have merited distinction, to so impress it upon our memory that we may be able to recall it, as it were, for comparison with the next year's display at the same place; then, assuming that the judges are the same, as quite often happens, it will probably prove an interesting psychological study to compare the awards of the two years, and try to arrive at the principles and ideas on which they are issued. It may be quite posible for a keen and logical observer to distinctly trace the influence that passing theories may have left behind, or the subtle changes of sentiment and artistic judgment that the departed year has evolved. We may fancy ourselves saying, "If this show were put a year back, just as it is, and judged at that distance, would the results be quite the same?" And the answer in the negative seems almost inevitable. It must necessarily be so. The old order changes; new ideas, new paths, new men, come on the scene, and influence, imperceptibly but surely, all the standards and gauges by which our work is measured, till, before we know it, we find ourselves looking back with a pitying eye on what once seemed to us so excellent.

After all, it is a thankless work, this judging of pictures. Happy are the men who get through their task with the minimum of disagreement and dissent, for some there must be. In view of the, as human nature stands, practically unavoidable jealousy and heartburn that are often caused by the competitive system at exhibitions, it has sometimes been doubted whether it would not be better to abolish awards and distinctions altogether. But, alas, human nature again steps in with the immutable decree that without competition interest flags and progress ceases. And that being so, the photographic world may congratulate itself that it possesses so many in its ranks, of the requisite knowledge and acumen, combined with unchallenged fairness and impartiality, to undertake and carry out the arduous and troublesome duties of judges.

A. Lockett.

NOTES ON TELEPHOTOGRAPHIC LENSES AND A NEW SYSTEM ("ADON") FOR ATTAINING MAGNIFICATION WITHOUT LOSS OF RAPIDITY.

[A paper read before the Royal Photographic Society.]

In order to grasp most readily the significance of a telephotographic system, it is, perhaps, best to take as a starting point the case of a non-magnifying system.

In Fig. 1, A represents a plano-convex lens, and B a plano-concave lens. If these lenses are made of the same material, and the radius of curvature is the same in each case, it is evident that, if placed in contact, the combination will act as a plane disc of glass with parallel faces. Thus we have a lens of infinite focal length, or to express the case in words leading up to the significance of *practical* telephotographic combination, we have a combination of a positive and negative element, so situated that the distance between them is equal to the difference of their focal lengths. As the focal lengths are equal, the separation becomes nothing, or the lenses are in contact, and incident parallel rays emerge parallel, the diameter of the incident beam being equal to the diameter of the emergent beam. Again, the focal length of the positive element divided by the focal length of the negative element is unity, and in this case, with the lenses in contact, the focal length is infinite, with unit magnification. In practical telephotography it is usually essential that the magnification of the system shall exceed unity, in other words that the focal length of the positive lens be greater than the focal length of the negative lens. Fig. 1, in which the elements are so disposed that (1) they are separated by a distance equal to the difference of their focal lengths, or (2) that incident parallel

rays emerge parallel, is essentially the normal position to be taken as a standpoint for the subsequent interpretation of performance of the system.

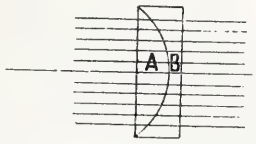


Fig. 1.

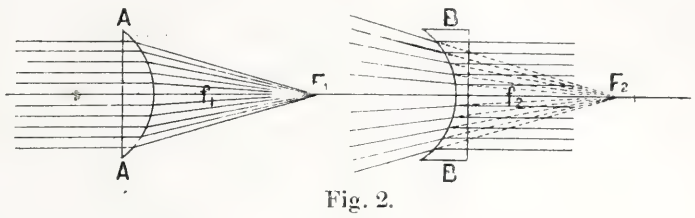


Fig. 2.

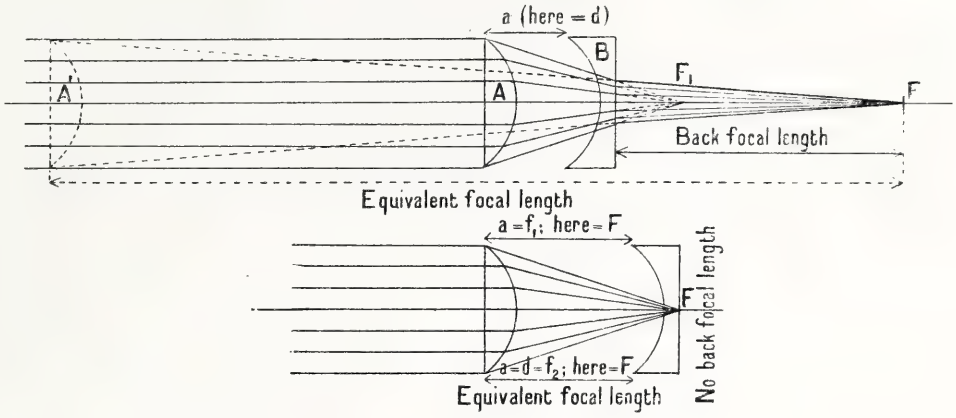


Fig. 3.

In Fig. 3 we can at once follow the departure from the normal position. Immediately the separation of the elements exceeds the difference of focal length, the combination has a positive focal length, or in order words a real image is formed. The measurement of either true focal length or back focal length is then exceedingly simple from the well-known formulæ :—

$$F = \frac{f_1 \times f_2}{d}.$$

$$F_{back} = \frac{-f_2(f_1 - a)}{d}.$$

Where F is the equivalent focal length of the combination, f' the focal length of the positive lens, f_2 the focal length of the negative lens, d the amount of separation greater than the difference between f_1 and f_2, and a the entire separation. (In the case illustrated $d = a$.) It is obvious that as the separation increases the focal length diminishes, until the focal length of the positive lens is also a measure of he equivalent lens, and the back focal length is = o. In ordinary systems composed of a positive and a negative element the range of separation, for practical utility, must be between a minimum, equal to the difference of the focal lengths of the component elements, and a maximum, equal to the focal length of the positive element. Fig. 4 represents any ordinary telephoto system in which the positive element is of greater focal length than the negative element, and shows clearly that the system becomes divergent if the minimum separation prescribed is passed in the one direction, and that the positive element alone forms a real image before the rays are taken up by the negative lens, if the maximum separation prescribed be exceeded in the other direction. It is hardly necessary to remind you that the chief objection to the present telephotographic systems is the very rapid diminution of the inensity of the sysem for increasing magnification. The initial intensity of the positive element is reduced in direct proportion to the linear magnification obtained, and the exposure must be increased as the square of the linear magnification, or in direct proportion to the area of the magnified image as compared to that given by the positive element alone. The problem of obviating this defect within reasonable and practical limits led me to construct the "Adon" system. A telephotograph has been popularly described as "a photographic record of telescopic vision"; again, the lens and the image formed by it upon the photographic plate has often been insisted upon as a parallel to the conditions of vision by the eye. Now the function of the object glass of the telescope is practically to furnish the user temporarily with an eye as large as the object glass itself, with the accompaniment of greater light-grasping power. Used in conjunction with its eyepiece the telescope is said to possess a certain magnifying power, or, in other words, of enabling the observer to obtain vision of the object focussed upon as though he were this certain number of times (= power) nearer to the object. [It is for this reason that celestial objects such as the sun, moon, and planets, situated at *measurable* distances, appear larger by telescopic vision, whereas the stars at "infinite" distances do not appear larger in a telescope although brighter. Stars invisible to the naked eye may become visible, and double stars are divided by this temporary nearer approach afforded by the telescope showing them under a greater angle.] The power of the telescope is determined by (1) dividing the focal length of the object glass by the focal length of the eyepiece, or (2) by dividing the diameter of the object glass (effective aperture) by the diameter of the pencil of light emergent from the eyepiece. The diameter of the emergent pencil is of considerable importance in the selection of a telescope as a "night-glass"; it should be at least as large as the pupil of the eye, which is about two-tenths of an inch when fully dilated, in order to obtain the maximum illumination of any object in the field. If the emergent pencil exceeds this diameter, no advantage can be taken of it by the eye, which may be said to be "diaphragmed" to a diameter of two-tenths of an inch at its largest aperture. By employing telescopes of very high power the emergent pencil from the eyepiece becomes very small and considerably below two-tenths of an inch in diameter, and the field is proportionally darkened. Reverting to the parallel between the photographic lens and the lens of the eye, the aperture of the former is ordinarily of much greater diameter than the extreme aperture of two-tenths of an inch possessed by the eye.

To solve the problem of maintaining the initial intensity of the photographic lens for any degree of magnification at its focal plane, it is evident that the parallel emergent pencil from the

magnifying system (Adon) must be at least as large as the effective aperture of the ordinary lens-system to which it is applied, and the effective aperture of the positive element of the *enlarging system* must be as many times greater in diameter than the emergent pencil as the degree of lineal magnification desired. If the positive and negative elements are separated by a distance equal to the difference in their focal lengths, parallel incident rays emerge parallel, and if the ordinary lens to which it is applied is focussed for parallel rays (distant object), it is evident that the enlarged image will also be received at the focal plane of the ordinary lens, the degree of magnification depending upon the ratio of the focal lengths of the positive and negative lenses forming the enlarging system.

elements of the Adon, permitting a greater degree of magnification for near objects than is possible by the neat contrivance based upon the addition of positive lenses, known as "Frena Magnifiers." These in reality shorten the focal length of the lens to which they are applied, enabling the conjugate focus of the lens for a near object, temporarily shortened in focal length, to be received at the focal plane. Before proceeding to the readiest means of arriving at intensity and correct exposures with the "Adon" system, let us examine the conditions of its use in a definite example:—Take a lens of $5\frac{1}{2}$ inches focal length working at an intensity of $f/8$, its effective aperture being $\frac{7}{10}$ inch. In order that its intensity may be maintained at the focal plane, the parallel emergent pencil from

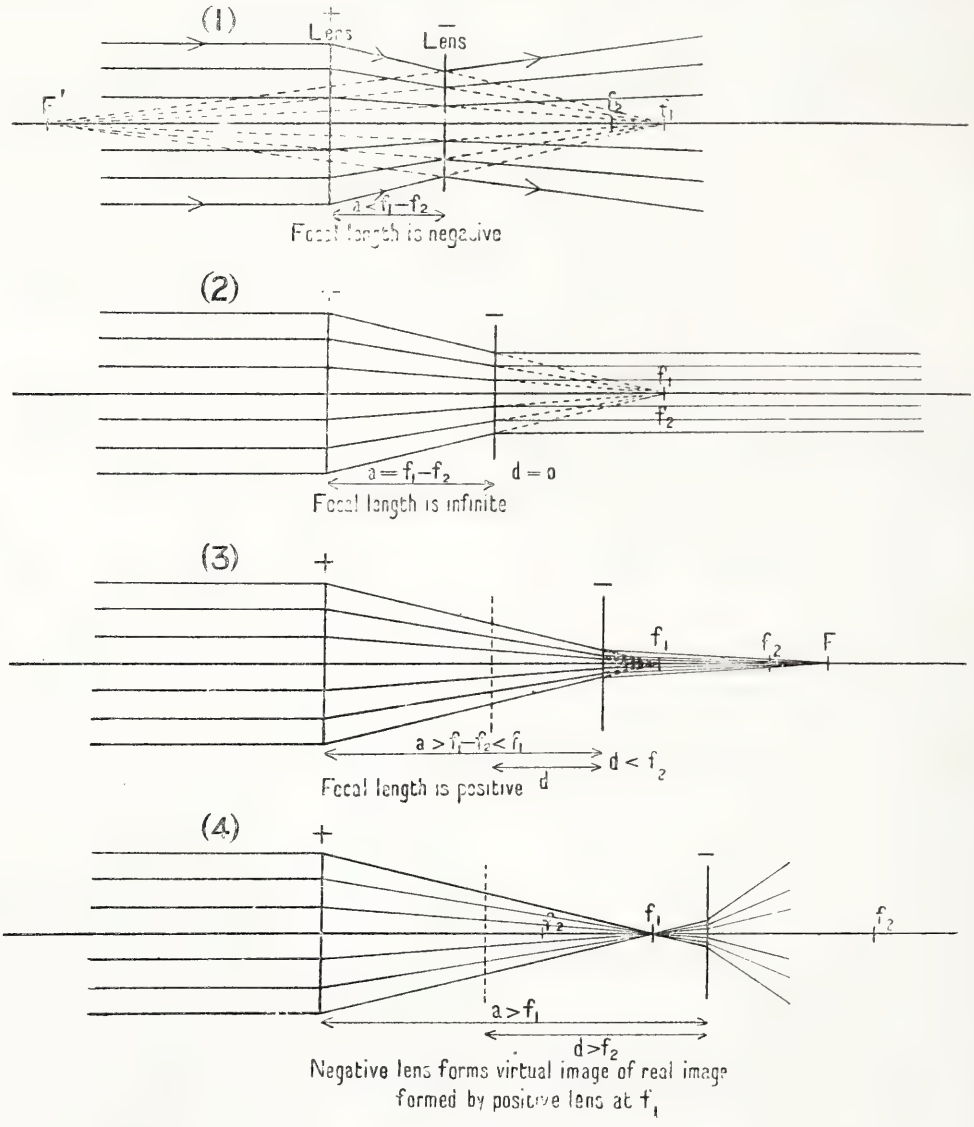


Fig. 4.

It is hardly necessary to state that the optical construction of the "Adon" is such as not to interfere with either the spherical or the chromatic corrections of the lens to which it is applied. The *full* covering power of the latter is necessarily curtailed by the added length, but it is possible to obtain a $3\frac{1}{2}$-inch circle or rather more upon a quarter-plate at the focal plane of most hand-camera lenses.

In common with known forms of telephotographic lenses an adjustment of the separation of the elements of the "Adon" will permit the image to be received upon a nearer or more distant plane than the focal plane, with altered conditions of rapidity. Any plane also in the object may be received upon the focal plane, by increasing the separation of the

the "Adon" must be $\frac{7}{10}$ inch in diameter, and this determines the minimum diameter of negative element of the system. For a linear magnification = 2, the positive element of the system must be at least 1.4 inch in diameter, and twice the focal length of the negative element. In order to curtail the angle of field to the least possible extent it is essential to keep the focal lengths of both elements as short as is consistent with good correction. I have found it convenient to make the positive element of the system of approximately the same focal length as the ordinary lens to which it is applied, and the negative lens of one-half that focal length, for a linear magnification = 2. In the case chosen as an example the focal length of the positive element is $5\frac{1}{2}$ inches and the negative $2\frac{3}{4}$ inches. (See Fig. 5.) This figure

represents the optical conditions under which the instrument can be practically applied, but does not represent the optical system of lenses adopted; an opportunity may be taken to refer to this at a technical meeting shortly. Two methods are available to determine the intensity of the complete combination of the "Adon" and ordinary lens to which it is applied. The first is irrespective of the focal length of any lens to which it may be applied. Adjust the separation of the elements of the "Adon" so that incident parallel rays are parallel upon emergence. The diameter of the emergent beam is then measured by a rule, or more conveniently by a micrometer eyepiece called a "dynameter." If the diameter so found is equal to or greater than the largest effective aperture of the lens to which the "Adon" is applied, no theoretical loss of intensity will result, and the calculated exposure for the ordinary lens used alone will hold good for the magnified image at the focal plane. It follows that if the correct exposure is known for any given intensity ratio of the ordinary lens, and the effective aperture of that particular stop is known, it is only necessary to reduce (by an iris diaphragm) the emergent beam from the "Adon" to this diameter in order to maintain the same intensity for the entire instrument.* The second method will perhaps be more easily carried out by those familiar with the present forms of telephotographic lenses:—By placing the *negative* element *only* as near as may be in contact with the ordinary lens system, this converging system is converted into a somewhat complicated, diverging, or negative system. Approximately, the ordinary lens system of $5\frac{1}{2}$ inches focal length is converted into a negative system of $5\frac{1}{2}$ inches focal length (by the simple formula)

$$\frac{1}{f} = \frac{1}{5{\cdot}5} - \frac{1}{2{\cdot}75}.$$

If now we consider the $5\frac{1}{2}$ inches positive element of the "Adon" as the positive component of a differently conceived system in which its negative element combined with the ordinary lens system forms a complete negative element, the familiar rules for obtaining the intensity of the entire combination from magnification, or camera extension, etc., will apply.

THOMAS R. DALLMEYER F.R.A.S.

* The diaphragm is placed between the combinations of the "Adon," and is best left to govern the intensity, the ordinary lens to which it is applied being used finally at full aperture, in oreer to favour the greatest angle of field possible to be covered.

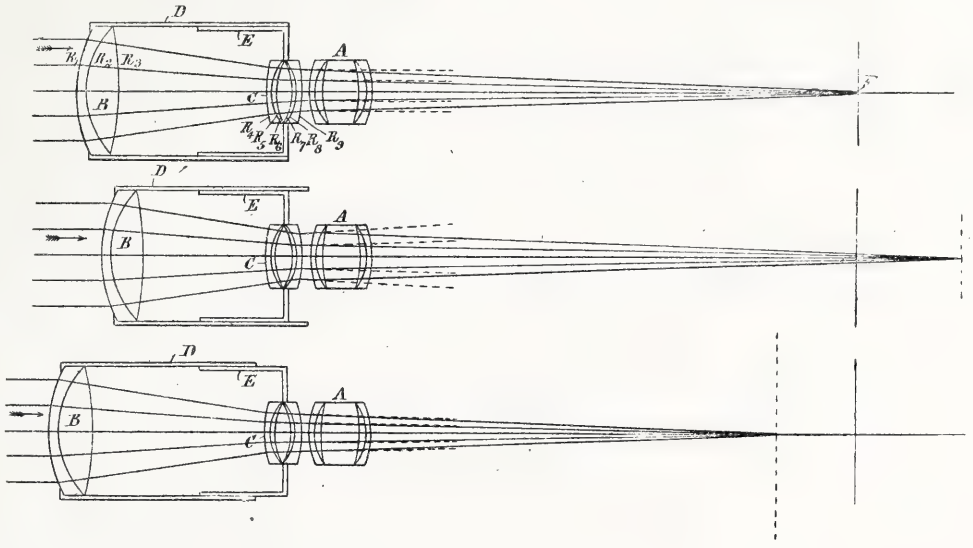


Fig. 5.

SEARCHING FOR NEW STARS.*

[Reprinted from "Popular Astronomy."]

"AND must I ravel out my weaved-up"—"follies," I was about to say, like King Richard; but since nothing astronomical could possibly be called foolish, I shall alter Shakespeare, and say "my weaved-up past?" Of course, I am reluctant; but your request is a sufficient excuse for any apparent lack of modesty on my part.

I need hardly say that before the advent of Nova Aurigæ my astronomizings were fruitless—fruitless, that is to say, so far as the rest of humanity was concerned, but far from being fruitless as regarded myself, for there was for me at least a certain joyful calm when, after a long evening spent in writing sermons or in other work, I threw up the window, and taking out my little pocket telescope, surveyed the never palling glory of the midnight sky. But after the appearance of Nova Aurigæ, the thought occurred to me that perhaps after all new stars might not be such rare phenomena as had up to that time been supposed. The correctness of that surmise has been proved by Mrs. Fleming's discovery since then of no fewer than five of these objects on the Harvard College photographs, although it is certainly strange that all these Novæ should have appeared in the Southern Hemisphere. I therefore resolved to commence a search for new stars, a resolve in which I was encouraged by Professor Copeland, the Astronomer Royal for Scotland, who gave me advice as to instruments, charts, catalogues, etc., and told me that my search, if unsuccessful so far as Novæ were concerned, would almost certainly lead to some discovery or other.

Accordingly, I at once purchased a large binocular. This I soon reinforced by a second-hand $2\frac{1}{4}$in. refractor by the well-known Jesse Ramsden, which shows me stars down to the tenth magnitude; but desiring to see still fainter objects, I bought in 1899 a 3in. refractor by Mr. William Hume, of this city. With this last instrument I can on a clear night see stars as faint as the eleventh magnitude. As regards charts, I was somewhat unfortunate, for I had the mortification of learning, when I sent to Bonn for those of the B.D., that many of them were out of print. However, I secured the whole of them for the sky north of +40 deg., and I filled up the lacunæ among those for the more southerly regions by means of some constructed by

* This paper is a letter written by Dr. Anderson, of Edinburgh, Scotland, February 19th, to Mr. H. B. Hollis, editor of "The Observatory," and published in that journal in March of this year.

myself, with the help of the positions given in the B.D. Verzeichniss. These home-made charts, containing as they do, upwards of 70,000 stars, cost me a deal of time. It was a work which I should scarcely have undertaken had I known that a new edition of the B.D. charts would appear in a few years. In the matter of catalogues, too, I was somewhat unsuccessful, since all my efforts failed to obtain for me that part of the B.D. Verzeichniss which contains the stars north of + 41 deg. Still, as I had the charts for that part of the sky, the want of the "Verzeichniss" was little felt by me, and I subsequently supplied any deficiency in that respect by purchasing the various volumes of the great Gesellschaft Catalogue as they came out.

Thus armed, I began to hunt for new stars. I worked with might and main, never going to rest as long as the sky remained clear, and often rising in the night to see if the clouds had passed away, and if they had, hurrying downstairs to begin work, either with binocular or with telescope. The chief obstacle that I have had to contend with in such work is that the only windows in this house from which I can thoroughly examine the heavens face the north-west. Not only is my field of labour thereby very greatly circumscribed, my telescope being able to command only that part of the heavens which extends from the equator to + 70 deg., but the discomfort is frequently not inconsiderable, as the northerly and north-westerly winds which so often bring with them transparent, unclouded skies, are in winter and early spring far from being balmy, and can make themselves felt even when the window-shutters are partially closed.

At first my search was mainly for Novæ, and was prosecuted by means of my binocular, but after several months passed in diligently comparing the heavens with my charts, I found nothing that could be mistaken for a Novæ, except the eighth magnitude star Weisse-Bessel XIXh 358 (otherwise 4767 of the First Glasgow Catalogue), which through some oversight is omitted from the first edition of the B.D. charts. As this star lies in the constellation Aquila between the two branches of the Milky Way, I pounced on it at once as a Nova, only to find to my disgust that it was a well-known and long-established denizen of the firmament. (This star has, I may mention, been inserted in its proper place in the new edition of the B.D. charts.) When I came to see that hunting for Novæ was not attended by the success which I had anticipated, I began, without entirely abandoning such work, to make a systematic search for variable stars. For this I used my 2¼in. telescope, comparing what it showed me with the representation of the heavens contained in the B.D. charts. Of course, there were very many discrepancies between the two, for it must be remembered that Drs. Argelander, Schönfeld, and Krueger, when making the B.D., never intended that it should be complete except for stars of the ninth magnitude and brighter. Of fainter objects—and, as those who use the B.D. know, these form a large proportion of the stars laid down—there is only a selection. In many instances stars little brighter than the tenth magnitude have been omitted. It can easily be imagined how puzzling this was to me, especially as it was to a large extent faint stars that I examined for variability. I was always glad if, after three or four months of serching, during which I might have examined perhaps 20,000 stars and suspected fifty or sixty of variability, I was able at last to come across one whose brightness changed.

I found Nova Persei, I need hardly say, without either binocular or telescope, when I was casting a casual glance round the heavens.

PHOTOGRAPHY AT THE ROYAL SOCIETY'S CONVERSAZIONE.

If proof were wanted of the great place taken by photography in the nation's scientific work, it would be found in the exhibits of the yearly conversaziones of the Royal Society, which would not be complete without one or more illustrations of what photography does for science. At Burlington House last week this annual function was held, and was the usual success. Among the exhibits that attracted much attention were those of Mr. J. Mackenzie Davidson, who showed some Röntgen ray transparencies and negatives stereoscopically treated. He had also two skiagraphs of a bullet fired from a revolver. During the evening he developed dry plates without the intervention of the usual non-actinic light, the result being a reversed negative. Then there were Messrs. Sawyer Shepherd's natural colour photography apparatus, and also a new camera for obtaining the three necessary trichromatically correct negatives with the use of one lens only and at one exposure; and again a camera for photomicrography, which was fitted with trichromatic filters for natural colour photography.

Ultra-violet radiations.—The specially actinic power of the rays of the spectrum in this region upon ordinary photographic plates is well known, and a number of experiments with these particular rays were exhibited. This effect in promoting the electric discharge, as discovered by Hertz in 1887, was shown by Professor A. J. Fleming, while Dr. Dawson Turner showed the transparency of rock-salt to those radiations, this particular substance being the most transparent to ultra-violet radiations. We have heard it argued that photographic records of the operator should always be made with rock-salt prisms and rock-salt lenses. For absolute comparative records this would perhaps be desirable; but as all, or virtually all, photographic work is done with glass lenses it is obvious that the record of spectral regions made with glass lenses would give true indications of what might be anticipated in practical photographic work.

As bearing on the variations of individual colour perception—colour blindness not being suggested—Professor Ramsay's Krypton tube was instructive. It was stated that the colour of a vacuum tube containing this gas is termed green, while others describe it as lilac. In the Meeting Hall, at 9.45 p.m., Sir H. Truman Wood demonstrated the application of photography to the production of pictures in colour, and Dr. R. D. Roberts an hour later demonstrated the practical outcome of such methods by showing with the electric lantern a number of slides in natural colours, which he had taken of the Grand Canon of the Colorado, the Sierra Nevada, California, and the Yellowstone Park.

AMONG THE PICTURES.

By a Photographer.

A precept inculcated in all branches of life is that we should follow a good example. The photographer may well take this to heart, and in his yearning after the pictorial, to what better fount of learning can he go than to the work of our great artists; these will educate his sense of perception, and he will learn, by intuition, as it were, to see for himself the beautiful in Nature, and the common everyday life about him. The opportunity is not given to everyone to view collections of paintings as they come from the brush of the master, and not a few who have that opportunity fail, by reason of the glamour of the colouring to grasp the component lines forming the picture, just as a scene which may look beauty personified on the ground glass of the camera, is common-place and uninspiring when translated into the monochrome of the photograph—the colour bewitched us.

To these the many reproductions of paintings that are now offered for sale come—if they are good—like a glimpse of paradise, and for many years I have looked forward to the opening of the Royal Academy, so that I could get the annual issue of "Pictures," by "Black and White." There may be better annuals dealing with the subject, but in our out-of-the-way townlet we have not all the privilege of Fleet Street.

This annual, which, of course, owes its existence to photography, used to in a way acknowledge the cult of the camera by printing a small photograph of the president of the R.A. on the title page. This practice still continues, but following that we have fourteen full-page reproductions of photographs of leading artists at work; then (after the Stereoscopic Company's advertisement) follows the pictures.

A study of these reproductions will well repay any photographer with ambitions towards betterment, and from them he can learn much. Landscapes are more strongly represented than in previous years, and many of them lend inspiration to the photographer, while some show us our limitations; for instance, the photographer fails to give that idea of "vastness" and space that we have in "Across the Heath," by B. W. Leader, R.A., although not a few have tried to render this feeling, the most successful perhaps being Inston's "Whence and Whether," which was, I think, the "biggest" photograph (leaving inches out of count) that I have seen. In "Three Kings, Sherwood," by MacWhirter, we have an able lesson on simplicity (a lesson to which we may frequently recur), and the power of contrast; the three fine old tree trunks

dominate the picture, although at a second glance we find some birch trees that, by their smallness, tend to accentuate the majesty of the "kings." In "A Woodland Walk," by Arthur Lucas, we have another "tree study," it lacks the grandness of the MacWhirter, but has yet a beauty of its own, and the composition is instructive. "In the Tangled Wildwood," by Ernest Parton, would gladden the heart of "Birch and Bracken," Thomas; while on the opposite page "The Yellow Moon," by Tom Robertson, would be an inspiration to the "gum-bi school." On page 52 we have two quiet pictures, that might well act as head lines for the landscape photographer. Again simplicity is insisted on, especially in "Summer Silence," where a few tall poplars and a winding river form the principal notes in the theme. The author of this, Harry W. Adams, gives us another subject for study in his "Malvern's Lonely Height," a telling study of winter, simple yet convincing. Photographers for long rendered the sky in their landscapes by an absolutely blank expanse of white. In the natural course of events it was found that the sky was never white, and now, as a rule, every landscape has a very obtrusive sky printed in. This is not necessary, but it is just what might be expected—the opposite swing of the pendulum. The artist makes his sky quiet if his subject is quiet (see pages 35, 76, 109, 110, and others), but space and the fear of the editor's blue pencil hurries us on.

In the figure studies we have some telling illustrations for our guidance, to mention only one or two. In "The Skipper's Yarn," by Stanhope A. Forbes, we have the simplest of material arranged with absorbing concentration; on the opposite page we have "For the Rose is Beauty, the Gardener Time," by Frank Bramley. Here we have a splendid old man, bearing a sickle, amongst clustering roses, the careworn, weather-beaten face, in its setting of grey hair, contrasting with the fragile beauty of the roses, form a memorable picture, yet it is quite within the scope of the camera. C. Kay Robertson, in "A Bit of Old China," has a telling character study in the head of an old Chinaman, strongly lighted and powerfully limned.

The photographer of a bye-gone day posed his victim amongst marbled pillars and palatial conservatories, but now we are coming to an age of simplicity, and in portraiture we have learned that the principal item is the person portrayed, and not a crowd of meaningless accessories. This same lesson is powerfully impressed upon us by a perusal of the hand-book before us; all the portraits in greater or less degree have for their keynote simplicity. For those who sigh for the days of old and the costumes of that period, Herbert Schmalz has painted a portrait of Miss Constance Meredith, to show us that modern costume is quite amendable to picture making. On page 58 we have an object lesson in grouping, which seems to be a lost art with the majority of our photographers. Page 78 recalls memories of Craig Annan's "Little Princess," while all through the book we have many portraits from which we might learn much, but space forbids us to particularise. We can thoroughly commend a careful study of these reproductions.

THE THORNTON-PICKARD PRIZE COMPETITION.

The new rules and conditions of this competition, in which 35 cash prizes of £3 each are offered, as as follows, and the special features are that negatives need not be sent in the first instance, and are only required in the event of any picture securing a prize, and that additional prizes will be awarded at the discretion of the judges, and there is only one class:—

1. Date.—All competing photographs must be sent in on or before October 1st, 1902. 2. Thirty-five cash prizes of £3 each will be awarded for single photographs and their negatives. 3. Negatives need not be sent with the photographs, but in the event of any picture being awarded a prize, the negative must be sent to the company, and on being found to comply with the rules against re-touching, etc., the amount of the prize will be remitted. 4. Winning prints and negatives become the absolute property of the Thornton-Pickard Manufacturing Company, Ltd., who will have the sole right to publish, copyright, and use them for advertising and other purposes. 5. Extra prizes.—Should they desire to do so, the judges will be empowered to award additional prizes beyond the 35 now offered. Such prizes to be of the same value—viz., £3 each. 6. Quantity of prints.—Any number of prints may be entered. They may all be different subjects, or a series of the same subjects in different styles or positions. 7. Size of prints.—The prints may be any size, but must be printed direct from the negatives. Enlargements not allowed. 8. Mounting of prints.—All prints must be mounted; this may be done in any way the competitor desires, but framing is not allowed. 9. Printing process.—The pictures may be printed by any process, on any kind of paper, but transparencies are not allowed. Composite negatives or printing from two or more negatives not allowed. 10. Re-touching.—Ordinary spotting of defects on the prints or negatives will be allowed, but re-touching will result in disqualification. 11. Apparatus used.—All photographs sent in for competition must be taken with either a Thornton-Pickard camera or shutter. Any camera or shutter of the company's manufacture may be used. 12. Successful competitors must furnish such information as may be deemed necessary, and if desired submit their apparatus for inspection and state when and where it was purchased. 13. Sending in the prints.—Every print must be clearly marked in ink on the back of its mount with the following particulars:—(a) The name and address of the competitor; (b) The exposure given, and full particulars of the circumstances under which the picture was taken; (c) the pattern of camera, shutter and lens used. 14. Judges.—The pictures will be judged by the directors and officers of the Thornton-Pickard Manufacturing Company, Ltd., whose decision shall be final. No director, officer, or employee of the Thornton-Pickard Manufacturing Company, Lt., will be allowed to compete. 15. All competitors sending in prints thereby bind themselves to accept and abide by the rules and conditions of this prospectus. 16. Packing.—It is important that the prints be carefully packed and forwarded, carriage paid, addressed: "The Thornton-Pickard Manufacturing Company, Ltd., Altrincham. Photo Competition." Date sent off..... Upon receipt of stamps to defray postage, prints which have not received a prize will be returned. Entry forms will be supplied on application.

INCANDESCENT ELECTRIC LIGHTS.

Electric lighting by means of incandescent radiators appears to be coming to the front in a very decided manner. We have from time to time described the progress of the Nernst lamp, and it now appears to me making decided headway. We saw the other day several of them fixed for an installation in a small provincial town, and the effect was all that could be wished for. The consumption of electricity was stated to be not more than that required for a 20-candle power ordinary glow lamp, while the power was evidently enormously superior. The only drawback that presented itself to the casual observer was the fact that the light did not appear with the instantaneity shown with the ordinary glow lamp. From twenty to thirty seconds were required before the full incandescence of the porcelain rod was arrived at. It will be remembered that before the current can be sent through the rod the latter must be raised in temperature. The first lamps made required an application from external sources, but now the lamp is self-contained. The current passes through a metallic spiral surrounding the rod, and after quickly denting, it is automatically cut out while the lamp "burns." The next interesting glow lamp is the Crawford-Voelker, which, however, is not yet a marketable commodity, though if it acts up to the claims made for it, the sooner it is made to sell the better. A 200 volt lamp consumes 2.5 watts per candle. After running for a thousand hours (by the bye, 800 hours' life is claimed for the Nernst). more electricity is needed (3.35 watts), and the candle power diminishes from 16 to 13. This lamp requires no preliminary heating. The filament is made, not of the usual carbon, from one source or another, but carbide of titanium made by working in the arc a carbon filament, which has previously been impregnated with an organic compound of titanium. We consider that one or other of these lamps should have a great future before it, for photographic use in lieu of the now well-known umbrella or glow lamps, on the one hand, or the electric arc on the other. The former type, even with double rows of burners, is inferior for rapidity of exposures to the arc light, though more handy in use, while the latter, though powerful, requires more attention to the carbons, and consumes a great deal of current, a single arc, as a rule, costing as much in current as if four were used.

THE Austin-Edwards Monthly Film Negative Competition.—The prize camera for the current month has been awarded to Mr. W. C. Hope, Pawys Villa, Park Road, Cowes, I.W., for his negative "The Young Angler."

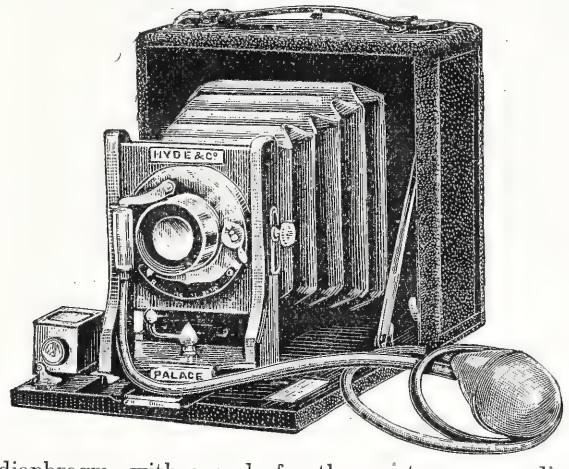
STOPPING Down the Lens of the Human Eye.—In photography, if the lens is affected with spherical aberration or other defects, or if the aperture is too large for good definition, the operator usually gets over the difficulty by using a smaller aperture or stop. This improves the definition and makes the picture sharp even to the corners of the plate. This process is technically called "stopping down the lens." In amateur landscape work I generally use an aperture or stop with a diameter of 1-50th of the focal length of the lens, or f/50. But the human eye has defects, especially as we get old. For instance, the curvature of the crystalline lens becomes too flat, etc., and we have to use spectacles to enable us to read. Reasoning by analogy, diminishing the aperture of the eye by "stopping down the lens" ought to improve defective definition and make the vision sharper, and experiment proves that such is actually the fact. I find that the best effect is obtained by holding a thin metal plate close to the eye, with an aperture in it 1-50th of an inch in diameter. This arrangement resembles the old single landscape lens used in photography. The small stop is in front, the lens in the middle, and the sensitive plate or retina at the back. I use convex spectacles myself for reading, but with a stop of that size I can easily read small print within 4in. of the eye (or even less) in a good light without spectacles. I have tried the experiment with several of my elderly friends, and in every case with success. Anyone can try the experiment by means of a pinhole in a card. I do not know exactly what is the focal length of the lens of the human eye, but supposing it to be ½in., then with a stop of 1-50in. the technical expression for the size of the stop would be f/25, or double the diameter of the one I use in landscape photography. I enclose a metal disc with such an aperture. By looking through it I can read the smallest type in "Nature" at 4in. from the eye.—WM. ANDREWS in "Nature."

New Apparatus, &c.

THE "PALACE" CAMERAS.

Hyde and Co., 1, Palace Street, Buckingham Palace Road, S.W.

We gave the particulars recently of a competition organised by Messrs. Hyde and Co., open to users of the "Palace" cameras. The cameras have now been submitted to our inspection, and we have pleasure in giving a description of them. The Palace magazine hand camera is a well-finished instrument of the box form. It is covered with black, long-grained leather, and the outside metal fittings are bronzed, thus it presents an extremely neat appearance. The camera carries twelve quarter plates or films, which are changed automatically by pressing a lever, an indicator, registering the number of the plate exposed. In our hands the changing arrangement worked perfectly, and the change of plate we found could be effected very rapidly, enabling a quick succession of plates to be exposed, if required. The lens is a Rapid Rectilinear, working at *f*.8, and has



an iris diaphragm, with a scale for the apertures, according to the standard system. The lens is fitted with a focussing jacket, a lever with scale indicating the distance for which the lens is set. The shutter is "everset," and gives time and instantaneous exposures, the latter ranging from 1-25 to 1-100 of a second. A pneumatic release is also provided. There are two brilliant view finders, and bushes are provided for fixing the camera on a tripod for both vertical a d horizontal pictures. The price complete is £2 2s.

The Palace folding hand camera is also an extremely well finished instrument, and is designed either for use as a hand camera or upon a tripod. It possesses every movement that is usual in ordinary stand cameras, and the plates are contained in double dark slides, of which three are provided. The body of the camera is of polished mahogany, the interior being covered with black leather, and the fittings are of polished and lacquered brass. The body of the camera is square and has a reversible back, and a focussing screw is provided. The finder is also reversible, giving a correct image of the view included

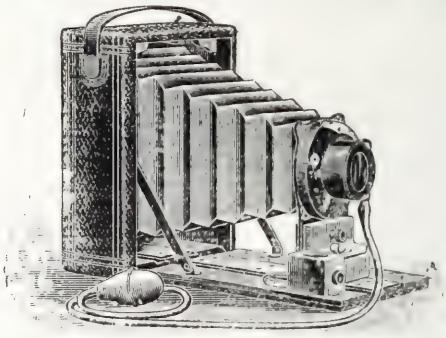


on the plate, whether used vertically or horizontally. The lens is a Rapid Rectilinear, working at *f*.8, and is fitted with an iris diaphragm and an automatic shutter, with pneumatic release arranged for instantaneous, time, and bulb exposures. The price of the camera, including three double backs, is £2 2s. Both these cameras are wonderfully good value for the money, and are designed with an attention to details which shows that they are the outcome of the practical experience of an expert in hand camera work. Apart from the inducement of a chance of securing some portion of the £80 offered for competition among users of these instruments, they should secure a large share of popular favour on their merits.

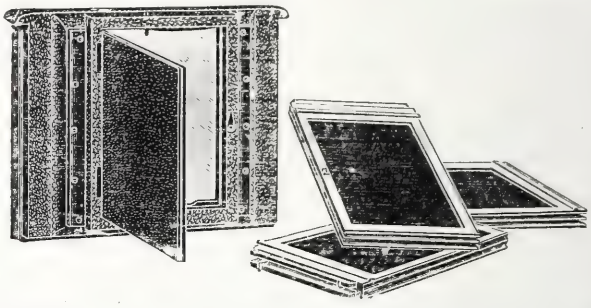
The "Roll Film" Sanderson Hand Camera. Manufactured and sold by Geo. Houghton and Son.

The Sanderson patent front and ordinary hand cameras are so well known it is unnecessary for us to more that state all the good features of the one are to be seen in the new "Roll Film" hand camera, which may also be supplied with a special plate adapter if required. The details as given by the makers are as follow:—

"The make and finish of the 'Sanderson' hand cameras is of the very best. The wood-work is of well-matured mahogany, polished inside. The metal work used in their construction is chiefly hard rolled brass, and all the mechanical parts are beautifully fitted and finished. The rack and pinion work is of the diagonal pattern, which imparts a freedom and smoothness which are delightful to the operator. The covering is



of black morocco, and the bellows are of a special hard-grained leather, both calculated to stand the wear and tear of every-day use. The camera is also fittted with a shoulder strap. The lens is a 'Bausch and Lomb' of very fine quality, with iris diaphragms, the focal length being that best suited for all ordinary purposes on the particular-sized camera to which it is fitted. It is of the rapid symmetrical type, has full covering power, and gives exquisite definition. It can be used in doublet form, or the separate components may be used as single lenses by unscrewing the front or back combination, either of which possesses a focal length about double that of the complete lens. A wide angle lens to screw into "Unicum" shutter in place of the ordinary lens can be supplied, also a telephoto lens of very light and compact form to use in conjunction with the 'Bausch and Lomb' lens and shutter. 'Goerz' double anastigmat, 'Dall-



meyer' Stigmatic, 'Cooke,' 'Beck-Steinheil' orthostigmatic, 'Busch,' and lenses by any other makers can be fitted. The shutter is the well-known 'Bausch and Lomb Unicum,' working between the lenses, and giving a varying exposure of from one second to 100th part of a second, either by hand or pneumatic release. Time or ball exposures are also obtainable, the shutter in the latter case remaining open as long as the ball is pressed. The finders are of the improved brilliant form, and even in sunshine give a bright image the correct way up. The double dark slides, usually supplied for use with the plate adaptor, are of solid pattern with draw-out shutters, but polished mahogany bookform slides with spring catches can be had, if desired, at a small extra cost, as listed."

The Ensign Developers.

The same firm are also issuing in cartridge and packet form a very convenient series of developers, toning, and toning and fixing baths, which will be found not only useful in ordinary work, but also during the holidays for the tourist.

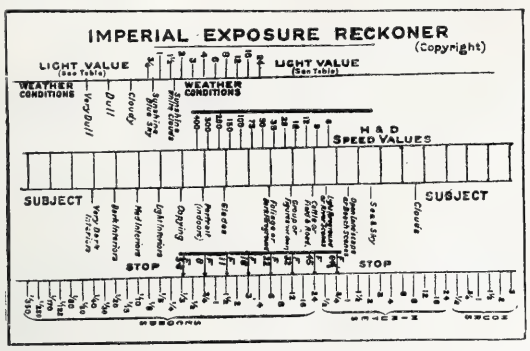
The Imperial Exposure Reckoner. Manufactured and sold by the Imperial Dry Plate Company, Ltd., Cricklewood, London, N.W.

This is an instrument for calculating the corect exposure to be given by the photographer.

The instrument consists of a stout piece of cardboard, about the size of a business envelope, which has two sliding arms fitted into it and flushed with the surface. The top sliding arm has printed on it the various weather conditions under which the exposure is made, and also the speed values of the plates being used. The bottom arm has spaces allotted to various classes of subjects, which may form the object being photographed, and also to the aperture at which the lens is being worked.

A table of the light values is printed on the back of the instrument. This table is adjusted for latitudes about 53deg. N., and so is suitable for exposures in the British Isles. Other tables, which can be gummed on to the back of the meter, can be obtained if the photographer is working in other latitudes.

To find the exposure, ascertain from the table the light value corresponding to the month and time of day. Turn to the other side of the meter and move the topslide till the line corresponding to the weather conditions is opposite to the light value.; then move along the lower slide till the line corresponding to the subject is opposite to the speed number of the plate employed. The stop used (F-value) will then point to the exposure required.



It will be seen that only two operations are required to ascertain the correct exposure, and five weather conditions and fifteen subject being enumerated on the face of the meter place such a fine discretionary power in the hand of the operator, that a mistake can only result from a gross error of judgment.

The instrument is protected when not in use by a neat case, and the cost of it will be saved many times over by those whose limited experience causes exposure errors to be an all too real phenomena.

We recommend this handy instrument to all photographers in search of a cheap and reliable exposure meter.

The Columbia Exposure Meter. Manufactured for and sold by the Columbia Optical and Camera Company, 42, Goswell Road, London, E.C.

This meter is a flat slide-rule printed in red and blue on ivory celluloid, and thus takes a form very convenient for the pocket. On the back is a table of light-values for each hour and month of the year, and on the front data as to the class of subject and speed of films and plates, and also the f/x numbers of diaphragms. The method of using as given by the makers is as follows:—"Find the correct light-value number, as directed on the back; slip the slide so that the light-value number (in red figures) is against the space containing the name of the subject you are photographing. Then the arrow will point to a certain number. Put that number against space containing the name of your plate or film. Then the correct exposure will be found in blue figures simultaneously every stop from the largest to the smallest." For those who desire to measure the light-value exactly by taking a strip of solio paper; fold it across so that a small part is exposed; hold edge down to part exposed, and hold it so that the same light falls on it as falls on subject. Count the seconds it takes to print a line that is just visible between exposed part and covered part. Use that number of seconds as light-value number. We especially recommend this method for inaeriors."

CATALOGUES.

The Columbia Optical and Camera Company, 42, Goswell Road, London, E.C.

A new compilation, containing descriptions of the special 1902 forms of shutters and cameras and other accessories.

Seabrook Bros. and Co., 21, Edmund Place, Aldersgate Street, London, E.C.

An art edition of this firm's catalogue, containing full description, with illustrations, of their specialities in Wizard cameras, and of work done by them. It is tastefully got up, and well printed.

Canonbury Camera Club.—A meeting was held on Monday evening, May 12th, at 28, St. Paul's Road, N. The first lecture and demonstration for the season was conducted by Mr. W. L. Prosser, who pointed out many little intricacies in toning and fixing, and made comparisons with the single solution and comgnned baths. All the members were present, and the meeting proved very successful. Next meeting June 2nd. All particulars from the hon sec., J. J. Curtis, 60, Canterbury Road, Islington, N.

A "Defective" Photo.—A friend was invited by a gamekeeper to photograph some young pheasants, and after doing so, he sent a proof print to the man, who inquired, "Why ain't 'em all the same size?" In order to make the point clear, the photographer led the gamekeeper to the scene of operations, and asked, "Do you mean to tell me that the birds which are farthest off look as big as those which are nearest to us?" "Well," replied the keeper, "whatever you may think, I knows they be as big, 'cos they was all hatched at the same time."

Patent News.

The folowing abridged descriptions are specially drawn for the British Journal of Photography by Messrs. Hughes and Young, patent agents, 55 and 56, Chancery Lane, W.C., who will give advice and assistance free to our readers on all patent matters:—

Patent Applications.—No. 10,609.—Paul Brandt, Lord Street, Liverpool. "Improvements in dishes for photographic purposes."

No. 10,610.—Paul Brandt. "An improved holder for use in treating photographic plates and films."

No. 10,617.—Gustav Adolph Sommer, Hillcrest Road, Acton. "New or improved shutters for photographic cameras."

No. 10,690.—Edward Russell Clarke, 35, Leinster Gardens, London. 'Improvements in methods and apparatus for taking colour photographs."

No. 10,766.—Joseph Thacher Clarke and Kodak, Ltd., Hatton Garden. "Improvements in film spools and in their connection with photographic cameras."

No. 10,813.—Jan Szczepanik, Lincoln's Inn Fields. "Improvements in or relating to the production of photographs in natural colours."

Patents Illustrated.—No. 1,196.—Photography. Patentee: G. Orth, Carl Zeiss Strasse. Jena, Grand Duchy of Saxe-Weimar, Germany.

Shutters, roller slides, change boxes.—Relates to mechanism for actuating a roller-blind shutter, which after exposure resets the shutter and brings a section of film or a plate into position for the next exposure. The shutter is placed in front of the film. The two blinds of the shutter are wound on separate rollers. These rollers are actuated by two toothed wheels on the same axis. and connected together by a pin and slot, so that there is a backlash between the two wheels equal to the length of the slot. The wheel is rotated by a mainspring through the wheel and pinion. To release the shutter a detent lever is dwisengaged from a stop on the wheel.

No. 1,291.—Photography. Patentee: A. V. Christiani-Mayail, Le Raincy, France.

Printing; developing; lamps, actinic.—Relates to an automatic apparatus for printing from negatives on a continuous roll of sensitive paper, and a device for developing the print. The apparatus is designed to be worked by hand or by a motor, the apparatus designed to be driven by a motor. The band of printing paper is drawn from the spool by the traction roller passing down between it and the pressing-roller to the receiving roller. Between the rolers the papr passes under the negative, against which it is pressed intermittently by a presser paid, which is moved up and down by the cam on the axis. The axis is rotated by gearing from the wheel, which is driven by a chain and weight. The roller is rotated intermittently by chain-gearing from the axis, the roller being disengaged at intervals from the gearing by a clutch controlled by a cam.

Mr. J. H. Jamieson, late of the London Stereoscopic Company, London, has taken over the photographic business of Mr. Fred Ash, at 91a, Fishergate, Preston.

We regret to have to announce the serious illness of Mr. R. Flamauk, through which considerable delay in the execution of orders for enlargements has been caused. Every endeavour is being made by Mrs. Flamauk to cope with the work, and the indulgence of our readers is asked for the same.

Messrs. Chas. Griffin and Co., Ltd., of Exeter Street, Strand, announce a second edition of "Photography: Its History, Processes, Apparatus, and Materials," by A. Brothers, F.R.A.S. The first edition of this work has been to us an extremely useful reference book, and judging from the preliminary prospectus, which contains a list of the general contents, the new edition should be as welcome as its predecessor, for it seems to have been brought thoroughly up to date.

The editor of "Bibby's Quarterly," published at Exchange Chambers, Liverpool, is issuing the following circular:—"To the Photographic Artist into whose hands this may come.—Dear Sir,—I have long had an idea that there are now in the hands of photographers throughout the United Kingdom copies of photographs which I might be able to reproduce in 'Bibby's Quarterly' to the advantage of all concerned, if only I could put my hands on the prints as required. In order to try and bring myself into some sort of communication with photographic artists, I am sending out this letter with a sample of my 'Quarterly' to a selected list of name in order to put forward the following suggestion:—Should any photographer to whom this letter may come have any specially interesting print of his own work which he thinks would be of interest to the general public, I suggest that he will send a copy of same to me for inspection. I undertake to look over all prints submitted, and any which I consider likely to come in for my purpose I will pay 2s. for each print which I retain and a further 10s. 6d. when reproduced; but on these conditions the names of the photographic contributors will not appear in the "Quarterly." The rest of the photographs submitted I would return by next post, so that in any case nobody would stand to lose on the transaction. If you are agreeable to this proposal, I should be glad to hear from you. I do not know if you would like to receive the next four numbers of the 'Quarterly' as published, but I enclose you a subscription form in case you may wish to use it, now or later on. My next number will not appear until August."

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK

May	Name of Society.	Subject.
24.....	Camera Club.....	Ramble—Instow and Westleigh.
24.....	Ashton-under-Lyne Photo.	Ramble to Kenilworth and Warwick.
26.....	Southampton Camera Club.....	Demonstration of Apparatus and Materials by the representative of the Kodak Co.
27.....	Royal Photographic Society ...	*Clouds and the Photography of C ouds.* Captain D. Wilson-Barker, R.N., F.R.S.E.
27.....	Birmingham Photographic	*A Demonstration of the Wet Collodion Process.* Mr. A. H. Saunders.
27.....	Croydon Natural History.....	*Foraminifera from the Gault at Merstham.* Mr. W. Murton Holmes. Ordinary Meeting.
28.....	North Middlesex Photographic	Lantern Lecture (title not fixed). J. A. Sinclair, F.R.P.S.
28.....	Croydon Camera Club	Subject to be announced.
29.....	Oldham Photographic Society	Demonstration on Stero. Photography. Messrs. J. Hall and J. Whitehead.
29.....	London and Provincial.....	Open Lantern Night.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

May 15th.—Mr. R. Beckett in the chair.

Mr. R. P. Drage alluded to the remarks which fell from Mr. Haddon at a recent meeting, in whoch he strongly condemned sulphocyanide toning baths. Mr. Drage felt that he could not do less than refer to the almost universal popularity of the sulphocyanide bath, and suggest that any condemnation of the method should be accompanied by a clear statement of the grounds upon which the adverse verdict was given.

Mr. Haddon reminded the meeting that he had not been alone in expressing the opinion in question. The vote that was taken had shown that something like ten were against he sulphocyanide bath to seven in favour. As for the grounds upon which this opinion was based, personally, he found that sulphocyanide was not the best salt, because the results were unreliable. One batch of prints might turn out well with a bath compounded exactly as one which, at another time, gave extremely bad results—blue in the high lights and delicate half-tones and red in the shadows. He did not know of another salt which, associated with gold, gave results of such unwelcome variety. When a sulphocyanide bath could be made free of such annoying proclivities, he would be ready to withdraw his criticism. Asked to name a bath he would recommend in lieu of sulphocyanide, he said that he would infinitely prefer the formate bath.

Mr. A. Mackie remarked that the formate bath would not tone all gelatino-chloride papers. He thought that the discussion in general terms of the toning question was of little avail, seeing that printing-out papers were of such variety and differed so extensively in their action under various baths.

Mr. Haddon said of course it had to be remembered that some papers toned satisfactorily only with sulphocyanide; but, on the other hand, others toned equally well with any bath, and therefore there was no reason for keeping to sulphocyanide if its behaviour was not of the best.

Messrs. George Houghton and Sons' representative exhibited and described several forms of camera embodying the principle of Sanderson's rising front. This principle is now so well known that detailed description here is unnecessary. At the request of the meeting, the limits of the range of the camera were shown, and a short discussion ensued.

SOUTHAMPTON CAMERA CLUB.

At the Philharmonic Hall, on the 12th inst., there was a good attendance of members of the above Club, presided over by Mr. G. Vivian.

After the election of new members, the summer programme was opened with a print competition, the subject being "Portraiture and Figure Study."

The pair of prints contributed by Mr. Jurd were declared the winners, and he was accordingly awarded the Club's certificate of merit.

Arrangements were then made for the first ramble of the season, the rendezvous, St. Cross, near Winchester, being briefly described by the chairman.

The outing took place on the 14th inst., when the members mustered in force and fully embraced the many photographic opportunities afforded by the grand old structure, and its neighbourhood.

A good harvest of picture was reaped, and the ramble was thoroughly appreciated by all.

CROYDON CAMERA CLUB.

Chromatype, an interesting printing process, demonstrated by Mr. J. R. Gotz, formed the subject on 14th inst. Briefly it may be described as a mixture of colloid (apparently hardened gum) and pigment, spread on paper in a perfectly homogeneous layer or film. It is sensitised in an alkaline bichromate solution, dried, and exposed to the light behind a negative in the usual way. No image is visible, and a print meter is therefore necessary. Development, or "etching" as Mr. Gotz preferred to call it, is performed by means of hot water, to which fine sawdust has been added, the gentle friction of the latter assisting in proportionately removing the pigment and colloid body which has been slightly or not at all acted upon by the light. No transfer is required as in the carbon process, and the results are permanent. Local development can, if desired, be carried out with a soft brush, and the print modified, altered, and retouched in a manner that will bring delight to the heart of the gum bi-chromate worker. The paper is supplied in three tints—black, red, and sepia—and the prints obtainable are broad in character, of a delightful texture, and free from gloss. At the instance of the vice-chairman (Mr. Rogers) a cordial vote of thanks was accorded the demonstrator. During the evening the hon. secretary (Mr. E. A. Salt) drew attention to the new "Aldis" lens, the latest introduction of the anastigmatic and flat field type now so much in vogue. Although of exceeding simple construction, consisting of a front cemented double combination and a single back element, the high intensity of f/6 has been attained, together with brilliant definition, at full aperture. Comparatively low in price, and of British design and manufacture, the lens is worthy the attention of all photographers.

MARPLE AND DISTRICT PHOTOGRAPHIC SOCIETY.

On Thursday evening, the 8th inst., Mr. C. J. Harrison, of Manchester, read a paper upon the retouching of negatives, including practical directions for this desirable adjunct in photographic art. With the aid of prints and negatives he illustrated both the technical and the æsthetical considerations of the subject, and thereby proved himself no mere theoriser, but a capable worker, possessing an elevated taste and the true artist's aspiration for the realisation of his ideals. He said that retouching placed the ultimate result under personal control. A retouched negative did not imply lack of skill in any of the previous operations. The structural defects and accidental injuries which even the most expert photographer is liable to experience in his negatives makes it necessary for him to possess the ability to remedy them. Further, the photographer who defines art as a faculty to command in other minds thoughts and feelings by deliberate intention, soon realises the limitations of the merely mechanical means at his disposal in apparatus, chemicals, and printing mediums, and finds that a retouched negative gives him increased power and renewed interest in his work by enabling him to give fuller expression to his artistic conceptions. Retouching might be overdone, however, as in cases where the work was evident upon the finished print, or where the characteristic qualities of a photograph *per se* were lost in a vulgar apeing of some perhaps more fashionable form of pictorial representation; and this applied also to any other method of supplementing the ordinary operations for the sake of artistic effect. To succeed in retouching, he said, the only essential qualifications are a definite idea of what is wanted in the final appearance of the print and a steady hand. A knowledge of drawing is not needed. Referring to his own practice, he found a bottle of medium and two pencils—hard and soft respectively—were all the implements he considered necessary. In actual work he placed the negative at a convenient angle upon a table, in front of and sloping down to a window facing north. Upon the table, and under and behind the negative, he laid a sheet of white paper. He did not use a retouching frame, although it was an advantage to do so. He worked the pencil with a continuous circular motion. Any excess or error in the marks could be removed by a fresh application of the medium rubbed on with cotton wool. The lines of the image should not be interfered with. He used stipple and cross-hatch only rarely; the latter should never be intersected at right angles. He also used a thin wash of Indian ink for the purpose of filling up spaces. Three of Mr. Harrison's prints from retouched negatives may be mentioned. The first a busy river scene; steamship and river craft in the middle distance in good pictorial arrangement, but nearly a third of the negative, from the bottom right-hand corner, occupied with an objectless landing-stage. In the final print this has been obliterated and partly replaced by wave ripples. The result is a small masked oval bit of prettiness, just the kind of thing to give pleasure to one's appreciative acquaintances; yet the true impression of the scene had been recovered, for in the actual view the eye did not apprehend the landing-stage when looking at the shipping, and its appearance on the print would have claimed attention. Again, in one of Mr. Harrison's best pictures—the one he has entitled "Sunlit"—the motive of the picture is an effect of sunlight and shadow associated with the boles of forest trees. In its untouched condition the negative gave a print which showed the only too familiar patches of white at the top of the print, due to the sky exposed between the branches. This had the fault of drawing the eye from the central idea, and therefore Mr. Harrison, by means of pencil and a thin wash of Indian ink, reducedthese obtrusive whites to a tone which represented their relative value in the picture. A third example was still more remarkably improved. It was a winter scene: a brook-course, snow and trees, but right up the middle of the negative there appeared a straight black tree trunk without any feature of form or lighting to warrant its inclusion. This had been so marked out upon the negative that the ultimate print did not show the slightest trace of its existence in the scene, and this notwithstanding that it was placed in the midst of a thick growth of bushes and smaller trees. The print just described was awarded a prize at a recent exhibition in the district. Mr. Harrison's method is to study the scene and decide upon whatever pictorial possibilities there may be in it. Then, after having done everything to attain this end up to the negative condition, he makes a trial print, and where this is unsatisfactory, or fails to translate the desired effect, he continues his effort by retouching the negative. Sometimes, in the case of bad chiaro-oscura, he takes a piece of what is known as glass-paper, roughens the surface in the required places by means of pumice powder, and then works with pencil upon them. In other cases he resorts to the well-known process of rubbing down with methylated spirit and cotton wool. He als ouses powdered charcoal applied with a stump, the glass side of the negative being coated with matt varnish. Pinholes, the photographer's bane, he remedies by retouching in pencil with the circular movement referred to.

News and Notes.

London and Provincial Photographic Association.—On Thursday, May 29th, Mr. R. Beckett will give a lantern lecture illustrating his recent travels through Spain. Visitors are always welcome at the meetings of the Association.

Squabble at the Photographer's.—At the Nottingham Police Court, on Friday last, Mary Brady and Mary Owen, mother and daughter, were summoned for assaulting Terest Agnes Edley. Mr. Clayden, who appeared for the complainant, said the assault arose out of the visit of a travelling photographer to the neighbourhood 'in which the parties resided. The complainant arranged to have her baby and herself taken, but the elder defendant, who was the worse for drink, pressed for a photo to be taken of herself before the complainant. This ended in a squabble, and defendant struck complainant in the face, causing her nose and mouth to bleed, and the younger defendant scratched her with a hat-pin. The baby also received a blow on the forehead. The defendants alleged that the complainant was the aggressor, and called four witnesses in corroboration. The magistrates said it was a most disgraceful affair, and the complainant was not entirely free from blame. The defendants were fined 10s. each.

At the Spelthorne Petty Sessions last week, Charles Blumberg, 35, of Oakham, Cedars Road, Teddington, manager to the P.O.P. Company, was charged on a warrant with being the bailee of three sums of money—£5, £13 10s., and £4—the property of Henry Beaumont Watson, between January 27th and February 11th, and converting the same to his own use, thereby stealing the same. Mr. Young prosecuted, and asked that the word "servant" might be substituted for "bailee." Mr. Lay defended, and asked for a remand. Prosecutor said he was about to establish a factory at Teddington for the manufacture of photographic paper, and he engaged prisoner at £3 a week. He agreed to give prisoner £400 to make a machine to enable them to manufacture the paper. The business was to be known as "The Zenith P.O.P. Company," and was to be owned by prosecutor's brother, or prosecutor himself, under power of attorney. A deed provided that prisoner should not become a partner. On January 27th prisoner asked for money to begin necessary purchases. Twenty-five pounds were given to the prisoner, who first bought a cutting machine for £20. Prisoner was to give a weekly account, but rendered them very irregularly. The first account covered all amounts from January 27th to February 10th. It included £5 paid out by defendant for deposits on dyes, which were obtained on prisoner's advice. He asked to be allowed to fetch them, and went to London several times. On April 16th they arrived, and prosecutor found that they had not been paid for, and the £5 had not been deposited. The case was then adjourned, bail being allowed.

On Monday about 100 members of the Federation of the Photographic Societies of Northumberland and Durham paid a visit to Durham City. The outing, the first arranged by the Federation, was a splendid success, and it will doubtless be the forerunner of many similar gatherings at other places of photographic interest in the North. On arrival at Durham the visitors were met at the station by the president and members of the Durham City Camera Club, and afterwards the party assembled for a group photograph in the Castle Quadrangle, when they were joined by Dean Kitchin and the Mayor of the city (Councillor R. T. Herring). They then dispersed for camera work in the Castle, the Cathedral, the college grounds, the banks, and the environs of the city. Although somewhat gusty, the weather was fairly propitious, and both indoor and outdoor workers found plenty of scope for the exercise of their favourite pastime. In the evening the members gathered at the Shakespeare Hall for tea. Mr. W. Moult, president of the Durham Society, presided, and he was supported by Dean Kitchin and the Mayor, Councillor William Gray (Durham), Mr. A. Payne (secretary of the Federation), Mr. W. F. White (Gateshead), Mr. J. Davenport (South Shields), and Mr. Henry Dalton (Blaydon). Mr. Davenport, in proposing a vote of thanks to Dean Kitchin for his presence, said the idea of the Federation was to draw together the scattered societies of the two counties of Northumberland and Durham, and by this means to encourage struggling societies and generally to help the art of photography. The Mayor of Durham having seconded, Dean Kitchin replied. He said their work was one, to a large extent, of relaxation, but he should be sorry to think that this work, which coupled together science and art in a wholesome way, should be merely looked upon as a plaything and not as a serious element of their life at the present day. So many of the sciences had had a tendency to destroy art that really it was a great mercy to find something where science could be made the handmaid of art. In many ways photography had been a very great benefit. By photography they had the power of reproducing the rarest treasures of ancient manuscripts they possessed. This was a great boon to art. He went on to say that, through the agency of the Röntgen rays, photography had taken, in measure, the place of vivisection. In other ways photography was extremely valuable and useful. It had placed a great power in the hands of the workers in architecture, sculpture, and painting, and in these domains much had been wrought by its aid. Still, photographers had much to learn. The greatest difficulty was the representation of Nature in Nature's dress, and not merely in black and white. However, he had no doubt that in the long run some means would be discovered of solving the problem. In concluding, Dr. Kitchin expresed the view that as they progressed in their art it would bring them more into touch with man's work and with God's work in the world in which they lived, and the result would be to raise the intellectual characteristics of the people of the time, and to bring eventually a revival of science and art among them.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

WARWICK COMPETITIONS.

To the Editors

Gentlemen,—We have pleasure in handing you herewith the list of awards of the Warwick Competition for current month:—£1 Prize, F. W. Beken, Blenheim House, Cowes, I.W. "Steeplechasing at Ashey." £1 Prize, Mrs. G. J. Bell, Schoolhouse, Brimington, Chesterfield. "Reflections." £1 Prize, E. S. C. Betteley, 27, Dry Hill Park, Tonbridge. "S.S. Rapide, Dover." £1 Prize, Miss Maye Bruce, 2, Cromwell Houses, London, S.W. "Sweet Seventeen." £1 Prize, Miss Kate Dod, 52, Chalsey Road, Brockley, London, S.E. "Eve." £1 Prize, W. Gibbs, photographer, High Street, Halstead, Essex. "Football Team." £1 Prize, Rev. S. Hassall, 213, Brunshaw Road, Burnley. "Townley Gates." £1 Prize, A. W. Sargent, photographer, 12, Albany Road, Cardiff. "The Little Lady Photographer." £1 Prize, C. E. Walmsley, photographer, Rydal Road, Ambleside. "Daffodils." £1 Prize, F. W. Williams, Te Rawhiti, Napier, New Zealand. "Interior of Drawing Room." Hoping that we may have the pleasure of seeing your name among future competitors, we have the honour to be, yours faithfully, The Warwick Dry Plate Co.

Warwick.
May 15th, 1902.

"A NEW AND LUCRATIVE PROFESSION."

To the Editors.

Gentlemen,—I have read Mr. Henry Foster's letter in last week's issue of the British Journal, and as I read it I found myself softly quoting Tennyson's well-known lines:—

"An infant crying in the night,
An infant crying for the light,
And with no language but a cry."

Such a defence of the Illinois College of Photography would hardly, one would think, be welcomed by its promoters. Meanwhile, my main contention, and that of your admirable article, remain unanswered. The Illinois College of Photography may be a most praiseworthy institution, but its advertisements are calculated to mislead the inexperienced, and, to maintain the reverse, demands facts, not words; demands, in fact, "language other than a cry."—Faithfully yours,

H. Walter Barnett.

1, Park Side, Hyde Park Corner, S.W.
May 20th, 1902.

PEROXIDE v. RADIOGRAPHY.

To the Editors.

Gentlemen,—May I suggest that the term "radiography" is best restricted to the action of immaterial emanations, such as those from uranium? Mr. Duncan, for instance, in his article on page 391, applies the word to the phenomena Dr. W. J. Russell has demonstrated to be due to peroxide of hydrogen, *e.g.*, in *Nature* of, I think, January 2nd last.—Yours truly, J. Dormer.

May 20th, 1902.

THE PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

To the Editors.

Gentlemen,—I regret that my suggestion of last year, which you did me the favour to commend, re. Certificates of Membership of P.P.A., that might be framed and exhibited in our receptions rooms, etc., has not been followed. If every member took one, at, say, 2s. 6d. each, it would afford a considerable profit to go to the association funds, and would be worth infinitely more to the photographer, as making him appear somebody in the eyes of his clients, especially if his deportment and work were consistent.—Yours faithfully, "Othello."

ADVERTISEMENTS AND SPECIMENS.

To the Editors.

Gentlemen,—I think it hardly fair for applicants for vacancies, advertised weekly in this Journal, to be requested to send specimens to a *Box number*. As an operator, with a limited number of specimens, *to me very valuable*, I do not care to risk sending them to an unknown destination without any guarantee of their return, and this method for employers to advertise is greatly on the increase. I am sure other assistants feel the same on the subject, and I should like this inserted, as probably some good may come of it.—I am, yours, etc.,

"Hypo."

May 16th, 1902.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY, 24, *Wellington-street, Strand, London, W.C." Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

PHOTOGRAPHS REGISTERED:—

A. Joscelyn, 128, Albion Road, Stoke Newington, N. *Photograph of Music Hall Artistes.*

F. Preece, 24a, Commercial Street, Hereford. *Photograph of group including Princess Henry of Battenberg.*

J. R. Bleasdale, Ashgrove, Cockermouth. *Photograph of Cockermouth from a balloon.*

W. R. A. Dobbs, 34, Bridge Street, Hindley. *Photograph of the Old Danes, Hindley.*

T. R. Hammond, 1, Rose Hill Street Conway, N. Wales. *Photograph of the reception of T. R. H. Prince and Princess of Wales. Photograph of their arrival in Castle Square, Carnarvon. Photograph of Ceremony of Installation of H. R. H. Prince of Wales.*

W. P. Varney, 22, Bore Street, Lichfield. *Photograph of entry of Shakespeare's Birth. Photograph of entry of Shakespeare's Death.*

BLOCKING OUT SKIES.—S. K. Y. asks the best medium for blocking out skies.—In reply: Ordinary black varnish as sold by all the dealers. Bates' is as good as any, and is more easily applied than some.

W. H. GOBBETT asks for a good and quick formula for precipitating silver residues. We do not think there is any quicker method than that of using liver of sulphur. The addition of granulated zinc is a good method, but not so quick as the other.

DRY PLATES BY SPECIAL FORMULA.—H. B. B.—We do not think any of the dry plate makers would make you plates according to any formula that you would supply. We expect, if you require them made to any special formula, you will have to make them yourself.

FADED PRINT.—J. C. A.—We cannot see that the print has faded at all. All that has happened is that the pink tint of the paper has faded where the mount has not protected it from the action of light. The image appears to be quite intact. Avoid pink-tinted paper when the prints are for the show-case.

"DEVELOPER" asks for a good formula for bromising and developing P.O.P. prints. A good method was given on p. 771 of our issue of 9th inst., and this requires no bromide bath. The other method, which will be found described in the "British Journal Almanac," is more tedious The prints require but faintly printing; from one-sixth to one-fourth of the usual depth is quite enough.

STEEL PUNCHES.—HERBERT J. UNWIN writes: "A correspondent asks in last number of the BRITISH JOURNAL OF PHOTOGRAPHY about steel punches for stamping name on mounts, etc. Messrs. Baddeley Bros., Chapel Works, Moor Lane, London, E.C., make them. Prices vary according to size, style, and number of letters. Probably what he requires would be from 15s. to 20s."

COPYRIGHT.—S. W. asks: "Can an amateur make a portrait copyright that he took of a local celebrity, as he and the gentleman wish to prevent its publication in the local papers, as, we learn, is the intention if they can get a copy? None have yet been out of our possession."—In reply: Yes, an amateur, or anyone else, can register the copyright in his work, and many do so.

PHOTOGRAVURE PATENT.—A. SINGLETON says: "I have bought Mr. Denison's work on photogravure, and intended to work the process. But a friend tells me that I must not, as I should be infringing somebody's patent. Can you please tell me who is the patentee of photogravure, or whether it is really patented in England?"—In reply: There is no patent for photogravure as described in Mr. Denison's book, or, so far as we are aware, any other process of photogravure at the present time.

NITRATE OF SILVER.—"ARGENT" says: "On reading your article on the low price of metallic silver, the question arises with us as to whether it would be more economical for us to make our own nitrate, as we think of going back to albumen paper, and sensitising it ourselves, as we did years ago. Your opinion will oblige."—In reply: We do not think it would pay you to make the nitrate. Although the metal is now so low in price, that of the nitrate is equally as low in proportion.

STUDIO CARPET.—"STAIRS" writes: "Could you tell me what to do to the carpet in the studio to make it take lighter? It is now red and yellow, hence it takes black. Any information will be thankfully observed, as the effect of it is very bad at present. Time would be no object if it could be satisfactorily improved."—In reply: The only thing we can suggest is to get another carpet. We do not know of any method by which the one you have can be made lighter. Possibly a dyer might help you, but we are inclined to doubt it.

OPINION WANTED.—J. H. H. says: "I should be much obliged if you would tell me whether I am qualified for an assistant operator and retoucher, or not. If so, please state wages I am worth. The specimens are absolutely my own work."—In reply: "To be candid with you, we should say you were not—at least, in any first-class house. We would suggest that you should go to some good photographer as an improver for a time; you would then have the opportunity of improving your work, both in operating and retouching

COMPARISON OF LENSES.—"ANASTIGMAT" writes. "(1) When comparing rectilinear lens along with Goerz or Zeiss anastigmat lens at f/8, which is the quickest, and which gives the best definition or depth of focus? (2) What is the advantage of anastigmat lens over the older ones?"—In reply: (1) If both lenses have the same F-value, they will have equal rapidity. The definition depends upon the quality of the respective instruments: there are rectilinears and rectilinears. The depth of focus is dependent upon the size of the stops used. (2) That they give a flat field, free from astigmatism.

"PHOTOPHIL" writes that he will shortly have at his disposal a Woodburytype press, but is doubtful as to the commercial success of the process. He also asks whether the liquid lens of Dr. Grün is on the market. We know of no photographer who is using the Woodburytype process, though it is used for book illustrations and also for the making of lantern slides. As our correspondent lives in a rather remote part, we should doubt the commercial value of it. Dr. Grün's liquid lens is on the market, and can be obtained from the Syndicate, Southwick Hall, Brighton.

ACETATE TONING BATH.—T. BRIDGEWATER says: "I have recently been making (or rather trying to make) some prints on albumen paper and toning them in the acetate bath; but all the prints I get are mealy like the three enclosed. I have used the bath directly after it was made and after it has been kept for two hours, or perhaps more, but with no difference in the result."—In reply: The mealiness is, no doubt, due to the bath being used too new. The acetate bath should be kept for some time after making; twenty-four hours used to be considered the proper time. Try mixing the bath one day and toning with it the next.

MOTTLED ALBUMEN PAPER.—J. COX writes: "Will you please say what is the cause of the mottliness of the enclosed albumen paper when exposed to light? It was floated on a 50-grain bath for three minutes. The solution was very slightly acid. Some sheets from the same paper turned out all right, and some like the enclosed."—In reply: The trouble arises from too weak a solution. It may have been a 50-grain solution when first made, but has probably got weaker by use; or, may be, several sheets have been floated in succession without it being stirred up, so that the upper portion of the solution has become weakened.

DAMAGED PRINT.—J. H. A. says: "I shall be greatly obliged if you will give your opinion on the enclosed. The print, which comes from abroad, was sent to the framer's. He states that as soon as it was immersed in water the surface came away. The water, he states, was quite cold. As the print appears to be bromide, this does not seem to be likely. Can you aid us in the matter?"—In reply: So far as one can judge from what remains of the picture, it was a bromide finished in monochrome. Of course, the colour would come off if the picture were soaked in water, but we cannot account for the bromide image dissolving unless it were treated with warm water. The picture has been returned.

STEREOSCOPIC TRANSPARENCIES.—"STEREO" writes: "I have some stereoscopic negatives taken in a binocular camera, and, of course, the prints from them require to be transposed in the mounting. That is easily done. But I want to make some transparencies from them, and cutting the glass and neatly mounting the slides afterwards is not such an easy matter. Can you tell me the easiest way to go about the work?"—In reply: The simplest way out of your difficulty will be to make the transparencies in the binocular camera, then no transposition at all will be necessary; or you may employ the special transparency printing frames that are supplied by most stock-dealers who make a speciality of stereoscopic appliances.

*** NOTICE TO THE TRADE, WHOLESALE AGENTS AND BOOKSELLERS.—*A Contents Bill is issued with each number of the* JOURNAL, *and copies may be had on application to the Publishers.*

*** NOTICE TO ADVERTISERS.—*A Revised Tariff for advertisements in the* JOURNAL *is now in force. Blocks and copy are received subject to the approval of the Publishers, and advertisements are inserted absolutely without condition, expressed or implied as to what appears in the text portion of the paper.*

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*** *The Editor can only be seen by appointment.*

*** *We do not undertake to answer letters by post.*

EX CATHEDRA.

Weather Vaticinations. The Briton's national topic, always of special interest to photographers, has an abnormal attraction just now, in view of the eventful month we are shortly entering upon. Whether we shall have King's (or Queen's?) weather or not will make or mar one of the grandest spectacles this generation is likely to witness. Hence the weather prophets' utterances are more closely than ever attended to by photographers. Among the prophets is M. Jules Capre. His predictions this year have been extraordinarily accurate. Take his May forecast, given on May 1st. He predicted a dismally cold and rainy month. He could not have been much nearer the mark. Considerable anxiety is being shown as to what his June prophecy will be. The well-remembered Dr. Falke, of Vienna, in the prophets' business, promises us that next June we will have weather even worse than that of the present month. It is somewhat strange that, as in 1879, the May of which year was so cold, the whole island of Iceland is separated from the rest of the world by a dense mass of drift ice from polar regions. This ice is supposed to be the cause of the cold, though some aver that the cold is the cause of the ice. No one can dogmatise. As for ourselves, we remember Artemus Ward's advice about prophesying, and we refrain, but hope for the best.

Telephotography. We are glad to learn from one of our principal opticians that much greater interest is being taken in telephotography this year. The advent of brighter and warmer weather should give some excellent opportunities for the use of the telephoto lens, as the spring is without doubt the best season for this branch of work. We have seen some beautiful photographs taken by amateurs with telephoto objectives, and we would strongly advise those who may desire to enter this branch of photography to use orthochromatic plates and suitable colour screens for distant landscapes. In the selection of a screen care should be taken to obtain optically-worked glass, especially if it is to be used as a lens cap. By optically-worked glass we mean glass with perfectly flat, parallel surfaces. A moment's thought will make it evident that these conditions should be observed. If the surfaces are not parallel the screen is wedge-shaped, and acts as a prism. If they are not flat they will refract the light from its true path. These inconveniences may be obviated in a large measure by placing the screen close to the plate. For a quarter-plate camera this will be found a very suitable arrangement. Perfectly true optical flats are difficult to make, and we would recommend the intending purchaser to place his order with a first-class optician.

* * *

Flashlight Photography. Monsieur A. Londe recently read a paper before the Société Française de Photographie concerning the duration of the flash of various kinds of powders used as illuminants in photography. Unfortunately, from a scientific point of view, the various powders are enumerated under their commercial names, and no information is given as to their composition. It is, however, interesting to obtain some exact knowledge of the duration of the flash. In each case the quantity of powder used was one gramme, and the time of combustion varied between $\frac{1}{4}$ and $\frac{1}{33}$ of a second. In the latter case the powder was of doubtful value for photographic purposes, as it detonated. In most instances the duration was $\frac{1}{10}$ to $\frac{1}{15}$ second, but as the flash is of unequal intensity, rising to a maximum of brightness, and then declining, its effective value may be estimated at about half the time of combustion. The practical value of a flashlight mixture should not be estimated simply by its rapidity of combustion, some of the slower powders being of considerable usefulness for interiors, but in portraiture, or for any purpose where the effect of movement has to be avoided, rapidity of combustion is essential. This has led certain manufacturers to claim much greater rapidity than Monsieur Londe's experiments warrant. It has frequently been claimed that the flash lasted but $\frac{1}{100}$ second. Monsieur Londe purposes to make further experiments to ascertain the length of the

effective exposure, the influence of the quantity of powder, and its arrangement, and likewise of the method of ignition.

* * *

The Cost of Modern Lenses. Our attention is frequently drawn to the high price of anastigmatic lenses by photographers who know the shortcomings of the older types, but are reluctant to incur the expense of a new equipment. Excellent work has been done with the older types, especially the Aplanat, or Rectilinear, but when the photographer has to grapple with critical work he feels how important it is that his lenses and apparatus should be of the best. If we compare the catalogues of lenses by our best opticians with the price-lists of, say, fifteen years ago, we are not surprised that there should be some demur on the part of the photographer to purchase a new outfit. The chief consideration is the price, but it would be very unjust to infer that the optician is not giving an equivalent for the addition to the cost. As a correspondent writes to us for information concerning some new lenses, and concludes with the remark, "We have plenty of superior lenses on the market, but their prices are very high," it may not be out of place to draw attention to certain considerations, of which the photographer may have but a faint idea, but which must be weighed in forming a just opinion of the value of the opticians' work of to-day. We have before us the catalogue of one of the best continental opticians, and we find the prices of the new lenses rather more than double those of the rectilinear series. What is the reason for this addition to the cost?

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The Difference between the Old and New Lenses. To form some accurate idea of the difference in cost between the well-known rectilinear and the anastigmatic types which have hitherto been in most favour, we would first point out that the former contains but four lenses, whilst the latter is formed of six. Moreover, the anastigmatic lenses are considerably larger in size, as they work at greater intensity. Another fact, which also adds to the cost, is the hardness of some of the glass used in modern lenses. The grinding and polishing of such a lens is, therefore, a much more tedious process. It will thus be seen that if we merely take the number and the area of the surfaces, which have to be prepared in the anastigmatic lens, the cost of production must at least be more than half as much again. Other factors have also to be borne in mind, such as the higher cost of the optical glass, the greater accuracy of workmanship, and the finer mechanical adjustments. If we add to these differences in the cost of production, the remuneration of the skill of the inventor, and the cost of the many months of tedious calculation requisite to find the most suitable curves and other optical data for the lens, it will be seen that the modern instrument must of necessity be much more expensive. On the other hand, the photographer obtains important advantages, for which he should be prepared to pay. He has a lens which will work with greater speed and greater accuracy. Subjects are brought within his range which are impossible with the older lenses, and he should not shrink from giving the optician the just reward for his skill.

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Miniatures. When photographic portraiture first became possible it was believed that it would kill miniature painting, just as photographic process work has since, most unfortunately, almost killed the art of the wood engraver. And no doubt, for a time, the miniaturists found their occupation gone. But in due time there came round the usual swing of the pendulum, and the producers of these dainty little paintings once more rejoiced. Miniatures have now for some years been admitted to the Royal Academy exhibitions, and anyone who likes can compare the modern work with the fine examples by those who have long been dead, by visiting the Wallace collection at Hertford House. The painters of to-day may also take heart of grace from the extraordinary prices which miniatures of merit now fetch in the open market. Last month Messrs. Christie, Manson, and Woods sold a few, and here are some of the figures which they commanded:—"Portrait of the Hon. Mrs. Dawson Damer," by R. Cosway, 620 guineas; "Portrait of George IV. when Prince Regent," by the same artist, 520 guineas; "Portrait of the Duke of Sussex," by Richard Collins, 105 guineas; "Portrait of a Lady," by John Smart, 80 guineas; "Portrait of a Lady," artist not named, 200 guineas; "Portrait of One of the Queens of Henry VIII.," artist not named, 100 guineas. Cosway's work might have been expected to fetch high prices, but the others quoted, especially the last two, which appear to be the work of anonymous artists, certainly come as a surprise. Many families possess miniatures which are regarded rather as curiosities than in any other light, but some of those pictures may reasonably be looked upon as valuable assets.

* * *

The Sun and Moon near the Horizon. A topic that has given rise to more discussion, theorisation, and false conclusion than almost any other cosmical phenomenon is the appearance and size of these orbs when they are near the horizon. The most deceptive of these effects is that presented by the full moon when so situated. It undoubtedly does suggest the effect of a disc very much larger than when high in the heavens. Yet let a photograph be taken with the same lens and camera, from the same standpoint, the object being in each case brought into the centre of the field, and the closest measurement will fail to show the slightest difference in size, though almost anyone would feel justified in asserting that the low-down moon was larger by far. *En passant* we may say that should the photographic test not be convincing enough, the same end will be attained by viewing the moon through a rolled-up piece of paper—telescope wise—no matter how large it previously seemed to be; this simple expedient will restore the mental balance and cause it to be seen in its true relative proportion. Yet we have seen in scientific works elaborate proofs of the general magnifying action of the atmosphere near the horizon—a pure figment. What the atmosphere really does bring about is a distortion in one direction, and this point is excellently illustrated in some work done by Professor W. Prinz, of the Royal Observatory, Potsdam. Using a photo-heliograph by Steinheil, he has obtained several photographs of the setting sun on a large scale. That there is a deformation is shown most clearly in his prints, one of which is published in the proceedings of the Italian Spectroscopic Society. The extent that the disc deviates from symmetry is twelve per cent. increase of the horizontal over the vertical diameter.

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Metals of the Platinum Group. Platinum, though perhaps more largely used nowadays for photographic purposes than any of the precious metals, has yet far less known about it than any of these others. Very few photographers ever attempt to make their own platinum salts from the metal as purchased, or from that obtained as residue, and, indeed, we think that if a poll were taken we should find a lamentably small number even go to the extent of saving their platinum residues—a strange omission, seeing that of the platinous salts in platinotype paper (and they constitute a very large proportion indeed

of the price of this medium) a very small quantity is used up in forming the image; the rest goes into the developing solution, and eventually hence into the sink. There is little excuse for flagrant waste of precious metal so far as residues are concerned, but as to dealing with the metal beyond merely collecting it, the processes involve more chemical knowledge and manipulative skill than are likely to be possessed by the average photographer. Indeed, to skilled chemists there are difficulties in dealing with and separating platinum from its congeners; but a recent paper in the "Chemical News" shows how many difficulties hitherto experienced may be successfully encountered by the use of binoxide of sodium. MM. Leidié and Quenessen, the authors, say that with the "metals of the platinum group many and complicated operations have to be gone through," but they have "succeeded in making this analysis in one operation only"—by the oxidation of the metal by binoxide of sodium under the influence of heat. Briefly, the method consists of heating the metal, or mixed metals (of this group), with binoxide of sodium till the mass is semi-fluid, allowing to cool, and then dissolving in water, taking precautions against the result of the consequent elevation of temperature. All these metals but platinum and rhodium are formed in solution; the latter two form salts insoluble in water, but soluble in hot hydrochloric acid. We give merely this brief epitome of the leading parts of the operations; full details will be found on page 149 of the current volume of the "Chemical News."

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The Sulpho-Cyanide Toning Bath. It will be remembered that in our issue for the 9th inst. we commented on the fact that one of the members, at a meeting of the London and Provincial Photographic Association, had spoken against the use of sulpho-cyanide in any toning formula, adding that it would be interesting to know the grounds of objection to the salt in question. In making our comments we surmised, from the report, that it might, possibly, be on the question of the stability of pictures for which it was employed. At a subsequent meeting the member, Mr. Haddon, stated the grounds upon which his opinion was based, and it appears it was not on any question of permanency in the results, but on the score that the results yielded by it were not reliable. One batch of prints, he said, might turn out all right with a bath compounded exactly as one which, at another time, gave extremely bad results. It is a little difficult to conceive why any bath, if it were compounded to *exactly* the same formula—and under the same conditions—and used with the same paper, should behave differently at different times. We have never found the sulpho-cyanide bath do so under these conditions. If we have at any time found a variation in its behaviour we have always been able to assign a cause, either a difference in compounding, temperature, time of using after mixing, or a change in the brand of paper. "P.O.P.'s" are not all alike, and therefore necessitate dealing differently with, and unless they are, uniform results will not be obtained with all alike. With albumen paper a great variety of toning baths can be used, and good results obtained with them. But with gelatine papers, and with collodion papers the case is different, as with them the number is more limited. For instance, if some of the baths which were commonly used with albumen paper were employed for either of the two latter papers the tones would be very unsatisfactory, but more so with some than with others. All, we suspect, who desire to obtain the best results on different brands of modern gelatine and collodion papers must adapt their methods of working them to circumstances, as did the old workers of albumen papers. There is not an universal toning formula that will suit them all alike.

Dumont's Airship. The strange-looking monster, half balloon, half boat, in which M. Santos Dumont accomplished his famous feat of sailing round the Eiffel Tower, has been for some weeks on view at the Crystal Palace. It is hung up in the concert-room, where it extends from the gallery at the back to the orchestra. It would be almost impossible to get a good photograph of it as it is now placed, but camera bearers will get their chance of snapping at it on Monday next, June 2nd, for on that date, should the weather prove propitious, M. Santos Dumont will make his first ascent in England. After that he is to ascend from the Sydenham Palace every Monday, Wednesday, and Friday until further notice, or until, we suppose, some unfortunate accident stops him. If the first flights are successful, M. Dumont will attempt to fulfil his promise of sailing round the dome of St. Paul's Cathedral, and if that journey should succeed he will try a longer flight to Windsor, or Richmond and back. Then, we presume, he will feel competent to compete for Mr. Pearson's £4,000 prize, to be awarded to the man who first succeeds in journeying through the air from London to Birmingham. We have said, in connection with this initial trial, "should the weather prove propitious," by which we mean that, in order to ensure success, the wind must be tempered to a far higher degree of mildness than it need be to the shorn lamb. For the weak part of all these aërial machines, which depend for their lifting power upon a gas receptacle, is their utter helplessness in anything like a wind. Inventors will not see this, although it has been pointed out to them, and proved to demonstration over and over again. Take the case of a kite, such as is used for carrying up self-recording meteorological instruments into the atmosphere. If a breeze happens to be blowing at the time, such a kite, presenting only two or three yards of surface to the wind, requires an oil engine, or some other kind of motor, to pull it to earth once more. It is quite beyond the control of two, or even three men. Now the Dumont airship has a gas reservoir 120 feet long and about 15 feet in diameter. Imagine what resistance such a large surface must present, in comparison with the much smaller kite, to even the mildest of breezes, and how helpless its propellers must be in trying to move the bulky machine against such a force. The modern airship differs very little from the earliest models designed many years ago, save that the inventor has the advantage of using aluminium in construction, and finds improved forms of motors ready to his hand. The terrible danger of using a motor driven by explosive vapour, in conjunction with a gas balloon, was exemplified only the other day at Paris, and the question arises whether the law should not step in and prevent such a dangerous combination. We should imagine that, for experimental purposes at least, an engine driven cold—say, by means of liquid carbon dioxide—would answer every purpose. It is the settled conviction of everyone, not an inventor, who has studied the problem of conquering the air, that the gas balloon and its various modifications can never solve that problem. We must look to nature, and make something after the pattern of a bird, which is heavier than the air in which it is destined to float. Such a machine is quite within the range of possibility, but unfortunately we know of no means of endowing it with the power of balancing itself. This power the humblest flying insect acquires by instinct.

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Volcano Photographs. A correspondent has called our attention to the circumstance that in commenting, a fortnight ago, upon the photographs which we had seen which were illustrative of volcanic phenomena, we made no mention of the important book by Professor Milne—"The Great Earthquake in Japan, 1891"—which is so finely

illustrated by photographs taken by the late W. K. Burton, whose name is so well known to our readers. We were well acquainted with this book, and have every respect for its merits, but as our intention at the time was not to compile a bibliography of earthquakes and volcanoes, we omitted to mention it. Besides, we were then taking as a text for our remarks the recent volcanic outbursts in the West Indies, and the 1891 earthquake in Japan was unaccompanied by any apparent volcanic action. Japan has many volcanic craters, but they remained perfectly quiescent while the houses were rocking like ships on a tempestuous sea. It may, however, be interesting to our correspondent, as well as to others, to state what we know as to books upon this subject, which is of so much present interest. We have before us a list of works on volcanology, chiefly works in the Italian language, and these number more than three thousand volumes, half of which deal with Vesuvius, while about eight hundred are devoted to Etna, the remainder treating of the Lipari Islands and other minor volcanic vents of Southern Italy. We thus see that this very small portion of the earth's surface which happens to be subject to volcanic upheaval has been pretty thoroughly surveyed and written about, and we have little doubt that the more recent works in the list are illustrated by photographs. Possibly by the time that these words appear in print, photographs from Martinique and St. Vincent, taken since the disastrous eruptions on those islands, will have reached this country. Such pictures, we understand, have already appeared in some of the American journals. They deal with the after effects of the convulsion, and we may take it as quite certain that photographs of the mountains whilst in their active state were simply impossible. In the case of Martinique it was an explosion rather than an eruption, accompanied by an avalanche of hot cinders and fiery gases which, in the space of a few brief seconds, brought death and destruction to all within reach of their deadly embrace. In the meantime our own newspapers, in the absence of photographs, have done their best to meet the popular demand by publishing drawings and sketches. One of the halfpenny journals, bolder than the rest, published a typical "burning mountain" picture, of the kind which used to be tolerated by our forefathers, and had the temerity to assert that it was "from a photograph." We fancy that the editor would be puzzled to find that gem of a snapshot if it were called for in a court of law. The "Illustrated London News" reproduced drawings of Mount Pelée and the Soufrière (*Anglice* "sulphur-mine"), representing each in a torpid state, and also a very interesting picture, taken from an engraving after Turner, of the first-named volcano in eruption. It seems that Turner was never near the place, but borrowed the sketch from which to make his picture. The reproduction is singularly ineffective, and would very well pass for a display of Coronation fireworks at the top of Primrose Hill. Possibly the fine colouring of the original is its chief charm, as in the case of many other pictures by our greatest landscape painter.

THE Society of Arts Conversazione.—The Society's conversazione will take place at the Royal Botanic Gardens, Regent's Park, on Tuesday evening, June 24th, from 8.30 to 12 p.m. Each member is entitled to a card for himself (which will not be transferable), and a card for a lady. These cards will be forwarded in due course. In addition to this, a limited number of tickets will be sold to members of the Society, or to persons introduced by a member, at the price of 5s. each, if purchased before the date of the conversazione. On that day the price will be raised to 7s. 6d. These tickets will only be supplied to persons presenting members' vouchers (which can be obtained from the Secretary), or a letter of introduction from a member. Members can purchase these additional tickets by personal application, or by letter addressed to the secretary. In all cases of application by letter a remittance must be enclosed. Each ticket will admit one person, either lady or gentleman. Light refreshments (tea, coffee, ices, claret cup, etc.) will be supplied.

RETOUCHING AND ITS INFLUENCE ON TECHNICAL PHOTOGRAPHY.

IF one looks back, say, for about thirty years—and there are not a few of our readers that can do that from personal knowledge—we shall see the vast strides that have been made in photography generally. At the period to which we refer there were no gelatine plates; only the wet collodion process was available for negatives in the studio; and these had to be prepared as the sitters entered it. Also there was no retouching by which the negatives could be improved after they were taken, for it was only in the very late sixties and early seventies that retouching came into general use. Therefore the negative had, as a matter of course, to be printed from as it was taken. The only improvement that could afterwards be made was done by dodging in the printing, and that was not much. Those being the conditions then prevailing, it follows that the excellence, or otherwise, of the finished portrait was dependent upon the one who took the negative, and upon him alone.

It may be pointed out, in connection with the wet collodion process, to those who have never worked it—and they include, perhaps, thousands of present-day portraitists—that it was a very slow process as compared with even the very slow gelatine plates of to-day. Hence there was often a great tendency to under exposure, and, consequently, hardness which did not conduce to pleasing portraits, because the shadows, lines, and wrinkles in the face came out still more pronounced than they do with gelatine plates. Therefore success, or failure, rested entirely on the skill of the operator in the lighting of his subject, so as to ameliorate them as much as possible.

A short time back we had the opportunity of seeing a somewhat large collection of portraits that were taken from thirty to thirty-five years ago. They were, of course, all from untouched negatives, and we could not but be impressed with their general excellence—posing perhaps excepted, for as a rule that was none too good. While looking at these portraits one could not help thinking that it is somewhat doubtful if the general run of negatives that are now taken, notwithstanding the conveniences and facilities that modern workers enjoy, are so technically good as were these older ones. The lighting, as a rule, was excellent, the faces were round and full of modelling, and many of them were so good that they could not be much improved by retouching. Some few, it is true, could have been, but only a few minutes would have been necessary to do the work.

Since these pictures were taken retouching has become an important branch of portraiture. Its importance is evidenced by the number of advertisements for retouchers wanted that appear weekly in our pages. Often they exceed the number of operators that are wanted, and, sometimes, the salaries offered to the former are higher than those offered to the latter. This would almost seem to indicate that the retoucher is the more important personage than the operator. It is generally conceded that the public demand that, in their portraits, the wrinkles, crows'-feet, etc., wrought by age, should be subdued or almost eradicated, and the portraitist has to comply. But it is manifest that the more the operator has ameliorated them by skilful lighting, as the old hands had to do, the less is the work for the retoucher. Therefore one would imagine that the former should be the more important worker of the two, though this scarcely appears to be the case at the present time. We have, in different establishments, seen negatives before they have gone into the retoucher's hands that were very inferior, as regards the lighting and *chiaroscuro*

generally, and they would require a great deal of skilled work on the part of the retoucher to render them at all presentable in any high-class establishment. Technically, they were inferior negatives, and such as would not have passed muster in the days prior to retouching. They are passed now because the retoucher can set them right, and he does it, but at what expenditure of time? Many of the present-day photographers, skilful as they are in posing, rely too much on the retoucher for the quality of the finished result.

A friend, who some little while ago spent a week or two with one of the leading photographers in the south of Germany, and had some scores of the negatives in his hands, tells us that, excellent as they were, he was surprised at the small amount of retouching upon them—on some none whatever. The operators were very skilful, and took exceeding pains in the lighting of the sitters, which was principally done by movable screens, the blinds and curtains being seldom employed, except for stopping the sun out of the studio. They seemed to pride themselves on the little retouching their negatives required. Our friend tells us that seldom more than a few minutes' retouching was required, and much of that was done with water-colour on the back of the negatives. Yet the pictures had the appearance of being highly retouched, and were pictorially infinitely superior to the majority of the elaborately retouched, and over-worked, ones too often seen here. Taking portraiture as it is at present, it may be asked if retouching has really improved photography—that is, technical photography—considering that plates are far more sensitive, and capable of yielding better results under varying conditions than the old collodion process was? Judging from the old portraits that suggested this article, we must confess that it does not appear to have done so; it rather seems to have tended in a contrary direction.

THE LATE RICHARD LEACH MADDOX, M.D.

At the great age of eighty-five, Dr. R. L. Maddox died at Southampton, on Sunday, May 11th, and with his disappearance one of the most interesting personalities in photography is taken from us. Only within the last few weeks, we received a communication for publication from him; and it is remarkable to note that even in the later years of his life, when acute physical pain rendered the use of the pen a matter of great irksomeness to him, he manifested an unflagging interest in photographic progress. His association with this Journal and its Almanac extended over a period of forty years, and a list of his contributions on photographic and photo-micrographic subjects would be a very lengthy one. By his death we have cause to regret the snapping of an old and valuable link with the past which cannot be replaced.

We are indebted to Mrs. Gillies, Dr. Maddox's daughter, for the following particulars of his life:—"Born in 1816, for many years he lived at Constantinople, practising there as doctor, and where he married, in 1849, Amelia, a daughter of Benjamin Winn Ford, Esq., of that city, by whom he had a son, Richard Willes Maddox, artist, and a daughter, myself, the widow of Captain Andrew Gillies. My mother died in 1871, and in 1875 Dr. Maddox was married again to Agnes, a daughter of George Sharp, Esq., of Newport, Isle of Wight, who survives him, and by whom he had one son, Walter Vaughan Maddox. In 1875 my father left England for Ajaccio, where he practised among the English residents. From Corsica he and Mrs. Maddox went to Bordighera, remaining there some months. Dr. Maddox also practised near Genoa. He was also at different times resident physician to the late Duke of Montrose, the late Sir Watkins Williams Wynn, and the late Lady Katherine Bannerman. Dr. Maddox then lived for some years at Gunnersbury, and since 1886 has resided at Greenbank, Portswood, Southampton, in a most retired manner, but still interested in everything relating to science, frequently writing for journals and papers in America, France, and England. The loss to his family is beyond all words. They desire to thank the many scientific friends for their kindly sympathy, so much appreciated by them. My father's medical attendant, Dr. Wales, said it was simply 'the triumph of mind over body" that had kept him alive so long. He was interred on the 15th inst., in the Southampton Cemetery."

Commencing photography in 1853, the most notable piece of work associated with Maddox's name was undoubtedly the publication in the British Journal of Photography, on September 8th, 1871, of the first real attempt on record to compound a practicable gelatino-bromide emulsion. We reproduce the article in full, as it will probably interest many of the younger generation of photographers who are ignorant of the slow and laborious manner in which gelatine photography was placed within general reach:—

AN EXPERIMENT WITH GELATINO-BROMIDE.

The collodio-bromide processes have for some time held a considerable place in the pages of The British Journal of Photography, and obtained such a prominent chance of being eventually the process of the day in the dry way, that a few remarks upon the application of another medium, may perhaps not be uninteresting to the readers of the Journal, though little more can be stated than the result of somewhat careless experiments tried at first on an exceedingly dull afternoon. It is not for a moment supposed to be new, for the chances of novelty in photography are small, seeing the legion of ardent workers and the ground already trodden by its devotees, so that for outsiders little remains except to take the result of labours so industriously and largely circulated through these pages and be thankful. Gelatine, which forms the medium of so many printing processes, and which doubtless is yet to form the base of more, was tried in the place of collodion in this manner:—Thirty grains of Nelson's gelatine were washed in cold water, then left to swell for several hours, when all the water was poured off and the gelatine set in a wide-mouthed bottle, with the addition of four drachms of pure water and two small drops of *aqua regia*, and then placed in a basin of hot water for solution. Eight grains of bromide of cadmium dissolved in half-a-drachm of pure water were now added, and the solution stirred gently. Fifteen grains of nitrate of silver were next dissolved in half-a-drachm of water in a test tube, and the whole taken into the dark-room, when the latter was added to the former slowly, stirring the mixture the whole time. This gave a fine milky emulsion, and was left for a little while to settle. A few plates of glass well cleaned were next levelled on a metal plate put over a small lamp; they were, when fully warmed, coated by the emulsion spread to the edges by a glass rod, then returned to their places and left to dry. When dry, the plates had a thin, opalescent appearance, and the deposit of bromide seemed to be very evenly spread in the substance of the substratum. These plates were printed from in succession from different negatives, one of which had been taken years since on albumen with ox-gall and diluted phosphoric acid, sensitised in an acid nitrate bath, and developed with pyrogallic acid, furnishing a beautiful warm brown tint.

The exposure varied from the first plate thirty seconds to a minute and a half, as the light was very poor. No vestige of an outline appeared on removal from the printing-frame. The plates were dipped in water to wet the surface, and over them was poured a plain solution of pyrogallic acid, four grains to the ounce of water. Soon a faint but clean image was seen;

which gradually intensified up to a certain point, then browned all over; hence the development in the others was stopped at an early stage, the plate washed, and the development continued with fresh pyro., with one drop of a ten-grain solution of nitrate of silver, then re-washed and cleared by a solution of hyposulphite of soda. The resulting prints were very delicate in detail, of a colour varying between a bistre and olive tint, and after washing dried with a brilliant surface. The colour of the print varied greatly, according to the exposure. From the colour and delicacy, it struck me that with care to strain the gelatine, or use only the clearest portion, such a process might be utilised for transparencies for the lantern and the sensitive plates be readily prepared. Some plates were fumed with ammonia; these fogged under the pyro. solution. The proportions set down were only taken at random, and are certainly not as sensitive as might be procured under trials. The remaining emulsion was left shut up in a box in the dark-room, and tried on the third day after preparation; but the sensibility had, it seems, greatly diminished, though the emulsion, when rendered fluid by gently warming, appeared creamy and the bromide thoroughly suspended. Some of this was now applied to some pieces of paper by means of a glass rod, and hung up to surface dry, then dried fully on the warmed level plate, and treated as sensitised paper. One kind of paper that evidently was largely adulterated by some earthy base dried without any brilliancy, but gave, under exposure of a negative for thirty seconds, very nicely-toned prints when developed with a weak solution of pyro., having very much the look of a neutral-toned carbon print without any glaze, and I think might be rendered useful on plain paper. Some old albumenised paper of Marion's was tried, the emulsion being poured both on the albumen side and, in other pieces, on the plain side, but the salting evidently greatly interfered, the resulting prints being dirty-looking and greyed all over. These papers fumed with ammonia turned grey under development. They printed very slowly, even in strong sunlight, and were none of them left long enough to develop into a full print. After washing they were cleared by weak hypo. solution. It is very possible the iron developer may be employed for the glass prints, provided the usual acidification does not render the gelatine soft under development. The slowness may depend in part on the proportions of bromide and nitrate not being correctly balanced, especially as the ordinary, not the anhydrous, bromide was used, and on the quantities being too small for the proportion of gelatine. Whether the plates would be more sensitive if used when only surface dry is a question of experiment; also, whether other bromides than the one tried may not prove more advantageous in the presence of the neutral salt resulting from the decomposition, or the omission or decrease of the quantity of *aqua regia*. Very probably also the development by gallic acid and acetate of lead developer may furnish better results than the plain pyro. As there will be no chance of my being able to continue these experiments, they are placed in their crude state before the readers of the JOURNAL, and may eventually receive correction and improvement under abler hands. So far as can be judged, the process seems quite worth more carefully-conducted experiments, and, if found advantageous, adds another handle to the photographer's wheel.

Eight years later, when tracing the rise and progress of gelatine emulsion photography, the late W. B. Bolton, no mean authority, wrote of Maddox's experiments in the following terms*:—

"This formula differs in but one or two respects from the average formula given at the present time [1879]. In the first place, *aqua regia* is used, which must have an injurious action upon the gelatine; and, in the second place, an excess of silver exists in the finished emulsion. What that excess may be it is impossible to say without more definite information as to quantity and strength of *aqua regia* employed. But let us turn to the working of this 'pioneer' gelatine emulsion as described by Dr. Maddox himself. The plates were exposed under negatives, the exposures extending from half-a-minute to a minute and a half in a very poor light. The development was conducted with a plain four-grain solution of pyro., and after a thin, clear image appeared, it was intensified with pyro and silver. Some plates fumed with ammonia fogged instantly on the application of the developer. The emulsion, three days after preparation, was found to have greatly diminished in sensitiveness. It must be borne in mind that no instructions are given for removing the superfluous salts from the emulsion after sensitising, and that, therefore, in addition to the nitrate of sodium formed by double decomposition, the mixture contained free silver and free nitric acid. The presence of these two latter would sufficiently account for the development proceeding under the action of plain pyro. solution, the operation consisting, in fact, of silver development, and would further explain the slowness of the plates which Dr. Maddox complained of in the course of his article. Moreover, it is not surprising that after fuming with ammonia (which would neutralise the restraining acid) the plates should fog on the application of pyro., for in the absence of any restrainer the free silver contained in the film would be instantly reduced. Such was the first attempt to utilise gelatine as a vehicle in which to suspend the sensitive silver salts in place of collodion; and though it proved the possibility of thus utilising gelatine, the experiment cannot be said to have turned out a success. It is not difficult at this date to point out where Dr. Maddox failed; the emulsion itself was not so much in fault as the outside circumstances under which it was to be worked."

Maddox's experiments received, in a marked degree, the stamp of public acknowledgment, although it must be confessed the recognition was in many cases somewhat tardy. The gold medal of the Inventions Exhibition held in 1885 was awarded to him; and other distinctions were the John Scot bronze medal from Philadelphia; a bronze medal from Brussels; a gold medal from Antwerp, and numerous diplomas. The Progress Medal of the Royal Photographic Society was conferred upon Maddox on February 12th, 1901, the present Editor of this JOURNAL having the honour of being deputed to receive the medal on behalf of the distinguished experimentalist. In the autumn of 1891 the JOURNAL also took the initiative in raising a sum of between £500 and £600, contributed by photographers in England, France, Germany, and America, in recognition of the value of his work.

In microscopy and photo-micrography, Maddox also did distinguished work, and the latter subject gave him a theme for an excellent series of articles in the volume of the JOURNAL for 1883. In the following year his portrait and biography were also published in these pages, and the following extract from the appreciation of him then given will show the esteem with which his microscopic work had long been held.—

"Dr. R. L. Maddox, after a voyage round the world in 1839-40, in search of health, spent many years abroad practising in an official and private capacity, but had eventually to renounce the arduous duties of his profession from constant suffering of a very painful nature, which has extended over half-a-century. He had early taken up the subject of microscopy as connected with his profession, and had translated Dr. Dujardin's manual at the time that Quekett's 'Treatise on the Microscope' appeared. Owing to the impossibility of arranging for the use of the beautiful plates of Dujardin's work, the translation was never published. Being obliged to return to England, Dr.

* "B.J. Almanac," 1880, page 24.

Maddox employed himself in trying to extend the labours of others by combining photography with microscopic research, and in this path was so far successful as to be the recipient of two medals, and for his various writings on this and microscopical subjects he was elected an Honorary Fellow of the Royal Microscopical Society. About the time of his introduction of the gelatino-bromide process, Dr. Maddox was carrying on a series of examinations on the living organisms found in the atmosphere, and which necessitated prolonged and tedious work with the microscope, amounting sometimes to sixteen hours in the day. In his method he differed entirely from those who had preceded him, and this has been made the basis of further and most extended researches by others, especially by Dr. Douglas Cunningham and his friend, Dr. Miquel, of the Observatory of Montsouris, Paris. Dr. Maddox used an apparatus of his own invention—the 'aëroconiscope'—a kind of multiple funnel set up as a vane. The wind traversing this instrument deposited the organisms on a thin cover-glass duly prepared for the purpose. The organisms were then cultivated, and many of them carefully figured, the results being published in the current Monthly Microscopical Journal.

Of the gelatino-bromide process we need scarcely say more than that its present high state of utility has been brought about by the labours of the many, and Dr. Maddox may justly be proud that he closed his paper on the process with the hope that he had given another handle to the photographers' wheel, which has indeed, without restriction, been turned to their common benefit. He gave much of his time to microscopic drawing, as is attested in the work of the late Dr. Parkes on 'Hygiene,' and Dr. Nayler on 'Skin Diseases,' and other authors; but his coloured drawings of many of the Diatomaceæ under re-agents, and his figures of the ferments in the deposits of beer, etc., have, we believe, never been published. Worn down by much suffering, he was again obliged to reside abroad for a considerable period, and renounce his favourite pursuits; but since his return he has devoted much of his time to them, especially in the endeavour to photograph the Bacteria—some of the minutest living entities, which require both skill and patience for reproduction by photography. Dr. Maddox was always ready to impart any information he might possess, holding that the claims of science, for her advancement, were—'if freely ye have received, freely give.'

In aletter to Mr. W. J. Harrison, published in these columns on November 4th, 1887, Dr. Maddox explains why in emulsion work his attention was directed to gelatine and silver bromide:

"Firstly, the cost of the collodion, with the troublesome manufacture of the cotton; secondly, health more or less affected by its constant use when working, as I was, in my camera, a dressing-room, often at a very high temperature in the summer months; and, thirdly, dissatisfaction with the dry methods for the photo-micrographic work upon which I was much engaged. The first reason may be dismissed as of little moment when there was an adequate return upon the work done, but not so when there was an absolute loss even in an amateur's point of view. The second reason was a more important one. Being often shut up for hours in the said camera, the temperature at full summer heat, I found the system completely saturated with the vapour of the collodion, so much so, that it could be tasted in the breath on awaking in the night, and sleep was generally much disturbed and unrefreshing, while it was much needed to restore the nervous energy wasted by constant suffering, often very severe in character; moreover, there was an outcry in the household that the collodion vapour unpleasantly pervaded every room in the house. The third reason was that I could find no satisfactory dry or sticky process that did not embrace the first two reasons, and add another of its own in the shape of additional time and trouble in the preparation of the plate. These reasons set me experimenting, sometimes on paper, sometimes on glass, with vegetable gummy matters, as lichen, linseed, quince-seed; and with starchy substances as rice, tapioca, sago, etc.; and with waxy material as Japanese vegetable wax. Often I fancied I was just within the doorway when the door closed, and other plans had to be tried. All the literature I could find bordering on the subject was searched, but it rather bewildered than enlightened. At last I turned to the animal series, and wasted many eggs and some little silver; then I went to the finest isinglass, at about twenty shillings the pound weight, and the very first experiment led me to hope I was on the right track, only something had to be altered, as I was using iodo-bromide in varying collodion proportions, and the isinglass did not appear to yield a sufficiently even surface, in spite of all kinds of filtering; yet confidence was felt that a vein had been struck. Search was now made in the house for a packet of Nelson's gelatine; this afforded a better surface, especially as the plates were dried generally on a hot one-inch thick iron slab, and tested at once. Then came the mixture of isinglass and gelatine, but the advantages pointed to gelatine. The little plates were tried under a negative, then on out-of-door objects, but it was impossible to get some laurels depicted in anything more than black and white. I remembered that someone had stated that the bromides were better suited than the iodides for foliage; now came the experiment of diminishing the iodide and increasing the bromide, until it settled into bromide alone. Yet I was not satisfied, but experimenting went on so rapidly that often I did not wait to filter the gelatine before mixing the bromide of silver in it. Before this period, that talented experimenter, Mr. Carey Lea, had spoken of the use of *aqua regia*, and my attention was turned to it, fancying that its use would decompose some of the gelatine and furnish the extra silver a chance of forming an organic salt of silver, which might possibly improve the image. After working with this, and getting more satisfactory results, various substances were mixed with the gelatine, as gum, sugar, glycerine, etc., which gave different tints to the developed negatives, and it was seen that it only required farther experimenting to put gelatine into use; for some of the negatives were fairly plucky and half-tones beautifully rendered, but compared with collodion the gelatine was slower, although it stood its ground with some of the dry processes. Paper had not been neglected, for amongst the paper trials with the gelatine was one which I thought gave much promise, the tint on development equal to much of the kind of the present day. This was obtained by the addition of a small quantity of arsenite of silver. There was no thought of bringing the subject into notice until it had been lifted from the cradle. Soaking the plates before use, for of course I knew the useless salts were left in the gelatine, was noted down for trial; but at this stage, and while in the very heyday of experimenting, there came an urgent appeal from my kind friend, Mr. J. Traill Taylor, to assist him without delay by an article for The British Journal of Photography, of which he was the Editor, as he had been taken seriously ill. Without a moment's hesitation, and thinking it would give my friend pleasure, the hurriedly written and fragmentary article that appeared in the September Journal of 1871 was forwarded to him, and proofs of sundry negatives were also sent, some of which, almost entirely defaced, my friend Mr. W. B. Bolton and I found three or four years since amongst the glass in the office at No. 2, York Street. Another pen had also come to the rescue, and my paper was deferred to the following weekly issue, when Mr. Taylor, with far-sighted judgment, noted the process had a future before it. Health had now fairly broken down, rest was needed, so that very little farther experimenting was done, and as there were other irons in the fire demanding attention, the process was offered to a firm in Southampton

from whom I used to get my albumenised paper; but it was found there was no time to continue the necessary experiments to raise the rapidity and enhance its value. This was done at different stages by others, almost two years after I had freely given to the public what had cost me much time and labour."

If Maddox's experiment in emulsifying silver in gelatine does not entitle him to the credit, somewhat erroneously attributed to him, of having "invented" the gelatine dry plate, there is no doubt that it pointed the way for others in the work. It must not be forgotten that Harrison and Gaudin perceived the possibilities of gelatine for the purpose; and that the real difficulties of the process were encountered and overcome by those who followed after Maddox, whose ideas, as Bolton points out, were not altogether completely practicable. All the same, there stands the initial formula, which produced silver images in gelatine, and the historian is therefore justified in assigning to Maddox the distinction of making a new departure in experimental procedure. A pleasant trait of the deceased gentleman's character was his readiness to help, to the fullest of his capabilities, those who sought his advice and help in photographic and photo-micrographic work.

THE PHOTOGRAPHERS' CHURCH PARADE.—SERMON BY THE REV. E. HUSBAND.

[Reprinted from the "Folkestone Express," May 24, 1902.]

At St. Michael's Church, Folkestone, on Whit Sunday, the Rev. Edward Husband conducted a Photographers' Church Parade—the first service of its kind. Of course there was not a "procession" of photographers, as there is on Cyclists' Sunday, but there was a large congregation, who listened with much interest to the rev. gentleman's address. The service was bright with music, both instrumental and vocal, and all present enjoyed a peaceful afternoon, and left the church with, perhaps, some new ideas upon which to ponder during the week. The address was as follows:—

It is not our usual custom to preface our Sunday afternoon addresses in this Church with a text, but on this occasion we propose taking a text, and making it afterwards the sacred motto of our "Photographers' Church Parades"—"In all thy ways acknowledge Him, and He shall direct thy paths" (Proverbs iii., 6.) It is customary with a great many good people to sever religion from the arts and sciences, and to recognise no affinity the one with the other; and "to keep religion and science shut off from one another in two different compartments of the mind." It has for its parallel those who think that religion is a Sunday, and not a week day observance. "The tide comes twice a day in our labour," said a great intellectual speaker, "but to some minds they only come once in seven days in God's harbour of the sanctuary." They rise on Sunday, but ebb Monday, and are down and out all the rest of the week. Men write over their business door, "Business is business," and over the church door, "Religion is religion," and they say to religion, "Never come in here," and to business, "Never go in there." "Let us have no secular things in the pulpit," they say, "we get enough of them through the week." And so our week day work is put outside the domain of religion, although nearly the whole of Christ's religious life of thirty-three years on earth was spent in work as a carpenter at Nazareth. For He lived in retirement at Nazareth for thirty years, working with the hammer and the plane, but His public ministry occupied only the last three years of his life; yet I think no one would wish to argue that His life at Nazareth during those thirty years of work was less religious than His three years of public ministry. Now with regard to the arts and sciences, we claim them to be a part of what is named in general terms religion. No one has done more in these days to teach this great truth than the late Professor Drummond, who "championed the cause of science as a torch-bearer to religion." Who is it that has enabled man to invent the wonders of science? Who is it that has decreed divine laws by which such wonders become possible? Is it not God? Genius and the power to invent are Divine gifts, and I think we ought to thank God for all His gifts, and not merely for some of them, and to "acknowledge Him" in all these great marvels of science, and to recognise His Hand in connection with all the wonders and beauties of art. Who has been the greatest Bible preacher, for instance, during the past generation or two? Who has been the greatest teacher of the Holy Scriptures to the world? It has been the invention of printing. Were we without the invention of printing, and only had a copy of the Bible written on parchment, as it used to be, chained to the wall in a few privileged churches in our midst, the people, as a mass, would grow up ignorant of their Bible. The printing press has taught the people, and the Bible has become the cheapest and most universal of all books, so that now-a-days a Bible can be bought for sixpence! We claim for the wonderful invention of printing that it has religion stamped upon it, and that its invention was a Divine gift. And, to give another illustration, nothing is more intimately linked on to religion than the world of Nature. "Speak to the earth," as Job said in the days of old, "and it shall teach thee" (xii., 8). "God," as Luther once said, "writes the Gospel not in the Bible alone, but on trees and flowers, and clouds and stars." The finest, grandest, truest, sermons we have ever heard preached have been from the pulpit of Nature. Everywhere Nature takes the one text, "God is love." In the pulpits of our churches and chapels we hear too often the rancour of "party" strife, bitter denunciation, and narrow-mindedness. We too often hear God represented as One anything but a God of love. And then, as at this time of year, we go out into our lanes and woods and listen to the Voice speaking from the pulpit of Nature, and ask ourselves the question, "Why did God make Nature so beautiful for us?" (as the well-known lines of a poet have expressed it)—

> "God might have made the earth bring forth
> Enough for great and small,
> The oak tree and the cedar tree,
> Without a flower at all.
> He might have made enough, enough
> For every want of ours,
> For luxury, medicine, and toil,
> And yet have made no flowers."

And there is only one answer to these questions, and that is that the pulpit of Nature always takes the one text to preach from, and that one text is—"God is love." Amongst the most wonderful inventions that God has enabled man to discover (for the laws which govern photography existed before photography was discovered) is that of photography. Light is one of the chief governing laws of photography, and "light is perhaps the most wonderful of all visible things." Light comes direct from God. In the age of creation God said, "Let there be light. And there was light." But, like all God's good gifts, if we abuse them they can become our enemies; and light can become the photographer's greatest enemy, which when rightly used is his best friend. "And," as the late Cardinal Newman said, "things that do not admit of abuse have very little life in them." But because light can be abused in the photographer's dark-room, and elsewhere, that is no argument against the proper use of light. And this rule applies to many other matters than the one we are considering this afternoon. Now we claim for the "acknowledgment of God" in the art of photography, and, although we are not so vain

as to think that our addresses of the past live on in your memories, still we are propounding no new belief of our hearts in our subject to-day, for some years ago we took for the subject of our address at one of our monthly "Sunday Afternoons for the People," "Religion and Photography," in which our teaching was in unison with that which we are propounding to-day. Photography preaches the God of Creation to the people, and especially to those who have not the money to travel, by revealing to them many of the beauties of God's world. It is only, after all, the minority who have purses large enough to enable them to cross the seas, and to visit the distant portions of this beautiful earth of ours. But England is only a little island after all, and beautiful though many of her landscapes are, yet the majority of the grandeurs of scenery are to be found in the great wide world abroad, such as Switzerland and Algeria, revealing the same loving hand of God which is to be found in all His works. But through the invention of photography these distant scenes are now depicted on paper with a correctness and nicety beyond even that of the skilled painter. And just as printing has taught the Bible to the masses, so photography has revealed God in nature to the people. And now God's wonders in Nature can be studied at home by the aid of a photographic print, and people who have never, for instance, been able to visit Palestine, can, through photography, realise exactly what in these days Jerusalum or Mount Zion, or Olivet are like, or what Nazareth is like, where the carpenter's shop used to be, or what Bethlehem is like, beside the Judea hills. We see God's hand in all this, and we ask you to "acknowledge Him" in this way. And in saying this we are not speaking of photography as a mere trade or a mere amateur's "hobby," but we are speaking of the science of photography itself as a useful and beautiful art and as a marvellous science. But remember this, photography as yet is in its merest infancy, for, as you know, it was only in 1837 that the first photographs on paper were made. But already we have had marvellous photographic developments, and amongst them is that of what are termed the X rays. See what already this discovery has done for the surgery! See how it has helped to ease sufferers of their pains, and to reveal the medical treatment necessary to enable them to regain the priceless blessing of health. A few days ago we read in some of the newspapers a most cheerful piece of—may I not call it photographic news?—with regard to these X rays. A telegram from America said, "Experiments made with X rays on eggs indicate that the rays destroy the germ cells, thus preventing incubation. From the experiments it has been deduced that the cure of cancer and consumption by means of the rays will be permanent, not merely temporary." And all this from an art, as I have said, in its veriest infancy, before which developments are waiting to unfold themselves, such as colour photography, and further discoveries to aid the surgeon in his treatment of the sick and suffering. And I regard this "Photographers' Church Parade" as a public act of "acknowledging" God in our "way." It is but following in the wake of the British Association, founded at York in 1831, at the suggestion of Sir David Brewster, for the purpose of stimulating scientific inquiry, and for promoting the intercourse of scientific men, and which attends a special service in church at the time of its annual meeting, which may fairly be termed a "British Association Church Parade." The acknowledgment of God in all our "ways" is our duty. To ignore it is to stop God's blessing descending on our work. It is just the same with a nation. A nation that disowns or rejects God always comes to ruin. "Righteousness," says the Book of Books, "exalteth a nation" (Proverbs xiv., 34). To our minds the acknowledgment of the God who gives gifts unto men, is like the saying of grace before a meal. There will be some in the world to say it is not necessary to thank God for endowing man with genius, and the gift to invent wonders like photography. "We have to thank" (such would go on to say) "the lens manufacturers, and the plate makers, and the dispensers of the photographic chemicals." And, to be logical, such persons might equally argue that there was no need to say grace before meals, for those we have to thank, such would argue, are the butchers, the bakers, and the grocers! But who, we ask, made the corn to grow? Who made "the cattle on a thousand hills"? Who made the vegetables to grow in the fields and in the gardens? And so with photography. Who gave the world light? Who gave men talent, and genius, and the power to invent, and to discover hidden wonders? God! And this is why we advocate a "Photographers' Church Parade," that in that wonderful art of photography we may publicly recognise the Hand of God. And if we thus recognise and acknowledge God in the great arts and sciences, it will not only bring down a special blessing upon those arts and sciences themselves, but it will also bring down a special blessing upon those who work in connection with those arts and sciences. But no words of our own are necessary, for our text this afternoon explains everything—"In all thy ways acknowledge Him, and He shall direct thy paths."

PHOTOGRAPHIC PERMANENCE AND THE AMATEUR PHOTOGRAPHIC EXCHANGE CLUB—1860-64.

[A Paper read before the Franklin Institute, and reprinted from its Journal for May.]

(Being the Address of the Retiring President.)

I.

With the very first experiment in photography the question as to permanence of results arose. The process of Wedgewood and Davy failed in practical results, mainly because the pictures were permanent only when examined by artificial light, and even then deteriorated. The question, "How long will it keep?" has been running all through the literature of photography to the present time, and to-day, owing to the wide range in the applications of photography, it is continually recurring in regard to the preparations used, but more especially, in view of the growing application for record purposes, in regard to the final product, the finished print. The question as to the keeping qualities of any of the preparations used in any of the stages of the photographic practice toward the finished print is a very secondary one, except in so far as it may affect the permanence of the print. Whether developers will keep, matters, upon the whole, very little. Their very efficiency depends, in fact, upon their chemical instability. It is only a question of a little more or less trouble, and perhaps a little more expense. So, in regard to fixing solutions, where instability may have graver consequences to the finished print, there need be no room for question, because they can be placed above suspicion by fresh preparation. But how long negative plates or films will keep in good condition before exposure in the camera, and under what conditions, is not simply a question of convenience or expense, but of applicability of photography, where considerable time must necessarily intervene between their preparation and use, as upon scientific and other expeditions. Closely related to this is the other question, as to the length of time allowable after exposure before development. These questions are, however, of importance, practically only between comparatively narrow limits. An answer to the question as to the years that dry plates will keep in good photographic condition, or whether they will keep indefinitely, has, however, some interest, as affording an *a fortiori* argument for belief in and demand for plates that may keep in good condition for any particular purpose. But it is when we come to the print, as has been said, the question

assumes its highest importance, a dominant character. All consideration of the photomechanical print may be omitted in this connection. It has a utility and permanence all its own, but, as it is necessarily not strictly photographic, but one remove from the photograph, if it lacks some of the record qualities, especially of minute microscopic rendering of details, it fails, it might be said, in original entry quality of the photograph.

It is not proposed this evening to traverse this question of photographic permanence exhaustively, or to discuss it by means of facts independently and scientifically established, but rather as a question to be determined empirically by means of data of the highest character for authenticity, furnished by one of the earliest photographic organisations—the Amateur Photographic Exchange Club, from 1860 to 1864, composed of men of careful habits of systematic work and observation, many of high scientific attainments.

As preliminary, it may be well to fix definitely what is meant by time-effect in this connection. Time is recognised as so necessary a factor, that it has almost come to be regarded as capable *per se* of producing changes, or that some things will change, perhaps, all things deteriorate, simply with lapse of time. Now a time effect *per se* is inconceivable, and we are justified in any case of, what for convenience may be called photographic change, in looking for some cause as fully as we are justified in mechanics in assuming a cause where a body changes its state of rest, or of uniform motion in a straight line. These causes of change in sensitive films, and other photographic preparations, may be internal or external, or a combination of both. They may be minute, feeble, operating slowly, but with cumulative effect, through a very long time. There may be in some cases molecular movements in a sensitive film that will gradually change its photographic character. There are many analogies, physical and chemical, to suggest it. In a supersaturated solution of a salt, crystallization may take place rapidly, but gradually enough to be watched, and just as such crystallization can be started by an external mechanical impulse, so, it is conceivable, external causes, changes of temperature, vibrations of all kinds, even jarring of floors and buildings, may assist, even if they do not originate, molecular changes that may affect the whole photographic character of a film.

Perhaps a more analogous case is that of the slow crystallization of axles, wheels, bolts, cannon, and so forth by jarring. We are familiar, too, with what is called the "continuating action" of light, and it is a question whether sufficient allowance has been made for this fact in accounting for deterioration of films, and papers exposed even to a very feeble light during preparation in drying. Experiments made upon papers, though not as decisive as could be wished, seemed to substantiate this view. Again, well-defined chemical reactions, as experience in the laboratory shows, require time, and in many cases prolonged time, for perceptible result, and such may be taking place slowly in a sensitive film, and eventually affect decidedly its character. When, further, all that is covered by the term atmospheric conditions, normal and abnormal, is taken into consideration, we have a legion of possible agents operating to change photographic preparations and products. Now, the fact to be recognised is, that all these conditions are matter of observation and investigation, and in many cases may be eliminated or neutralised, as the great advance in certainty and keeping qualities of plates and papers in the past few years shows.

In investigation of such conditions a natural tendency to give, perhaps, undue weight to established chemical reactions may cause minute subtle conditions to be overlooked, accompanied by a conscious or unconscious assumption that highly sensitive photographic compounds are in their very nature sensitive to other physical and chemical agencies than light; that they are in short in their nature wanting in permanence, in spite of the fact that silver chloride, bromide, and iodide are amongst the most stable chemical compounds, so far as other agencies than light are concerned. An over-caution resulting from this want of faith in photographic preparations often manifests itself in *à priori* conclusions, and positive, scarcely tested statements, and a time-limit has been fixed entirely unwarranted, and once fixed is apt to maintain its place. As a little illustration, it was stated by someone that blue print sensitising solution would not keep; it became permanently incorporated in photographic literature, and there it remains in spite of published statements, again and again, that it will keep unimpaired for years, and many may be deterred from its use by this positive charge of instability. Time has in very many cases, then, doubtless, been made the scapegoat for many avoidable causes of photographic deterioration, for imperfect knowledge or oversight of conditions, for unscientific or careless work, for improper treatment, and storage, etc. The survival of one specimen in excellent condition is sufficient to establish permanence of any method, and direct investigation to the causes of deterioration with certainty of success in discovering and combating.

Considerations such as these suggested that the objective presentation this evening simply of some well-authenticated facts in this connection might not be without general interest, and at the same time recall some of the pioneer workers of your city. As to the keeping qualities of gelatino-bromide plates, it may be well to recall a partial report made at a previous meeting of this section. Reports upon this point have been exclusively made upon plates that have remained unused by accident, and not upon those carefully tested and deliberately placed aside for this purpose. One or two failures with plates kept longer than usual, ascribed to their age, served to fix a time-limit beyond which others were not permitted to go before use, and unused ones would not be likely to receive much care. Unopened dozen boxes out of gross boxes of plates, by Cramer, Inglis, and Eastman, in my possession since 1884, were furnished to this Section and to the Philadelphia Photographic Society to be tested. Plates from the same lot had been tested at different intervals since that date by myself and others. The results were generally as satisfactory as with the plates originally. The plates at that time had not the rapidity of plates subsequently prepared, and it is not possible to say positively whether there was any loss of sensitiveness with age, but there did not seem to be.

According to report made by Mr. M. I. Wilbert to this Section, with the accompanying negatives upon the Cramer plates exhibited here, they seem to have been in as good condition as when first received fourteen years before. By a singular coincidence, illustrative of what has been stated, whilst these old plates were establishing the permanent excellence of the Cramer plates, that maker was advertising the innovation of affixing to packages of all plates sold the time-limit within which they would be guaranteed, and there was expectation on the part of some that this lead would be followed by other makers. But the advertisement has disappeared. An interesting report upon plates submitted to the Philadelphia Photographic Society by its technical committee is published in its proceedings,* with full discussion, including the effect of mode of packing the plates. Whilst the lot of plates at their disposal seemed to manifest a greater tendency to fog, this may have been due in part to shorter exposure and energetic development, as the plates, although the most rapid of that date, were not as sensitive as those of to-day. These

* "Journal of Photographic Society of Philadelphia," Vol. 5, No. 6.

plates at the time they were submitted were, with reason, believed to be the oldest authenticated non-exposed plates, and are, probably, of gelatino-bromide plates; but in the course of the evening, in connection with other matters pertaining to the club already alluded to, prints will be laid before you from negatives made upon plates so much older before exposure that the importance of the preceding ones will be reduced.

CHARLES F. HIMES, Ph.D., LL.D.

Exhibitions.

THE R.P.S. EXHIBITION, 1902.

The forty-seventh annual exhibition of the Royal Photographic Society of Great Britain will be held from the 29th of September to the 4th of November next, at the New Gallery, 121, Regent Street, London, W. The following are the judges:—

Pictorial Section.

W. R. Bland, F.R.P.S.
William Crooke.
P. H Emerson, B.A., M.B., F.R.P.S.
Colonel J. Gale, Hon. F.R.P.S.
J. C. S. Mummery.

Scientific and Technical Sections. (IV. and V.)

Sir William Abney, K.C.B., F.R.S., F.R.P.S.
Chapman Jones, F.I.C., F.C.S., F.R.P.S.
E. Sanger Shepherd, F.R.P.S.

THE SELECTING AND HANGING COMMITTEES CONSIST OF:—

Pictorial Section.

J. T. Ashby.
H. Walter Barnett.
J. S. Bergheim.
W. R Bland, F.R.P.S.
J. Page Croft.
W. Crooke.
John H. Gear, F.R.P.S.
John Gunston.
Martin Jacolette.
The Rev. F. C. Lambert, M.A.
Llewellyn Morgan, M.D.
J. C. S Mummery.
Lyddell Sawyer.
J C. Warburg.
Eustace Young.

Scientific and Technical Sections (IV. and V.).

Sir W. de W. Abney, K.C.B., F.R.S, F.R.P.S.
Arthur C. Beard.
Thomas Bolas, F.I.C, F.C.S
Charles P. Butler, A.R.C.Sc., F.R.P.S.
James Cadett.
Douglas English, B.A.
William Gamble.
G. Lindsay Johnson, M.A., M.D.
E. B. Knobel, F.R.A.S.
E. Sanger Shepherd, F.R.P.S.
J. Wilson Swan, M.A., F.R.S., F.R.P.S.
Prof. W. C. Unwin, B.Sc., F.R.S.
Vaughan Cornish, D.Sc., F.G.S.
Capt. D Wilson-Barker, R.N., F.R.S.E.

The exhibition will be inaugurated on Saturday, September 27th, by a private view, followed in the evening by a conversazione. It will remain open daily (Sundays excepted), from Monday, September 29th, until Tuesday, November 4th, from 10 a.m. till 6 p.m. It will also be open on Monday, Thursday, and Saturday evenings, from 7 till 10 p.m., when lantern slide exhibitions will be given in the North Gallery. Admission, during the day or evening, 1s. Members of the society have free admission to the exhibition upon production of their cards of membership. They receive a book of six passes (for presentation), and can purchase tickets or books of passes at half price. Every exhibitor who is not a member is entitled to a non-transferable season ticket. Members of affiliated societies can purchase tickets of their respective secretaries at half price.

The exhibition will be divided into five sections, namely:—

I.—Selected Pictorial Photographs.
II.—General Professional Work.
III.—Photographic Apparatus and Material.
IV.—Photo-mechanical Processes of Reproduction.
V.—Scientific Photography and Photography in its Technical Applications.

GENERAL REGULATIONS.

Acceptance of Regulations.—The sending of exhibits will be held to signify the acceptance by the exhibitor of the regulations herein laid down for the management of the exhibition, and any further regulations that may be found necessary to make.

Medals.—Medals will be placed at the disposal of the judges in Sections I., IV., and V., and the judges' decision shall be final.

Specifying Section.—Exhibitors are requested to specify the section in which their exhibits are to be placed. Exhibits which are not specifically entered for a particular section, and those which, in the committee's opinion are entered in the wrong section, will be dealt with as the committee shall consider appropriate.

Competition.—All exhibits will be considered as entered for competition (in those sections where medals are offered), unless the contrary is definitely expressed upon the entry form. Exhibits may be entered "Not for competition" in those sections in which medals are offered, at the option of the exhibitor, and, if accepted, will be so marked. Exhibits in the competitive sections which may be accepted, but do not comply with the regulations, will be marked "Not for competition," without notice to the exhibitor. The Selecting Committees will make no distinction between members and non-members of the society, or between amateurs and professionals, except in so far as is contemplated in Section II.

Ineligible Work.—Photographs coloured by hand, and (except in Section II.) photographs already shown at any public exhibition within the London postal district will not be eligible for admission.

Lantern Slides, etc.—Lantern and stereoscopic slides will be displayed in frames and stereoscopes provided by the society. The loan of lantern slides for evening display during the exhibition will not debar them in any way from future competition.

Catalogue.—A catalogue of the exhibition will be published, and a copy supplied to every exhibitor. The Council reserve the right to reproduce any of the pictures or objects exhibited in the catalogue or in the society's Journal, and to give permission for the publication of general views of the exhibition.

Process.—Exhibitors are requested in all cases to specify the process by which their photographs have been produced, and particulars should be given of any new or special process.

Framing.—Photographs in Oxford frames will not be accepted. Excessive breadth in frames or mounts, silvered, gilt, or oval frames, or projecting mouldings are undesirable, and may prevent photographs from securing admission, or the position they might otherwise merit. It is desirable that each photograph be separately framed. A label bearing the name and address of the exhibitor, with the title or description of the photograph, together with a number corresponding with that upon the entry form, must be affixed to the back of every frame. The front of the frame, the picture, or the mount, may bear the name of the exhibitor and the title of the picture, neatly inscribed, and these only. To prevent damage to other exhibits, all frames should have sunken backboards, and the fastening nails must not project, the back being finally covered with thick paper. No plates, rings, or screw-eyes should be affixed to the frames.

Foreign and Colonial Exhibitors.—Foreign and Colonial exhibitors may send photographs unframed. They must, however, be mounted. The society will, without charge, provide frames for accepted photographs. The attention of foreign and Colonial exhibitors is drawn to the following regulation:—That carriage to and from the exhibition must be paid by the exhibitor. American exhibitors are requested to make their own arrangements for the return of their exhibits.

Charges.—Exhibitors are informed that the charges for space should not be sent with the entry form or exhibits, as heretofore. Those whose work is accepted will be notified of the amount due as soon as possible after the opening of the exhibition. Exhibitors in Section II.*a* and III. are required to pay for their space on allotment. A firm or company exhibiting in its corporate capacity is treated as a non-member, although one or more members of the firm may be members of the society. The privileges extended to members, in respect of charges, are granted only to those whose subscriptions are not in arrear, and in their individual capacity only. The charges made to those exhibitors who may be elected members of the society before the end of the current year, will be credited to the amount of their subscription due upon election.

Entry and Reception of Exhibits.—Exhibitors in Section I., II.*b*, IV., and V., must fill up the entry form supplied by the society, and send it by post to the Secretary, Royal Photographic Society of Great Britain, 66, Russell Square, London, W.C., on or before Friday, September 12th. Exhibits sent by carrier must be forwarded carriage paid, addressed to the Secretary, Royal Photographic Society of Great Britain, The New Gallery, 121, Regent Street, London, W., and must arrive on or before Thursday, September 11th. Exhibits may be delivered by hand, unpacked, at the New Gallery, 121, Regent Street, London, W., on Friday, September 12th, between 10 a.m. and 8 p.m., after which time and date no exhibit can, under any circumstances, be received.

Exhibitors in Section II.*a*, will be allowed to deliver, arrange, and hang their exhibits strictly between the hours of 10 a.m. and 6 p.m., from September 15th to September 20th, after which time the committee will complete the hanging of the Gallery. A list or description of the exhibits to be shown in this section must be in the secretary's possession not later than Saturday, September 20th, if it be desired that particulars shall be included in the catalogue. Stallholders (Section III.) will be allowed to erect their stalls and deliver and arrange their exhibits between the hours of 10 a.m. and 6 p.m., from September 15th to September 23rd, after which time any space allotted but not occupied will be disposed of as the committee shall decide. The exhibits for the table space in Section III. must be delivered at the Gallery not later than Saturday, September 20th. No charges whatsoever will be paid by the society on exhibits, and all exhibits upon which the carriers require payment will be refused.

Removal of Exhibits.—Exhibits in Sections I., II.*b*, IV., and V., received in packing cases, will be repacked and despatched as soon as possible after the close of the exhibition. All other exhibits must be removed on the day appointed, due notice of which will be sent to the exhibitors. Failing this, considerable expense will be incurred in removing and warehousing, which will be charged to the exhibitor. The society will not hold itself responsible for packing cases left on hand after the return of the exhibits.

Sales.—The prices of photographs will be published in the catalogue, so far as they are furnished by the exhibitors. Photographs not priced on the entry form will be taken as "not for sale." Fifteen per cent. commission will be deducted on all sales effected by the society.

Damage.—The Council do not hold themselves responsible for any damage to, or loss of, exhibits while in the society's custody, but every reasonable precaution will be taken for their safety.

Rejection.—The right is reserved to reject any work that is considered by the committees to be unsuitable. Exhibitors will be notified of the acceptance or non-acceptance of their works as soon as possible after the selection has been performed. Exhibitors are to understand, however, that the society gives no undertaking that such notices will be issued before the opening of the exhibition, although every endeavour will be made to ensure their early dispatch. The receipt of cards of invitation to the private view or soirée should not be taken as evidence of the acceptance of an exhibit.

Section I.

SELECTED PICTORIAL PHOTOGRAPHS.

The West Gallery will be set apart for this section, which will include portraiture, figure studies, landscape, architecture, exterior and interior work, stereoscopic prints and transparencies, lantern slides, etc., by any photographic process, competitive and non-competitive. Medals will be placed at the disposal of the judges. No exhibit will be eligible for an award unless the exhibitor has subscribed to the declaration on the entry form that, with the exception of mounting and framing, the work is entirely his own. In the case of lantern slides, the negative and the slide must both be the work of the exhibitor. If an award be made, it will be to an individual slide.

Charges.—No charge will be made to members of the society or to foreign and Colonial exhibitors in this section. Non-members will be charged one shilling per square foot (minimum, five shillings), and members of affiliated societies, sixpence per square foot (minimum, three shillings), of wall space occupied. To secure the benefit of this reduction, the entry form must be accompanied by the membership voucher, bearing the affiliation stamp for the current year, or by the affiliation annual with the voucher properly filled in. Lantern slides, stereoscopic, and other transparencies will be charged for as pictures, twelve lantern slides or six stereoscopic slides being calculated as equal to one square foot.

Section II.

GENERAL PROFESSIONAL WORK.

The walls of the North and South Galleries will be set apart for a non-competitive exhibition of general professional work, including portraiture, figure studies and groups, landscapes, architectural, and engineering photographs, exterior, and interior work, etc. No restrictions are imposed as to date of production, or as to previous exhibition of the work.

This section will be under the management of the committee and subject to their regulations, and the right is reserved to reject any work that is considered to be unsuitable.

Allotment of Space and Charges.—(*a*.) Space will be let to exhibitors who wish to make a collective exhibit of their work, which they must arrange to hang. Drapery and other decoration will be allowed. The scheme of decoration proposed must be submitted to the committee for their approval. Space will be charged for at the rate of five shillings per foot linear, payable on allotment. The committee do not bind themselves to allot any particular position, but will duly consider priority of application in their decision. Application for space (specifying the amount required) must be made by letter, addressed to the secretary, as soon as possible, in order to secure the position desired, but in any event not later than Saturday, July 5th. A plan of the Galleries may be obtained on application to the secretary. The regulations as to the reception and removal of exhibits will be found under "General Regulations." (*b*.) One or more works may be sent to be displayed in the space devoted to general exhibits. The committee do not bind themselves to hang the exhibits of any exhibitor together. The charge for space will be at the rate of one shilling per square foot occupied, with a minimum of five shillings. The regulations as to entry, reception, and removal of exhibits will be found under "General Regulations."

Section III.

PHOTOGRAPHIC APPARATUS AND MATERIAL.

The Central Hall will be reserved for exhibits of non-competitive apparatus and material. Floor space will be let for the erection of stalls, and a limited amount of table space will be provided for small miscellaneous exhibits. A list or description of the exhibits to be shown in this section must be in the secretary's possession not later than Saturday, September 20th. Applications for floor space, which will be considered in order of priority, should be made by letter, as soon as possible, in order to secure the position desired, but in any event, not later than Saturday, July 5th. Applications for table space will be received up to Saturday, August 30th. Stallholders must provide their own tables, stands, counters, show-cases, etc., and all structures, displayed signs, notice boards, etc., must be in accordance with the regulations of the committee and will be subject to their approval. Attendants, if necessary, must be provided by the exhibitors. Orders for goods may be taken at the stalls, but no delivery at the exhibition will be allowed. Catalogues, circulars, and price lists may only be distributed from the stalls. Any special lighting of stalls required will be arranged for where possible, at the exhibitor's expense. No exhibitor will be permitted to transfer or sub-let any part of the space allotted him, and no substance of a dangerous or explosive nature will be allowed in or on any such space. The regulations as to reception and removal of exhibits will be found under "General Regulations."

Charges.—Charges for floor space (which must be paid upon allotment) will be according to position, and may be learned on application to the secretary, from whom particulars and plans may be obtained. The charges for table space to members will be at the rate of five shillings for each piece of apparatus or square foot of table space (whichever is greater), with a minimum charge of ten shillings. The rate to non-members will be ten shillings, with a minimum charge of twenty shillings.

Section IV.

PHOTO-MECHANICAL PROCESSES.

This section will include all exhibits relating to or illustrating any process of photo-mechanical reproduction—viz., photogravure, line and half-tone photo-engraving, photo-lithography, collotype, photo-zincography, Woodburytype, polychromatic printing, etc.

Medals will be placed at the disposal of the judges, but exhibits may be entered not for competition

Charges.—The charges will be the same as for Section I.

Section V.

SCIENTIFIC PHOTOGRAPHY AND PHOTOGRAPHY IN ITS TECHNICAL APPLICATIONS.

This section will comprise examples of work shown for its technical qualities, and apparatus used in photographic investigations, *e.g.*, the various processes of colour-photography, the photographic reproduction of paintings, drawings, maps and plans, photographs by artificial light, photography applied to industrial and educational purposes, astronomy, spectroscopy, geology, meteorology, microscopy, medicine, surgery, and the Röntgen rays, surveying, and engineering, zoology, and botany, telephotography, new processes, enlargements, photography applied to military purposes, recording instruments, etc., negatives, transparencies, stereoscopic prints and slides, lantern slides, and general work.

Exhibits may be excluded unless the points of special technical or scientific interest are distinctly stated. Any special method of display required for an exhibit must be undertaken and provided by the exhibitor at his own expense.

Medals will be placed at the disposal of the judges, but exhibits may be entered not for competition.

Charges.—The charges will be the same as for Section I.

EXHIBITION AT THE CAMERA CLUB.

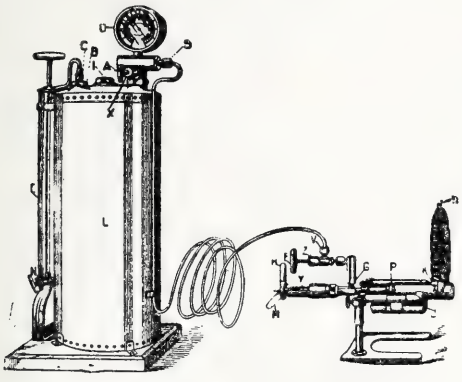
The annual exhibition of members' work, now being held at the Camera Club, Charing Cross Road, W.C., is an admirable collection of about 80 photographs. Many of the exhibitors—Reginald Craigie, Dr. Grindrod, Charles Job, Henry Speyer, Henry Stevens, among others—are well-known contributors to the most important of our exhibitions, and their work naturally helps greatly to give distinction to the entire collection, but it would be doing an injustice to those whose names are not so well known to lead to the inference that they have not worthily performed their part towards making the exhibition a success, for there is hardly a picture shown that is without sufficient interest to entitle it to a place on the walls.

The Camera Club has always taken an active part in the encouragement of pictorial photography, and it has numbered among its members a good many of the leaders of fashion in art as expressed in photography. The exhibitions it holds from time to time may therefore very reasonably be taken to be representative of the kind of photography that is considered the most advanced of its particular period in securing those qualities which entitle a photograph to be accepted as a work of art. In this connection the present exhibition shows a very healthy tendency towards the abandonment of extravagant means of attracting attention, and a return to the appreciation of the importance of sound photography as an essential even in photographs,

the aim of which is pictorial. Possibly the absence of photographs of —shall we call it—daring originality, may render the exhibition less attractive to those to whom merit and eccentricity are the same thing; but it is really a sign of the progress and not of retrogression that simplicity of treatment and perfection of technique are becoming increasingly relied upon for success.

A NEW LANTERN ILLUMINANT.

The apparatus herewith illustrated is an improved form of a hydrocarbon burner in combination with a glow mantle of the Welsbach order, for the production, by use of ordinary kerosene oil, of a brilliant white light particularly adapted for lantern illumination, as well as forming an artificial actinic light for photographic purposes. We ("Scientific American") are advised that it has lately been introduced by Williams, Brown, and Earle, of Philadelphia, Pa. The essential feature consists in vapourising minute quantities of kerosene oil in a heated state under air pressure, which, in mixing with air, burns in the form of a gas and renders a mantle over the burner highly incandescent. The complete apparatus is quite light, easily set up, and is readily put into operation. The small air cylinder, *L*, carries at the bottom of the interior the kerosene oil (which should be of the best quality) under an air pressure of fifty pounds to the square inch, maintained when necessary by an attached bicycle pump, *E*. A small pressure gage, *D*, at the top registers the pressure. The oil is forced up by the air pressure through a tube extending in the interior to the bottom of the cylinder through a regulating valve, *X*, on the exterior, and a very small spring coiled wire pipe to the burner, and the supply there is regulated by another valve, *F*. From this valve the oil passes through a hot tube at *P*, and is admitted by a needle opening further along in the form of a vapour to the concentric Bunsen burner located just to the front of *P* (not shown), which, consuming part of the vapour, constantly keeps the tube hot; the rest continues to the main burner located under the mantle, *R*, at *K*, and burning the gas there renders the mantle incandescent. *Y* is the needler for the purpose of keeping the needle aperture clear. To start the burner, it is necessary to heat for a few minutes the vapourising tube, *P*, which is done by igniting a small quantity of alcohol placed in the supplemental cistern, *J*, suspended underneath the vapourising tube. Small inlet air tubes are arranged on each side of the inlet burner tube. It will thus be seen that it is a very economical light to maintain.



Improved Lantern Hydrocarbon Burner.

London and Provincial Photographic Association.—On June 5th, Mr. Wilfred Emery will give a practical demonstration of "Enlarging." Visitors are always welcome at the meetings of the London and Provincial.

Messrs. H. and W. Green, Crown Works, Rotherham, send us samples of their new "Royal" cabinet mounts. These are in various tints, and the border designs are tastefully embossed. A charge of 10s. is made for 250, printed and post free.

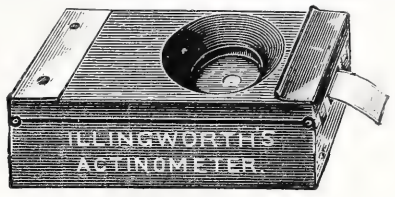
Messrs. Jas. H. Smith and Co., of 311, Wabash Avenue, Chicago, invite the attention of the trade to the fact that they have purchased and are now operating a factory which was built at Huntington, N.Y., a few years ago, and equipped for the manufacture of photographic apparatus by Mr. Wm. H. Lewis. By the addition of new machinery, and through improvements made in the equipment, they are placed in a position to produce all kinds of photographic apparatus.

A Question of Legality.—A correspondent of the "British Journal" asks, through the columns of our contemporary, if there is anything to prevent a photographer from taking and publishing snapshots of bathers, etc.? And if persons so taken can prevent him from exposing or selling their photographs? It seems from the editor's reply thereto that a photographer is quite within his legal rights in taking snapshots and selling prints therefrom without permission and in spite of protest and threats of legal proceedings from the parties aggrieved. In New Zealand this would not be permitted, and even the newspaper man who takes snaps in street or on racecourse may be restrained from publishing any photographs of persons or groups of persons without first obtaining their written consent thereto.—"Sharland's New Zealand Photographer."

New Apparatus, &c.

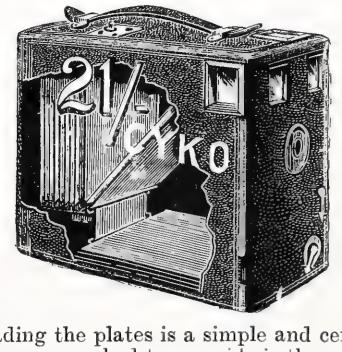
A New Actinometer for Carbon Printing. Manufactured and sold by Thos. Illingworth and Co., Willesden Junction, N.W.

Messrs. Illingworth and Co. have sent us one of their new actinometers for carbon printing. It is a compact and substantially made little instrument, measuring about 3in. long by about 1¼in. square. Inside is placed a roll of sensitive silver paper, about ⅕in. wide, which can be drawn through a slit in the end. In the top is a circle of slightly-tinted glass, under which is fixed a screen with four different tints, numbered ¼, ½, ¾, and 1, with a square opening in the centre, through which the sensitive paper is exposed. On exposure to light the paper assumes first the tint of the ¼, and the others in succession, so that the timing of the carbon prints can be conveniently gauged. In principle this little instrument is very similar to the actinometer introduced some years ago by the late Mr. W. B. Woodbury, but is, perhaps, more convenient in use. As only ¼in. of paper is exposed at a time, it follows that a roll of paper will last a very long time, for when the requisite tint for the negatives exposing is obtained it is only necessary to draw ¼in. more forward through the end slit, so that only ¼in. is used for each exposure. The instrument sells at 3s., and a cheaper form at 2s. We should say that this new form of actinometer would be a great convenience to all carbon workers.



The Guinea Cyko Camera. Sold by John J. Griffin and Sons, Ltd., 20-26, Sardinia Street, Lincoln's Inn Fields, London, W.C.

The special features of the Guinea Cyko are thus officially described:—"(1) The camera is made of well-seasoned wood, the metal parts of brass, and the whole covered in morocco leather. (2) The lens is the best form of tested achromatic lens, working at f/11. (3) The Stops.—The improved Iris diaphragms are adjustable for three apertures, f/11, f/16, f/22. (4) The shutter may be adjusted to three speeds of 1-10, 1-20, and 1-40 of second. Time exposures may also be given from 1-5 second to any longer period. The form of shutter is that giving equal illumination to the whole of the picture, and is frictionless. (5) View-finders are two in number, and are of the form known as brilliant. The image can be sharply seen even in full sunlight. (6) Loading Magazine.—The system of loading, changing, and unloading the plates is a simple and certain one. A button at the top of the camera pushed to one side is the only movement necessary. (7) Automatic Register.—As each plate is exposed, a figure at the side automatically indicates the number of plates used." We have carefully examined the camera. Although so cheap, the instrument is solidly built, and capable, we imagine, of standing all the wear and tear a hand camera is likely to receive; indeed, for its price, it is a marvel of good construction. The changing system in our hands worked to perfection, and the controlling movements of exposure, diaphragming, and differentiation between time and instantaneous are simple in the extreme. The bright, large images in the finders are a great convenience. Fairly light, and not inconveniently bulky, the Guinea Cyko is remarkably good value for the money. It is a mystery to us how it is produced at the price.



Dr. W. Harris, the recently-appointed principal of the High School and Technical Institute, and Mr. J. G. Roberts, the new assistant science master, are taking a keen interest in the Longton and District Photographic Society, in whose work they are in full sympathy. Mr. Roberts (who was formerly instructor in photography at the Northampton and Counties School) gave a demonstration on Thursday, May 22nd, on "Some Chemical Aspects of Development." Dr. Harris, it is stated, has expressed a desire, if there be time for the subject and a demand for a class, to include photography in the syllabus of the technical instruction classes next session. This would be realising one of the objects of the Photographic Society, whose programme of late years has resulted in a growing interest in the cult of the camera.

Patent News.

The following abridged description is specially drawn for the British Journal of Photography, by Messrs. Hughes and Young, patent agents, 55 and 56, Chancery Lane, London, W.C., who will give advice and assistance free to our readers on all patent matters:—

Patent Applications.—No. 10,992.—Edward Sanger Shepherd, 4, South Street, Finsbury. "Improvements in devices for dividing a beam of light for use in cameras or other optical instruments or apparatus."

No. 10,993.—Edward Sanger Shepherd. "Improvements in photographic cameras."

No. 11,178.—Edward Russell Clarke, 35, Leinster Gardens. "Improvements in photographic cameras."

No. 11,380.—Augustus Chalmers Bouvier, 126, Lancaster Road, Notting Hill. "Improved method of applying the system of flashlight to or for the purpose of photography."

Patents Illustrated.—No. 169.—Photography. Patentee: B. C. M. Bercegol, 13, Rue du Manége, Albi (Tarn), France.

Change-boxes; cameras.—Relates to a change-box for plates or films, combined with a device which automatically focusses the lens on the front plate of the magazine. The invention is described as applied to a folding bellows camera. The plates or films are enclosed in paper or cardboard sheaths, notched at the bottom according to their position in the magazine

No. 1,932.—Photography. Patentee: J. Adler, 23, Culmstrasse, Berlin.

Change-boxes; cameras.—Relates to a plate-changing arrangement combined with camera, which permits the camera to be packed compactly when not in use. The unexposed plates are released, one at a time, by an escapement arrangement consisting of a rod or L-section, which is actuated by an external knob. A frame is connected to the rod, and is raised when the rod is turned to release the front plate and allow it to fall on to the plate. When the camera is to be folded up, the plate, with its pile of exposed plates, is turned up by rotating the axis till the whole of the exposed plates are pushed back into the box.

No. 1,973.—Photography. Patentee: O. Moh, 23, Augusta Strasse, Goerlitz, Germany.

Cameras; roller slides.—Relates to a camera (which may be stereoscopic or of other type) with a roller slide, one roller of which is movable with the view of uncovering the focussing-glass, to enable focussing to be carried out before eachexposure. The store roller or reel is enclosed in a box, which can be moved across the back of the camera, so as to uncover the focussing-glass.

The second informal meeting, at the Royal Photographic Society's house, 66, Russell Square, will be held on Tuesday next, June 3rd, at 8 p.m. Members are invited by the House Committee to bring up objects of interest, etc. Mr. W. Smedley Aston's photographs will be on view. The house, it will be remembered, is now open daily from 10 a.m. to 10 p.m.

At the Royal Institution, on Friday, May 16th, a discourse was delivered by Sir Robert Ball, who took for his subject "The Nebular Theory." After stating that the sun was shrinking at the rate of about 16in. per diem, the lecturer said that this was not alarming, for, going on at this rate for about 40,000 years or so the sun would be still of fairly considerable dimensions. This shrinking must have been going on for ages and it was explained by means of a diagram how the sun must at one time have occupied what is now the earth's orbit. Indeed, our earth and the planets, together with the sun, formed, in the remote past, one great mass of heated gas, or what is now called a nebula. Amongst the names of those who evolved the nebular theory that of Kant occupied a prominent place, as did also that of Laplace. A series of photographs of nebulæ in various stages were thrown on the screen. Many of these were taken by Dr. Isaac Roberts, and some were from the Yerkes and Lick Observatories. The first of these showed the nebulæ in an amorphous condition, like a tiny streak of white cloud in a summer sky. Then followed a magnificent set of photographs showing the nebulæ in a spiral condition, the most perfect being shown first in order that the audience might know what to look for in stages in which the spiral form was not so well defined. These illustrated the process of evolution by which our solar system had been formed. The lecturer remarked, however, that our system had been evolved from a quite insignificant nebula, as compared with those which had been thrown on the screen. The problem of this evolution was enormous, but from a consideration of the fundamental principles of mechanics we were enabled to follow the general outline of the process. Supposing the nebula to be isolated from the external influence, it must have a greater tendency to movement in one direction than in another, and in the course of time that tendency would increase so that finally movement would take place only in one direction; then there would be a tendency for it to become flattened more or less into one plane. The movements also appeared to be all in the same direction with one or two exceptions. This explained how it was that in the solar system the planets were practically all in the same plane. Somewhere about 500 movements of this kind were known, and this fact was greatly in support of the belief that this was not due to accident, but to some physical cause, the explanation of which was supplied by the nebular theory. Some interesting photographs of the new star in Perseus showed the actual motion of a nebula. Photographs taken at intervals showed the nebula in its neighbourhood had moved in relation to certain stars.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK

May	Name of Society.	Subject.
31	Liverpool Amateur	Excursion to Bakewell. Leader, Mr. C. F. Inston, F.R.P.S.
31	Brentford Photographic	Watford and Rickmansworth.
31	Croydon Natural History	Excursion—Anthropological Section.
June.		
3	Croydon Natural History	Zoological. Mr. H. D. Gower.
3	Rotherham Photographic	*Practical Landscape Photography.* Mr. G. T. Harris.
4	Edinburgh Photographic	Forty-second Annual Meeting. Election of Office-bearers and Councillors.
4	North Middlesex Photographic	Fifth Lantern Slide Competition.
5	London and Provincial	*Enlarging.* Mr. W. Emery.
5	Röntgen Society	The President. A paper.

ROYAL PHOTOGRAPHIC SOCIETY.

May 13th.—Ordinary meeting. Mr. Thomas R. Dallmeyer, F.R.A.S., President, in the chair.

Nominations in favour of six candidates were read for the first time, and fourteen candidates were elected by ballot members of the Society.

It was announced that the Frome Mechanics' Institute Photographic Society had been admitted to affiliation.

The President read out a long list of presents, consisting chiefly of the different patterns of exposure meters, actinometers, and photometers, which had been presented by their several makers.

Mr. Fritz Kollmorgen read a paper on "A new form of Planar lens, with diminished secondary spectrum." This lens has been calculated by Dr. Rudolph, who had intended reading a paper upon the lens before this Society had he been able to come over for the purpose. Mr. Kolmorgen explained at the outset the origin of the so-called secondary spectrum, the difference in the correction of lenses free from this error, and ordinary achromatic lenses, and the way in which the apochromatic correction claimed for the new lens is achieved. The ideal of theoretically complete achromacy or apochromatic correction is one that has engaged the particular attention of opticians, and especially so at Jena, where glasses with proportional rates of dispersion were produced. Secondary colour aberration can be done away with in two ways: by combining either three lenses of three different glasses with different rates of dispersion, or by combining two or more lenses of strictly proportional dispersion. It is the introduction of such crown and flint glasses having proportional dispersions that made possible the construction of the Apochromatic Planar lens. The new lens is particularly useful in process work, three-colour work and astrophotography. In three-colour work the exposures for the three colours can be made with one focussing without fear of obtaining different degrees of definition or differently sized images. The circle of confusion in the lens is reduced to a minimum that renders it particularly valuable also to astronomers. A number of examples of work done by the lens were shown, and a short discussion took place.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

May 22nd.—Mr. F. E. Buckland in the chair.

The hon. sec. reported that Mr. A. L. Henderson had determined to inaugurate his award of an annual prize of £5 for the encouragement of readers of papers before the Association, by presenting £10 for the first year. This handsome gift would probably be awarded as two prizes of £5 or one of £10, as circumstances might dictate, but as to this the Committee would report later. The announcement was received with applause.

Mr. A. L. Henderson said that in passing through Paris recently he had seen at Levy's establishment a portable stereoscope which, with twenty-four stereoscopic postcard pictures reproduced in Collotype was being offered for 3fr. In presenting the novelty to the Association, he said a few words in support of a plea that something should be done to keep alive a very beautiful process which, he much regretted to see, had lost so much of the public favour.

Mr. P. Everitt said that one heard nowadays a great deal about the fading of silver prints. He came across quite recently, however, an instance of the deterioration of platinum prints. The print in question had been hanging in a frame for some five or six years, and was, when last seen, covered with spots. At first he thought it must be a bromide print, but, tested with cyanide of potassium against another print known to be a bromide print, it appeared that it was a platinum print. The surface was pitted and broken up by a sort of fungoid growth. The frame had been hanging against a wall that might be termed damp in the ordinary way, but the situation otherwise should be favourable to permanenc. There were two silver prints near by, one an albumen print and the other a glossy, gelatine print. The first had suffered to some extent, but the latter was in very good condition. He attributed the condition of the platinum print to a giving away of the sizing of the paper. It was improbable that the platinum image was faulty.

Mr. P. R. Salmon told the meeting that Mr. E. J. Wall's condition was so satisfactory that he was getting out of his bed for the first time after twenty-two weeks, and that he hoped soon to be out of the hospital. The members were very pleased to hear of this improvement, and expressed their pleasure that Mr. Wall was on the road to recovery from his unfortunate and severe accident.

Mr. R. P. Drage referred to the question of the use of the Affiliation Red Book as a permit to photograph in certain places, and urged upon the Association's delegates the importance of sparing no effort to have the concessions extended to stand cameras where as yet they applied only to hand cameras.

Mr. W. D. Welford read a paper entitled,

ROUND THE SOCIETIES.

It detailed his experiences during a tour of the country from October to March, when some 110 societies were visited for purposes of demonstrating certain photographic materials. Mr. Welford met with many amusing adventures, which he told in his own humorous vein. Sometimes he lectured as many as six nights a week, at meeting-places as various as they could be, from a back kitchen to a literary and scientific institute. Audiences ranged from fifteen to 200 and more, with an average of about forty. At least one meeting opened with prayer, not forgetting "our dear brother, the demonstrator"; but Mr. Welford seems to have kept his feet. He had good words to say for his reception, and said that in the provinces the coming of demonstrators was looked for more keenly than in London.

Mr. J. S. Teape showed a negative made on one of Fry's plates that was ten years old, and remarked upon the excellent keeping qualities that the plate possessed.

Mr. Welford showed a device for cutting circles, ovals, etc., by means of a wheel knife and metal pattern plates. The apparatus was rendered much more useful by means of two springs he had added for the better holding down of the paper to be cut.

CAMERA CLUB.

ON Thursday last week the lecturer was Mr. T. C. Hepworth, who dealt with a subject of much interest at the present time, namely, "Earthquakes and Volcanoes." The choice of such a subject at a time when volcanoes are "in the air," both metaphorically and in reality, drew a large audience, and the discussion following the lecture was of much interest. The lecture was illustrated by a really wonderful collection of photographs gathered from all parts of the world, and showing the effects of volcanic action in various countries.

After a short introduction, which dealt with the superstitions which have prevailed concerning the condition of the interior of the globe, the lecturer spoke of the varying temperatures of the earth as ascertained by borings in different countries, and discussed the question as to the solid or liquid condition of the rock-matter beneath the earth's crust. Quoting Lord Kelvin, he said that the earth might be regarded as being "as rigid as a globe of glass of equal size would be, and perhaps as rigid as one of steel." By means of several photographs, evidence of past volcanic action in Britain was brought forward. The island of Mull was once a huge volcano; so was the Isle of Skye. Lava, in the form of basalt, had forced its way through the upper strata to the surface at Antrim, at the Giant's Causeway, Fingal's Cave, and in many other localities. But earthquakes were not always associated with volcanic action. Re-arrangement of the rocks far below the surface of the ground, owing to the constant shrinkage of the earth's crust, would be quite enough to cause those slips and jars which resolved themselves into earthquake shocks. Of a somewhat similar character, but confined more to the surface, were those so-called landslips which occasionally wrought as much damage to buildings as the deeper-seated earthquakes would do. In proof of this, several pictures taken at Sandgate a few years ago were thrown upon the screen.

A reference to the damage wrought by the earthquake in the Eastern counties of England in 1884, with many striking photographs taken by the lecturer the day after the event, brought the first part of the lecture to a conclusion.

Evidence of volcanic action in the past is plentiful in Britain, and one or two places are noted for their springs of hot water, notably Bath, where the water issues from the earth at a temperature of 120deg. Fahr. But to learn more about volcanoes we must visit some district where they are active, but not too active. The Lipari Islands, to the North of Sicily, furnish a useful object lesson, and the volcanic island of Stromboli, otherwise known as "the lighthouse of the Mediterranean," presents a typical cone which can be conveniently observed and studied, for it is a tame volcano, not a fierce one.

Some beautiful views of Vesuvius, and its crater and its lava, brought under consideration the destruction of Pompeii, and a number of photographs showing the partly-excavated city, the major portion of which still lies buried in the plasterlike mud, not lava, which overwhelmed it nearly 2,000 years ago. A picture of Vesuvius in eruption exhibited a canopy of vapour above the mountain, which was estimated to be six miles in height; it was the torrential rain from such a body of vapour as this, mingling with the ash which had previously fallen on the doomed city, which destroyed Pompeii.

Interesting references to the volcanic outburst at Krakatoa, in the Straits of Sunda, in 1883, and the calamity which overtook a large portion of New Zealand a couple of years later, brought the lecture up to more recent times, and a number of pictures were shown to illustrate the condition of a country after one of these stupendous exhibitions of natural energy. Incidentally, Mr. Hepworth remarked upon the common fallacy that, because a volcanic eruption is accompanied by lightning discharges which do much damage, it has a close relation to atmospheric changes. A volcano creates its own thunder and lightning, the electrical phenomena being brought about by the upward rush of steam under heavy pressure. Armstrong's hydro-electric machine worked on the same principle, and we may regard an active volcano as a similar machine upon a magnificent scale.

Although, said the lecturer, he could show the audience no photographs from Martinique or St. Vincent, for none had yet arrived in this country, he could place before them a number of pictures which they might regard as applicable to those unfortunate islands. Here were some illustrating the manner in which a once fertile land was buried for several feet in a mantle of grey ash. Other photographs showed mud volcanoes, steam holes, masses of vapour rising from hot craters, and all the various effects common to these awful visitations.

Volcanoes and earthquakes had been part of the scheme of Nature since the beginning, and they brought with them good as well as evil. To volcanic action we owe the diamond, and most of the so-called precious stones. To the same action we owe the veins of mineral matter from which we procure the metals without which human progress would be slow indeed. Volcanic action was not confined to this earth. The moon was covered with huge craters which were active at one time, and there was something analogous going on in the envelope of the sun.

The discussion following the lecture was opened by the Rev. Mr. Porter, of Eton College, who gave a most interesting account of a nocturnal visit to the cone of Vesuvius at the time when an eruption was actually in progress. His temerity was rewarded by a most extraordinary sight. After awaiting their opportunity for a long time—which seemed like two hours, but was really no more than twenty minutes, during which red-hot stones of enormous size were dropping around them—he and his guide peeped for a few minutes into the crater. He could only describe it as a vast space lined with black velvet, so intense was its blackness, but all round about were incandescent points which marked the places where red-hot stones ejected from the crater had fallen back again. Now and again the vapours which hovered above the volcanic vent would blow aside, and for a moment the interior could be seen, bathed, it seemed, in molten silver. He stood spellbound to the spot, until the guide—who all this time had been invoking the protection of all the Saints in the Calendar—dragged him away, and they reached the lower slopes of the mountain in safety. The huge red-hot boulders which were thrown some thousands of feet into the air came down again with such velocity that they screeched through the atmosphere like big shells. One of them fell within seventeen feet of the observers, and although they were not touched by it, the rush of air it brought with it threw them flat on their faces. Mr. Porter said that, contrary to the often-expressed belief that flames did not issue from a volcanic vent, he had actually seen enormous forked flames coming from such an orifice. These flames were not of the non-luminous kind which we associate with hydrogen, but flared out like ordinary household gas. He attributed them to the presence of a hydrocarbon.

Another speaker, referring to the recent volcanic outbursts at Martinique and St. Vincent, said that he had passed those islands at sea, and had noted the positions of the two volcanoes, Mount Pelée and the Soufrière, which, according to the evening papers, were still in eruption. No one who has not seen those islands can imagine how beautiful is the tropical vegetation, and it seemed a grievous matter that all that rich scenery should have been spoilt and buried in ashes.

Mr. Lyon pointed out that we must thank volcanic action for having preserved to us such a wonderful relic of old-time life as the city of Pompeii, which, had it not been carefully wrapped up in the débris from Vesuvius, would long ago have been spoilt and modernised.

Mr. Inwards, the chairman, related some of his experiences in Chili, where earthquakes are so common that the factory chimneys are all furnished with wire stays. Upon one occasion when he was riding a sudden shock occurred, and he was nearly thrown. The usual vote of thanks terminated the proceedings.

CROYDON CAMERA CLUB.

ORTHOCHROMATIC photography and the use of light filters was considered at some length on Wednesday, 21st inst. The President (Mr. Hector Maclean, F.R.P.S.) opened the proceedings with a description of the practice and theory of this branch of photography, which, generally speaking, he considered advantageous. On the other hand, several leading photographers, to his knowledge, never employed the process at all, even for such subjects as flowers. He mentioned this as a fact, and not as commending the practice. It has also been stated that the use use of a screen had a tendency to destroy the sparkle of the negative. Mr. Kenneth Mees followed, treating the subject, as might be expected, more from the theoretical aspect. In his opinion, colour sensitive plates, together with properly adjusted light filters, were essential if a correct reproduction of the luminosity values, in proportion to their original intensities was sought. Many of the plates on the market were orthochromatic in little more than name. He passed round a neat spectroscope, made by Penrose, and photographs of the spectrum taken by its aid. Mr. Salt objected to the use of the term "colour sensitive plates," and pointed out that colour was a physiological effect only, depending upon wave lengths of light, to which the photographic plate was sensitive in varying degree. Mr. Hicks believed in a compromise. Absolutely truthful reproduction in monochrome was not necessary in ordinary work; a light yellow screen, as opposed to a dark one, was all that was required. This opinion was shared by Mr. Kough and many others. The latter gentleman complained that when using a forty-times screen, with a consequent lengthy exposure, "the clouds wouldn't wait." This was especially so in a high wind, and was most annoying. Mr. Maclean stated that the deepest-tinted Ilford screen required only six time normal exposure. He handed round Ilford screens No. 1 and No. 2, devised for use with the "Chromatic" plate. Mr. Smith mentioned that he had experimented with the process in connection with the oxy-magnesium lamp. A yellow screen was necessary, otherwise no difference could be discerned. In answer to a question, Mr. Wratten stated that

orthochromatism of emulsions could not be maintained at a fixed standard. If the plates were dipped, variations might occur in the same batch. Mr. Rogers invariably used orthochromatic plates, and said that even without a screen everything could be obtained possible on an ordinary plate, and probably more.

New Books.

"How to Make Ferrotypes and Glass Positives." Published by Jonathan Fallowfield, 146, Charing Cross Road, W.C.

Messrs. Jonathan Fallowfield send us a pamphlet with the above title, and it also contains a catalogue of all the necessary appliances for working the process, as well as such things as "mats and preservers," cases, envelopes, frames, etc.—in fact, all the things that were in vogue in the old glass-positive days. The instructions for working are concise, but we notice that there is an omission, evidently an oversight, namely, the formula for the positive silver bath, though that for negatives is given. However, an excellent formula for the silver bath for glass-positives and ferrotypes will be found in our Almanac. In addition to the instructions for working the wet collodion method of producing these pictures, instructions are also given for making them by the dry process, on the plates that are supplied by the Messrs. Fallowfield. The catalogue also contains the prices of the automatic photographic and developing apparatus for producing these pictures on the dry plates. We are frequently asked through the correspondence columns for particulars as to the production of ferrotypes and glass positives, but space, of course, is too limited there to give full working details, and those correspondents will do well to get Messrs. Fallowfield's pamphlet.

"The Watkins Manual of Exposure and Development." By Alfred Watkins. 136 pp. Price 1s. Hereford: The Watkins Meter Company.

Thus Mr. Watkins in the preface to the book before us:—

"It has fallen to my lot to devise two distinct methods in those branches of photography—exposure and development—which present most difficulty to the beginner. These methods (introduced in 1890 and 1894) are now widely used on both sides of the Atlantic, and advised in a number of independent text books. But there has been hitherto no complete text book on the subject. Hence this manual, which aims to instruct with some thoroughness how to make a negative. As I know the methods to be adequate for all conditions, and far more suitable for imparting exact information than the older plans of exposure and development, I have not complicated matters by giving these last. The manual presumes that the reader has no knowledge of photography, and it can be used as a text book for the veriest beginner. To those who simply will not read a word on the grammar or principles of the subject, I have at the commencement indicated those chapters which give the actual instruction. In these three important points: How long to expose, how long to develop, how long (or how much to tone, the plans given impart definite instruction, without need to add vague and helpless references to "judgment" and "brains." One more point: where it is possible to avoid the purchase of commercial appliance for these methods, I have explained what can be substituted, and, on the other hand, where full explanation of such appliance will be helpful to the reader, I have frankly given it."

The spirit of this characteristic preface pervades the whole of Mr. Watkins' ably-compiled book. For the edification of the raw beginner he dots his i's and crosses his t's with a precision as praiseworthy as it is painstaking. For example: "Filling the Dark Slide.—Go into the dark-room; open a dark slide; open the box of plates; take one out. The film side is the dull side, but if you have the slightest doubt, place a corner between the wetted lips, and the film side will stick a little." Four pages further on, however, we have advanced to, "The difference between the minimum and the maximum light exposures is not the same with all plates," which is surely a cut above the mere elements of the subject. One of the most difficult things in photographic authorship is to write down to the mental capacity of the beginner; still, Mr. Watkins has got through his task very well indeed. The author's familiar dicta relating to exposure and development are very properly insisted on in the book, which—we say this without intending the least offence—is Watkins throughout, *more suo*. There are many illustrations, and the graphic way of illustrating development (pp. 61-63) is a happy idea. The book is constructed on the paragraphic principle, with side headings, and there is no page without its useful axiom. Some beginners' books we burn, some we throw aside; but we shall do neither with Mr. Watkins' manual, which we are handing over to one of the junior members of a certain photographic household to read and profit by.

Messrs. Burroughs Wellcome and Co., of Snow Hill Buildings, write:—"During the months of June, July, August, and September our London offices, warehouses etc. will be closed at one o'clock on Saturdays."

Owing to the consolidation of Messrs. E. and H. T. Anthony and Co. and the Scovill and Adams Company, the "Photographic Times" and "Anthony's Photographic Bulletin" will, beginning with the May issue, be published as one magazine, under the title, the "Photographic Times-Bulletin." Many important changes and improvements will be made shortly. The subscription price will remain the same as for the "Photographic Times," i.e., two dollars per annum.—"The Camera."

News and Notes.

Mr. Birt Acres has removed from Hadley to "Woolocombe," Barnet Common, Barnet, Herts.

The Watkins Meter Company, Hereford, send us a novel trade showcard of their dial exposure meter. It is a bromide print of a lake view, and the lettering is a photograph of actual rustic work.

At the Röntgen Society's ordinary general meeting, on Thursday, June 5th, at 20, Hanover Square, the chair will be taken at 8 30 p.m. The President will read a paper on "The Sources of Phosphorescence."

Messrs. Burroughs Wellcome and Co., of Snow Hill Buildings, are issuing a striking showsign for their "Tabloid" photographic chemicals. It represents a charming young lady holding a developing dish in the dark-room, and is appropriately printed in red.

Health Resorts Development Association.—We have received a copy of the Souvenir Guide to Llandrindod published at 1s., but which will be sent post free if postcard request is addressed to Town Clerk, Llandrindod Wells. The Town Council think it may interest our readers, at this holiday season, to know they can have a free copy.

No Case.—At the Spelthorne Petty Sessions, on Wednesday last week, Charles Blumberg, 35, an Austrian subject living at Oaklea, Cedars Road, Teddington, was charged on remand with stealing from his employer, Henry Beaumont Watson, the following sums—£5, £13 10s., and £4—by converting them to his own use. Mr. T. Young appeared to prosecute, and Mr. G. W. Lay defended. The accused was appointed by the prosecutor and his brother as manager of an establishment for the manufacture of photographic paper, and they paid him various amounts to buy machinery. It was alleged that instead of doing this with the sums mentioned in the charge, he appropriated them to his own use. When the case for the prosecution was closed, the chairman, without calling upon Mr. Lay for his defence, said the magistrates did not consider that the charge had been proved and the case would be dismissed.

At the Middlesex Sessions, on Saturday last, Stuart Robson, 50, described as a photographer, pleaded guilty to several charges of obtaining money and cheques by false pretences. Mr. Travers Humphreys, who prosecuted on behalf of the Treasury, said the principal case against the prisoner was one of having defrauded a Mr. Cornish, an auctioneer, living at Harringay. The prisoner told him that he had patented an invention, called "The Periphone," for the improvement of itinerant advertisements; that there was a syndicate of influential people supporting it, and that it was already in use at eight London theatres. By this means he obtained various sums, amounting to £40, from Mr. Cornish. The prisoner had, in fact, taken out a patent for the periphone in 1892, and afterwards, with the assistance of Mr. Loftus Tottenham, sold it to a company in which he had 500 shares. The patent had, however, elapsed in 1896 for non-payment of fees. The periphone was not in use at any London theatre; no specimens of it had, in fact, been made, and there was no syndicate interested in it. There were other charges against the prisoner of having obtained money by means of worthless cheques, which he had been scattering broadcast. Mr. Littler said it was a very serious case, and postponed sentence until next sessions, that further inquiries might be made about the prisoner.

The Gem Dry Plate Company, Willesden Green, N.W., announce the following Coronation Competition, for amateur photographers only:—The first prize is £10, the second prize £5, and there are five prizes of £1, making a total of £20. The following are the conditions:—(1) Competitors must be bonâ-fide amateurs. (2) The plates and papers used must be made by the Gem Dry Plate Company, Ltd. (3) The plates and papers used must be purchased from a dealer. (4) There is no restriction as to size, but the subject must be in connection with Coronation festivities. (5) Mounted or unmounted prints may be submitted, and any of the Gem papers may be used, but each print must bear (a) the name, address, and occupation of the competitor; (b) the batch number and word "Gem" of the box of plates, and the batch number and word "Gem" of the packet of paper used; (c) full particulars of exposure and development of the plate, and toning of the print. (6) If prints are to be returned, the necessary stamps for return postage must be sent at the time of submitting the prints. (7) The negatives, as well as the successful prints for all prizes, are to become the property of the Gem Dry Plate Company, Ltd. (8) All prints for competition must be received not later than July 31st, 1902. (9) The decision of the Company to be final.

Taking Photos in Hyde Park.—Last week Dr. Edward E. Lehwess, of Holland Park Avenue, was summoned at the Marlborough Street Police Court for unlawfully exhibiting an advertisement on a motor-car in Hyde Park, on April 27th and 29th. Sergeant Pegg, the chief warrant officer, informed the magistrate that the defendant had started on a journey round the world by motor, and therefore the summons could not be served upon him.—Mr. Argent Archer, of High Street, Kensingtlon, was summoned for unlawfully taking a photograph of persons in Hyde Park on April 29th. Mr. Archer said he had a permit from the Office of Works allowing him to photograph scenery in Hyde Park. He had taken photographs for publication in illustrated papers for years on the strength of that permit. On the occasion in question he took a photograph of the event just referred to in the previous summons—the start for the

Round the World by Motor Trip. Constable Mungo Park of the A Division, having given evidence, Mr. Denman pointed out that the motor-car event could scarcely be called scenery, but a group, and the permits were granted for views only, in order to prevent persons with cameras taking groups of persons, and thus turning Hyde Park into a second Margate Sands. If the defendant would pay 2s., the cost of the summons, it would suffice in the present case.

AMSTERDAM Exhibition of Photography.—An International Exhibition of Photography and Allied Industries will be held at Amsterdam, from August 28th to September 8th, 1902, in the Velox Buildings, near the Rijksmuseum. The exhibits will be divided into seven classes:—First class, for professionals. Second class, for amateurs. Third class, Allied Industries.—(a) Photogravure, heliogravure; (b) photo-zincography (half-tone blocks, line blocks); (c) photo-mechanical printing (collotype, Woodburytype). Fourth class, Scientific and Medical Photography.—(a) Astronomical photography; (b) colour photography; (c) micro-photography; (d) X-rays photography. 5th Class, Materials and Machinery in use of Photography and Allied Industries, exhibited by Manufacturers and Dealers.—(a) Utensils (optical instruments); (b) systems for artificial lighting; (c) furniture; (d) ingredients (chemicals, etc.); (e) frames and mounts. 6th class, Various.—(a) Automatic photography; (b) bioscope; (c) cinematograph; (d) mutoscope. 7th class, Literature.—Books, periodicals, etc. Diplomas of honour, medals in gold, silver, and bronze will be awarded. The Board of the "Nederlandsche Fotografenbond" Executive Committee, asked for help to make the exhibition as complete as possible. Application for further particulars should be made to Secretariaat Internationale Tentoonstelling van Fotografie en aanverwante vakken, Keizersgracht 533, Amsterdam.

CAUTION to Holders of Permits to Photograph in the Royal Parks.—It is tolerably well known that no one is allowed to use a camera in the Royal Parks without having a formal permit to do so. There is no difficulty in getting this permit if application be made to the Board of Works, Whitehall, S.W. But those who obtain the permit are under certain restrictions that they may not be fully aware of, and may find themselves in an unpleasant position. As noted above, a Mr. Archer had to appear at the Marlborough Street Police Court to answer a summons charging him with unlawfully taking a photograph of persons in Hyde Park. The defendant holds a permit to take "scenery" in the park, and imagined that it also entitled him to obtain a picture of the start of a motorist who was going round the world, the idea being to reproduce the photograph in one of the illustrated papers. Such, however, is not the case, for the magistrate, Mr. Denman, held that such an event did not come within the category of "scenery"; that the official permits were granted for views only, so as to prevent persons with cameras from taking groups, and "turning Hyde Park into a second Margate Sands." The defendant was ordered to pay the cost of the summons (2s.), the magistrate remarking that that would suffice in the present case. From this remark it may be assumed that future cases will not be so leniently dealt with. As this is, we believe, the first instance that anyone who holds a permit has got himself into trouble, we call special attention to the fact, so that others may be warned as to what they are not allowed to do. From Mr. Denman's remarks it is clearly unlawful for anyone to take snapshots in the Row of the fashionable equipages and their occupants, which is being done almost daily with hand cameras.

INTERNATIONAL Patents.—It is time that invention should secure some of the blessings of international legislation. Inventions in industry, literature, and art have always suffered for want of laws to better their condition. The value invention bears to commercial interests has long been unofficially recognised, but it is time for a recognition now which will be bounded by the confines of no country on earth. Any legislator who will so assist in stimulating the ambition of inventors will stand in history side by side with the greatest of statesmen. When a man perfects his ideas and converts them into an invention of value, protection should be extended to him to the fullest extent in the form of Letters Patent, not only in his own country, but everywhere. The property rights of the man who owns a cow or who mines gold by his own labour are fully established over the entire civilised world, and no individual or corporation can lawfully deprive him of his ownership. But the man who labours, perhaps for years, and through his own efforts and genius alone, invents some valuable device, discovers some unknown power or new force which will benefit all mankind, is denied the universal right of property or the enjoyment of the fruit of his labours, unless he secures protection through Letters Patent from every Government in the world. His exclusive ownership is then only for a very limited term of years. Under the present international laws, to protect his property from robbery and infringement, an inventor must secure a patent from every nation in order to ensure exclusive possession. An invention patented in one State only is common property in the balance of the globe. A man's rights in his work should gain him just rewards. The narrow legal views existing to-day, whereby a man's property is only protected in the limited borders of the country where he obtains his initial patent, should be superseded by an international patent bureau, which would issue protective papers operative for the whole world. The establishment of international patent right is not to be considered a project of benevolence or charity, but an indication of a fuller and higher appreciation of the demands of justice. International treaties should be altered to include this pretty medium of reciprocity. What would the postal system be without the International Postal Union? Where our banking system without an international exchange? Why, then, this discrimination against the ideas of men who make the improvements in conditions and things which are, in reality, the sign and portent of our civilisation?—"Invention."

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

THE SALE OF PHOTOGRAPHIC POISONS.

To the Editors.

Gentlemen,—The article on "Photographers, Pharmacists and Poisons," in the last issue of the Journal, was written by one who evidently knew his subject well from a chemist's—or, as he prefers it, and rightly so, too, pharmacist's—point of view. But although full of interesting matter, there is not much attempt at its arrangement in a logical way, nor of formulating a practical change for the better in the present method of selling poisons. For these purposes the question may perhaps be advantageously treated under the following heads:—(1) The Poisons' Act was designed to protect the public. If so, how? (2) Admitting that there is a reasonable grievance in the confining of the sales of photographic poisons to chemists, would it be safe and judicious to allow dealers in photographic materials to sell such poisons? And if so, under what safeguards?

With regard to the first point, as to whether the Poisons' Act protects the public, it certainly does. But it as certainly does so, not so much by confining the right of selling poisons to a chemist, as a chemist, but by making it obligatory upon him as a responsible man to label a dangerous substance carefully with its name and the word "Poison," in the case of the most powerful poisons, by a further safeguarding by an entry in a poison book. As a responsible man he also has, of course, the right of refusing to sell a poison asked for.

These precautions in the main, nowadays, are of value against carelessness or ignorance. A good deal has been made of them as a means of minimising suicide, but a would-be suicide, if determined to effect his purpose, can obtain poison in spite of all the enactments of the Poisons' Act. Suicides, however, are fortunately rare. They may be fairly dismissed, as a leading consideration anyway, in discussing the question. In a personal experience of twenty years, two-thirds of them in business for myself, I only had two cases of attempted suicide with anything which I had sold. In both the full legal requirements of sale had been fulfilled. In both cases the attempts proved abortive. The latter may incidentally be mentioned, owing to the rather peculiar reason, given by the doctor called in, for the failure. It was a case of a man in the first depressing reaction after a heavy drinking bout, swallowing enough crude carbolic acid, that was in the house as a disinfectant for defective drains, to have killed two or three men. The doctor, a promptly acting Irishman, was injecting apomorphine as the surest emetic within a quarter of an hour of the act. There was no doubt as to its action, more than of the efficacy of the subsequent operation of thoroughly washing out the stomach, for the patient—also an Irishman—was shortly begging, with great earnestness, to be allowed to stand on his head so as to give him a fairer chance of getting rid of the contents of his stomach. He was all right in four or five days, the doctor attributing his speedy recovery to the combined reasons, that he had been tackled so promptly and that he had been drinking so much cheap whiskey that the lining of his mouth, throat, and stomach had become so hardened, or, as it were, seared, that it had been in great measure protected against the usual fatal burning and inflaming action of the acid.

The chemist's function as a seller of poisons is, therefore, mainly that of safeguarding honest and commonplace—as to knowledge—buyers of poisons against the results of their own carelessness or ignorance. As far as personal experience goes, he does it very honestly and thoroughly. Not, however, as a chemist, but as an intelligent and a responsible man, reasonably concerned, on the higher plane, that his customer does not come to any harm, and on the lower commercial one, that his business does not suffer from any mishap in the use of a poison sold by him. The technical knowledge of poisons that he possesses (or did possess, when passing his qualifying examination, for it soon gets sadly rusty in the majority of cases, as, frankly, it did in my own), is not so much the safeguard of the purchasing public as his general good sense and knowledge of human nature. He could not utilise an abstruse knowledge of poisons very well without first educating his customer up to the point of understanding him. It is quite sufficient that he knows a little more than his customer about them. It is on the latter, commonsense, side that he acts as the true protection, in not selling poisons to weak-faced lads, with silly, inconsequential talk, those of maturer years, in the shakiness following drink, and so on, in carefully labelling all poisons as "poisons," when he does sell them, and in a word of kindly warning as to danger in careless use. A chemist when asked for a poison always takes a good look at his customer to size him up, and his probable object in buying it. The writer of the article referred to very truly and aptly puts the chemist's case in respect to this by saying that "he always has somewhere in his mind's eye a vision of the coroner." Or, as an

American writer has, with less reverence puts it, he is ever thinking of the possibility of having "to square off the coroner." If a chemist elects in his own and his customer's presumed best interests not to sell a poison asked for, he tells the most symmetrical lie he can think of at short notice, to get out of it. I have told dozens of such, and my conscience has never given me any trouble over them.

The question is, that, as it is clearly a matter of general good sense, or "nous," plus a little knowledge of poisons, whether a seller other than a chemist gifted with these qualifications would not constitute as effective a safeguard to the public as the chemist himself. He would, undoubtedly. From this broader point of view it is not hard even to conceive him a better man for the purpose. The chemist, from being so closely and personally confined to his business throughout a long day in one room, has not so good a chance for picking up such a wide knowledge of men and things at first hand. He could not hope to compete with the chemist in a general knowledge of poisons. But, taking the case of the general photographic dealer, he does not need it. The range of the poisons he would be asked for would be very narrow, and would not include those poisons which in general practice need watching over most, strychnine for killing cats and dogs, and so on. It would be merely transferring a portion of the present task of the chemist into other, and, for all practicable purposes, quite as capable, hands. The same restrictions should apply, of course, to sales as at present, labelling with name of substance, and the word "poison" in all cases, and entry in a poison book in that of the strongest. It may be advanced that this would be but the thin end of the wedge, and that the sale of poisonous weed killers by florists, poisonous sheep dips by corn factors and ironmongers, and so on, would follow. I can see no reason why it should not be so, provided the sellers were responsible men. Personally, when a chemist in business, I would have been very pleased to have got rid of the sale of all poisons, as poisons, that is, barring their use in prescriptions, mixtures, pills, lotions, liniments, and so forth. It is in these that the profits of a chemist are gained. The sale of a small quantity of poison is a nuisance, something of an anxiety in a sub-conscious way, and altogether not worth the profit.

It would be necessary to have some voucher for the responsibility of the seller of photographic poisons, and that there should be a check upon him, as there is upon a chemist. These could be very readily gained by following broadly the French system. A license to sell poisons, limited to those in photography, might be issued by the superintendent of police in a town, provided the applicant's written application were endorsed by a magistrate or leading citizen who knew him. A poison book could be given at the same time, and a register kept at the town hall or police station of both sellers and books. The cost of the whole could be met by a small fee—half-a-crown—for the license.

As against such a scheme, it is no use advancing possibilities very unlikely to happen. It should be treated on a basis of broad probabilities. If so, it would act all right, and there would be no abuse, for there is far more good sense about than people get credit for by faddists.

AN EX-CHEMIST.

DEMONSTRATIONS OF THE USE OF COLLODION EMULSION.

To the Editors.

Gentlemen,—We shall be glad if you will kindly make the fact more widely known, through your valuable Journal, that we are daily giving demonstrations in the use of Dr. E. Albert's collodion emulsion, and evening classes are being held to enable practical operators to obtain fuller instruction and practice. We have an electric light studio specially fitted up for the purpose, and instruction is given by Mr. H. O. Klein, who is an experienced worker in this process. The greatest interest has been taken in the application of the emulsion to three colour work, but it has also been successfully applied to orthochromatic copying, line and half tone negative making, transparency and lantern slide making, ferrotype positive work, and photography on engravers' wood blocks. It will be seen, therefore, that the process is of wide adaptability, and we think that many photographers will be glad to take the opportunity of obtaining practical instruction in a photographic method which has always been acknowledged as productive of the most beautiful results, but which has of late years fallen so much into disuetude. Further information will be gladly sent to any of your readers by, yours very truly,

109, Farringdon Road, London, E.C. PENROSE AND CO.
May 23rd, 1902.

"STOPPING DOWN THE EYE."

To the Editors.

Gentlemen,—With reference to the paragraph in this day's BRITISH JOURNAL, as to stopping down the "lens" of the eye, this is not a novelty by any means. There are many hundreds of good rifle shots in England who use an "orthoptic" for this purpose. It is usually made of black vulcanite, and has a series of revolving "stops" (similar to those usually fitted to a wide angle lens) of varying diameters to suit changes of light, etc. The primary object of it is to correct the "blur" arising from the endeavour to focus simultaneously the back sight, the fore sight, and the object aimed at, and it certainly does this. Quite sixteen years ago there was, I believe, a discussion by the authorities as to excluding the "orthoptic" from competition shooting, but it did not come to anything, as the use of ordinary spectacles is allowed. The one I have screws into the stiff peak of the shooting cap, and has a universal joint and cup and ball action, so that when firing from the prone position it can be readily adjusted to any angle. I believe that "Steward's," in the Strand now make an orthoptic with a real "iris" diapraghm, as we photographers now understand it, in addition to which I have seen one with a yellow glass in front of the opening, practically a "light filter," and extremely useful on a hot, sunshiny day.—Yours faithfully,

Gray's Inn, W.C. W. MCRAE.
May 23rd, 1902.

A MISPLACED BLOCK.

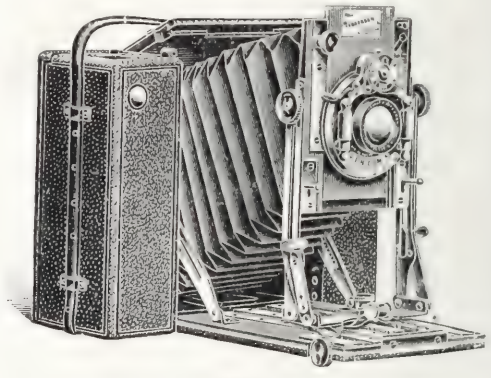
To the Editors.

Gentlemen,—We notice in your kind review of the Roll Film Sanderson Hand Camera, in your issue of to-day, that the printers have inadvertently used a block of an American model camera. We think one of our blocks was duly sent you, and as the one used is so misleading we shall be glad if you make a note of the error in your next week's issue, using the correct block.—Yours truly,

G. HOUGHTON AND SON.

88 and 89, High Holborn and Dean Street, London, W.C.
May 23rd, 1902.

[We append the correct block of the Sanderson Roll Film Camera, and express our regret to Messrs. Houghton for the error.—Eds. B.J.P.]



CLEANING PUBLIC BUILDINGS.

To the Editors.

Gentlemen,—Apropos of your seasonable article on London grime, in the issue of the 25th of April, it might interest your readers to know how we clean buildings in San Francisco.

Several large buildings have lately been cleaned by the operation of the sand blast, which has had a wonderful effect. In the case of the Bank of California, the building, of a beautiful pearl-grey sandstone, had been coated with some cement preparation, entirely changing its colour, and ruining its appearance. The sand blast has entirely restored it to its original colour, and the appearance of a sandstone building in course of cleansing is a study in black and yellow. A small portable compressor, worked by a gasoline engine, a man with a canvass mask, with glass goggles, and a long hose makes up the plant. The process is not very pleasant for the passers-by on the street, who think that they have temporarily removed to the deserts of Arizona. It will be curious to know how long a time will elapse before the buildings resume their previous dirty appearance, but San Francisco is by no means a smoky town, in contrast with London.—Yours truly,

E. L. WOODS.

San Francisco, 222 Sansome Street.
May 9, 1902.

FRESSON PAPER.

To the Editors.

Gentlemen,—I was interested to find in your Journal an editorial note on "Fresson Paper." It may be of interest to you also to know that we are the sole agents for this paper in Great Britain, which we are introducing under the name of "Mezzograph Paper." So great is the demand for the paper on the Continent that we find a difficulty in obtaining from the maker a good stock, although he has just enlarged his works. We hope, however, in the course of two or three weeks to hold sufficient stock to place it upon the market.

You very happily remark that the paper is more suited to the wants of the amateur, as each print appears to require individuality of treat-

ment. So far as my own experience in the use of the paper goes, I find each colour requires different exposure, and also slightly different treatment in development, a treatment which also differs with the various papers upon which the pigment is coated.—Yours faithfully,

St. Martin's, Leicester. HARRY QUILTER.
May 24th, 1902.

ACETYLENE.

To the Editors.

Gentlemen,—Our attention has just been called upon an article, published in your issue of the 20th of April last, concerning "Acetylene Gas," considered as an illuminant. We were pleased to see that your article is written with the utmost impartiality. But for the sake of the art whose interest you so ably represent, we beg to be allowed to make a few remarks respecting acetylene in general, which we hope may be of some utility to your readers. Acetylene gas is produced, as everyone knows, by placing carbide of calcium in contact with water, thus producing a chemical action which can be expressed by this formula.

$$C\,Ca^2 + 2\,H^2O = C^2\,H^2 + 2\,Ca\,O.$$

The difficulty, therefore, is not in producing the gas itself, but in constructing an apparatus working automatically, both simple enough to be placed into inexperienced hands, and so scientifically combined as to prevent any of the inconveniences to which your article alludes.

It should be remembered, in the first place, that the production of acetylene gas by the chemical action of carbide of calcium, in contact with water, develops a certain amount of heat, generally 67 deg. C. or 182 deg. F., which is, therefore, the temperature of the gas at the moment of its production. In that state the gas, besides being hot, is also saturated with water in a vaporous or vesicular form. Now, if, as in many apparatus, the gas is burned almost as soon as it is produced, it burns at high pressure, the combustion is incomplete and an unpleasant smell arises, while the presence of water in the gas causes the flame to flicker.

In buying an apparatus, those where the gas is taken direct from the generator without undergoing a cooling and purifying process should be totally discarded. The formula of the combustion of acetylene gas is $C^2H^2 + 5O = H^2O + 2CO^2$, which may be rendered thus: Two volumes of acetylene gas absorb in burning five volumes of oxygen, producing one volume of vapour and two volumes of carbonic acid; the large quantity of oxygen required shows the necessity for the burners to be in immediate and free contact with the air. This, joined to the cause mentioned above—the burning of hot gas—explains to a certain degree why, up to the present time, there has been no practical means devised for using acetylene gas for vehicular purposes. As to the danger, it has been demonstrated that it is inferior to that attending the use of gas, and considerably less than that of petroleum. We have had many an opportunity of comparing the relative value of many apparatus, and we find that the greatest obstacle to the development of acetylene gas light has been the introduction on the market of a number of apparatus where cheapness seems to be the only object in view, without any regard to the scientific principles upon which this construction should repose.

We trust the above remarks will be sufficient to convince your readers that acetylene gas as an illuminant is not altogether a Will-o'-the-wisp, but is grounded on a perfectly scientifical theory, which is open to everyone to discuss and verify.—We beg to remain, dears Sirs, yours very truly, G. P. W. BEACH.

The British Acetylene Gas Apparatus Syndicate, Dover.
May 22nd, 1902.

PHOTOGRAPHIC CHEMISTS AND AMATEUR PHOTOGRAPHY, ETC.

To the Editors.

Gentlemen,—I should be glad of some explanation to the following:—A chemist sells photographic materials, uses some of his stock cameras, and photographs objects of interest, gets some occasionally in illustrated papers, and sells copies, etc., calls himself an amateur, enters competitions as such, obtains trade discount on materials, and so on. I might mention other interesting points, but what I wish to know is: First, whether he is honest, passing as an amateur; second, why should *he* obtain heavy discounts on materials, and yet the true and honest professional, whose business the chemist often damages somewhat, has to accept considerably less discount, because he does not retail goods, and yet he uses more than the chemist buys?—I am, yours, etc., "LOGIC."

May 16th, 1902.

PHOTOGRAPHY AT THE CRYSTAL PALACE.

To the Editors.

Gentlemen,—We have much pleasure in notifying you that we have succeeded in securing for users of our Kodaks the unrestricted right to photograph in the buildings and grounds of the Crystal Palace during the forthcoming "America in London" Exhibition, at which we are making an extensive exhibit with demonstrations. Many amateurs have often wished to photograph at the Palace, but have not hitherto been able to do so, as the sole rights have been strictly reserved to firms contracting for same. We have no doubt that this concession will be much appreciated by many amateurs, and will be largely taken advantage of, and we shall feel obliged if you will kindly bring the matter under the notice of the readers of your esteemed journal. The privilege extends to the use of Kodaks only, and applies only as long as the exhibition lasts—namely, from the present date until the end of September next.—We are, yours faithfully, KODAK, LTD.

Head Offices: 43, Clerkenwell Road, London, E.C.

"A NEW AND LUCRATIVE PROFESSION."

To the Editors.

Gentlemen,—As Mr. H. Walter Barnett has, from his letter in last week's issue of the B.J.P., made me aware from whence my identity was revealed to him, I must confess I am somewhat surprised at so eminent a gentleman deigning to put into use information acquired in such a manner, when information from another and more reliable source would have impressed him quite differently. At the same time, it reflects no credit on the institutions I make reference to; indeed, it sets me wondering which of two institutes should be considered most preferable—*i.e.*, the one said to advertise in a way calculated to mislead the public, or the other obviously indiscreet in their office work, giving publicity to the private correspondence of their clients, when sanction for publicity is withheld. In his letter I note Mr. Barnett endorses my proposition of the previous week, that facts, not words, etc., will better convince us as to the advantages affirmed by the college in question, and who, Sirs, is more able to be our informant than as I have already suggested?

Mr. Barnett's cynical musing, and whether such a "defence" would be welcomed by the promoters of the Illinois College of Photography, to me are matters of indifference. As I have no inclination to further this discussion, I would say, in conclusion, that, as Mr. Barnett observes in his letter, dated May 4th, "There is no royal road to excellence in any profession," he will also agree that, in order to succeed in photography and prove it lucrative, as in all other industries and undertakings in life, does not wholly depend upon "college education," "work room advantages," or even the "most influential technical teaching," all of which in their way are necessary, but individual merit acquired by those of an adaptable disposition, and who are fortunate, aye, fortunate in being the possessors of good sound intellect, combined with sagacity.—I am, Sirs, yours very truly, HARRY FOSTER.

London, W.
May 26th, 1902.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY, 24, *Wellington-street, Strand, London, W.C.*" *Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

PHOTOGRAPHS REGISTERED:—

R. L. Hagyard, 17, Hartington Road, Stockton-on.Tees. *Photograph of Mr. W. H. Jude.*

C. Hands, 46, Effra Parade, Brixton, S.W. *Photograph of Cricketers.*

ADDRESS WANTED.—L. S. writes: "Will you be good enough to give me the address of a firm that would buy old negatives (cabinets)?"—In reply: We do not know of any firm that purchase old negatives.

ADDRESS WANTED.—T. KING writes: "Will you kindly give me the address of a good firm who manufacture glass bottles for photographic purposes?"—In reply: Messrs. Kilner Bros., King's Cross; but they only supply in wholesale quantities.

TONING PROCESS.—J. BIDGOOD writes: "I should be much obliged if you would tell me what the enclosed print is toned with."—In reply: The print is on matt paper, and appears to have been deeply toned with gold.

F. J. PERCY.—We can give no idea as to the value of the two old engravings, so much depends upon the quality of the impressions. We should say they are not worth much. Better submit them to a picture dealer.

LENS FOR STUDIO WORK.—F. H. writes: "Will you kindly inform me what lens should be used for a 2in. head in a studio, 18ft. from sitter?" In reply: A lens of about 12in. focus will be suitable for a 2in. head.

One of shorter focus may be used, but the perspective will not be so pleasing.

ADDRESSES WANTED.—T. P. WALDER writes: "Will you kindly give me the addresses of firms from whom I can hire a 12in. by 12in. outfit for a day?"—In reply: Messrs. Sands and Hunter, Cranborne Street, and Messrs. Morley and Cooper, Upper Street, Islington, we believe, lend apparatus on hire. The Tella Company, Shaftesbury Avenue, may possibly also do the same.

RETOUCHING.—"IN DOUBT" writes: "Your opinion of retouching of enclosed prints will be valued. Am practically self-taught, and work has been done at home at night."—In reply: We are sorry we cannot congratulate you on your work. We should recommend you to get a few lessons from a competent retoucher, as you do not seem to know what is required in retouching negatives.

VALUE OF LENS.—T. L. writes: "I have a 1-1 rapid Euryscope lens, f/6, with no maker's name on it. (1) If I sent it up to you, could you value it for me and give me your opinion as to whether it is a good lens, as I do not seem to get very good results with it? (2) If you could not undertake to do this, please name a firm who would examine it for me."—In reply: Send us the lens, with stamps for its return, and we will give you an idea of its value.

ADDRESS WANTED.—J. T. writes: "Can you let me know anything further concerning the new lenses (Lacour) noticed in the BRITISH JOURNAL of last week; if there is an agent for them in England, or where a price list can be obtained?"—In reply: Our information was obtained from the April number of "La Photographie Francaise." We are sorry we cannot give you M. Lacour's address, but perhaps a letter to the editor of the paper, at 156, Avenue de Suffren, Puteaux-sur-Seine, would be the means of obtaining the information you require.

BACKGROUNDS, ETC.—"BACKGROUND" writes: "(1) Will you kindly inform me where I can get a background similar to the one in photo enclosed; (2) and also how to copyright a photo, and the cost of same?"—In reply: (1) Probably such houses as Marion's, Houghton's, and the like, would supply a similar background. It seems to be made of the ordinary embossed wallpaper, and any house-decorator would make you one to order. (2) Send two copies of the photograph, together with 1s. 6d. in stamps, and our publishers will make the picture copyright for you.

IDENTITY OF PROCESS.—THE SOUTHWARK PHOTO ENGRAVING COMPANY write: "We should be greatly obliged if you would inform us as to what paper the enclosed print (No. 2) is on. We have made numerous inquiries of manufacturers, and tried many papers, but without success. The print No. 1 is the nearest we can get, but it has not that "eggshell" tint in the whites, nor are the blocks the same. It is not a question of quality or taste, we simply want to match No. 2 identically."—In reply: Quite impossible to say on what particular paper the print in question was made, as there are so many brands that will yield similar results if toned to the same cold colour; indeed, most of them will do so.

PYROXYLINE.—"COLLODION" asks: "(1) In making pyroxyline, is it absolutely necessary to have acids of a certain specific gravity, or would that commonly sold as "pure" answer the purpose. (2) Is there danger in mixing (a) the specified quantities of sulphuric and nitric acids, (b) sulphuric acid and nitrate of potash? (3) Would strong methylated alcohol answer as a solvent?"—In reply: The specific gravity of the acids, and the temperature, are the most important points to be attended to in the making of pyroxiline. The specific gravity and the temperature should be exact to the formula. (2) Only from the fumes given off. (3) Yes; unless the collodion is required for the wet collodion process.

INSTANTANEOUS PHOTOGRAPHY.—W. P. N. writes: "I have a 1/1 plate camera I wish to use for instantaneous work, such as processions, moving objects, etc. I know I should require shutter and view-finder for same. Not having used one before, perhaps you would inform me where to fix finder, and how do you determine when picture is in focus? I am using a stigmatic lens."—In reply: The best position for the finder is on the top of the camera; but if the camera be used on a stand it may be more convenient to have it on the side, and as near the front as possible. As regards the focussing, the best way is to have a scale on the camera marked for different distances, and adjust the focus by that.

LENS FOR VARIOUS PURPOSES.—"INQUIRER" writes: "I have a saloon studio camera 15in. by 12in. Whose make of lens would you recommend me to use for same, to take all sizes down to midgets; what focal length, and what stop to use for rapid work?"—In reply: To take a 15in. by 12in. portrait, you will require a lens of from 20in. to 24in. focal length. One of the portrait or the group type will be the most useful in the studio. But the same lens cannot be used for such small portaits as midgets, unless, indeed, you possess a studio of extraordinary length. The larger the stop, of course, the shorter will be the exposure. It is against our rule to recommend any particular maker's goods. Get the catalogues of different opticians.

BOOK WANTED.—"HOPE" writes: "In successive JOURNALS reference has been made to "Artistic Anatomy" (page 384). This must be something different from the ordinary principles that such men as H. P. Robinson enunciate. If so, what is a suitable book on the subject, and where may it be got?"—In reply: Read Nos. 17, 18, and 19 of the "One Shilling Hand Books on Art," published by Messrs. Winson and Newton, 37-40, Rathbone Place, W. "Hope" should recollect that no amount of book knowledge will be any good unless he is born with the natural aptitude for deduction and application of knowledge. It is in this that the majority fail. Morbid forms of anatomy are best studied at a hospital school, and a knowledge of this is necessary for the better appreciation of the normal type.

YELLOW STAIN.—"PERPLEXED" writes: "Will you please give me your opinion as to cause of yellow stain on enclosed print, which makes its appearance during final washing. I may say prints are toned in sulphocyanide bath. After previous washing in running water, then alum, good wash again, wash after toning, fix (ten minutes), well wash (ten minutes), passed through alum bath, and then final washing (thirty minutes). Occasionally a yellow tint comes over the whole surface of paper, as enclosed print, which puzzles me."—In reply: So far as one can judge from the print, it was not long enough in the fixing solution, or that was too weak; or, may be, there was a large amount of hypo in the paper when it was treated with alum. Use a stronger hypo solution, or allow a longer time in it, and omit the alum treatment.

MIDGET PHOTOGRAPHS.—"MIDGET" writes: "I shall be pleased if you will inform me where I can obtain an apparatus for taking midget photos, such as are sold here (Isle of Man) for 6d. and 1s. per dozen. The process, to my mind, appears to be they are taken on a half or whole plate negative, and printed on a whole sheet of rapid paper and then cut off the sheet in strips of a dozen, the plate being divided into squares, and the same being moved at the back of the lens. I may be wrong, but I think I have made clear to you the kind of apparatus I mean, and shall be glad of the particulars of the making or purchasing of such; also where to obtain Ferrotype dry plates, and price of such."—In reply: Various forms of aparatus for producing midget photographs are supplied by such houses as Fallowfield's; indeed, by all large stock dealers. Ferrotype dry plates are also supplied by Fallowfield's.

CRACKS IN COLLODIO-CHLORIDE PRINTS.—"OTHELLO" writes:—"Lately I have used a good deal of matt collodio-chloride paper, which I get from Thom and Wiggin, Giltspur Street. On the whole, I find many prints disfigured by irregular hair-like cracks, which appear white in the shadows. Is this the fault of the paper or manipulator? I am exceedingly careful not to bend the paper more than necessary. The cracks are only apparent when paper is dry, and are in patches, and more frequently occur near the edges of sheet. The baths used are chiefly gold, followed by platinum."—In reply: We are inclined to the opinion that the trouble is more due to the manipulation than to the paper, seeing that it is only some prints that show cracks. We should advise you to try drying the prints flat between blotting-boards, which will prevent their curling. We suspect that the cracks are due to pressing the prints flat after they have curled in the drying.

A DIFFICULTY WITH ENLARGERS.—P .O. P. writes: "On January 19th last I sent away for enlargement three negatives. I duly received an acknowledgment from the firm of their arrival, and they sent the enlargements on in about two months' time. These were two bromides and one oil. Owing to carelessness on the packer's part the enlargements were considerably damaged, and I refused to accept them. They were returned, and I heard from the firm to the following effect: that they had worked enlargements up as far as possible for the amount paid, but suggested me sending another 4s., when they would go over the enlargements again. This I agreed to do on their sending the pictures, but up to the present I have been unable to obtain possession of either the negatives (which were not sent at first) or the enlargements. I had much trouble to get the enlargements back at first, and had to write several very threatening letters before I succeeded in getting a satisfactory reply."—In reply: You tell us the circumstances, and we surmise you want our advice as to how you should act. It seems to us that the firm have a lien on the pictures and the negatives for the 4s. owing. Send that, and if the picture and the negative are not promptly returned, sue in the County Court.

*** NOTICE TO THE TRADE, WHOLESALE AGENTS AND BOOKSELLERS.—*A Contents Bill is issued with each number of the* JOURNAL, *and copies may be had on application to the Publishers.*

*** NOTICE TO ADVERTISERS.—*A Revised Tariff for advertisements in the* JOURNAL *is now in force. Blocks and copy are received subject to the approval of the Publishers, and advertisements are inserted absolutely without condition, expressed or implied as to what appears in the text portion of the paper.*

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THE BRITISH

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*** *The Editor can only be seen by appointment.*

*** *We do not undertake to answer letters by post.*

EX CATHEDRA.

Local Influence in Photography.

In writing upon the Lippmann colour process, Dr. Neuhaus mentions in the "Photographische Rundschau" that whilst residing in Berlin he obtained excellent rendering of colour with pryo-bromide and ammonia as a developer for the plates. However, upon removing to Grosslichterfelde, he failed completely with the same developer. As an alternative, he used a very dilute Amidol developer, and intensified the plates before fixing. In this way he obtained colours of great beauty. Owning that such trifles may appear to be of little interest, he thinks it well to draw attention to them, as they may offer an explanation of the circumstances under which some persons utterly fail to obtain good results, although they may have followed the usual instructions with the greatest care. In commenting upon this fact, the Editor of "Photographische Kunst" remarks that some years ago J. B. Obernetter sold his method of preparing gelatine emulsions by the cold process to a number of photographers. Although good results were obtained in every other town where the process was tried, in Berlin it utterly failed. Obernetter visited Berlin himself to ascertain the cause, and seems to have failed at first, also. Differences in the water supply and other local conditions frequently affect the photographer in his work, and he should be constantly watchful of his surroundings.

* * *

Submarine Photography.

A very interesting account is given in "Lux" of Louis Boutan's experiments in photographing submarine life and landscape. As assistant to Lacaze de Duthiers, Professor of Zoology at the University of Paris, he carried out a series of investigations concerning sea fauna, and thus, as a diver, became intensely interested in submarine scenery. In a work he has published upon the subject, he gives a number of photographs of these extraordinary aspects of nature. The apparatus consisted of a hand camera, enclosed in a box of sheet copper, fitted with a circular piece of plate glass in front of the lens. The lid of the box was made watertight by means of thick strips of india-rubber placed between it and the walls of the box, to which it was firmly screwed. Suitable mechanism was provided for opening the lens and changing the plate. Even at a depth of ten metres the pressure of the water is inconveniently great, and to provide against it an india-rubber ball of about four litres capacity was used. The air was pumped into the box through a tube, and the pressure of the water counteracted. A cast-iron tripod was used as a stand for the camera. It was found that at a depth of six metres the light was so much reduced that half-an-hour's exposure was necessary. At seven metres depth exposures by daylight were impracticable. To overcome this difficulty artificial light was used, and obtained by burning magnesium powder in oxygen. The lamp was formed of a glass globe connected with a supply of oxygen, and the magnesium powder was introduced by means of an india-rubber ball and composition tube. In this way instantaneous exposures were made and most interesting results obtained.

* * *

Edison's Dark Room.

Edison, the wizard of Menlo Park, as he is called, has perhaps more reason to cry "Save me from my friends" than have most inventors, for during his busy and useful life he has been credited with a variety of ridiculous doings by those who evidently wish him well. And the wonderful things which he has been made to say by journalistic interviewers would be enough to turn Baron Munchausen or M. de Rougemont green with envy. If we can believe one of the most recent of these energetic scribblers, Edison is now busy on something in the photographic way. He has built a big dark room, with no windows to it, and only a very small door. Even the ventilation of this darkest of dark rooms has eight sharp angles in its course, in case a glimmer of daylight should get inside. Some of us

would think that three angles would be sufficient for the purpose, but Edison is nothing if not thorough, and he has eight. What he is going to achieve in this wonderful camera obscura he does not say. Dozens of workmen have been labouring upon its arrangements for months past, "and soon the great inventor will shut himself away and work out his problem alone." But what that problem is no one yet knows. The worthy interviewer was not, however, allowed to go quite empty away. Although Edison studiously refused to sav what the dark room was for, or to give a hint regarding his coming labours in it, he gave voice to the following remarkable pronouncement: "In the light," said he, "the pupil of the eye contracts; in the darkness it expands." Possibly, as the great inventor delivered himself of this remarkably original thought, he "winked the other eye"; but as to this the ingenious youth who interviewed him is silent.

* * *

Patents During 1901.

The annual report of the Controller-General of Patents, Designs, and Trade Marks, which was issued last week, is interesting, as showing the inventive genius of the country. From the report it appears that during the year 1901 the number of patents applied for was 26,777, as compared with 23,924 in 1900, an increase of nearly 3,000. Our weekly lists of patents relating to photography, it will have been noticed, have shown no falling off during the past year. Although nearly 24,000 patents were applied for, it must not for a moment be surmised that anything like that number will be completed, for a very large proportion of them will not be carried beyond the initial stage—the provisional specification—the cost of which is but 20s., whereas the cost of a patent for four years is four pounds. During the past few years the patent news in connection with photography has shown nothing very important in the way of inventions, either in connection with processes or apparatus, and this is not altogether surprising, considering that a decade ago there seemed nothing really new to invent. In the comparative infancy of photography, when the most important inventions and improvements were made, there were very few patents taken for them—less in the year than are often applied for weekly now. The most valuable processes, for example, the collodion process, wet and emulsion, and the gelatine processes, were never patents; yet, what fortunes they would have brought to their inventors! It would be interesting to learn what proportion of the many hundreds of patents that have been taken in connection with photography during the last couple of decades have brought a profit to the patentees, or even recouped them for the outlay for the patent? Still more interesting it would be to learn how many of those taken out would prove valid if they were contested in the law courts.

* * *

A New Metallic Support.

The effect of the metalline photograph is familiar to most photographers, and has special qualities, which render it peculiarly suitable for certain subjects. The "Photographische Kunst," a new publication which has recently been issued at Munich and Leipsic by the "Vereinigte Druckereien und Kunstanstalten," gives particulars of a series of various kinds of metallic plates manufactured by Karl Winter, of Pforheim, Baden. These are for use as support for photographs by the carbon process. The plates are formed of two metals, the "white," having a surface of pure silver, and the coloured, a surface of pure gold. The colours of the latter range from pale yellow to orange, red, and green, the variations being produced by suitable additions to the metal. The surface plate of silver, or gold, is supported by a second plate of copper, or other suitable metal, and the two are welded under hydraulic pressure of several hundred atmospheres. At this stage the plates are several centimetres thick, and they are then rolled to a suitable degree of thinness. By a final mechanical process a fine grain is given to the surface. The transfer of the carbon print to the metallic plate is effected in the usual way. For single transfer, the plates are immersed in warm water, to which a little caustic soda is added, and they are then rinsed. It is, however, preferable with the gold plates to use a substratum of $1\frac{1}{2}$ grammes of gutta-percha, dissolved in chloroform, to which 500c.c. of benzine is added. A 2 gramme solution of gelatine in 500c.c. of water, with addition of 2c.c. of glacial acetic acid, is also a good substratum. The plates should be coated and dried. For double transfer, the plates should be coated with a 5 per cent. solution of gelatine. Dry the plates, and the print may then be squeezed upon them in the usual manner. Care should be taken to cut the prints smaller than the plates, so that when expanded by the water they do not overlap the edges of the plates. The prints should receive one and a-half times the normal exposure for the silver plates, and rather more for the gold. Unsuccessful prints may be washed off by immersion in hot water, to which caustic soda is added, and the plates may then be used again.

* * *

The Parks and the Camera.

It should be generally known that the possession of the photographic "Red Book," issued by the Affiliation of Photographic Societies, gives the owner the privilege to use a hand camera in the London parks. Every member of a society affiliated to the "Royal" should procure for himself one of these handy little volumes. The question as to the use of stand cameras in the parks was raised recently at a leading London society, and a well-known, respected member expressed the wish that the Affiliation Committee should use its influence to obtain an extension of the privilege to the use of stand cameras also. It was stated that unsuccessful attempts had already been made in that direction. Much as we desire to see every reasonable opportunity given for the use of the camera, we think the authorities are right in limiting photographers to hand apparatus in the parks. These open spaces are the recreation grounds of the people, and the free enjoyment of them for that purpose should be the first consideration. Passing through the Broad Walk of Regent's Park, a few days ago, we were greatly impressed with the beauty of the foliage and the reposefulness of the surroundings. It was a delightful change, which seemed to be appreciated by many a person with careworn face, besides the numerous children, who look upon the parks as their urban playgrounds. Had our friend been with us, with his whole-plate camera, he would have attracted a crowd, and completely marred the peacefulness of the spot. It must be remembered that photographic societies are open to all-comers. We have little to say against the itinerant photographer, although he may be over persistent at times. He endeavours to obtain an honest subsistence, and often does creditable work. Yet our experience of him at the seaside and at various suburban resorts, makes us cling to the desire that he may be permanently excluded from the parks. It is true that regulations might be framed prohibiting the use of stand-cameras for trade purposes, but the ease with which a "Red Book" may be obtained, would be a great temptation to set the regulations at naught, and the privilege to use the hand camera in the parks

might then be lost through the transgressions of a few men hard pressed in the struggle for existence.

* * *

Weather Prognostications. Last week we referred to the extraordinary accuracy of M. Jules Capre's forecast of the weather for last month, which he issued at its beginning. He has now issued another for the present month, in which he says that from the 1st to the 15th we are to have hot weather, but until the 5th we must expect frequent thunderstorms. From the 6th onward, he says we may leave our umbrellas at home, for rain is most unlikely; though sailors on the North Sea will have to look out for squalls on the 14th and 15th of the month. From the 15th to the 25th, M. Capre says the barometer will stand at "change," and the tendency will be to rain, but not in any undue quantity. Switzerland and France are to have bad weather from the 19th to the 24th, but here in England, and the North of France, we may expect better things. These are M. Capre's forecasts for June, and it is to be hoped that they will be realised. On the other hand, Dr. Falke, another weather prophet, tells us that we shall have weather worse than that of May. It will be seen that these two forecasts are diametrically opposed to each other, and it will be interesting to note which of the two prove the most accurate, or if either approach accuracy. Our meteorological authorities tell us that it is impossible to forecast the weather for more than twenty-four hours in advance, with accuracy. Unfortunately, the forecasts made by them, that appear in the daily papers, appear to bear out that assertion—even for much less than twenty-four hours, unless the weather is very settled, so frequently inaccurate are they. We notice that the Meteorological Office have announced again this year that they will be prepared to issue, during the harvest season, to presons desirous of receiving them, forecasts of the weather on the payment of the telegrams for them. It is mentioned that these special harvest forecasts are prepared at 3.30 p.m., and are applicable to the twenty-four hours from midnight to the following time of issue. The Meteorological Office have done this several years, but the applications for the forecasts have been but limited. Possibly farmers, from past experience, prefer to rely upon their own judgment, rather than upon the forecasts supplied from the Meteorological Department. As a rule, farmers and boatmen, who are so much dependant upon the weather, are pretty good weather forecasters. On the other hand, photographers, particularly outdoor ones, to whom the weather is equally as important, seem to devote very little attention to the subject.

* * *

Science and Photography. We are glad to see that one of the two scientific observers who, under the auspices of the Royal Society, left England last week en route for St. Vincent, in the person of Dr. Tempest Anderson, is an expert photographer. Moreover, he has had much practice in photographing volcanoes and their attendant phenomena, and is credited with possessing a unique series of pictures of this character. A year or two ago he spent much time on the slopes of Vesuvius, making a study of the natural features of that historic mountain, and taking many photographs near the crater whilst an incipient eruption was in progress. He also devoted much study to volcanic formations in other countries, notably in the Colorado region of the United States, where, with a party of geologists, he was carrying on investigations as late as 1900. It is too often the case that in an inquiry of this kind the photographic duties are deputed to some enthusiast who is reputed to know all about it, but whose real knowledge is of a theoretical and non-negotiable kind. The result is a series of splendid opportunities lost, recorded by some hundreds of spoilt plates or films. Of course, the unfortunate maker of the goods comes in for most of the blame, or it may be the weather, or the careless development of the things—or something else. It is of first importance that nothing of this kind should take place in connection with the volcanic inquiry now on foot. The scientific men of all nations are hurrying to the Windward Islands, in order to see for themselves, and for their respective governments, the results of Nature's destructive handiwork; and we may be sure that photography will play a most important part in furnishing unimpeachable records for future reference. Upon these men will then rest the decision of that serious question whether Martinique is to be still considered fit for the dwelling-place of mankind. The inquiry will, we hope, be extended to a consideration of the islands forming the Windward group as a whole. If we look at a map of them, we shall see the little specks of land peeping out of the Caribbean Sea in the form of a crescent. In three of these islets, namely Guadeloupe, Martinique, and St. Vincent, have destruction of property and awful loss of life taken place within the past month. Is it within the power of science to say how far these horrors are likely to be repeated? We shall know in due course the answer to this question, and, whether it be yea or nay, we may be quite certain that photography will have some hand in the decision.

* * *

Cinematographic Definition. Dr. Grün in his recent lecture before the Camera Club, while advocating the employment of his fluid lens for cinematographic pictures, was understood to say that want of definition, which seems to be characteristic of that instrument, is no detriment to a picture intended for cinematograph projection, because "rapid movement does away with want of sharpness." And he instanced the case of a picture of a torpedo being fired in which the screen projection appeared sharp enough, although the component photographs were fuzzy. We cannot admit the correctness of the conclusions at which the lecturer arrived, and, at the same time, cannot help thinking of that old fable in which the fox who had accidentally lost his tail advocated deprivation of the caudal appendage to all his fellows. Dr. Grün also implied that few such pictures were sharp, the majority being taken at too slow a speed. We must beg to differ from the doctor on this point also. A good cinematograph picture requires to possess finer definition than any other class of photograph, for the simple reason that it has to be magnified to such an enormous extent. If a picture which is only the size of a postage stamp is enlarged, as these cinematograph films commonly are, to fifteen feet, or more, on the screen, every blur becomes painfully apparent, and any film possessing such a fault would be rejected by its manufacturer as quite unsaleable. We have had the opportunity of closely examining many cinematograph films by the best makers, and unhesitatingly state that they are absolutely sharp. In corroboration of our contention, let us, as the lawyers say, state a case. At various manufacturing towns local showmen make a practice of exhibiting moving pictures of the hands leaving one or other of the big factories, fifty men occupying the field of view at any given movement. These workmen will bring their wives and sweethearts to see the pictures on the screen, the exhibition having been well advertised beforehand, and their chief enjoyment is the recognition

of their own likenesses and those of their pals. Now, as in the original pictures, which measure only one inch across, the image of each face cannot be bigger than a pin's head, it is obvious that those little photographs, for the features to be readily identified, must possess definition of the most perfect kind. Would Dr. Grün have us believe that if the individual faces were blurred by movement during exposure, they would set sharp when projected on the screen? If so, the cinematographer need no longer trouble to focus his camera.

* * *

Published Portraits. There is, perhaps, no more useful and pleasing application of the camera than its employment for portraiture of celebrities, be they statesmen who are doing the nation's work in Parliament, soldiers who are fighting for the Empire, the writers of books and the painters of pictures, stars of the concert room and the stage, or any others who in any way are connected with public life. All these, in their several useful rôles, have their admirers, and their portraits find ready entrance to palace and cottage. These portraits obtain a still wider publication through the medium of the various illustrated journals and periodicals, and are much appreciated by the public in general, who, after admiring a man's work, are naturally interested in acquainting themselves with his personality. Of late years the scope of published portraiture has been much enlarged, and we find, with regret, that persons who have absolutely no claim to public recognition are being advertised in this way, apparently merely for their own gratification. We may suppose that the notion originated in the portraiture of private persons at the annual exhibition of the Royal Academy. But in this case there is valid reason for such publication, the pictures being shown as works of art, that is to say, as specimens of the skill of certain painters, the personality of the sitters being quite a secondary matter. In fact, up to recent years such pictures appeared in the catalogue as "portrait of a lady," or of a gentleman, as the case might be. But now, owing to the ease with which a photograph can be adapted to the printing press, we are deluged with portraits of Mr. Nemo, or his sisters, cousins, and aunts, simply because that gentleman has the means to pay for the advertisement, for advertisement it is, and a very vulgar one at that. Possibly the payment is an indirect one, the advertiser guaranteeing to take so many copies of the publication in which the picture appears. The system is carried to its most offensive point when portraits of a bride and bridegroom are published, with notices as to the number of presents which they have secured, an account of the dresses worn by bride and bridesmaids, and other particulars of no interest whatever to the general reader. There is something very unpleasant in this form of vainglory, and it can best be compared with the vulgar ostentation exhibited by the ornate funeral trappings so dear to a lower stratum of society. We suppose that no man would think of parading his bride in her wedding finery, followed by a cart containing the presents, along one of our public thoroughfares, but this is, in effect, what he does when he sends the portrait of his newly-wedded wife for publication, and for Tom, Dick, and Harry to criticise. Are we, as a nation, getting lax as to the sacredness of the home, and of home life, or is this mania for publishing the contents of the family album merely a sport of the vulgar few? The system has not even the small merit of benefiting the poor photographer, for such multiplication of portraits brings no grist to his mill. It merely increases the circulation of periodicals which are not above pandering in such a way to the self-complacency of their patrons.

PERSULPHURIC ACID AND PERSULPHATE OF AMMONIA.

In 1834 Faraday electrolysed aqueous solutions of sulphuric acid, and found a remarkable disappearance of oxygen, but he did not carry his discovery any notable distance farther. It was not till 1878 that the explanation of the phenomenon was discovered by Berthelot, who announced that the formation of persulphuric accounted for this disappearance. Moreover, the latter chemist isolated the anhydride S_2O_7, and concluded that the corresponding acid was formed by, among other methods, dissolving the anhydride in water, which would give us $H_2S_2O_8$. Later on, we find that in 1891 Dr. Hugh Marshall discovered that salts of this acid were obtainable by electrolysing either the potassium or ammonium hydrogen sulphate. In a few years' time, in 1898, in fact, Caro found reason to believe that persulphuric acid was not the simple body that it had hitherto been believed to be, as, on acting upon a persulphate with sulphuric acid, the acid liberated was unlike the acid of Berthelot. Later still, the topic of persulphuric acid and its formula has been the subject of much discussion, the last word of which, so far, is to be seen in a paper by H. E. Armstrong, V.P.R.S., and Dr. Martin Lowry, read before a recent meeting of the Royal Society. Here the authors adduce evidence that the hitherto received formula is not correct, or, rather, is imperfect, and that there are at least three persulphuric acids, instead of one, the ratios of sulphur to active oxygen being respectively four, two, and one in the acids named pertetrasulphuric, perdisulphuric, and peranhydrosulphuric acid. At present the chief value of the alkaline persulphates in photography is as reducing agents, the potash salt being least useful; its water will only take up about seven or eight grains to the ounce, while over half an ounce of ammonia persulphate will dissolve in that quantity of water. The former salt has been added, under the name of "anthion," to the long list of "hypo-eliminators," of which it is not possible to say anything of a laudatory nature. In this particular case one of the products of "elimination"—tetrathionate of soda, etc.—is decidedly more objectionable than the hypo itself, owing to its great instability. But beyond that, as we have often pointed out, it is not the hypo per se in itself, at any rate, in comparatively small proportion, that we must look to for an explanation of faded prints, but to the fact that, so long as a portion of the original "fixing solution" is present, so, also, must there be a portion of the dissolved silver it contains, and which, as the water evaporates, is likely to assume a most unstable form. Hence, no hypo eliminator is likely to be of the slightest use; rather the reverse.

As to the employment of the ammoniacal salt, we have recently been experimenting, with the endeavour to ascertain whether some of the alleged difficulties of its use really do occur in practice. In the first case, the point upon which considerable stress has been laid is the necessity for a freshly prepared solution. We happened to come across a 10 per cent. solution, which, to our knowledge, was at least six months old. That decomposition had set in was evident to the sense of smell directly we took out the stopper; still, we persevered, and placed an old negative in the solution, further diluted. The action was perfect. When the particular action peculiar to this intensifier, the non-eating away of the half-tones and lighter deposits, was first called attention to in this country by Mr. Watmough Webster, he described the liability to the production of spots and markings as erratic as the comets, etc., of old worn plate days. Some experimenters failed to experience these markings, and we endeavoured

to find out the conditions. This we quickly discovered to be almost a function of strength of solution. So long as the strength was kept below two per cent. (nine or ten grains per ounce), no difficulty arose; but when two per cent. or stronger solutions were employed the whole image seemed to be in a state of unstable equilibrium, and liable to become marked and spotted without apparent cause. The remedy is obvious—to keep the solution always below the two per cent. strength. It will be found amply strong enough even for a dense film, for it is advisable to keep the strength down to keep the action under control. The reduction continues for some time after the removal of the plate and the washing. There is a point beyond which the reduction should not pass—that is, a rather rapid change of colour which takes place after the plate has been in the solution a certain length of time. If it be left in the solution for a longer period, the denser parts lose their opacity, and the whole negative has a "washed-out" appearance, devoid of crispness and quality.

As the reduction continues while the plate is being washed, it is desirable to adopt some means to check its action. The usual recommendation is to put the plate straight from the reducer into a bath of sulphite of soda. This plan is to be deprecated, on account of the great liability to iridescent and other staining upon the contact of the sulphite and the persulphate solutions. We found that it was better to wash the plate slightly before placing it in the sulphite bath. Little precipitation then took place. If placed into a hypo bath, ineradicable stains will be brought about.

Our experience is that the best plan to proceed is, wash for about a couple of minutes in a running current of water and then to immerse in a 10 per cent. sulphite solution. If allowed to remain long enough, the first stain-like effect produced, together with an occasional iridescence of the surface, will disappear gradually, and leave a beautifully clear negative behind. If, however, time be an object, the quickest result will be obtained by leaving the plate a few minutes only in the sulphite and then to transfer to fresh hypo solution of ordinary fixing strength. The stains that would have inevitably followed the use of hypo as a first bath are entirely avoided. As briefly as we can, we have narrated the results of our experimentation, and, in conclusion, we may state that a continued experience of its use strengthens our conviction that, used as above described, there should be no difficulty whatever in taking advantage to the full of the special powers as a reducer possessed by persulphate of ammonia.

Royal Institution.—A general monthly meeting of the members of the Royal Institution was held on Thursday afternoon. Mr. J. Christie, Mr. F. K. McClean, and Sir John Denison Pender were elected members.

The Royal Photographic Society of Great Britain.—At the ordinary meeting, June 10th, at 8 p.m., Professor J. C. Bose, D.Sc., will read a paper on "The Strain Theory of Vision and of Photographic Action." and show illustrations. Mr. W. Smedley Aston's exhibition of portrait and landscape photographs will be on view until the end of July. Members may introduce two friends to each meeting.

A Census of Lancashire and Yorkshire Photographers.—The occupational results of the census of last year in respect of the Administrative Counties of Lancaster and York are now available, and in regard to the first-named county, show that 1,127 male persons and 374 female persons were enumerated as photographers, whilst in regard to the last-named county the respective totals are 840 and 292. Distributed under the following range of ages the results obtained are:—

	10	14	15	20	25	35	45	55	65	75 and upwards.	
Lancaster.											
Males ...	4	7	95	189	343	252	136	72	24	5	—1,127
Females ...	3	7	92	110	109	31	14	5	3	—	— 374
York.											
Males ...	2	5	98	115	243	167	126	60	24	—	— 840
Females ...	3	10	101	73	70	25	5	3	—	2	— 292

JOTTINGS.

The times change, and we change with them. Messrs. Alfred Ellis and Walery, the well-known photographers and photographic publishers, of 51, Baker Street, London, N.W., have issued the following notice:—"To meet the requirements of amateur photographers, we have opened a department for the sale of plates, sensitised papers, and apparatus; also to develop, retouch, print, mount, make lantern transparencies or enlargements from customers' own negatives. We shall stock the best and most up-to-date materials, and give every attention to the requirements of amateurs, who will find our experience as photographers of great advantage to them." There are several professional photographers who already retail photographic materials as well as use them in their businesses for portrait and view taking; but, nevertheless, the number who do so is comparatively small. One of the largest concerns of the kind in London—the Stereoscopic Company—has been conducted on this plan from a period long anterior to the time when chemists and others began to stock photographic supplies, and it is surprising that this example has not been more widely copied. A hint from so shrewd a man of business as Mr. Alfred Ellis is worth taking, and although I do not for a moment suppose that the 4,000 or 5,000 professional photographers in this country are all in a position to profit by it, there is probably a considerable percentage of them armed with the necessary capital to qualify them for following so excellent a lead. Locality and the suitability of the premises for a retail trade are also questions that have some bearing here, but in general it is a matter for the individual to settle for himself. Photographically, I know my London and the principal towns of Britain intimately, and I can recall dozens and dozens of photographic shops which would serve in an admirable manner for the display and sale of photographic apparatus; and surely the man who is habitually using plates, papers, chemicals, lenses, cameras, etc., should, *ipso facto*, be qualified to sell them across the counter? It is too often urged, and not without reason, that photographers are painfully prone to shut their eyes to the opportunities that come their way—witness how they let the half-tone process slip through their fingers—but taking up the selling of photographic goods is such a simple plan of adding a string to one's bow that it may reasonably be conjectured the Ellisian departure will not be without its effective moral influence.

Now that the heaviest war-cloud of modern times has been dispelled by the sun of peace, it may be supposed that photographers as well as other classes of the community will find occasion to divert more of their thoughts into the channels of pleasure than they have allowed themselves to do during the past two years and nine months. The ordinary burdens of life are heavy enough in all conscience without the added weight of depression which a protracted war necessarily imposes on the mind of every single member of the community. The Photographic Convention of the United Kingdom has now reached the charming age of "sweet seventeen," and the Cambridge meeting will be held in the week July 7th-12th next. Members have already received the official handbook, and it is in the hope that the attendance of photographers from all parts of the country will be favourably influenced thereby that the substance of the book, which deals with the week's arrangements and the papers descriptive of Cambridge, Ely, and the other places to be visited is printed *in extenso* in this number of the Journal. The Fenland Convention will have as its President the genial astronomer, Sir Robert S. Ball, and I am assured that the local committee, amongst which Mr. F. H. Sanderson has figured prominently, has worked hard in perfecting the arrangements for the meeting. Besides a portrait of the President, the handbook contains a reference map of Cambridge, four architectural illustrations, and

a fifteen-page list of local apartments giving details of the accommodation. This is a new feature of Convention information which will, no doubt, be appreciated by many who, arriving from a distance, tired and travel-worn, wish to spare themselves the unpleasant task of hunting for rooms. From such a finished speaker as Sir Robert Ball a good and luminous address is sure to be forthcoming, and as the "papers" this year take the form of practical demonstrations by practical men, the Conventioner who likes his intellectual fare served up in an easily digestible doses need not go in fear of having to sit, at the evening meetings, under Professor Dryasdust, F.R.S., "toying with the alphabet and the numerals." It is to be noted that the business day of the meeting has been changed from Wednesday to Thursday, excursions being made on Tuesday, Wednesday, and Friday. Cambridge and the places to be visited give the photographer a splendid choice of subjects; and a successful and pleasant week should reward the efforts of those gentlemen who have ungrudgingly given their time and trouble to provide entertainment for their visitors. My last visit to Cambridge was to assist in some practical trials of the Sanderson camera, when it was first brought out. The test subject was the exterior of King's College Chapel, and the sportive undergraduates in neighbouring rooms pelted us and our cameras with lumps of loaf sugar. I was assured that this pretty, but occasionally inconvenient, custom is peculiar to this classic seat of learning. I prefer loaf sugar in my tea or coffee.

Mr. Harry Foster, who last week (p. 439) gave Mr. H. Walter Barnett "the retort courteous," in the correspondence relating to the Illinois College of Photography, wrote a letter of which time will probably bring home to him the futility and unwisdom. I do not know Mr. Foster from Adam: but the question whether a much-advertised American College is likely to send out professional photographers after from three to six months' instruction completely qualified to open studios or start business on their own account in these exacting times, is surely one that lends itself to a form of discussion from which ambiguity of reference and the *tu quoque* style of reply should be absent. Mr. Barnett devotes time, thought, and effort in order to elevate the profession to which he belongs, and if there were more of his *confrères* animated by the same unselfish spirit, the long desiderated improvement in the status of professional photography would be brought appreciably nearer. It is by one and all upholding the dignity of their calling and maintaining its rights and honours that an ever just public comes sooner or later to award that true measure of recognition which sustains the individual in the reflection that in the stern battle of life he bears a part in which, for its own sake, he may take pride. It is a good thing to be proud of one's profession—a stimulating and inspiring thing, without which success is rarely attainable. Take journalism. At one time, within my recollection, its social status was much lower than it is at present. I question very much whether Mr. Pinero, supposing his pretty little play of "The Squire" to be produced in 1902 instead of 1882—ah, me! it does not seem twenty years since the "scent of the hay" was first "wafted across the footlights"—would be permitted by the Fourth Estate to pass off the unpleasant caricature of journalism which that piece contains. Journalists do not hold themselves so cheaply as formerly, nor should photographers. There is a great deal of truth in the saying that the world rates you as you rate yourself. Elsewhere in this week's JOURNAL there is given the copy of a correspondence that has passed between Mr. Barnett and the Proprietor of "Bibby's Quarterly." The pith of all that is claimed in that correspondence, on behalf of the professional photographer, is that he should not only be paid for his work—and well paid—but that he should have every reasonable recognition of and publicity for it, which in these days constitute the very oxygen of his existence. In recent times the rapid growth of the illustrated press has rendered the position of the professional photographer an exceedingly difficult one to maintain. First of all, his publication trade has been destroyed; then his reproduction fees have formed the object of concerted destructive attack; his copyright interests have been repeatedly menaced; and now his very identity is to be obscured, if not effaced. Mr. Barnett's call to arms sounds at an opportune moment.

Dr. Grün shares the fate of the heterodox, and it is not surprising that his Fluid Lens, which is attracting much attention just now, should excite feelings that, to quote Longfellow, are "uttered not, but comprehended" by orthodox photographic opticians and photographers. But since he first exhibited specimens of the work it produced some eighteen months ago, the results have conspicuously improved in quality, and of the examples now hanging over the clock at the Camera Club, one, a view of a harbour, at least shows a near approach to what used to be termed *f*.64 definition. Some of the stage scenes are also fairly well defined, natural and spontaneous looking, and the portraits are here and there distinctly "pictorial." A few years ago none of these results would have been looked at a second time; nowadays, thanks to the movement which has educated people up (or down) to the acceptance of photographs in which definition, as the opticians understand the property, is non-apparent or non-existent, a class undoubtedly exists to which the Grün lens appeals. In at least two branches of work, to which little or no reference was made in the Camera Club lecture of last week, the system has possibilities—telephotography and portraiture. Dismissing the theoretical side of the subject from consideration here: what I understand Dr. Grün to claim is that with his fluid lens of the newer construction, fitted inside a hand camera of simple form, one has the power of taking rapid photo-sketches, if I may so term them, of artificially or dimly lighted subjects, more or less well defined over a small field. The most rapid hand camera lens of the day works at *f*.5; by the Grün system one may work at *f*.2.5 or *f*.1.5, practically twice or four times the rapidity. The only results I have seen are by Dr. Grün himself, who perhaps is far too busy a man to devote much time to photography, and I am curious to know how others succeed with his lens. For special subjects and in special circumstances, the system has a value of its own—that is to say, where a comparatively large area of fine definition which will stand amplification is not required; and it will stand or fall by its merits and the appreciation of a particular class of workers. At the same time, while recognising its distinctive possibilities and usefulness, I do not think it will displace any of the existing types of lens systems, each of which serves a special purpose. Optically, Dr. Grün possibly lays himself open to criticism; practically, his system opens up what is really a new field of work.

The publication of the R. P. S. Exhibition prospectus is a reminder that we are only three months removed from the sending in date—only three months from autumn, with, at the time of writing, winter not merely lingering in the lap of spring, but firmly and comfortably seated there. I would specially direct attention to the lists of the Judges and the Hanging and Selecting Committees. Taking the technical side first, most phases of scientific photography have their representatives, and it is doubtful if a better set of men could have been got together for the work. The pictorial section has its complement of "back numbers"—people who have no claim, save the mandate of an hysterical electorate, to a share in the management of the Exhi-

bition, but they will be fully accounted for by such strong men as P. H. Emerson, William Crooke, J. S. Bergheim, H. Walter Barnett, and Martin Jacolette. I congratulate Mr. Crooke, who is incomparably the most gifted professional photographer of his time, on his accession to the R. P. S. Pictorial Jury, which this year realises an old dream of mine, that of being composed entirely of photographers, to the exclusion of the casual academician. A few years ago I was laughed at for suggesting that the R. P. S. Exhibition of photographs should be judged by photographers only—but time has vindicated me. It is a small point this, and yet it is one of some importance in its way, for it makes towards self-reliance and self-respect in photographic work. I shall look to the forthcoming Exhibition to play a great part in educating the public to appreciate sound photographic portraiture, and I earnestly appeal to all professional readers of these lines to send in work of their best. May I also suggest to the authorities that Hill and Adamson's magnificent volume of portraits, produced over 50 years ago, should be placed on view, so that visitors to the Exhibition may have an opportunity of comparing the old with the new, and thus of realising exactly what advance or retrogression has been made in this vital branch of photographic work.

COSMOS.

Exhibition.

EXHIBITION OF PHOTOGRAPHS BY MR. SMEDLEY ASTON.

An exhibition of the works of Mr. Smedley Aston, of Birmingham, is now being held at the House of the Royal Photographic Society, 66, Russell Square, W.C., and will remain open for about a month. On the opening night Mr. Aston gave an address, which deserved a better audience than the dozen or so that assembled to hear it.

It has been frequently the fate of those photographers whom the society has honoured by the invitation to provide an exhibition at its rooms that their ideas and aims as expressed by themselves in words have received little or no confirmation from their works; indeed, in some cases it has appeared as though the examples on the walls have been selected for the purpose of illustrating characteristics which their authors considered deserving of condemnation. In this respect Mr. Smedley Aston has not erred. His address sounded a note too seldom heard when photography in its art association is the theme. It was a defence of simple, straightforward photography, and a protest against the methods of those who sully its fair fame by attempting to disguise instead of making the most of its natural characteristics, and by prostituting it to unworthy aims. At considerable detail, Mr. Aston set forth his views regarding the scope of photography as a means of artistic expression, the spirit in which pictorial work should be attempted and other matters appropriate to the subject, altogether a very wholesome disquisition to a refreshing change from the high falutin' nonsense frequently indulged in on similar occasions.

About 140 pictures are shown, the landscapes and the portraits and figure studies being hung in separate rooms, an arrangement which may have its advantages but which somewhat lessens the attractiveness of the exhibition as a whole by depriving it of that sense of variety of subject which is naturally pleasing. It is not the fact, however, that there is any want of diversity, either in material or in treatment. There is nothing sensational in the whole collection, and it is evident that, throughout, the aim has been to keep strictly within the limitations of pure photography, and by photographic means to reproduce the actual effect that appealed to the eye at the time the picture was made. Many of the landscapes are strongly reminiscent of the kind of work that was most appreciated twenty or so years ago, and the fact is not surprising. Mr. Aston deliberately restricts himself to the methods which the photographers of those days practised. In their case want of knowledge of how to sophisticate their photographs prevented them from attempting to achieve success by any other means than those which Mr. Aston lays down as being the only legitimate ones, and their resource was to perfect their photography technically to enable them to cope with the difficulties that arose. As we know, too often, the cult of technical perfection led, not so much to overestimation of the value of technical photography, as to wrong understanding of what constituted technical perfection, and to that conventional treatment to which the term "photographic" is generally applied. Towards this conventional treatment Mr. Aston occasionally lapses, and probably intentionally. A few of his works we should certainly describe as topographical photographs, using the expression in its strict and simple sense, and not in the depreciatory way it is now commonly used. On the other hand, there are many examples that are eminently pictorial in character, but still unadulterated photographs. These we would commend to the study of all interested in pictorial photography. It may be that Mr. Aston is a little uncompromising in his ideas of what is legitimate in the production of photographs, but he is certainly to be honoured for having acted up to his convictions. The path he has chosen is the most difficult one, and that he has succeeded is, therefore, the more meritorious.

PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM.

17TH ANNUAL MEETING AT CAMBRIDGE, JULY 7TH TO 12TH, 1902.

The Meetings and Exhibition of Apparatus, Pictures, etc., will be held in the Guildhall.

President for the year.—Sir Robert S. Ball.

Retiring President.—Sir William J. Herschel, Bart.

Vice-presidents.—Thomas Bedding, C. H. Bothamley, F. P. Cembrano, W. Crooke, George Davison, Sir Howard Grubb, Andrew Pringle, and John Stuart.

Members of the Council.—C. S. Addison, Cambridge; Harold Baker, Birmingham; G. B. Bainbridge, Newcastle-on-Tyne; W. Barry, Hull; Godfrey Bingley, Leeds; Alexander Cowan, London; W. J. Croall, Edinburgh; T. R. Dallmeyer, London; Dr. Dufton, Cambridge; W. E. Dunmore, London; Alfred Ellis, London; S. H. Fry, London; F. H. Gandy, Derby; J. Pattison Gibson, Hexham; C. E. Goodrich, Cambridge; H. M. Hastings, London; E. J. Humphery, London; Col. Impey, Oxford; E. C. H. Jessop, Oxford; Sydney Keith, Hounslow; C. Phipps Lucas, London; Percy Lund, Bradford; J. L. Lyell, London; Col. Lysaght, Bloemfontein, O.R.C.; Rev. W. M. Merry, Oxford; A. F. Mowll, Liverpool; Rev. T. Perkins, Blandford; Claude Rippon, Oxford; R. Robinson, Redhill; J. A. C. Ruthven, Dublin; P. R. Salmon, London; F. H. Sanderson, Cambridge; D. J. Scott, Cambridge; A. Seaman, Chesterfield; E. Sanger Shepherd, London; Alexander Tate, Belfast; W. Taylor, Leicester; G. H. Tyndall, Ely; J. H. Walker, Leeds; E. J. Wall, London; H. Snowdon Ward, London; S. B. Webber, London; G. Watmough Webster, Chester; J. B. B. Wellington, Elstree; A. Werner, Dublin.

Messrs. R. W. Dugdale (of Gloucester), W. Thompson (of Newcastle-on-Tyne), and G. W. Norton (of Oxford), are by Rule XII. ex-officio members of the Council for one, two, and three years respectively.

Vice-presidents are by Rule X. members of Council ex-officio.

Trustees.—Samuel Blatchford Webber and Frederick Albert Bridge.

Hon. Sec. and Treasurer.—E. A. Bridge, East Lodge, Dalston Lane, London, N.E.

RECEPTION COMMITTEE.

Alex. Peckover, LL.D., Lord Lieutenant of the County.

The Right Rev. Lord Alwyn Compton, Lord Bishop of Ely.

Adolphus William Ward, Master of Peterhouse, Vice-Chancellor of the University.

The Worshipful the Mayor of Cambridge, Mr. Alderman G. Kett, J.P.

The Worshipful the Mayor of St. Ives, G. Kiddle, Esq.

John Willis Clark, M.A., Registrary of the University, formerly Fellow of Trinity College.

James Dewar, M.A., F.R.S., Jacksonian Professor of Experimental Philosophy, and Fullerian Professor at the Royal Institution.

W. Ridgeway, M.A., Disney Professor of Archæology.

Sir William Martin Conway, Slade Professor of Fine Art.

Montague Rhodes James, Litt. D., Director of the Fitzwilliam Museum, Fellow and Tutor of King's College.

A. H. Mann, Mus. D., Organist to the University, and of King's College Chapel.

A. C. Haddon, Sc.D., F.R.S., University Lecturer in Ethnology.

J. Griffiths, M.A., M.D., Reader in Surgery in the University.

T. B. Wood, M.A., University Lecturer in Agricultural Chemistry.

F. Dewberry, Mus. B., F.R.C.O., Borough Organist.

H. I. Hankin, Esq., ex-Mayor of St. Ives.

A. J. Pell, Esq., Wilburton Manor.

G. D. Day, M.A., Town Clerk, St. Ives.

Horace Darwin, M.A.

T. D. Atkinson, Esq., Hon. Sec. to the Cambridge Antiquarian Society.

E. A. Newell Arber, M.A., F.G.S.

J. Palmer Clarke, Bury St. Edmunds.

Local Executive Committee.—F. H. Sanderson (Chairman), W. C. Addison, Dr. Bansali, W. Barrett, F. W. Bird, J. Bolton, W. Butcher, F. P. Dew, Dr. Dufton, E. Field, W. Goodrich, W. H. Hayles, T. B. Hunt, John Johnson, Stanley C. Johnson, J. H. Leech, E. S. Peck, M.A., W. B. Redfern, D.L., J.P., D. J. Scott, T. J. Sowdon, F. J. Stoakley, R. Sturton, W. Tams, W. F. Taylor, G. H. Tyndall, and J. Wilson.

Excursion Committee.—F. W. Bird, W. Butcher, Dr. Dufton, T. B. Hunt, John Johnson, W. F. Taylor, G. H. Tyndall.

Accommodation Committee.—Dr. Bansall, W. Butcher, D. J. Scott, F. J. Stoakley, W. F. Taylor.

Dinner and Entertainment Committee.—C. S. Addison, Dr. Bansall, F. P. Dew, Dr. Dufton, E. Field, W. Goodrich, Stanley C. Johnson, J. H. Leech, E. S. Peck, M.A., W. B. Redfern, D.L., J.P., D. J. Scott, F. J. Stoakley, W. F. Taylor.

Local Hon. Sec.—H. A. Chapman, 5, Trumpington Street, Cambridge.

NOTICES TO MEMBERS.

On Monday, July 7th, the hon. secretaries will attend all day, from 10 a.m., in the Guildhall. Members are requested to report themselves as early as possible, receive their badges of membership, and secure tickets for the excursions.

SIGNATURE BOOK.

It is desirable that members, immediately on arrival, should enter their names, full addresses, and where staying in Cambridge, in the signature book at the Guildhall.

PLAN OF CAMBRIDGE.

A plan of the city, with references showing the positions of the principal buildings, etc., will be found in the Handbook.

The Guildhall, where the conversazione, evening meetings, and exhibition are held, is situated on Market Hill, and is numbered one on the plan. Tram cars from the railway station to the post office every few minutes. Fare one penny.

EXCURSIONS.

Members should obtain tickets for these as early as possible, in order that adequate provision may be made for their comfort and convenience. With regard to Tuesday's excursion, it is particularly desirable that members wishing to go should write to the Hon. Secretaries, Photographic Convention, Guildhall, Cambridge, so that the letter is delivered not later than first post on Monday, July 7th.

HOTELS.

A list of hotels will be found below. A summary of the charges is given, but members are advised, where possible, to obtain a printed tariff on arrival; there can then be no misunderstanding as to terms.

PRIVATE APARTMENTS

Members preferring private apartments (of which a large number will be available) are requested to communicate with the local hon. secretary, Mr. H. A. Chapman, 5, Trumpington Street, Cambridge, who will forward a list of rooms, with terms, etc.

ANNUAL DINNER AND SMOKING CONCERT.

The annual dinner and smoking concert, at which ladies are welcomed, will be held in the University Arms Hotel.

EXHIBITION OF APPARATUS, PICTURES, ETC.

An exhibition of apparatus, pictures, etc., will be held in the Guildhall during Convention week.

ORGAN RECITALS.

Dr. A. H. Mann, organist to the University, has kindly promised during the meeting, to give one or more recitals on the King's College chapel organ. Particulars will be duly posted on the notice boards.

LANTERN SLIDE EXHIBITIONS.

There will be an exhibition of specially selected lantern slides of places in and around Cambridge, in the Guildhall, after the president's address, on Monday evening, July 7th.

EVENING MEETINGS.

On Wednesday and Friday evenings the meetings will commence at 8.30.

PERMISSION TO PHOTOGRAPH.

By the courtesy of the authorities, every facility will be given to those members desirous of photographing in the colleges, college grounds, etc., from July 7th to 12th inclusive. It is imperative that the Convention badge should be worn.

POLITICAL AND MASONIC CLUBS.

The committees of the Liberal and Conservative Clubs have decided to consider all members of Convention as honourary members of their clubs during Convention week. A hearty welcome will be given to masonic brethren, and the committee of the Masonic Club offers them the free use of the rooms, 12, Market Hill, during the meeting.

DARK ROOMS.

A list of dark rooms in Cambridge will be found below.

NOTICE BOARDS.

Notice boards will be placed in the lobby of the Guildhall, and also in the meeting room. Members are requested to consult these daily.

GUIDE TO CAMBRIDGE.

"A Concise Guide to the Town and University of Cambridge," by John Willis Clark, M.A., F.S.A., to whom we are indebted for our interesting article on Cambridge, may be obtained at the bookstall in the Guildhall. Price one shilling.

LONDON AND CAMBRIDGE TRAIN SERVICE.

DOWN.

From Liverpool Street, week days.—5.30, 8.40, 9.10, 11.0, 11.50, 2.30, 4.30, 5.15, 8.20, 10.2. Sundays, 8.5, 9.50, 3.30, 9.10.

From St. Pancras.—9.15, 12.5, 2.35, 5.5, 9.50. No Sunday trains.

From King's Cross.—7.45, 9.0, 11.10, 12.40, 3.10, 5.0, 5.10, 7.30, 9.35. Sundays, 8.30, 11.45, 6.0.

UP.

To Liverpool Street week days.—7.37, 8.53, 9.43, 11.20, 11.35, 1.36, 3.5, 4.42, 4.55, 7.3, 8.36, 9.44, 12.55. Sundays, 9.15, 5.10, 5.50, 8.18, 12.55.

To St. Pancras—8.53, 9.43, 11.35, 12.6, 3.5, 4.42, 7.3.

To King's Cross.—7.40, 8.30, 10.0, 12.0, 2.15, 4.35, 6.12, 7.45. Sundays, 7.20, 5,35, 8.30.

Fares.—1st class, single, 8s. 9d.; return, 15s. 10d. Third class, single, 4s. 7½d.; return, double fare.

Special Notice.—The times of departure of trains on the excursions have been given as correctly as could be ascertained at the time of going to press. It is not expected that there will be any alteration; but in any case, the correct times will be stated on the excursion coupons.

CAMBRIDGE.

By John Willis Clark, M.A., Registrar of the University.

In the following hints to a stranger visiting Cambridge, I propose to draw his attention only to the most picturesque and interesting objects. I suppose him to start from the Fitzwilliam Museum.

As a visitor walks north down Trumpington Street, he finds on his left

PETERHOUSE,

the earliest college, founded on this site in 1234, by Hugh of Balsham, Bishop of Ely. The Hall, still standing, though much altered, was built 1286, and the west and north sides of the quadrangle between 1424 and 1431. The fifteenth century buildings still exist behind the classical facing added 1754. The chapel and cloisters were finished soon after the Restoration, and the building on the north side of the entrance court in 1732. Walk through the passage between hall and kitchen into the Fellows' garden, and note the picturesque tower containing the stairs which originally led from the Hall to the Master's chamber. The brick building which prolongs the south side of the college to the street contains the library. Note the bookcases (1632). Next to this college stands the

CHURCH OF ST. MARY THE LESS,

built 1340 to 1352. Note the decorated east window, and the remains of piscina and sedilia and other architectural details. In the churchyard, note the north wall of Peterhouse, and the picturesque gallery connecting the college with the church. Opposite to the west end of the churchyard is the museum of General and Local Archæology and Ethnology. Return to Trumpington Street. Opposite the end of St. Mary's Lane is

PEMBROKE COLLEGE,

founded 1346. The original quadrangle was completed before 1376, but of this little remains, except the facade from the corner of Pembroke Street to the south side of the gable which contains a pointed window of three lights. The old chapel (corner of Pembroke Street) has been remodelled, and the old facade was ashlared 1712, but with these exceptions had been little changed. Note gate of entrance—a plain arch with a hood-mold and a pair of oriel windows above—the whole composition belonging to a period before gate-houses with flanking turrets had come into fashion. This college was greatly changed by Alfred Waterhouse, architect (1872-75). Note the chapel by Wren (1664); the wood-work and plaster-work put into the old chapel when it was fitted up as a library (1690), and in the second court the two ranges of chambers built 1633 (north side) and 1659 (south side).

Opposite Pembroke College is the University Press. On the other side of the street note the church of St. Botolph, with a picturesque tower of the fifteenth century. Pass down Silver Street to

QUEEN'S COLLEGE,

founded 1447 by Margaret of Anjou, Queen of Henry VI. These beautiful buildings, which are in almost their original state, deserve very careful examination. Note especially the gate of entrance, the second court with its cloisters, the gallery of the President's Lodge (built about 1520), both inside and outside, especially from the garden, the river front, and the Walnut Tree Court.

Leaving Queen's College, turn left along Queen's Lane, and note the entrance gate of St. Catherine's College, built 1675-97. Pass

through the college, noting the picturesque grove of elm trees between it and the street, and cross to

CORPUS CHRISTI COLLEGE.

The modern quadrangle, built by Wilkins (1823-27), contains nothing of interest. Pass through it to the Old Court, built 1352, by the united Guilds of Corpus Christi and St. Mary. It preserves much of its original construction, and gives a good idea of what a primitive college was like. Pass through the kitchen into Free School Lane, and note the outer walls built of uncoursed rubble, the gallery leading to the church of St. Benedict (used anciently as the college chapel), and the church itself. It is the oldest church in Cambridge, the tower being in the style called Saxon. Cross Trumpington Street to

KING'S COLLEGE,

founded by Henry VI. (1440). It was intended, according to the original plan, that the chapel should form the north side of the quadrangle, the east and west sides butting against it. The King's death prevented this scheme being carried out. The Fellows Building (Gibbs, architect), was built 1723, and the rest of the college 1824-28 (Wilkins, architect). In the chapel note the stained glass, made in London 1526-30, with the exception of the west window by Clayton and Bell (1879), and half the south east window (1845); the woodwork, especially the organ screen, a splendid specimen of Italian work, set up while Anne Boleyn was Queen (1532-36); the brass lectern (1509-1528); the fan vault; and the heraldic devices in the antechapel, which commemorate the work done by the executors of Henry VII. Those interested in the history of architecture should carefully examine every part of this chapel, including the small side-chapels, which contain many curious objects.

The street in front of King's College, called King's Parade, is picturesque, especially when seen from the steps of the Senate House.

GREAT ST. MARY'S CHURCH,

the largest in Cambridge, is a fine specimen of perpendicular Gothic, begun 1478 and finished 1608. Behind this church is the

MARKET PLACE,

which reached its present size as a result of an accidental fire, 1849. There are several picturesque bits of domestic architecture in this place, especially on the east side. On the south side is the Shire Hall (1747), behind which is the new Guildhall, begun 1859. At the south-west corner of the Market Place is the Pease Market, commonly called Pease Hill. Between the Pease Market and King's Parade is the

CHURCH OF ST. EDWARD,

rebuilt at the end of the fourteenth century, but the lower part of the tower is Early English. The original architecture has been much obscured by modern alterations. The interior is worth a visit. Pass through St. Edward's Passage to King's Parade, and visit the

SENATE HOUSE AND UNIVERSITY LIBRARY.

The Senate House was finished in 1730 (Gibbs, architect). Note the fine interior, with contemporary woodwork. The group of buildings now called University Library, were originally the schools or lecture rooms, in which the mediæval university instructed its members. They were built 1400-1473, the range on the north side being the earliest. The old east front was destroyed 1758, when the present classical facade was built. In the room on the first floor of the south side note the original roof (1457-70), and the book-cases (1649). In the Catalogue Room (first floor, north side), formerly the Senate House, note the roof (1600), and the book-cases (1719-34). On the opposite side of Senate House Passage is

GONVILLE AND CAIUS COLLEGE,

founded 1348 by Edmund Gonville, and re-founded 1557 by Dr. Caius It is best to enter this college by the small gate in Trinity Street. The court here entered, called Tree Court, was rebuilt by Waterhouse (1868-70). The gate, as built by Dr. Caius, was called Gate of Humility. In this spirit a student was supposed to enter, and to pass along the avenue of trees to the Gate of Virtue. Note the architecture, emblems of virtue, etc. Guided by virtue, the student spent his university career in the college, and at last, if worthy, passed through the Gate of Honour to receive his degree in the schools. Note the architecture of this quaint structure, sadly mutilated by time, and also that of the two ranges of building erected by Dr. Caius. North of these is the small court of the original Gonville Hall (founded 1351), completely transformed in 1753. Pass through the Gate of Honour, turn to right, and then to left, so as to reach (right)

CLARE COLLEGE,

founded 1338, and rebuilt 1638-1715. The rebuilding began with the east front. The south range was interrupted by the Civil War. After the Restoration, part of the west range was built. The north range was begun 1683 and finished 1693; the chapel was begun 1763 and finished 1769. Examine carefully every part of this college, including the bridge built 1640, the river front, and the avenue. The ironwork of the gates, and the book-cases in the library should also be noted. On leaving this college note west front of University Library, built by Pearson (1889). The gate of entrance originally belonged to the old court of King's College. The foundation stone of the gate was laid by Henry VI. in person, 2nd April, 1441, but it remained unfinished till 1889. Note the original doors and the east front of the gate in the quadrangle. Passing along the street a visitor soon reaches on the left,

TRINITY HALL,

founded 1350. The east front was rebuilt after a fire 1852. Pass through the larger court, faced with stone in a classic style (1745), to the smaller court beyond. On the north side of this is the library, approached by a staircase opposite to the door of the hall. It is a most interesting room, and a visit to it should on no account be omitted. It was built in the reign of Elizabeth, but preserves earlier traditions in its ground-plan and book-cases. Note that it is a long, narrow room, with windows of two lights at no great distance apart. The book-cases stand at right angles to the walls, between the windows, a seat for the reader being placed in front of each window. The books were chained to their cases, and the original iron bars and locks still remain. The chains now attached to some books are modern, and quite unlike those that would have been used originally. The cases are of unusual construction, arranged so that a reader could either stand or sit, as he pleased. There was only one shelf for books; and beneath this a desk that could be drawn out for the convenience of a seated reader.

Enter the Fellows' garden, a good specimen of one of the smaller college gardens, with splendid chestnut trees. On leaving Trinity Hall, turn left and then right up Trinity Lane. On entering Trinity Street note the

CHURCH OF ST. MICHAEL,

a unique specimen of a church which accommodated both a parish and a college. It was rebuilt soon after 1323 for a college called Michael House, absorbed in Trinity College by Henry VIII. Note the interior, which remains as originally arranged. Turn to the right along Trinity Street and enter

TRINITY COLLEGE,

by the great gate. This college was founded by Henry VIII. in 1546. The gate of entrance was built 1535, by King's Hall, the most important of the foundations which preceded it. The great court was laid out by Dr. Thomas Nevile, Master, 1593-1615. The chapel was begun by Queen Mary, and finished by Queen Elizabeth. Next enter the bowling green (door out of court next chapel). From this picturesque spot good views may be had of St. John's College, the river, and St. John's College bridge. Returning to the court, note the Fountain (1602), and go up the steps to the Hall (1604-8). Note the open roof and the carved work of the screen. From the Hall enter Nevile's Court, completed about 1612 at the sole expense of Dr. Nevile, but altered 1755. On the west side of this court is the library, built by Wren (1676-95). Note the book-cases designed by him on a plan which was quite unusual at that time; the wreaths of fruit, flowers, and arabesques carved in limewood by Grinling Gibbons; the marble busks, several of which are by Roubiliac; and the statue of Byron by Thorwaldsen. Enter the walks behind the college; note the avenue, the group of chestnut trees, and the view of St. John's College, with the river in the foreground. Cross the iron bridge over the water-course separating Trinity College from

ST. JOHN'S COLLEGE

—founded 1511 by the Lady Margaret, mother of King Henry VII. Begin by exploring the walks, especially the part called the "Wilderness." Returning to the river, note the old bridge with its gate-posts (1696-1712), and the modern bridge, commonly called "Bridge of Sighs," between the New Court and the Third Court. Enter the New Court (1826-30) and pass over the bridge into the Third Court (1669-73). As you cross the bridge note the west oriel of the library, with the date 1624, and the letters I.L.C.S., for "Johannes Lincolniensis Custos Sigilli," in commemoration of the benefactor who built it—namely, John Williams, D.D., Bishop of Lincoln. On reaching the second court, turn to the left and pass through a door in the corner, which leads to the library staircase. On entering the library, the most beautiful room of the kind in the university, note the contemporary book-cases. From the library, enter the gallery, built for the use of the Master. It was originally 148ft. long, and is still one of the finest specimens of this class of building left in England. Descend the staircase at the east end of the gallery, and enter the second court, built 1598-1602. It is a beautiful specimen of the brick-work of the time, practically unchanged. Enter the screens, and, having noted the original arrangement of three doors to the buttery, kitchen, and pantry, enter the Hall. Note the excellent linen-panels, the canopy over the dais, and the series of memorial pictures. Pass from the Hall into the first court. On the north side is the new chapel, built by Scott (1864-69). On reaching the street, note the picturesque facade, almost unaltered, and the gate of entrance, the most beautiful of all the Cambridge gateway-towers. Like the others, it is in two floors, with four turrets, of which that at the south-west angle is the largest, as it was built to contain the staircase leading to the original library, the room with windows close together on the first floor next to the gate.

The ornamentation of the gate commemorates the Lady Margaret.

The string-course between the first and second stages is formed of the branch of a vine, bearing leaves and fruit. Two portcullises and two roses are set among the foliage. Below this string-course is a band of daisies, or marguerites, in allusion to the name of the foundress. These bands project outwards in the centre of the facade and form a bracket for the niche containing the statue of St. John. This statue was set up in 1662, probably to replace an older one destroyed in the Civil War. Below the bracket the hood-mold of the arch terminates in a bold finial. The shield beneath the finial bears the arms of France and England quarterly, crowned and supported by the antelopes of Beaufort. Beneath the shield, in the triangular space formed by the arch and the rising branches of the hood-mold, is a rose. To the right of the central device is a portcullis, to the left a rose, both crowned. The crown of the former has the points composed of bunches of daisies, and the whole ground of the spandrel-space is covered with daisies and other flowers. In the second stage, the window to the left of the niche is surmounted by a rose, and that to the right by a portcullis, both crowned.

On leaving St. John's College, turn left. On reaching Bridge Street turn left again. Before long the Great Bridge is reached, so called to distinguish it from the small bridge or bridges in Silver Street. Looking up stream from the bridge, a small picturesque quay is seen, called "Fisher Lane." This is the last left of the numerous "hithes," as they were called, which existed along the River Cam, when merchandise used to be conveyed to the town in barges. On crossing the bridge we come (right) to

MAGDALENE COLLEGE,

founded 1542. In the Hall, note the double staircase leading to the Combination Room, said to have been designed by Vanburgh. In the second court is a range of chambers, called the Pepysian Library. It was begun between 1079 and 1090, and completed before 1713. When Mr. Samuel Pepys had decided to bestow his library on the college, he selected for it a room in this building. The books arrived in 1724. Note his arms and motto. If possible, visit the terrace in the Master's garden, believed to be part of the outworks of the castle.

On leaving Magdalene College, before proceeding (right) up the street, note the picturesque old house opposite, with two overhanging floors, and brackets carved with grotesque figures. It was until recently an inn, called "The Cross Keys." The yard should be entered for the sake of the view of the rest of the house, which has been but little altered, and enables us to realise what a mediæval hostelry was like. It contains some good carving.

On the left is the church of St. Peter by the castle, and on the right that of St. Giles. Neither contain much that is interesting.

THE CASTLE HILL,

approached through a gate just before you come to the Shire Hall, should on no account be missed. It is a lofty conical mound, commanding an extensive view over Cambridge and its neighbourhood. Recent investigation has proved it to be artificial. There are a good many interesting old houses in this part of Cambridge.

Descend Bridge Street as far as the

CHURCH OF THE HOLY SEPULCHRE,

commonly called the Round Church, one of the few round churches in England. It was probably built between 1120 and 1140. In 1841 it was practically rebuilt. Note the interior of the circular Norman nave. Proceed along Sidney Street as far as Jesus Lane, and follow it to

JESUS COLLEGE,

founded 1497, by John Alcock, Bishop of Ely, on the suppression of the nunnery of St. Rhadegund. The arrangement of the buildings is, therefore, to a great extent, monastic, and differs from that of any other college in the university. In the cloister, note the entrance to the Chapter-House, a splendid example of early English work.

Leaving the monastic peculiarities, note the tower-gateway, of unique design, built for the college. The range out of which it rises unfortunately received a third floor in 1718, by which the effect of the tower was much injured. Note Alcock's crest on the gate, and elsewhere, a cock standing on a globe.

From the entrance court pass into the cloister, through a doorway of Alcock's time, though not where he placed it. In going through the passage, notice (left) the lancet-window, forming part of the nunnery.

Before proceeding further, take a view of what Alcock did. He proposed to found a college for a Master, six fellows, and a certain number of scholars, for whose use the church of the nuns was far too large, while other buildings, as the Infirmary, were not required. He therefore pulled down the aisles of the choir and the nave, and cut off four bays at the west end of the latter. The pier-arches were walled up, and the windows replaced by others in the style then in fashion. The east range of the cloister he transformed entirely, walling up the arches of the chapter-house, and changing the dormitory of the nuns into ordinary chambers. The Hall is probably that of the nuns, but to a certain extent rebuilt by Alcock. The Combination Room, eastward of the Hall, is of later date. The kitchen is practically that of the nuns. The west range was also altered and raised by Alcock, and a library was built by him on the upper floor. The cloister was made larger by the addition of the space occupied by the north aisle of the church, and its level raised by about two feet. The present cloister arcades are modern.

Enter the chapel, which deserves careful study. The restoration, begun 1847, is in excellent taste. After the removal of ceilings, partitions, etc., in the course of which the original extent of the nuns' church was discovered, the north aisle of the choir and the organ-chamber were rebuilt; the roof of the choir was raised to its original level; the Early English triplet at the east end was restored from fragments found built into the wall; and new woodwork was constructed in accordance with the style of some fragments still remaining. Note also the pier-arches of the tower, and the roof-storey gallery above them. The modern stained glass in the transept and nave was designed by Burne Jones, 1873-77.

From Jesus College it is easy to visit

THE RIVER

by turning to the left, and then crossing Midsummer Common. If this is not convenient, turn to the right till, at the corner of Jesus Lane and Sidney Street, you reach

SIDNEY SUSSEX COLLEGE,

founded 1589. It was reduced to its present appearance by Jeffrey Wyatt, 1831-32. On the garden front are some picturesque oriel windows, and other features of the original college. On leaving, turn left, and passing (right) Trinity Church you reach Petty Cury, a picturesque street, in which are some interesting remains of a mediæval hostelry, the "Falcon Inn." Proceeding along Sidney Street, now St. Andrew's Street, we come (left) to

CHRIST'S COLLEGE,

founded 1505, by the Lady Margaret, mother of King Henry VII. Note the gate of entrance with her emblems, as at St. John's College, and in the court, the oriel of the Master's lodge. Enter the second court, and note the admirable stone building, finished 1642. Behind this is the most beautiful of the Cambridge College gardens, in which many points suitable for artists may be selected. Here is the ancient mulberry tree which tradition associates with Milton; but it is more probably the last survivor of a number bought in 1609. On leaving Christ's College, turn left and walk up St. Andrew's Street till you reach

EMMANUEL COLLEGE,

founded 1583 by Sir W. Mildmay. Note the arrangement of the principal court, with the chapel and the gallery supported on a cloister. This was designed by Wren, obviously in imitation of Peterhouse. The garden is beautifully planted, with a bath, summer house, etc., as at Christ's College.

THE WEEK'S PROGRAMME AND ARRANGEMENTS

Monday, July 7th.—For the benefit of those members of Convention who will be in Cambridge previous to, or early on, Monday, members of the Local Committee will attend at the Meeting Room, Guildhall, to act as guides, and parties will, at convenient times, be conducted over the colleges, etc. For particulars, see notice boards.

Conversazione.—The opening conversazione will take place in the Guildhall at 7.30 p.m., when the members will be officially welcomed to the city by the Right Worshipful the Mayor of Cambridge, G. Kett, Esq., who will be supported by members of the Corporation and an influential Reception Committee. The Convention will be declared open, and the president, Sir Robert S. Ball, will deliver his address. After a short interval, there will be an exhibition of lantern slides.

Tuesday, July 8th.—Excursion to Bury St. Edmunds, Lavenham, and Long Melford. Leaders: Dr. Image and Mr. J. Palmer Clarke. A special train will leave Cambridge at 9.30, arriving at Bury at 10.22. Luncheon at the Angel Hotel at 12.45. The train will leave Bury for Lavenham at 2.15, arriving at 2.35. Tea at Lavenham at 5 o'clock. The train will leave Lavenham for Long Melford at 5.55, arriving at 6.5. The train will leave Long Melford at 8, arriving at Cambridge at 9.2. Tickets, including railway, luncheon, and tea, 7s. 6d.

Dark Rooms: Bury St. Edmunds.—Mr. J. Palmer Clarke (four rooms), Abbey Hill; the Camera Club, Masonic Hall, Chequer Square. Long Melford.—Mr. R. G. Pearman, Hall Street.

There will be no meeting at the Guildhall on this evening.

Wednesday, July 9th. Excursion to Ely. Leaders: The Very Rev. the Dean, Mr. G. H. Tyndall, and the Rev. H. R. Campion, M.A. Trains leave Cambridge at 8.50 and 10.4, arriving at Ely at 9.14 and 10.24. Luncheon in the Public Rooms at 1 o'clock. The Dean (the Very Rev. C. W. Stubbs, D.D.) has granted full permission for members to photograph in the cathedral, and has kindly promised for this occasion to allow the chairs, etc., to be removed from the lantern. Trains leave Ely at 4.33 and 6.33, arriving at Cambridge at 4.58 and 6.55. Tickets, including railway and luncheon, 5s. 6d.

Dark Rooms: Ely, Ely Public Rooms (two), Market Place; Mr.

Harold Archer, Market Place; Mr. Laxton, Bell Hotel; Mr. J. Titterton, Lynn Road.

At the Guildhall, at 8.30.—A demonstration of Practical Enlarging, by Mr. Thomas Illingworth.

Thursday, July 10th.—The annual general meeting and election of the new Council will take place at the Guildhall at 10 o'clock. The new Council will meet at eleven o'clock. The president, Sir Robert S. Ball, and Lady Ball, have invited the members to a garden party in the grounds of the Observatory at 3 o'clock. The official group will be taken by Mr. T. B. Hunt at 3.15. The Observatory will be thrown open for the inspection of the members.

The annual dinner and smoking concert will be held at the University Arms at 7 p.m. Lady members are cordially invited to be present at the dinner and concert. The musical arrangements are in the hands of the Local Committee, and a very attractive programme is being prepared for the occasion. Tickets, not including wine, 5s. 6d.

Friday, July 11th.—Excursion to St. Ives, Hemingford, and Houghton. Leaders: Messrs. H. I. Hankin, Dendy Sadler, and F. H. Sanderson. The train will leave Cambridge at 10.16, arriving at St. Ives at 10.46. On arrival, there will be a reception by the Mayor. Boats will leave St. Ives Bridge for Hemingford at 11.45. Luncheon will be served at Hemingford at 1 o'clock. Boats will leave Hemingford for Houghton at 3 o'clock, returning at 4 o'clock to Battcock Island, where tea will be served at 4.15, by kind permission of Mr. J. Male. Boats will leave Battcock Island for St. Ives at 5 o'clock. The train leaves St. Ives at 6.6, arriving at Cambridge at 6.45. Tickets, including rail, boats, luncheon ,and tea, 6s. 6d.

At the Guildhall, at 8.30.—A demonstration of Posing and Lighting, by Mr. Harold Baker.

Saturday, July 12th.—Parties will be conducted round the colleges and short excursions arranged as may be desired.

HUNTINGDON.

The Right Honourable the Earl of Sandwich has given permission for any member of Convention who may be able to visit Huntingdon on the 12th or 14th of July, to take photographs of Hinchingbrooke House. Members desiring to avail themselves of the opportunity of seeing this interesting mansion, which for several generations was the chief seat of the "Cromwell" family, should communicate with Mr. H. Trench Smith, 15, East Street, New Town, Huntingdon, who has kindly promised to make the necessary arrangements and provide dark room accommodation.

Dark Rooms: Cambridge.—At the Guildhall, Market Hill; *Mr. C. S. Addison, 6, Market Hill; Mr. W. Butcher, 13, Bridge Street; *Mr. E. Field, 30, Hills Road; Mr. T. B. Hunt, 8, St. Edward's Passage; *Mr. J. H. Leech, 36, Trinity Street; *Messrs. G. Peck and Son, 30, Trumpington Street; *Mr. D. J. Scott, 47, St. Andrew's Street; Y.M.C.A., Alexandra Street.

*Marked thus are dealers.

HOTELS AT CAMBRIDGE.

Bath Hotel, Benet Street.—Bedrooms, 2s. 6d.; double, 3s. 6d.; breakfast, 1s. 6d. to 2s.; luncheon, 2s. Dinner, 2s. 6d. to 3s. 6d. Inclusive terms, 8s. per day, each person.

Bull Hotel, Trumpington Street.—Bedroom, 3s. to 5s.; double, 4s. to 7s. 6d.; service, 1s. 6d.; breakfast, 1s. 6d. to 2s. 6d.; luncheon, 2s. to 3s.; dinner, 3s. to 5s. 6d.; table d'hote, 5s; tea, 1s. 6d. to 2s. 6d.

Great Northern Hotel, Station Road.—Bedroom, 2s. 6d.; breakfast, 1s. to 2s. 6d.; dinner, 2s. 6d. to 3s. 6d.; tea, 1s. to 2s. 6d.

Hoop Hotel, Bridge Street.—Bedroom, 4s. 6d.; double, 7s. 6d.; breakfast, 1s. 6d. to 3s.; luncheon, 1s. to 2s. 6d.; table d'hote, 3s. 6d. No charge for attendance.

Lion Hotel, Petty Cury.—Single bedroom and attendance, 2s. 9d.; breakfast, 2s.; dinner (mid-day), 2s. 6d.; meat tea, 2s.; table d'hote, 3s. 6d.

Sirdar Hotel, Market Street.—No fixed tariffs, but members will be taken on reasonable terms.

University Arms Hotel, Regent Street. — Single bedrooms, from 3s. 6d.; attendance, 1s. 6d.; breakfast, 2s. 6d.; table d'hote each day.

Temperance Hotels. — The Birdbolt, St. Andrew's Street; The Livingstone, Petty Cury; The Central, Market Place.

Restaurants and Dining Rooms.—J. G. Buol, 17, King's Parade; R. A. Hard, 14 and 15, Market Street; A. J. G. Hartman, 3, Market Street; the Oriental Café, 14, Trinity Street.

Tea Rooms.—The Albany Café, St. Mary's Passage; the Oriental Café, 14, Trinity Street; J. G. Buol, 17, King's Parade.

Private Apartments.—A list of private apartments, with terms, will be forwarded on application to the hon. local secretary, Mr. H. A. Chapman, 5, Trumpington Street, Cambridge, to whom all communications on this subject should be addressed.

"BIBBY'S QUARTERLY" AND THE PHOTOGRAPHIC PROFESSION.

THE following correspondence has been handed to us for publication:—

Copy of circular received by H. W. Barnett from Mr. J. Bibby:—

To the Photographic Artist into whose hands this may come.

Dear Sir,—I have long had an idea that there are now in the hands of photographers throughout the United Kingdom copies of photographs which I might be able to reproduce in "Bibby's Quarterly" to the advantage of all concerned, if I could put my hands on the prints as required. In order to try and bring myself into some sort of communication with Photographic Artists, I am sending out with this letter a sample of my "Quarterly" to a selected list of names in order to put forward the following suggestion:—Should any photographer to whom this letter may come have any specially interesting print of his own work which he thinks would be of interest to the general public, I suggest that he will send a copy to me for inspection. I undertake to look over all prints submitted, and any which I consider likely to come in for my purpose, I will pay 2s. for each print which I retain, and a further 10s. 6d. when reproduced, but on these conditions the names of my photographic contributors will not appear in the "Quarterly"; the rest of the photographs submitted I would return by the next post, so that in any case nobody would stand to lose on the transaction. If you are agreeable to this proposal, I should be glad to hear from you.

I do not know if you would like to receive the next four numbers of the "Quarterly" as published, but I enclose you a subscription form in case you may wish to use it, now or later on. My next number will not appear until August.—I remain yours sincerely, for the Editor. R. S.

Letter to Mr. Joseph Bibby from H. W. Barnett.

Sir,—I am in receipt of the elaborate advertisement of your doubtless excellent goods, which you entitle "Bibby's Quarterly." Unfortunately I am neither in need of soap nor of sheep-cake, nor should I take the trouble to acknowledge your production did it not contain a type-written effusion addressed to "Photographic Artists," which for calm impertinence it would probably be hard to match.

You ask me in plain English to further the sales of your soap and your sheep-cake by providing you with the products of my trained intelligence and artistic knowledge, for which products you propose to pay the sum of 12s. 6d. a piece if approved, and then by suppressing my name to keep the credit of my work for the benefit of yourself and your soap. Now I am not taking the trouble to answer this impudent suggestion for my own sake. I have many other better things to do; but I am writing this because such proposals as yours are calculated to mislead struggling beginners in the photographic world, and thereby to degrade the profession to which I have the honour to belong, and also to assure you that even though, to quote your own words, "the agricultural community will be the losers should "Bibby's Quarterly" untimely die, I shall do everything legitimately in my power to prevent photographic artists from postponing the date of its demise. May I hope that this will induce you to find other means of making your advertising fulfil your ambition of costing your firm "absolutely nil"?—Faithfully yours, H. WALTER BARNETT.

Copy of letter from Mr. J. Bibby to H. W. Barnett.

May 10th, 1902.

Dear Sir,—Your letter has just reached me here, where I am spending a few days a-holidaying, and I feel I ought to reply to you at once. There is certainly nothing lacking in your frankness in the matter of criticism, and it is quite a revelation to me to imagine how such an innocent letter as the one I recently despatched to a few photographers should provoke so much displeasure.

I had no intention, I assure you, other than to bring myself into pleasant business relations with a number of the best firms in this line of business, and I cannot for the life of me see how I could achieve this end without making some overtures such as are made in the letter complained of.

If the terms I proposed, which I believe are slightly better than are paid by "Country Life" and such papers, were not satisfactory, there was nothing to prevent you quoting other terms and conditions. In fact, I fancy my letter suggested this.

Regarded as a business proposition, I do not think in any way it calls for a discourteous reply, and as a business man of some considerable experience of life, I should question very seriously the wisdom of anyone who has a wish to get on with his fellows writing in such a spirit.

If I had asked you to go out and photograph specially for me the case would have been different. I pay my own man on a much higher scale, but what I asked of you was leave to reproduce work you had already done (and which I submit is clear gain to you) on

such terms as I believe is commonly paid, or, as I said above, rather better terms.

You need not trouble yourself in the least about other photographers. The letter was sent to all the best houses only so far as we could get them, and such photographs as I want (those which appear in the literary supplement) have nothing whatever to do with the sale of my soap and cake; and to speak of you and your craftsmen giving their brains to accomplish this end is like the fly on the flywheel of the engine attributing the motion to its insective prowess. I can only say in conclusion that if you can tell me how I should have acted in order to achieve the end set forth above I shall be extremely obliged to you; but at present I do not see that I could have done in any way better than I have, your criticism to the contrary notwithstanding.—Sincerely, J. BIBBY.

Copy of a letter from Mr. Barrett to Mr. Bibby.

Mr. Joseph Bibby, Exchange Chambers, Liverpool.

Dear Sir,—I beg to acknowledge your courteous answer to what, I fear, must have seemed a very rough letter. I am still of the same opinion as when I first wrote, that your suggestion is an insulting one to the photographic profession, and I would point out to you that your letter leaves entirely untouched and unanswered the whole point of mine, viz., that the proposal to suppress the name is one to which no self-respecting photographer ought to consent That was the whole point of my letter, as you will see if you will do me the favour of re-reading it. I did not in any way quarrel with the terms offered, which, as you say, compare favourably with those of most periodicals. What roused my indignation was your proposition that work which I had produced at the cost of long years of experience should appear in your quarterly advertisement without any recognition of its source. You ask me to suggest an improvement in your appeal to photographers. Surely the one I have mentioned is a fairly obvious one, viz., that you should offer to the photographers whose pictures you use the publication rather than the suppression of their names.—Faithfully yours.

Copy of a letter from Mr. Bibby to Mr. Barnett.

17th May, 1902.

Mr. H. Walter Barnett.

Dear Sir,—I am glad to have a letter from you couched in more courteous language. The point between us is a debatable one, and one I think, that might fairly be discussed without the use of opprobrious epithets. It seems to me to be a pure matter of business. I have reasons of my own for not wishing to give out the name and address of the quarry from which I obtain the stones out of which I construct the edifice I choose to build. If any particular quarryman declines to sell me his stones without I imprint his name and address on them, he has a perfect right to put that in his conditions; and, so far as I can see, I have an equal right to decline to use his stones if I do not like the conditions. Some stones that I particularly want to use and cannot obtain otherwise I shall purchase on these terms; others I shall buy on my own terms. I do not see that you are called upon to interfere in the matter or call me names so long as the business is done to the satisfaction of both buyer and seller.

I may be all wrong as to this, but I have not seen at present that I have made any proposal which one gentleman may not fairly make to another. I think, therefore, that your former comments were under the circumstances uncalled for.—I am yours faithfully.

J. BIBBY.

You no doubt think it ungracious of an editor wishing to suppress the names and addresses of his contributors, but if you had as many imitators as we have had you might hesitate to give them facilities. Personally, I would prefer to give the names and addresses of all contributors, but, at the same time, I think it would be extremely bad business for me to do so.

Copy of letter from Mr. H. W. Barnett to Mr. Joseph Bibby.

May 22nd, 1902.

Mr. Joseph Bibby.

Dear Sir,—I am afraid from your communication received this morning that the comparative mildness of my last letter has been misinterpreted by you into an abandonment by me of the position taken up in my first. This is very far from being the case, as a re-reading of my second letter will probably convince you. I still maintain that your proposal was an impertinence to all self-respecting photographers

As for your simile of the quarry, I can only reply that a man who seeks in a gold mine the materials with which to erect a possibly jerry-built house, expecting to get them for the same price and on the same terms as inferior red sandstone, would not generally be considered either a very wise or fair-minded person. If photographers refuse to supply you with the gold of their experience to raise the edifice of "Bibby's Quarterly" they will be acting like men of sense and dignity.

In conclusion I should like, with your permission, to send this correspondence as it stands to the "British Journal of Photography," whose readers it will undoubtedly interest. Awaiting your reply, I am, sir, faithfully yours, H. WALTER BARNETT.

Copy of letter from Mr. J. Bibby to Mr. H. W. Barnett.

May 26th, 1902.

Dear Sir,—My letters have not been written for publication, and I hardly think it a fair procedure to publish letters so written; but if you are very anxious to have my so-called "insulting" letter pilloried before the photographic world, I have no particular objection, provided you give the whole of the correspondence from first to last. With regard to your simile of gold and red sandstone, I am only using the very best materials for my building, no red sandstone being accepted; and if you consider my terms inadequate for such materials, all I can say is that my terms are better than any other paper of the same class, as I give an extra 2s. on acceptance and the usual reproduction fee of 10s.6d. on publication.

I may also mention that I am giving my photographic contributors the choice of taking 10s. 6d. on reproduction with name, say as follows:— "Copyright—Barnett (or with the extra 2s. if the name is omitted);" and so far as I can discover these terms appear to meet with general approval.—I am yours faithfully J. BIBBY.

P.S.—If you publish, be kind enough to let me have copy of the "Journal" in which the correspondence appears.—J.B

New Books.

"First Steps in Photomicrography." By F. Martin Duncan, F.R.H.S. 104 pp.; seventeen illustrations. Price 1s. London: Published by Hazell, Watson, and Viney, 52, Long Acre, W.C.

The part of a book to which we always turn first is its preface; moreover, we always read it. For here you find the author's excuse for his book; the self-raised standard by which he asks to be judged. Here are Mr. Duncan's prefatory words:—"In writing this little book I have endeavoured to supply a handbook essentially for the beginner—namely, a simple and, as far as possible, a non-technical account of the methods and apparatus employed in the production of photomicrographs. For this reason, I have refrained from going into any details likely to bewilder or alarm the tyro, and have devoted the space at my command to a description of the manner in which he may most successfully surmount those difficulties which are sure to beset his first attempts. For, given a certain modicum of success from the very first effort, the interest is bound to increase, so that what was perhaps begun as a casual form of amusement eventually becomes an absorbing and lifelong hobby. Photomicrography has made such great progress towards perfection during the last few years that it is now rapidly becoming a very popular hobby. To the bacteriologist, medical student, botanist, and to all who are interested in natural science, it is of the greatest importance, enabling them to keep a faithful and accurate record of their observations and experiments. If the instructions given in these pages are carefully followed, the novice should have no difficulty in gaining an insight into the mysteries of this most fascinating branch of photography. When he has successfully mastered these first steps and gained some amount of experience and facility, he may then, with advantage, consult the more exhaustive and technical works."

It may be said at once that Mr. Duncan's book not only comes up to, but exceeds, the expectations raised in his preface. Written throughout in simple language, and mainly popular in its illustrations, the volume exactly fills one of the few vacant places in photographic literature, for, writing from memory, an elementary book on photomicrography has not been produced for some years. Our own pages have from time to time afforded evidence of Mr. Duncan's ability as an expositor of his subject, and these "First Steps" further testify to his perspicacity of style. Divided into two parts, the book successively deals with low power; medium and high power photomicrography; developing; printing; the preparation of objects; and stereo-photomicrography. In passing, we suggest that when a future edition is called for, a chapter on micro-photography should be added. Information on this subject is often sought. We have not read the whole of Mr. Duncan's book—the section dealing with development and printing we confess to have entirely skipped, as the subject is somewhat familiar to us—but we have gone through the other parts, and we can recommend the "First Steps" as an excellent primer of a fascinating branch of work.

"Photography for Novices." By Percy Lund. 191 pp.; sixty illustrations. Price 1s. London: W. Butcher and Sons, Camera House, St. Bride Street, E.C.

After Mr. Duncan's preface, Mr. Lund's:—"The intention in this little book is to describe practically the elementary processes of photography, in as simple terms as possible, avoiding theory excepting where absolutely necessary, and taking to the utmost extent what is known as the common-sense view of the subject. Some of the methods advocated will probably be regarded by the critics as not strictly academical: the chemist, for example, may look upon certain chapters as superfluous, and the optician take exception to the brevity of our account of lenses. But our own early days in photography are not yet far removed, and we remember how many of the difficulties which we met with might have been removed by a plain statement of practice, and by avoiding the discussion of theoretical matters that merely act as stumbling-blocks in the first steps of the novice."

Mr. Lund, in the days of his novitiate, would probably have worried himself into a bad headache had anybody placed "a little book" (!) of 190 pages into his hand for preparatory study in taking up photography. The book, in fact, is far too large and diffuse for its purpose. While aiming at simplicity of style, Mr. Lund seems curiously unable at times to avoid the opposite evil of a superabundance of words. Again, he is not always happy in his definitions. Thus, on page 189 we read:—

"RECTILINEAR.—A particular form of lens, consisting essentially of two single lenses combined in order to counteract the errors of distortion produced by single lenses when photographing buildings. A rectilinear lens is often called rapid, but it is not necessarily more rapid than other forms, and the title is a misnomer. The rapidity of a lens depends almost entirely upon the size of its working aperture."

We humbly venture to suggest that Mr. Lund might with advantage have been a litle clearer and more explicit here. Again, referring to hand cameras:—

"It is easy to understand why manufacturers prefer short-focus lenses: they require shorter-bodied cameras, and they are quicker than those of long focus."

Of course, Mr. Lund or his novices are not limited in the focal length of their hand cameras by the manufacturers. At any rate, it is a curious way of expressing the fact that increased focal length of lens means increased bulk of camera. But parts of Mr. Lund's book, like the curate's egg, are excellent, and the novice cannot fail to learn something from it. The volume is well printed, and quantitatively good value for the money.

Patent News.

THE following particulars of patents are specially drawn for the BRITISH JOURNAL OF PHOTOGRAPHY by Messrs. Hughes and Young, patent agents, 55 and 56, Chancery Lane, London, W.C., who will give advice and assistance free to our readers on all patent matters:—

PATENT APPLICATIONS.—No. 11,488.—Ferdinand William Schaap and Willem Hylkes Brandsma, Chancery Lane. "Improvements in or connected with photographic objectives."

No. 11,559.—William Marshall Hutchinson, Chancery Lane. "New or improved machine or means for developing, fixing, and washing photographic plates or flat films."

No. 11,596.—Anton Pollak, Gyula Egger, and Friedrich Silberstein, Liverpool. "Improvements in photographic developing apparatus."

PATENTS ILLUSTRATED.—No. 1,139.—Photography. Patentee: J. Carpentier, 20, Rue Delambre, Paris.

Cameras; enlarging.—Relates to an enlarging camera adapted to correct distortion in negatives owing to their being out of the true plane when the photograph was taken. The frame holding the negative is mounted so as to turn on the pivot, and the frame holding the sensitive surface turns on the pivot. These frames are turned simultaneously by a transverse sliding rod which engages with two arms fixed at right-angles to the two frames. The distance of the rod must be equal to the distance of the optical centre of the lens. On another form the frames are turned on their centres by a rod with right and left-handed screws.

No. 2,375.—Photography. Patentee: H. L. H. Schroeder, Whetstone House, Heslop Road, Balham.

Lenses.—Relates to a photographic lens consisting of a double objective comprising two unsymmetrical halves, each of these halves consisting of four single lenses cemented into a solid block by Canada balsam, Each half contains two positive and two negative lenses, and in the arranging of the same a positive lens may be placed at the front, or a negative lens may be placed at the front. Each half comprises three crown-glass lenses, which are achromatised by one negative flint-glass lens. For the purpose of obtaining an astigmatic flat field, one of the negative lenses has a higher and the other a lower refractive index than the lens cemented to it.

THE Professional Photographers' Association.—There will be a meeting of the general committee, at 51, Baker Street, London, W., on Friday evening, June 6th, at six o'clock. Business:—Election of members; consideration of annual report and balance-sheet; preparation of ballot papers, etc.

SUNDAY Prohibition of Cameras.—Mr. Sherarld Cowper-Coles, 45, Morpeth Mansions, Westminster, writes complaining to the "Morning Post" that he was refused admission to Kew Gardens on a recent Sunday because he was carrying a camera, though on other days of the week visitors are permitted to take them into the grounds. He says that many others were also excluded because they had pocket cameras, and he is curious to know what justification there is for the regulation.

THE council of the National Photographic Record Association wish to draw the attention of photographers to the forthcoming ceremonies in connection with the Coronation, and ask their co-operation in securing a good series of photographs for the British Museum collection. No doubt many interesting local celebrations will take place in all parts of the country, which will be of interest in the future, pictures of which they are desirous of obtaining, and it is only by the efforts of local photographers that such a collection can be got together, and to these workers they now appeal. Any such photographs, unmounted and printed, or platinum or other permanent process, will be much esteemed. and may be sent to George Scamell, hon. secretary, 21, Avenue Road, Highgate, London.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK

June	Name of Society.	Subject.
6.....	Croydon Natural History.....	Photographic.
7.....	Camera Club.....	Ramble—Fremington Old Road. 2.45.
9.....	Southampton Camera Club.....	Print Competition—*Lanascapes or Seascapes.*
11.....	Southampton Camera Club.....	Ramble—Salisbury.
11.....	North Middlesex Photographic	Subject by W. Thomas, F.R.P.S.
12.....	London and Provincial.....	Sub-committee's Report and Open Night.

ROYAL PHOTOGRAPHIC SOCIETY.

MAY 27TH, 1902.—Technical meeting. Mr. Douglas English, B.A., in the chair.

A very interesting lecture was then given by Captain D. Wilson-Barker, F.R.S.E., of H.M.S. Worcester. He dealt, as announced, with the subject of

"CLOUDS,"

and, as a sailor, the importance of a close study thereof has not been lost upon him. All clouds, he said, may be placed in one of two well-defined groups—the Cumulus and the Atratus. A cloud is vapour that has risen or fallen in the atmosphere from a point having a greater density than that of the position taken up, which is then unable to retain it in its visible form. The lecturer holds that all shapes and forms of clouds are merely varieties of one of the two types named. Cirrus, cirro-stratus, cirro-cumulus, stratus, and nimbus clouds, recognised by Luke Howard, come under the head of "Stratus," but the so-called cumulo-stratus has no real existence. Captain Barker disagrees with the view that cirrus should be regarded as a third form of cloud, on the ground that its formation is the same as the ordinary low-level stratus, its slighter density being caused by particular conditions of the atmosphere. The cumulus type of cloud presents a more or less rounded and solid appearance, while the stratiform type is of great extent laterally, but very thin vertically. Cumulus clouds may be divided into five well-defined varieties:—(1) The fine weather variety; (2) roll cumulus, seen generally towards the close of stormy weather; (3) squall cumulus, accompanied either by rain, snow, rain and waterspouts, etc.; (4) pillar cumulus, which indicates a locally unsettled state of atmosphere; (5) shower cumulus, a loose, ill-defined cloud, giving off fine rain, but accompanied by little wind. All cumulus types of cloud belong to the lower atmosphere; their formation begins at a low level, though they sometimes tower to great altitudes. The stratiform type of cloud belongs to the middle and upper atmosphere, although in ground-fog it appears in the lower regions. The varieties of stratus are:—(1) Fog; (2) true stratus, observable in anticyclonic areas when, in dry weather, a black pall of cloud may possibly cover the sky for days; (3) high stratus, to which variety belong the "mackerel" skies (precursors of unsettled weather); (4) cirrus, the highest form of stratus, composed of ice-dust or crystals. Captain Wilson-Barker made his lecture the more interesting by means of lantern slide illustrations of all types of clouds. He also showed half-a-dozen panoramic photographs over the Swiss mountains, which, embracing so extensive an area, clearly showed the grouping and shapes of the cloud formations. Speaking of the actual photographic operations, he said that he preferred to use a single lens, well stopped down, and slow plates. Apart from their scientific value, with which the lecturer was, perhaps, more concerned, the slides presented in several instances exceedingly picturesque effects.

Dr. E. W. Prevost passed round a sample of the dust emitted by Mont Pelée and deposited in Barbados. It was of no photographic interest, of course, but Dr. Prevost hoped to have it analysed. He thought some present might like to see the dust, which was certainly examined with deep interest.

CAMERA CLUB.

THE decision of the Club Committee to keep on the Thursday evening lectures far into the summer months seems to have been more than justified, if we can judge by the large attendance last week, when Dr. Ed. Grün read a paper on his "Fluid Lens," Lord Rosse occupying the chair. The subject, no doubt, was a very attractive one, for amateur photographers are always on the look out for anything new, especially if the new thing promises greater rapidity of working, or if it will enable them to perform extraordinary feats. The Grün lens had been before the public for some time, through the medium of newspaper articles, and it had been heralded at the Camera Club by certain photographs which have been exhibited there for some days. Hence Dr. Grün found himself faced by an eager and kindly expectant audience.

The lecturer said that he had constructed his first fluid lens about two years ago; that it had gone through certain changes, and the one he had now in use he had employed for various purposes during the past eighteen months. He must apologise for some of the lantern slides which would illustrate his lecture. They were by no means of first-rate quality, for the negatives had been taken under very difficult circumstances, from crowded theatres and in other places where photography was not easy. In such light as he had worked, photography had hitherto been utterly impossible, and his chief object was to produce a

lens which would do what had never been accomplished by existing apparatus. He did not put forward his work as perfect examples, but his results were improving day by day, and he hoped, as soon as he could get opticians to thoroughly meet his ideas, to produce lenses far nearer perfection. In the meantime he wished others to profit by his work, and he therefore placed his fluid lens on the market. Such lenses must necessarily be accompanied by a certain want of marginal definition, but this, he thought, was quite of secondary importance, from a pictorial standpoint. This want of definition is due to spherical aberration, and, as they all knew, it could be cured by the use of a curved support for the sensitive film, a remedy which was beyond their reach. The term "spherical aberration" was differently translated by various opticians; he himself regarded it as being synonymous with "curvature of field."

The improvement generally in artificial illumination, owing to the introduction of the electric light, allowed us to take photographs of indoor scenes almost instantaneously, and this opened up a new field of work for the photographer, and a productive one withal, for the dark hours were associated with far more interesting episodes than were the hours of daylight. He referred to scenic displays, acting, etc., at the theatres and other places of public amusement. It might be said, "Oh! that can all be done by flashlight," and so it can; but we must remember that the relative value of lights, upon which scenic effects so much depend, is altogether lost in the glare of the magnesium compound. The management of stage illumination is quite as much an art as the painting of the scenery.

Then there is another phase of photography which has many charms—the taking of landscapes by night, by the light of the moon; or of illuminated streets. The last are often quite artistic, a thoroughfare which would be hopelessly commonplace in daylight becoming beautiful under the beams of the lamps. *En passant* he might observe that night photographs of military positions might prove to be of immense value. Such pictures, impossible by day, might be taken by a courageous man under cover of darkness.

In order to compare the performance of his liquid lens with ordinary glass lenses, he might say that those working at f/8, f/6, or even f/4 were no good whatever for the subjects at which he aimed. He had procured lenses from two opticians of great repute. Each of these worked at f/2, but he found that they must be used at full aperture, and they both suffered badly from want of depth of field and from marginal distortion.

He himself was not limited to f/2, but commonly used a lens working at f/1.5. Of course, the pictures were very small, but they were well adapted for use with the cinematograph, in which instrument rapid movement did away with want of sharpness. He had, for example, examined the cinematograph film of a torpedo being fired, and although the individual pictures were the reverse of sharp, as they blended on the screen they had all the appearance of being sharp. He believed that the majority of these pictures were taken at a speed of 1-32nd of a second, which was not quick enough for rapid movements. He did not make a necessity of microscopic definition. In some cases it was a question of getting a picture at all under circumstances which seemed almost insurmountable.

(After alluding to the history of fluid lenses, and the work in this connection of Dr. Blair, Dollond, and others, he pointed out that their reign came to an end with the introduction of improved flint glass for optical purposes, by chance, of Birmingham.)

Dr. Grün then explained the construction of his own lens by means of diagrams on the blackboard. Before making it, he said that he had bought specimens of all the rapid lenses procurable, and had noted that they all suffered from want of depth. There were many difficulties to encounter in constructing a fluid lens, and he had made experiments on the refranjability of many fluids before he hit upon the right one. For these experiments he procured from Germany a refractometer, an instrument not sold in this country, where opticians seemed to work by rule of thumb and to accept the statements of the makers as to the refractive index of the glass they employed without question. Among other uses, the refractometer would be most useful to the medical profession for examining the fluids of the body, which varied in their refractive index from day to day in the same individual.

The fluid which he had now adopted for his lens he had used for six months. It showed no change, and seemed to well answer its purpose. The use of a fluid in a lens brings the surfaces into optical contact, and caustic curves are not produced. With regard to the cinematographic work which he had attempted in artificial light, the first difficulty which confronted him was the want of rapidity in films as compared with glass plates. But he had found it possible to obtain such pictures. He might observe that in the case of most of the lantern slides he was about to show them, and also in the case of the films, he had simply gone into the theatre as one of the audience, paid his fee, and taken his place, generally in the pit, and worked his camera without those on the stage knowing that they were having their portraits taken. Many of the pictures were practically instantaneous, the exposures ranging from a second or two to 1-50th of a second.

The lights were then lowered, and a large number of lantern slides were exhibited, Dr. Grün furnishing particulars of place, time of exposure, etc., as the pictures were shown. The first were of "Poses Plastiques" at the Alhambra Theatre, which admitted of comparatively long exposures. Next were scenes from "La Poupée," "The Belle of New York," and "The Toreador." The leading lady in this last scene had her mouth wide open, evidently in the delivery of that top note we all know so well. After the lantern slides came a series of cinematograph films, the first of such pictures, Dr. Grün said, taken in a theatre, during performance, by artificial light. It may be said that it is a matter for wonderment that such pictures could be taken at all; but, with due deference to Dr. Grün, and fully admitting the difficulties and the pluck with which he has endeavoured to surmount them, we must say that these moving pictures are valueless except as photographic curiosities. A dancer is represented as a white something moving in uneasy jerks across the field of view, but whether that something is a man, a woman, or an animal it is impossible to say. The "Three little maids from school" (from "The Mikado") was, perhaps, the best subject shown, but this was terribly blurred.

Lord Rosse congratulated the lecturer in having taken a distinct step in advance in the production of this fluid lens. He considered that some of the pictures shown were marvellous, considering that the incandescent electric light by which they were taken was no whiter than gaslight. Of course, the subject of fluid lenses was not a new one. His own father experimented in that direction many years ago, not in connection with photography, but with the telescope. The main difficulty seemed to be the connection currents caused in the fluid, owing to variations of temperature. This would cause the upper part of a fluid lens to act differently to the lower part, and would spoil definition. Dr. Grün would have found that in the case of theatrical scenery much of the difficulty connected with depth of focus was removed, for the background, although by an illusion it seemed far off, was in reality close to the actors.

Mr. Cadett asked a few questions with regard to the lens, not, he said, antagonistically, but merely from a wish to obtain information. He had found it impossible to get good definition with a liquid colour-filter, owing to connection currents. He asked the lecturer whether a solid glass could not take the place of the liquid, and whether Dr. Grün had contemplated an improvement in ordinary lenses in this direction.

Mr. Inwards, after referring to a large liquid lens made by Mr. Van der Weyde—which broke over his head and deluged him—said that in tracing the history of such lenses we must not forget the Creator of the eye; we had all our lives been using—some without knowing it—a liquid lens for the ordinary purposes of vision.

Dr. Grün, in his reply, pointed out that the apparent difference of opinion between him and one of his questioners resolved itself into a question of terminology. A solid glass lens, as suggested by Mr. Cadett, might prove effective, but it would be far more costly than a fluid lens such as he advocated. The fluid which he employed was of a viscous character, and therefore the difficulty with regard to connection currents, mentioned by Lord Rosse, did not arise. Some fluids were quite inadmissible for lens construction—the ethereal fluids, for example. The one he employed had worked as well below freezing-point as it did in the heat of a crowded theatre. He used a focal plane shutter, Imperial plates, and developed with pyro and soda.

Separate votes of thanks to the lecturer, and to Lord Rosse for presiding, terminated the proceedings.

CROYDON CAMERA CLUB.

Mr. W. H. Smith, on Wednesday, the 28th ult., had some further words to say on Orthochromatic Photography, which had occupied the attention of members at the preceding meeting. With the aid of the oxy-magnesium lamp he had photographed coloured tapestries on orthochromatic plates, with and without light filters, and on Wratten's "Speed" plates. The negatives, prints therefrom, and the tapestries themselves, were shown, so that ready comparisons could be drawn. So far as true rendering in monochrome was concerned, little difference could be detected between the results, none being quite correct. This can be explained by the fact that Mr. Smith used only faintly-tinted filters, and that the magnesium light is particularly rich in the more refrangible or violet rays, which require a considerable amount of cutting out to allow time for the reds to act.

The President (Mr. Hector Maclean, F.R.P.S.), commented on the results shown.

Mr. Kenneth Mees drew attention to a peculiarity of Wratten's "Speed" plates. He had found them to be sensitive to a narrow band in the red end of the spectrum, though comparatively insensitive to the yellow and orange. The hon. sec., reminded members that Ives, if he recollected rightly, whilst lecturing at the Croydon Camera Club, had stated that the Imperial Flashlight plates possessed a somewhat similar peculiarity. Personally, he considered this out of place in an "ordinary" or "non-orthochromatic" plate, which should act up to its name.

During the evening Mr. Maclean showed plates which had received a backing of "Solaraxe." He had found it easy to apply, and it formed a dense and even non-actinic layer. It seemed, however, likely to rub off unless carefully handled. A discussion ensued as to the constitution of the preparation, the general opinion being that it was a mixture of a red powder in a collodionised fluid.

The Club having offered a silver medal for the best print taken at the Good Friday excursion, fifty pounds were sent in. The prize was awarded by the judge to Mr. Councillor J. Noakes. The prints, which are now on view at the Club meeting-room, form quite an imposing "one day" display.

NORTH MIDDLESEX PHOTOGRAPHIC SOCIETY.

May 17th,—Mr. J. A. Sinclair gave a lantern lecture, entitled "Tabloid Travel."

It was a photographic record of a short tour through Spain, with a hand camera. The slides, which were excellent, gave a good idea of the country and the description of them was very interesting.

SOUTHAMPTON CAMERA CLUB.

On the 26th ult. the members of the above Club held their fortnightly meeting at the Philharmonic Hall, under the presidency of the Sheriff of Southampton, Dr. Weston, who, after the usual preliminary business, requested Mr. A. T. Horne, the representative of Kodak, Ltd., to give his promised demonstration of the Company's apparatus and material. The process of manipulating the new Dekko printing paper and post-cards was shown, the printing being accomplished by the burning of about an inch of magnesium ribbon. The printing can also be done by ordinary gaslight, no dark-room being necessary for the development. Rolls of the Kodak films were then developed and fixed, and the process thoroughly explained. Several of the firm's latest improved cameras were exhibited, the working of them being fully explained by Mr. Horne.

The appreciation of a very able and instructive demonstration was shown by the passing with acclamation of a hearty vote of thanks, which was very suitably proposed by the chairman, on behalf of the members of the Club, and similarly acknowledged by Mr. Horne.

Commercial & Legal Intelligence.

A fire occurred late on Thursday evening, last week, at 107, High Street, Sydenham, occupied by Messrs. J. A. Marshall and Co., photographers. The studio, a building of two floors, 80ft. long and 20ft. wide, on the top floor, was burning fiercely when the Crystal Palace firemen arrived. In the result the entire place was severely damaged. The building is owned by Mr. J. Blundell, of Rowland Grove, Wells Road, Sydenham.

Theft of a Camera.—Before the Croydon Bench on Thursday, last week, William Fanning, who refused his address, was charged on remand with stealing a hand camera. Prosecutor placed the camera on a seat at East Croydon Station, and walked up the platform. When returning, he saw prisoner walking off with the camera, which he claimed as his property. Prisoner refused any information about himself when brought before the Bench, and, upon the applicationof the police, was remanded for inquiry. Nothing was found out about him, and prisoner, who pleaded guilty, was bound over under the First Offenders' Act.

Planiscope Supplementary Lens Competition.—The competition organised by Messrs. John J. Griffin and Sons, of Sardinia Street, which was open to all amateur photographers, has just concluded, and the awards are as follows:—Class A, for the best picture made with the Telephoto Planiscope: Mr. Jas. Frankland, of 8, Greengate, Barrow-in-Furness, takes the first prize of two guineas, and Mr. G. F. Coushion, of 21, Kempe Road, Kensal Rise, the second prize of one guinea. In Class B, for the best picture made with the Wide-Angle Planiscope, the first prize of two guineas is won by Mr. H. F. Beauchamp, Guildford Lodge, Nunnery Fields, Canterbury, and the second of one guinea by Mr. Alex. Simpson, 30, Westgate, Burnley. In Class C, for the best figure study made with the Portrait Planiscope, Mr. C. E. Lyon, The Priory Cottage, Burnham, Bucks., takes the first prize of two guineas, and Mr. A. Brough, Pretoria Terrace, Oakengates, Salop, the second prize of one guinea. In Class D, for the best flower study made with the Copying Planiscope, Mr. J. Hesford, of Cemetery, St. Helens, Lancs., takes the first prize of two guineas, and Mr. Alex. Storrar, of 3, St. Catherine Street, Cupar, Fife, the second prize of one guinea.

Transit of Chloride of Calcium.—Henry Harris, of Neate Street, Camberwell, was summoned at the Lambeth Police Court, one day last week, by the Great Western Railway Company, on two summonses, for having on April 8th and May 1st unlawfully sent by a railway goods of a dangerous nature, to wit, carbide of calcium, without distinctly marking their nature on the outside of the package containing the same, or giving notice in writing to a servant of the Company at the time of sending. Mr. F. W. Mills, from the Solicitors' Department of the Company, appeared in support of the summonses, and Mr. H. I. Sydney represented the defendant. Mr. Mills said the summonses were issued under section 105 of the Railway Clauses Act, 1845, and the complaint was that the defendant sent off certain boxes containing this dangerous stuff without labelling them as to their contents. The Railway Company did not know what they were carrying, and an accident might have happened with disastrous results. The Act required that the contents should be declared. For the defence, Mr. Austin Harris, son of the defendant, was called, and said it was the general practice to label the goods, and the omission on the two occasions in question was purely accidental. Mr. Horace Smith ordered the defendant to pay a fine of £5 and 2s. costs upon each of the two summonses against him.

Kodak, Ltd., v. The Columbia Optical and Camera Company.—Messrs. Kodak, Ltd., write:—"We enclose you herewith copy of a judgment which was given on the 9th ult., by Mr. Justice Buckley, for Kodak, Ltd., as against the Columbia Optical and Camera Company, for passing off as Kodak goods articles not of our manufacture, and for infringing our trade mark. We shall be obliged if you will publish this judgment in your esteemed journal:—'1902 K 359.—In the High Court of Justice.—Chancery Division.—Mr. Justice Buckley.—(Mr. Reed, Registrar, fo. 101.)—Between Kodak, Ltd. and reduced, plaintiffs, and Columbia Optical and Camera Company, defendants.—Upon motion for injunction this day made unto this Court by counsel for the plaintiffs and upon hearing counsel for the defendants and upon reading the Writ of Summons issued on April 29th 1902 and the plaintiffs and defendants by their counsel consenting that the hearing of the said Motion should be treated as a motion for judgment And the defendants by their counsel undertaking to disclose to the plaintiffs the names and addresses of the manufacturers of the goods in question and apologising for having infringed the plaintiffs' trade mark "Kodak" and for having passed off films which were not manufactured by the plaintiffs as the plaintiffs' films and the plaintiffs and the defendants by their counsel consenting to this judgment This Court doth Order that the defendants their servants and agents be perpetually restrained from infringing the plaintiffs' registered trade marks No. 75818 in class 8, No. 152483 in class 8, No. 154848 in class 1, No. 154849 in class 15, and No. 155,009 in class 8, or passing off photographic films not being of the manufacture of the plaintiffs as or for the goods of the plaintiffs And It is Ordered that the defendants do pay to the plaintiffs their costs of this action to be taxed by the Taxing Master.—Friday, May 9th, 1902.'"

The Goerz Competition, for Photographs taken with Goerz Double Anastigmats.—We append full particulars and conditions of this competition, for which £300 in prizes are offered:—Class 1: For Anschutz Work.—First prize, £20; second prize, £15; third prize, £10; two prizes of £5 each; four prizes of £2 each; twelve prizes of £1 each.—The prizes will be given for the best series of four photographs taken with the Goerz Anschutz folding cameras or with cameras fitted with the Goerz Anschutz focal plane shutters. The photographs must be of objects in rapid motion. Class 2: Architectural Work.—First prize, £20; second prize, £15; third prize, £10; two prizes of £5 each; three prizes of £2 each; twelve prizes of £1 each.—For the best sets of four photographs of architectural subjects (of which not less than two must be interiors) taken with the Goerz Double Anastigmats (any series) or the Goerz Hypergon Double Anastigmat. Flashlight may be employed for lighting up dark corners without disqualifying competitors for this class. Class 3: Pictorial Work.—First prize, £15; second prize, £10; third prize, £5; three prizes, £2 each; eight prizes, £1.—For pictorial work of any kind in sets of four, e.g., landscapes, seascapes, portraiture, groups, animal studies, ruins, still life, etc. Class 4: Flashlight Work.—First prize, £10; second prize, £5; third prize, £2; three prizes, £1 each.—Best sets of four photographs of in or outdoor flashlight work. With architectural work taken by flashlight, it should be said whether the photographs are to be judged in Class 2 or 4, and, with general pictures, whether they are to be judged in Class 3 or 4. Class 5: Hand Camera Work.—First prize, £15; second prize, £10; third prize, £5; five prizes of £2 each; ten prizes of £1 each.—Work done with any hand camera fitted with the Goerz Double Anastigmat will be admitted in this class. Photographs to be submitted in sets of four. Class 6: Photos of General Interest.—First prize, £8; second prize, £5; third prize, £3; five prizes of £2 each, twelve prizes of £1 each.—In this class prizes will be given for single photographs, but a competitor is at liberty to send in a set of not more than six prints for this class. The prints must be of special interest in one or all of the following points:—Subject, conditions under which they were taken, and the manner in which the Goerz Double Anastigmat was used. The well-known photograph of "A Rainy Day in Berlin" is one which would fall under this class. The following are the conditions:—(1) All photographs must be taken with the Goerz Double Anastigmat, of which the series and number must be stated, but any camera or shutter may be used unless debarred by the special rules applying to the particular classes. (2) All photographs submitted for competition must be sent on or before December 31st, 1902. Those received after that date will not be eligible. Competitors from Great Britain, Ireland, and the Colonies should send their work, postage paid, to the London office, C. P. Goerz, 1 to 6, Holborn Circus, E.C., or to his West End agents, the London Stereoscopic and Photographic Company, Ltd., 106 and 108, Regent Street, W., marking the packets "Competition." Continental competitors should send their photographs either to C. P. Goerz, Optische Anstalt, Berlin-Friedenau, Germany, marking the envelopes "Preisausschreiben," or to C. P. Goerz, 22, Rue de l'Entrepot, Paris, marking the envelopes "Concours photographique." American competitors should address their photographs to C. P. Goerz, 52, East Union Square, New York, marking the wrapper "Prize Competition." (3) Every competitor must select a pseudonym, and the back of the photographs must be marked with this only. A sealed envelope bearing the pseudonym, having enclosed the competitor's name and address, must accompany the photographs. (4) Any printing process may be used. Photographs must be mounted, but not framed. The prints submitted must be actual contact prints from the negatives. (5) Competitors gaining a prize give to Mr. C. P. Goerz the right of reproduction in any form of the winning prints, and the use of the negatives at any time, if desired. The giving of this right will not prevent the competitor from also publishing the prints, provided it is mentioned under each print that the same was taken with the Goerz Double Anastigmat or Goerz Anschutz camera or shutter. The photographer's name will be, if desired, inserted under all the prints published by C. P. Goerz. I reserve the right to use the negative of any competitive print, although it may not have received a prize, at the following fees:—Up to 7 by 5, 10s. 6d.; up to 8½ by 6½ and 18 by 24 cm, 15s.; up to 10 by 8, 20s.; up to 15 by 12, 25s. After use the negative would be returned to its owner. (6) Sets of pictures can be entered in one class only, which must be mentioned. (7) Employees of the different factories and branches of C. P. Goerz are disqualified. (8) Should the judges consider the work submitted in any class not of sufficient merit to qualify for the prizes offered, it shall be at their discretion to proportion the award according to the quality of the work submitted. The right is also reserved of increasing or dividing the prizes should the prints submitted justify this. (9) Competitors should, as far as possible, give particulars of exposure, stop, camera, and shutter used. In Class 2 these particulars must be supplied, and information given also as to the raising of the front, if such a device is resorted to. (10) The judge's decision in all points will be final.

News and Notes.

THE Photographic Camp.—Full printed details are now to be obtained of this event from Mr. Walter D. Welford, Warwick Lodge, 166, Romford Road, London, E. The cost for the ten days is £4 for a gentleman and £3 for a lady, and the date is July 17th to 26th.

LONDON and Provincial Photographic Association.—On Thursday, June 5th, Mr. Wilfred Emery will give a practical demonstration of enlarging, and on June 12th the meeting will be open to any members who have matters of interest to bring forward. Visitors are always welcome.

THE Photographic Club, Anderton's Hotel, Fleet Street, London, E.C.—Mr. E. A. Newell has been compelled, by pressure of business, to resign the secretaryship of the Club. The new hon. secretary and treasurer is Mr. T. W. Derrington, 85, Trinity Road, Wimbledon, S.W., to whom all communications should be addressed.

THE Photographic Survey and Record of Surrey.—The following circular has been issued to photographic societies:—"This Society is now formed, as a result of the meeting held at Croydon on May 9th. At that meeting it was resolved that :—'The council of this Society be composed of the Provisional Committee, plus two delegates from each of the societies willing to co-operate where such societies are not already represented on the Provisional Committee, and with power to add to their number.' Will you kindly bring the matter before your Society, and notify me of the delegates appointed to represent your Society on the Executive Council, as soon as possible, unless you have already done this? I also beg to inform you that the next council will be held at the Lecture Room, Central Library, Town Hall, Croydon (by kind permission of the Libraries' Committee), on Friday, June 13th, at 8 p.m. The business, which is very important, will include the election of permanent officers.—I am, faithfully yours, HARRY D. GOWER, hon. sec., pro tem."

RISKS Photographers Often Run.—This was well exemplified in a case that came before the Law Courts, one day last week, on a case for damages for personal injuries. It appears that the plaintiff, an amateur photographer, wished to take a snapshot in a street in Camden Town, and in his desire to get what he required he took a step or two backward and fell through a grating that had just been opened, and sustained serious injuries. We know that photographers, when they are desirous of securing the best views of their subject, often run risks that, until they have realised them after the picture is taken, they would not care to repeat. We must confess to having placed ourselves in such positions in our anxiety to secure pictures from perilous positions. Often a photographer, in his enthusiasm to get a certain result, will, thoughtless while intent on his object, run risks that, with a little consideration, he would wisely have avoided. These risks are always, more or less, great in mountainous districts, but one is not always prepared for them in the streets of London. But, as will be seen from the case just cited, it is well to be on the alert even there.

"PYRO" as a Developer.—At a meeting of one of the London societies, a few weeks back, the question was raised as to whether pyrogallic acid was as much used now as formerly. "Pyro" was the first developer used for glass negatives—collodion and gelatine—and during the past few years very many newer ones have been introduced, each claiming to be superior to the older one, and, for that matter, superior to any other. But who are their chief users? We might well speculate that they are, in this country, at least, amateurs. We venture to say that if the professional photographers of the United Kingdom were canvassed to-morrow, the larger majority of them would be found still using what they term the "good old pyro" for their general work, notwithstanding that they have given the newer agents a fair trial. It is also noteworthy that, in the formulæ issued with their plates, the makers always place that for a "pyro" developer first. Pyrogallic acid has its advantages as well, it must be admitted, as its disadvantages. The same may be said of all the newer developers, but, as a matter of fact, "pyro" still holds its own amongst professional photographers, also with many of the best men amongst amateurs.

MORE Pictures for the City Art Gallery.—The Corporation of London's Art Gallery at the Guildhall is to be further enriched. The late Mr. Chas. Gassiott, a City merchant, has bequeathed his collection of pictures, from which he had frequently lent to the City's loan exhibitions, to the Corporation, with the exception of four which will go to the National Gallery. It is said, according to the Exchange Company, that the value of these pictures is £170,000. It used to be thought that the only idea in the City was commerce and money-making, but recent years, as witness the fine collection of pictures the Corporation has acquired during the last few years, and the excellent frescoes already painted, and to be painted, by the best living artists, in the Royal Exchange, quite dispel that notion. In time we hope to see the Corporation in possession of an art gallery that will be worthy of the greatest city in the world, to say nothing of the annual loan exhibitions held at the Guildhall. We may remind our readers that the loan exhibition now open contains pictures by the best English and French artists of the eighteenth century, all of which are lent from private collections, and can only be seen by the public while this exhibition is open.

THE "Nottingham Evening News" states that at Mr. Hindley's shop in Milton Street, Nottingham, are some fifty or sixty photographs of views and incidents connected with the South African war, which have a pathetic interest, inasmuch as they were taken by the late Private J. H. Lewis, of the R.H.R. Active Service contingent. Lewis had a fatal attack of dysentery—that dreaded scourge, which has killed thousands of poor fellows more than the enemy's bullets were ever likely to do—and he lies buried in a soldier's grave at Krugersdorp. A widow and five children in Nottingham mourn his loss, but no application has yet been made on their behalf to the Reservists' Fund officials; the widow has preferred to make the courageous attempt to work for her children and herself. Surely, however, it will not be deemed an intrusion on the privacy of sorrow if I draw readers' attention to the fact that Private Lewis's photographs are worth purchasing, and the money would be more than useful. A correspondent states that Private J. H. Lewis was for some years previous to his death managing photographer to Boot's Pure Drug Company, Ltd., (Photo Publishing Department). He was a Reservist and a member of the Robin Hood Rifles. He was called up for service with other Reserves, but went out actually with the second contingent of the Robin Hood Volunteer Corps. Anyone who has seen the fine set of view-books published by "Boot's" will know the class and style of work of which Private Lewis was capable. Enough to say that he was a good photographer and a painstaking worker, and liked by everyone with whom he was associated. The photos referred to in the above cutting are as briefly described. Lewis had, as a matter of fact, barely time to get used to the changed conditions of light and surroundings, but these photographs are extremely interesting, and, considering also the small sum (one shilling) asked for well-mounted copies, no doubt many of our readers will feel desirous of assisting in their disposal.

EVERY Registered Chemist should make a point of carefully reading the article on photographers, pharmacists, and poisons, which is reprinted in this week's "P.J." (see p. 458) from the BRITISH JOURNAL OF PHOTOGRAPHY. That important organ has not always been distinguished by the accuracy and fairness of its comments on matters appertaining to the business of chemists and druggists, but the article referred to is beyond criticism in those respects, the writer evidently being both well-informed and capable of forming a just estimate of the position of affairs in regard to the sale of poisons. As he clearly shows, for a great many years pharmacists have had an intelligent appreciation of the poison danger, and have taken every possible precaution to protect the public against that danger. But it is impossible for the most conscientious pharmacist to exercise watch and ward over poisons after they have passed from his possession, and, if further legal restrictions be required, it seems as though they should be made to apply to purchasers rather than sellers of poisons. The pharmacist may, and does, supply poisons in suitable receptacles, properly labelled, but cannot ensure that purchasers will retain them in those receptacles, and thus do what is requisite to protect others. So careful has the pharmacist been to anticipate any demand for further restriction of the sale of poisons that the use of the poison label has been overdone, and familiarity therewith has bred the usual contempt. The late William Martindale was a strong advocate of greater discrimination being exercised in the use of poison labels, holding that it was not always wise policy to let the public know how potent are many substances which are freely available for misuse. With that view many pharmacists are in full accord, believing with the writer of the article under consideration that, in many instances, a note of warning that the substance requires careful handling would answer all requirements. For the rest, pharmacists who have ever felt the need of arguments in support of their peculiar position as retailers of scheduled poisons will do well to read, mark, learn, and inwardly digest the article in question, in order that they may avoid being at a loss for satisfactory reasons in defence of their conduct on occasions when they consider it desirable to refrain from selling poisons, or find it necessary to refuse to supply them except under conditions which experience has proved to be necessary in the public interest.—The "Pharmaceutical Journal," May 31st.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

CHANGING BOXES.

To the Editors.

Gentlemen,—I would be greatly obliged if you will kindly publish the following.

Last year I purchased a "Sinclair" changing box from Messrs. Rae Brothers, of Glasgow. I used it twice, but as it took rather longer to change the plates than I cared to spend on the operation, I laid the changing box aside. I found also that in changing the plates they got scratched; but at the time I attributed this to my want of skill, though I believe I handled the apparatus as the average user would do. I recently tried to sell the changing box, but the dealer, having the prudence to first try it, which I had not the opportunity of doing, found that the plates did get scratched. This was confirmed by a customer of the dealer referred to, who would otherwise have purchased the changing box. It seems to me that a changing box that scratches the plates is of very little use to anybody, and I wrote to Messrs. Rae Brothers about it, asking them whether they had received any complaints, and what was the best to do under the circumstances; but though I have written twice, both letters have been ignored. I might say that before purchasing the apparatus I wrote to Messrs. Rae Brothers asking them whether it was reliable, but I remember I received no reply to that letter.

But on the strength of a circular issued by them, in which the changing box was described as having stood the test of years, and also because of an advertisement in one of the photographic papers, in which it is said that the box is the "simplest, the lightest, the best," I purchased one of the changing boxes, half-plate size, with the above result. The firm in question is still advertising that the apparatus is the "simplest, the lightest, the best." I do not think that the above experience confirms that description. Perhaps some of your readers have had experience of this form of changing box. If so, perhaps you will be good enough to publish their experiences, if they care to send them. I cannot understand the refusal of Messrs. Rae Brothers to consider communications when the efficacy of goods sold by them is called into question.—Yours faithfully,

J. A. REID.

Kineraig, Cutcliffe Grove, Bedford,
May 29, 1902.

THE ILLINGWORTH COMPETITIONS.

To the Editors.

Gentlemen,—We shall be very much obliged if you will kindly note in your valuable journal that the date for entries for our carbon printing competition has been extended to August 1st, 1902. We have been asked by several of our Colonial friends and customers to extend it, so as to give them a chnace, as the time previously mentioned was too short for them to get in their entries. Thanking you in anticipation, etc, we are yours faithfully,

THOMAS ILLINGWORTH AND CO., LTD.

The Photo Works, Willesden Junction,
London, N.W., May 17th, 1902.

THE BECK STEINHEIL LENSES.

To the Editors.

Gentlemen,—It has come to our ears that many people believe that the Beck Steinheil Orthostigmat lenses are not manufactured in this country, but are merely imported by us for re-sale. We should esteem it a great favour if you would find room for this letter in your valuable paper, and show your readers that from beginning to end the aforenamed lenses are manufactured at our factory at Kentish Town, from the raw glass right up to the finished lens.

Since their introduction two years ago they have carried the reputation which they now possess through the great care that is taken in their manufacture.—Yours faithfully,

R. AND J. BECK, LTD.

68, Cornhill, London, E.C., May 29th, 1902.

MATT BROMIDE PAPER.

To the Editors.

Gentlemen,—We have pleasure in sending you herewith a copy of a statement of a very interesting patent case, which has been prepared by a patent expert, and which, we think, would be of considerable interest to your readers and also to all photographic manufacturers, inventors, and bromide paper users.—Yours faithfully,

KODAK, LIMITED.

Head Offices, 43, Clerkenwell Road,
London, E.C., 28th May, 1902.

The issue of the Junk versus Kodak case, which has been going on in various courts of Germany for several years, is one which has had considerable interest for a number of photographic manufacturers, both in this country and in Germany, who have used, or desire to use, starch in their photographic emulsions. The case also is of some interest as bearing on the storm of controversy which has been excited by the Bill which is now before Parliament for the purpose of instituting a Board of Official Examiners in the English Patent Office, who shall have the power of rejecting applications for patents on the ground of want of novelty. Hitherto there has been no investigation whatsoever as to anticipation, and any application framed in correct form is accepted and sealed forthwith regardless as to its novelty. It is, for instance, perfectly possible for anyone to obtain to-day a patent for the principle of the incandescent electric light, or, for the matter of that, for the application of steam to locomotives, and the British Patent Office will roll up its enormous profits by taking the fees of any alleged inventor for the full term of fourteen years. Those who are in favour of keeping up the old rule argue that the Patent Office is merely a bureau of registration, and exists for the sole purpose of obtaining authenticated dates for a given specification, leaving entire responsibility as to the novelty and validity of the invention to the inventor himself. When it is argued against this view that the most complete examination possible is made by the Patent Offices of the United States and of Germany into the actual novelty of all applications submitted to them, they retort that this examination is not, and in fact cannot be, that conclusive proof of validity for which it is usually taken.

A striking proof of this is provided by a recent case concerning a German patent which was tested in all the courts of the Empire. A certain Berlin photographer, named Junk, invented some ten years ago a photographic emulsion which had for its purpose the preparation of canvases and papers suitable for being painted upon, after printing, with oil or water colours. This end the inventor effected by mixing his gelatine emulsion with a large proportion of starch paste. The German patent granted to him, after having passed the scrutiny of the Board of Official Examiners, was so wide in its claims as to be held by the courts to cover all photographic bromide papers coated with an emulsion containing starch in any form, and this notwithstanding the fact that photographic papers containing raw starch had been described, manufactured and sold for well-nigh twenty years prior to the date of the German application in question. Chief among the photographic papers of this class is the Matte Solio of Kodak, Ltd., and against this firm an action was brought by the inventor. In view of the far-reaching character of the attack, Kodak, Ltd., was supported in its defence by another English company, Ilford, Ltd. The suits heard in this connection were divided into three distinct issues, one for an injunction; another for damages or royalty; and a third, brought by the defendants, for a restriction or annulation of the patent. Since it is the custom of the German courts to view a German patent which has received the sanction of the Official Examiner in the light of, one might almost say, a governmental decree, the plaintiff was successful throughout in the suit of injunction, which went to five hearings, first of all in the Lower Courts, then in the Court of Appeal, then in the Supreme Court, or Reichsgericht, at Leipsig, where it was on the first hearing sent down again to the Court of Appeal, on account of an error of form in the phraseology of the judgment, then in the Court of Appeal again, and finally to its ultimate decision in the Supreme Court. In like manner the suit for damages went to hearings in the Lower Court and the Court of Appeal.

But in the meantime the defendant company had made the greatest efforts to prove the entire want of novelty of the patent, involving the collection of materials in all parts of Europe, and more particularly in Spain, where the earliest photographic emulsions, consisting of a combination of gelatine and starch, had been traced. Armed with irrefragable proofs of this kind, and supported by the evidence of the greatest photographic experts of Europe, including such authorities as Professor Dr. Eder of Vienna, Professor Dr. Miethe of Berlin, and Professor Dr. Schmidt of Carlshruhe, the German Patent Office was invited to revise its grant by a revocation of the patent, or at least by a restriction of its claims. And here comes in—would say the opponents of the new institution of Examining Boards—the greatest weakness of this sysetm. For the very men who had decided that the patent was novel and should be granted were now called upon, in the first instance, to reverse their own decision and to admit themselves to have been in the wrong. This is perhaps more than could be expected of any bureaucracy. At all events, the German Patent Office refused to annul the patent, in spite of the altogether conclusive evidence, thus calling down upon themselves a very general condemnation on the part of the technical journals throughout that country. One last resort remained to the defendants, namely, an appeal to the Supreme Court against the decision of the Patent Office. This step was taken, and here, at last, they were entirely successful, all the previous judgments of the courts being overruled and set aside by the total annullation of the patent.

The Kodak Company has shown the greatest persistency and thoroughness in carrying out this defence, which has occupied the German Courts for over four years, and they have rendered a service not only to other manufacturers, but also to inventors and patentees by furnishing a striking proof of the fact, too readily overlooked, that the decision of a Board of Examiners, however, well instituted, cannot possibly provide any trustworthy proof of novelty or validity.

THE THORNTON-PICKARD FOCAL PLANE SHUTTER.

To the Editors.

Gentlemen,—In view of the fact that a Continental manufacturer is extensively advertising his failure and inability to make a satisfactory and efficient focal plane shutter, with a blind aperture adjustable from the outside of the shutter, we have pleasure in informing you that we have recently perfected and patented a shutter of this description, which works splendidly. In this shutter the modification of the blind aperture is effected simply and easily by turning a knob on the right-hand side of the shutter box. The ease and comfort with which this shutter can be worked is remarkable, and contrasts most favourably with any other focal plane shutter hitherto placed upon the market, and, further, it does not easily get out of order. We take this opportunity of drawing your attention to the fact that the remarkable photographs which we have during the last ten years reproduced for advertising and other purposes are genuine pictures taken from single negatives which have not been "manipulated." We do not superimpose one photograph upon another, and the exposure given with our pictures are always the real exposures—not fictitious ones. With our focal plane shutters, which work from 1-20th to 1-1,000th

of a second, it is not necessary to take every picture at 1-1,000th of a second. Whilst it may be an interesting thing from an experimental point of view to take photographs at such a speed it is advisable to give as long an exposure as the subject and conditions will allow, so that if an object can be taken at 1-500th or 1-600th of a second, it is better to take it at that speed rather than at a shorter one. Many of our pictures, which have been published for years, and which, for technical excellence as photographs and correct form and position of subject, have never been surpassed, have been taken at exposures varying from 1-400th to 1-600th of a second. A shutter which will take such pictures at these speeds is a better instrument than one that requires to be set at 1-1,000th before a similar result can be obtained.—We are, dear sirs, yours faithfully,

THE THORNTON-PICKARD MANUFACTURING CO., LTD.

Altrincham, May 28th, 1902.

FRENCH CHARITY FETES.

To the Editors.

Gentlemen,—I venture to ask your kind co-operation by affording the Fetes Committee the benefit of your columns in order to bring more prominently before the public the particulars concerning the series of fetes in aid of French charities in London to be held at the French Embassy on June 10th and 11th, followed at Earl's Court on June 12th, 13th, and 14th, under the patronage of their Majesties the King and Queen, the members of the Royal Family, and in response to the appeal of his Excellency the French Ambassador. These fetes will consist of a grand bazaar at the French Embassy, followed at Earl's Court by a series of battles of flowers, dramatic fetes, illuminated pageants, and carnivals, of which the following are some particulars:—

Thursday, June the 12th.

4 p.m.—Grand Battle of Flowers in Carriages.
10 p.m.—Dramatic Fete and Historical Pageant.

Friday, June the 13th.

4 p.m.—Grand Automobile Battle of Flowers.
6 p.m.—Aquatic Floral Fete and Pageant.
9.45 p.m.—Illuminated Pageant and Lantern Fete.

Saturday, June the 14th.

4 p.m.—Cycle Battle of Flowers.
9 p.m.—Fancy Dress Carnival.

Grand stands and other enclosures, holding over 10,000 spectators, will be erected along the route of the procession, the proceeds of which, together with entrance fees of participants, as well as of the sales of flowers, etc., will be entirely devoted to the benefit of the charities, the directors of the "Paris in London" Exhibition having generously placed the use of the entire grounds for these three days at the disposal of the committee. Special bands and a chorus of 600 will add to the brilliancy of the fetes. Over 150 magnificent banners will be awarded, among them being gifts of his Excellency the French Ambassador, the Lord Mayor of London, and many of the French and English Mayors. Some quantities of cut flowers have been promised for these fetes, but an enormous quantity of bouquets and cut flowers will be required, and we cannot appeal too strongly for large quantities being sent to us. Gifts of these will be gratefully received, and should arrive on the 11th, 12th, and 13th June, addressed to the French Fetes Committee, "Paris in London" Exhibition, Earl's Court, S.W. (Lillie Road entrance). It is anticipated that the proceeds from the sale of these flowers will in themselves produce a large revenue. We desire to impress upon owners of carriages and automobiles that their participation in the battles of flowers will materially help the charities by means of the entrance fees they will have to pay, and applications cannot therefore be received too early to enable the committee to make the necessary arrangements. This, of course, applies equally to owners of boats and cycles of all descriptions. Serial tickets for the whole of these fetes can be obtained from the various stewards, or from the Honorary Treasurer, Mr. Edward Roehrich, 3, Copthall Chambers, E.C.—Yours faithfully,

IMRE KIRALFY,
Chairman of Fetes Committee.

Tower House, Cromwell Road, S.W.,
London, 29th May, 1902.

TOURS IN IRELAND.

To the Editors.

Gentlemen,—I have pleasure in sending you herewith a copy of our tourist and excursion programme for current season, which may be of some service to you. This season we have included a page showing where dark rooms for photographers are provided in hotels in the districts served by our railway.

This is, I believe, the first notice of its kind that has appeared in a railway company's guide, and it is to be hoped that the information will be useful to photographers, who may visit some of the places during the season.—Yours truly,

R. J. MOORE.

Office of Superintendent of the Line, G.N.Ry. (Ireland).
Amiens Street Terminus, Dublin, June 2nd, 1902.

THE PUBLIC RECOGNITION OF ART PHOTOGRAPHY.

To the Editors.

Gentlemen,—I have read with interest, in the Journal of April 25th, the well-written article, entitled "The Public Recognition of Art Photography," and trust you will not consider comment by me out of place. I must confess to unfamiliarity with the status of photography in your country, but from reproductions in English photographic periodicals, I would conclude that you have many advanced amateurs whose work gives such convincing evidence of individuality in artistic expression and execution, that I do not see how their productions could be excluded from an exhibition in the Fine Arts building of the World's Fair, judged on the basis, or by the standard, which has been designated to the directors. I will admit there is a plentiful lack of knowledge of the anatomy of the human form among the general run of photographers, those who make the retoucher's work one of the most important elements in photographic portraiture. But those whose work would appeal most to the art critic of to-day do not place a very high value on the retoucher's skill, or more frequently lack of skill. Admitting that an intimate knowledge of anatomy is very essential to the portrait painter, it must be conceded that it is not nearly so essential to the expert with the camera, who does not make the exact and instant reproduction of line and form, by the free use of the pencil. Is it not possible that among the millions who handle the camera there are a few hundred whose artistic genius overcomes the barriers due to lack of educational opportunities? I do not wish to appear trivial when dealing with a subject in which we are so deeply, seriously interested, but I cannot refrain from inquiring, what bearing has this knowledge of the construction of the human form divine, upon the making, with lens and plates, of some of the most beautiful, truly, and purely artistic landscape pictures? It must be borne in mind that, while the brunt of this battle for the recognition of photography as an art has fallen upon a committee of professional photographers, the fight is being made for the amateurs. My esteemed colleague and friend, Mr. Stein, of Milwaukee, in our conference with Colonel Ockerson, Chief of the Liberal Arts Department, placed particular stress upon the statement that, out of every hundred prints accepted for display, eighty would be by amateurs. We are quite willing to concede that the most telling movements into the realms of art, on the part of photography, have been led by them. The professional labours under many disadvantages, as compared with the amateur. The latter works only when inspired, with selected subjects, in harmony with him, where the surroundings are congenial and the conditions most favourable. Limitations of time and considerations of money values do not hamper him. With the average professional most of these elements are usually in opposition. So we are not in the least envious of the glory gained by our amateur brethren. Let me quote from a letter, written by John Aspinwall, Esq., secretary of the Camera Club, of New York City, relative to my contention, "art buildings for art photography." Under date April 1st, 1902, he writes:—

"Their position is a perfectly proper one, and is borne out by facts. The pictorial photographers of the Camera Club of New York will not be willing to make an exhibition in the Liberal Arts building, but we should be largely represented if an exhibit can be made in the regular art building of the Fair. It is a well-known fact among the progressive photographic fraternity, especially the amateurs, that the best form of pictorial photography is a pure art, and not a mere mechanical process, and involves the individuality of the members. So distinct is this factor that we can incidentally say that such and such a photograph was made by Mr. Clarence White, such and such a photograph by Mr. Steichen, and another one by Mr. Steiglitz, and so on. There is no more mixing their identity than there is in the works of the great painters.

"I send you notice of the Print Competition, which is to be judged by the Camera Club of New York, May 1st to 15th. You will see that Mr. Coffin, Mr. Loab, and Mr. Church, all men of acknowledged ability as critics of the art world, have consented to be the critics to aid in awarding the prizes of this exhibition. You can readily conceive, and so should the authorities of the St. Louis Exhibition, that these gentlemen, of national reputation as art critics, would not consent, nor would they consider themselves competent, to award prizes if what they are to judge is nothing but a mechanical process having no relation to art. Should St. Louis conclude to open a department in the art building for pictorial photographs, there will be collected the greatest exhibition of pure art in photography that has ever been seen."

I enclose copy of a letter written by Mr. D. Dundas Todd, of Chicago, to Professor Halsey C. Ives, Director of Fine Arts, on this same subject, and I believe he presents some strong arguments on our side of the controversy, between photographers and the World's Fair management. Subsequent to my sending you the copies of correspondence with Colonel Ockerson, I called his attention to the acceptance of the great Paris Salon of American photographs. You are doubtless aware of this event, which opens a new era for camera workers, who are not tied hand and foot to the conventional. I trust the foregoing will do something towards convincing you that, though art in photo-

raphy in England may be but "an infant wailing for recognition," ere we feel ourselves justified in making a most vigorous demand for ignified representation. We feel that our work is close kindred o the other fine arts, and we are entitled to a cordial, hospitable elcome to the best accommodations in their most pleasant home. Ve do not intend to be quartered in one of the outhouses devoted to poor relations." The aim of your influential Journal is to elevate ie status of photography. You will admit that such recognition as e demand would be a long, forward step, a most beneficent one. Ve do not decry painting as a fine art, because many painters have o idea of proper colour values, and similarly, do not let us depreciate hotography as a fine art, because many of its votaries do not know ie difference between the supra-obitary and the vermiform-appendix. know it is begging the question, but do not mediocre paintings often nd space in exhibitions, alongside prized masterpieces? And quite requently do not even the latter give evidences of faulty drawing? Vhy discourage a possible opportunity for photography, through fear f bringing "on itself the contempt of the more serious thinkers," ecause, perchance, a number of photographic portraits are marred by ncorrect anatomical lines. If we wait until painters and sculptors nvite us to join in an exhibit, on an equal footing with them—well, ven art is not long enough for that.—Very cordially yours,

J. C. Strauss.

St. Louis.
May 16th, 1902.

OPY OF LETTER TO PROFESSOR HALSEY C. IVES, DIRECTOR OF FINE ARTS, ST. LOUIS.

Dear Sir,—In the matter of the photographic department of the ouisiana Purchase Exposition, permit me to draw your attention o the following point, which may have escaped the notice of the ommissioners.

The workers who are interested in the pictorial side of photography, s distinguished from the industrial phase, should they exhibit at the xposition, will not be influenced by commercial motives, as, whatever work they produce, is done for pleasure and not with ulterior ommercial views, therefore an exhibition of their work would not urther them financially, but would rather cause them to incur expense n preparing the prints for display. Such being the case, they are n a position to make terms with the Exposition, and if their desires re not met, they will positively decline to exhibit. If the managers esire such work, and I have no doubt it is their wish to have the est of everything, they must be prepared to provide such accomodation for pictorial photography, as distinguished from industrial hotography, as the leading workers demand, and I cannot assure you o strongly that for a number of years they have been unanimous in isisting that they will not exhibit where photography is classified s being a department of liberal arts.

For many years the Art Institute of Chicago declined to consider hotography as part of their sphere of work, but a few years ago ney recognised the present status of pictorial photography, and the ociety of Amateur Photographers is now housed in the Chicago Art nstitute. Mr. Hutchison, the president of the Institute, has been on over to the point where he realises the pictorial possibilities of hotography, although for many years he could not be convinced that possessed such.

Since writing the above, I am in receipt of a letter from Mr. Alfred tieglitz, who is, at the present moment, managing the most ambious photographic exhibition that has ever been held in this country. take the liberty of making extracts from this letter, as they will how you the status that pictorial photography has attained of recent ears, and proves to my mind that the best workers are perfectly stified in demanding that such work be separated from the liberal rts and placed where it properly belongs.—Yours respectfully,

F. Dundas Todd.

Chicago.
March 19th, 1902.

XTRACT FROM LETTER FROM ALFRED STIEGLITZ, WEST 29TH STREET, NEW YORK, TO F. DUNDAS. TODD.

March 17th, 1902.

"Our bitterest opponents amongst the artists, the greatest nonelievers amongst the critics, in fact, all who have seen the show, are stounded at the ensemble. Steichen's work is a revelation, and Richard Watson Gilden, that most conservative of conservatives, the ditor of the 'Century' has been won over. The exhibition is a greater uccess than I dared expect. It is the fairest photographic exhibiion which can be shown to the most critical without an excuse. It tands on its own feet and stands the test of time. The art critics, he best of them, are studying the pictures carefully, and some excelent articles have been written, and will be written, on the subject. Even the 'Century' is to open its pages to 'Photography as a Fine rt.'"

[Some remarks on Mr. Strauss' interesting letter will appear in our ext.—Eds. B. J. P.]

THE DETENTION OF SPECIMENS.

To the Editors.

Gentlemen,—It was with extreme pleasure I noticed in your journal the week before last a letter from an operator complaining of the annoyance and delay caused by photographers advertising for operators through a box number.

I also, as an operator, have a great grievance in the same direction. At various times I have sent my specimens to some of these photographers, who have put a somewhat fascinating advertisement in the Journal to this effect:—"First-class operator wanted, one who thoroughly understands his business; excellent opportunity to a good man.—Address Box, etc." It has been my lot to answer such advertisements, and the replies in many instances are after the following:—

"Thanks for specimens. The situation I have vacant is for an operator for my branch studio, and I should want you to take full charge of same and do your own retouching, at a salary of 30s. per week Wire reply if you care to accept the same, etc."

Now, you can imagine the feeling of disgust when, on opening my returned specimen, I find a letter enclosed similar to the above, when for my retouching alone I command a salary of £2 10s. per week. Yet these men advertise for first-class operators, and want nearly every branch of the work thrown in for 30s. The above annoyance is not so bad when compared with some of the same class, who are pleased to call themselves first-class photographers, and advertise as such, who have the base ingratitude as to keep an operator's specimens nearly a fortnight, thus depriving him altogether of applying for a situation the following week, and when they do come they generally contain some such offer as stated; and others again sometimes keep them over a fortnight, and are returned unaccompanied by a letter of any kind, not even a thank you, thus depriving an applicant of any knowledge of this ungrateful individual.

Just imagine an assistant out of a situation, with only sufficient money by him to keep him for a fortnight or so, and he happens to send his only specimens to some of these photographers that I have mentioned, and the following Friday is round again, and still he has not had his specimens returned to him, and as he gazes down the advertisement column he observes a situation that would just suit his requirements, but finds himself unable to apply owing to this selfish, slave-driving, price-cutting individual detaining his only means of success. Thus the poor fellow is thrown into a most miserable state of mind, knowing, as he does, that the little money he has saved is about at an end.

It is one of the greatest pities these black sheep cannot be made to give compensation to assistants for detaining their specimens, or rather make them pay the full salary assistants ask when applying for the same if kept over a week, and every part of a week that passes after the first week, while the specimens are in their hands.

Trusting I have not encroached too much on your valuable space, I am yours faithfully, Operator.

June 2, 1902.

Answers to Correspondents.

*** *All matters intended for the text portion of this* Journal, *including queries, must be addressed to* "The Editors, The British Journal of Photography, 24, *Wellington-street, Strand, London, W.C." Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* Messrs. Henry Greenwood & Co., 24, *Wellington-street, Strand, London, W.C.*

Photographs Registered:—

C. H. Young, The Studio, Towyn, North Wales. *Photograph of Mr. Roberts.*
T. Lewis, 200, Stratford Road, Birmingham. *Photograph of English XI Cricket team.*
C. Frank, 15, Cornwall Street, Plymouth. *Photograph of Bedford Street, Plymouth.*
E. G. Brewis, 8, New Bridge Street, Newcastle-on-Tyne. *Photograph of E. Diggle. Photograph of C. Dawson. Two photographs of Sir W. H. Stephenson.*
W. G. Honey, 102, Patrick Street, Cork. *Photograph of the Industrial Hall. Photograph of H. E. Earl of Cadogan. Photograph of H. E. Earl of Cadogan, Countess Cadogan, Lord Plunket, and others.*

G. W. S.—See reply to "Hope" in last week's Journal.

Address Required.—A correspondent informs us that the address of M. Lacour, the French optician, is: E. Lacour, neveu et successeur to C. Berthiot, 168, Rue Saint Antoine, Paris, 4e.

Copyright.—H. E. S. writes: "I have a photograph that I wish to pub-

lish sent to me by a friend in South Africa, and taken by an amateur out there. I should be glad if you could tell me in your paper if it would be legal for me to copyright and publish it?"—In reply: If the author of the photograph has registered it, and you publish it, you would be liable to an action.

ADDRESS WANTED.—WILL ENGLISH writes: "Can you kindly supply me with the name and address of the firm who sell those cameras that you see men with in the street gaining a livelihood? I have noticed a small plate on some of them which says "Nievsky's Patent."—In reply: The apparatus, we believe, is supplied by Jonathan Fallowfield, Charing Cross Road, W.C.

THE CHOICE OF A CAMERA.—"LANDSCAPE" writes: "Will you please tell me which is the best hand camera to use for the purpose of photographing pictures—I mean landscapes, etc., to use as guides to painting? Kindly mention the cheapest one that can be depended upon."—In reply: All hand cameras are suitable for the purpose. It is quite against our rules to recommend any particular maker's goods. But you may rely upon it that, now, whatever price you pay, you will have full value for your money—such is competition.

SCREW FOR CAMERA STAND.—H. T. J. writes: "Could you inform me where to get an archimedean screw and fittings for the camera stand, print of which I enclose? We have written to Marions, and they say they are unable to supply it, unless I give them the maker's name. This I cannot do, as there is no name on the stand. The stand is in excellent condition, except that the screen is worn down. Should feel much obliged if you could give me the name and address of a firm where I can get the fittings?"—In reply: If Messrs. Marion cannot give you the information we cannot. We expect you will have to get an entirely new rack, and screw to match it, made. That, any machinist will supply.

FINISHING IN BLACK AND WHITE.—"SUBSCRIBER" writes: "Could you kindly inform me as to which is the best way of finishing a black-and-white enlargement? (1) Do you use crayons; if so, what sort? (2) Or do you use powdered black with paper stumps? (3) Or is it best to use a medium, such as oil colours? If so, would you kindly name the best, and how would you stop same from shining?"—In reply: Photographs may be finished in all the methods mentioned. (1) The ordinary crayons as sold by the artists' colourmen for crayon work. (2) Yes, that may be used. (3) Oil colours can also be used. By using a large proportion of turpentine in thinning the colour, the gloss will be considerably subdued.

COPYRIGHT.—A. L. asks: "Will you kindly inform me if I can claim any fee from an illustrated paper who has made use of one of my photographs supplied by the customer direct? He is an amateur sportsman, and on the evening of carrying off the championship of Wales, I supplied the same paper also with one portrait of him, but the paper did not even acknowledge my name. Will you also be good enough to give me the address of the Copyright Union?"—In reply: If the customer paid for the portrait, of course, you have no copyright in it, and therefore no claim on the paper. If the picture was not paid for, and you did not register the copyright in it, you have no claim. The address of the Photographers' Copyright Union is London Chamber of Commerce, Botolph House, Eastcheap, E.C.

A LENS INVENTION.—J. O. LLOYD writes: "I have a method for converting an ordinary lens into a wide-angle one. By its use a picture double the size of that produced by an ordinary lens is thrown on the focussing screen. With this very simple invention a wide-angle lens is not necessary. It can be made to fix on or take off in a moment of time, and could be produced for a few shillings, and would occupy no space. May I ask if you think such an invention would be of sufficient service to professional and amateur photographers to justify its registering as a patent?"—In reply: If there is anything new or novel in your idea it might possibly be worth your patenting it. But as we do not know what it is we cannot advise. There are several well-known methods of arriving at the same end, but at some sacrifice.

TRANSFERRING FILMS, ETC.—T. W. JONES writes: "I have taken a view of the town of Tregaron from high ground behind the town, and have a deal of foreground (it is on a whole plate). I want a photo of the County School shown in an oval in one side of foreground, and a view of the Square Monument inserted in the other side. I cannot transfer the film from one to the other myself. I should be glad if you could inform me who will do it for me? I want all done on the original negative. Afterwards I shall want the negative registered, and should be glad if you will get that done for me."—In reply: We are unable to say who would do the work for you. Most photographers do that kind of work for themselves, and we surmise you will have to do the same. If you refer to page 819 of our last volume you will find an article on combining negatives. From that you will see how to do what you desire. If you send a couple of prints from the combined negative we shall be pleased to effect the registration for you.

BURNISHING—HARDWICH'S "PHOTOGRAPHIC CHEMISTRY."—SALOPIAN writes: "My burnisher (bar) scratches prints when burnishing. Could you tell me where I could get it made right, and have you any idea as to the cost of doing same (it is about 7 inches)? I have an opportunity of obtaining a copy of Hardwich's "Photographic Chemistry," 2nd edition. Of course, I am aware that it will not be up to date, and that some of the chemical formulæ are not quite accurate as compared with modern chemistry. Do you think such a work is worth buying? Is the wet-plate information accurate?"—In reply: The best way will be to send the bar to the maker of the burnisher. Next to that, send it to an engineer to do the needful, if you cannot do it for yourself. The 2nd editi of Hardwich's "Photographic Chemistry" is good for the time which it was issued; but as that is over 40 years ago, and in t very early days of the collodion process, it is not of much go now, except for a museum or library of historical works.

OPINIONS WANTED.—S. J. writes: "I enclose three bust pictures, whi I may say are my own work throughout. I am not an amateu as you will see by the above address, but have two studios of n own, but have not taken to retouching until after I took to the businesses, and I feel I would like to know from someone w understands photography in all its branches candidly what kind work I do, etc. (1) What sort of work is mine, taking it on t whole? (2) What wages am I worth to a photographer as operat and retoucher? (3) What am I worth per week as retouch alone? The prints I enclose have the time they took me to them on the back. (4) What kind of a retoucher am I? Goo bad, or indifferent—that is, very good, medium, or no good at a I have been retouching now for about 18 months. Therefore (5 have I got on with it well or slowly, and am I slow or otherwise —In reply: We have at times strange questions to answer, and t above is one in point. One would have thought that a phot grapher who is carrying on two businesses would have been ab to assess the value of his services as an operator and as a retouche However, he asks us to do so from three small specimens indifferent work, indifferent both as regards the photography a the retouching. As he asks our candid opinion, we can say ver little until he can improve his work in both directions.

EXPOSURE METERS.—W. LAGOWSKY asks: "Is there a correct formula convert Warnerke's, Wynne's, and Watkins's plate speed numbe into Hurter and Driffield's later standard pyro-soda carb. pla speed numbers? I am an amateur, and use a Hurter and Dri field's actinometer; but on the Continent plates are marked by t Warnerke's method, and I have not time or knowledge enough make tests, inasmuch that I am travelling about for the presen If there is no correct formula for such conversion, you would pe haps tell me an approximate way of calculating the exposure Hurter and Driffield's actinograph, knowing only Warnerke's Wynne's or Watkins's plate speed numbers?"—In reply: We kno of no correct formula or method of converting Warnerke degree into H and D, and the difficulty is increased by the fact th Warnerke sensitometers were made in practically two scales, on more transparent than the other. We give a table of correspondi degrees in Warnerke and H and D, which has just been publishe by Dr. Eder, of Vienna:—

H and D.	Warnerke (ordinary).	Warnerke (more transparent
3.2	8	11
4	9	12
5	10	13
6.5	11	14
8	12	15
10	13	16
13	14	17
16	15	18
20	16	19
26	17	20
32	18	21
40	19	22
52	20	23
60	21	24
80	22	25-26
100	23	26-27
130	24	27-28
160	25	28-29
200	26	29-30
260	27	30-31
320	28	31-32

*** NOTICE TO THE TRADE, WHOLESALE AGENTS AND BOO SELLERS.—*A Contents Bill is issued with each number of the* JOURN *and copies may be had on application to the Publishers.*

*** NOTICE TO ADVERTISERS.—*A Revised Tariff for advertiseme in the* JOURNAL *is now in force. Blocks and copy are received subject the approval of the Publishers, and advertisements are inserted ab lutely without condition, expressed or implied as to what appears the text portion of the paper.*

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*** *The Editor can only be seen by appointment.*

*** *We do not undertake to answer letters by post.*

EX CATHEDRA.

A Singular Paper on Development. One of the papers read at the Paris Academy of Sciences was of a kind rather out of the common; M. R. A. Reiss was the author. He has been experimenting with urine as a factor in development, and he finds it has a slight reducing action, and that it may replace pure water in developing solutions.

* * *

Malleable Glass. We read so many accounts of wonderful inventions in America, the writers of which are not characterised by painful efforts to be exact, that a natural doubt starts up whenever a scientific novelty is announced. Quite lately we have another accumulator (it is only a few months since his last—in the papers) by Edison, which is to revolutionise motor work, and now, this time from Richmond, Indiana, we read that Mr. Louis Kauffeld has re-discovered the lost (!) art of making malleable glass. As such an invention would, if realised, cause as great a revolution in photography as has been brought about by celluloid rollable films, we may make a note of it, carefully abstaining from giving an opinion on the matter. Mr. Kauffeld is a lamp chimney maker, and has for years been trying to make a chimney that would not break when strongly heated. It is asserted that his success has been so great that he can make cooking vessels out of glass. If glass is malleable, it should not break if dropped on to the floor—we should then have unbreakable negatives and lenses!

* * *

Poisoning by Cyanide of Potassium. This chemical is one of the most deadly poisons known, on account of the rapidity of its action leaving little time for the obtaining and administration of antidotes. One of the most remarkable cases in this connection that ever occurred happened years ago at Woolwich. A non-commissioned officer swallowed a lump of cyanide with the object of committing suicide. The cyanide lodged in his gullet, and in a brief time he was likely to die of suffocation, as his breathing quickly became almost reduced to nothing. At the moment a medical man happened to be passing by. He took in all at a glance—performed tracheotomy, removed the piece of cyanide, applied suitable antidotes, and the man recovered! If he had taken the same quantity in a state of solution, no power could have saved him; the action would have been so quick. Fortunately, the use of this most deadly and once photographically common chemical is now mainly confined to the enlarger and the process-worker; still, as its use has by no means died out amongst photographers (among gold-miners it is largely increasing), it will be well to make a note of the method of treatment in cases of poisoning by cyanide, which for the last three years has been successfully used in the English mining districts in South Africa. It consists in the use of peroxide of hydrogen solution. A 30 per cent. solution is administered internally, and a 3 per cent. solution hypodermically. The reaction that takes place is the converting the deadly hydrocyanic acid ("prussic acid") into a harmless oxamide; thus:—

$$2\,CNH + H_2O_2 = \begin{matrix} CONH^2 \\ CONH^2 \end{matrix}$$

* * *

Faded Prints. In the noble Egyptian Gallery of the British Museum may be seen several framed photographic prints representing some of the architectural marvels of the Land of the Pharaohs. These include finely-executed views of the stately "hall of columns" at Karnak; the deeply-cut wall sculptures adorning the palace built more than two thousand years back by Ptolemy; the picturesque island of Philæ, doomed, we fear, to partial destruction when the great Nile dam is completed; the temple of Abu-simbel, in Nubia; and many other spots well known to Egyptologists, and to Cook's tourists. We are sorry to see that these excellent photographs are yellowing, and perishing after the manner of their kind—the kind being albumen prints, and it seems

incredible that pictures, presumably intended for permanent exhibition, should not have been produced by a more permanent process. The name attached to the pictures is that of a foreign photographer, but it is not likely that the negatives have been destroyed; therefore, it would be possible to secure from them fresh prints in platinum or carbon. It is often for the want of someone not directing attention to such a matter as this, which is everybody's, and therefore nobody's, business, that such things of public interest are allowed to slide; and this is our excuse for calling attention to a detail of administration in a most admirably managed institution. Upon entering the beautifully-arranged mummy rooms upstairs, we noted another, but much worse, example of yellow fever contracted by photographic prints. These were pictures of the royal mummies which were discovered about fifteen years ago, and we presume that the prints in question date from that period. These most interesting portraits of Rameses, Seti, and the others have almost faded away, and their replacement by more permanent pictures should not be impossible. It is not difficult to imagine these mummied faces, which have survived the flight of so many centuries, grinning at modern ideas of permanence. They at least teach a different lesson, and could point to the wall paintings near at hand, which date from the Exodus, to prove that the media employed by the ancient artists for their picture-making were more to be relied upon than the chemical formulæ of yesterday.

* * *

Incandescent Gas Lighting. We would direct those of our readers who are interested in this topic—and what photographer is not interested?—to a most interesting "History of the Invention of Incandescent Gas Lighting," by Auer Von Welsbach, as given in translation in the "Chemical News" for May 30th. It is difficult to give an abstract of what is already a highly-condensed narrative, but we may make an extract bearing on that most remarkable and still unexplained point, the different values possessed by different bodies, alone or in combination, in respect to their light-giving power, when raised to similar temperatures:—"As for this singular property which is possessed by this mixture of 99 per cent. of oxide of thorium and 1 per cent. of oxide of cerium, it can be seen, it can be observed, but it cannot be explained. This powerful emissive property cannot be foreseen from any property of thorium; this hardly possesses it. We can give no exact scientific reason for this excitation of emissive power by cerium, and I expect we shall have to wait a long time before it is explained. I myself can give no explanation, but I can point out certain analogous facts. These are only ideas, and are not absolutely based on experiments; but still, I should like to refer to them briefly. A body having this emissive power. . . . is composed of infusible oxides in molecular mixture. The principal constituent of this mixture should remain intact in the flame, while the other may be easily reduced and oxidised. . . . The gas of the flame successively and very rapidly oxidises and reduces the emissive substance at points where it is situated in the mantle. If the constituents of the mixture could form a compound when one of them is in a state of higher or lower oxidation, the compound would be quickly destroyed at the moment when the body concerned passes from the usual to the other degree of oxidation. The earths are in a state of extremely fine division, and are surrounded by a mantle of flame both oxidising and reducing. If reduction takes place, there is also decomposition, and if oxidation there is re-combination of these elements. These reactions may go on several million times a second, and molecular shocks are produced which give rise to luminous oscillations of the ether, and the body becomes incandescent," etc. The subject is evidently one governed in practice by no rule except rule of thumb; but as this is the usual stepping-stone to perfect scientific elucidation in practical manufactures, there is no reason to despair of the principle of incandescence being ultimately expressible in scientific language.

* * *

Tri-colour Printing. It was only to be expected that directly the tri-colour method of printing in printers' ink became possible, it should be applied to journalism, and our illustrated papers and some of the magazines, in a kind of spasmodic manner, offer their readers now and again pictures produced in this way. A few years ago, too, a venturesome speculator started a journal with coloured illustrations of the three-colour kind. It was soon dropped for want of patrons, which meant that it was not good enough to attract subscribers, but not before much money had been dropped on its behalf. A less ambitious periodical with coloured pictures has quite recently made its appearance, and although we wish it well, and consider that a publication with advanced notions with regard to illustrations is to be encouraged, we are bound to say that judging by its early numbers, there is room for improvement. It is quite certain that the general public will not be attracted by coloured pictures unless such pictures are of good quality, and it must be confessed that the majority of specimens which have hitherto come under our notice cannot with truth be thus described. Half-tone block work has now been carried to such perfection that a black and white picture, well etched and well printed, is always to be preferred to an indifferent print in colours. It is very difficult to say, in comparing a satisfactory three-colour print with one which is otherwise, exactly what is wrong. The one is bright and pleasing, and the other has a wooliness and a soiled appearance for which it is difficult to account. Comparing two pictures to which this description would reasonably apply, we recently submitted them to the test of the microscope, in order to find out whether magnification would reveal anything to account for the great difference between them. One picture was from the recently-published periodical in colours to which we have already adverted—and we picked out what we considered to be the best of the bunch—and the other was a specimen three-colour print taken from an exhibition catalogue, and no doubt printed with the greatest care and under the best conditions. Some will possibly say that the comparison was not a fair one; but we were not dealing with them competitively; we merely wished to find out where the discrepancy arose. In the specimen print we found that the dots in the high lights and the close network in the shadows were regular, both in outline and arrangement; that the inks used were pure in colour, the blue being especially so, and that where they overlapped they blended well. To our surprise, we found that a fourth colour— a sepia—had been employed, although the picture is distinctly labelled: "Specimen of three-colour process." Examining the coloured print from the other source, we found that the dots and network were most irregular in outline and disposition, that the yellow was the only tint exhibiting purity, that the blue and red were dull and lifeless, and that they blended into a very dirty neutral tint. There was no fourth colour in this case, and the registration left much to be desired. We may sum up the whole matter by saying that in one case the best material and the best labour had been employed, an additional advantage having been surreptitiously obtained by the employment of

an extra tint; and that, in the other case, we have an example of the same class of work done on the cheap. The business of producing first-class negatives and blocks for the efficient carrying out of good colour results represents labour of such a high-class character, to say nothing of the cost of printing and paper, that we are inclined to think that a periodical comprising a number of illustrations in colour cannot be produced, except at a prohibitive cost. The presentation of a special coloured picture by an established journal is another thing altogether—and it will be understood that our remarks apply only to the tri-colour method of printing.

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Divisibility of Gold. In old text books of physics gold was generally taken as an example of the marvellous divisibility of matter, and the wondering reader was told into what a big area—it generally ran into acres—a given quantity of gold could be beaten out. A much better example of this power of separation into minute particles is afforded by one of the commonest operations in photography, namely, the toning of prints. Old-fashioned photographers allowed one grain of gold chloride to each sheet of albumenised paper toned. This would mean not more, and often considerably less, than half a grain of the metal, and we may feel confident that a large proportion of that hypothetical half grain found its way to the sink, or to the residues account. In the mineralogical department of the Victoria and Albert Museum is an exhibit bearing upon this interesting question of the divisibility of gold. It consists of two glass jars of about two feet in length, and two inches in diameter, each filled with a dilute solution of gold. One is a red purple in colour, and the other, while of the same tint, is of much lighter tone. They are labelled: "Jars containing gold in a finely divided state, held in suspension in water. The darker liquid contains gold to the value of one halfpenny; the paler liquid contains gold to the value of half a farthing." Now we can arrive at the approximate weight of the metal held in suspension in these two spacious jars by remembering that a sovereign contains 113 grains of pure gold, plus alloy—the gold thus standing at about twopence per grain. So that the darker-coloured liquid would contain $\frac{1}{4}$ of a grain of gold, and the lighter-coloured one 1-16th of a grain. The wide diffusion of gold, and its power of sub-division into minute parts are however, best illustrated by sea water, which is known to contain an appreciable amount of the precious metal, probably in the form of chloride, although no one has yet learnt the secret of its profitable extraction. At present the recovery of gold from sea water seems to be as impracticable as the extraction of sunbeams from cucumbers, but in the course of time modern alchemists may possibly succeed in making the sea give up its treasure. The subject was alluded to in a discussion which followed the reading of a paper before a recent meeting of the Institute of Mining Engineers, when it transpired that a bold individual, who had not, like most of us, forgotten all the arithmetic which he learnt at school, had worked out the amount of gold in the ocean, and recorded it in tons. He had also taken the trouble to work it out in sovereigns, and he found that the amount for each man, woman, and child on the earth would be six millions sterling. We have felt much soothed since we read these remarkable figures, for we never knew before that we were *in posse* millionaires. But we are not proud, and hereby express our willingness to part with this our inheritance for a very moderate amount of metallic gold *in esse*. We fancy that most of our readers would consent to relinquish their reversionary interest in the ocean on much the same terms.

RETOUCHING AND RETOUCHERS.

In an article, a fortnight ago, we raised a question as to the influence that retouching has had on technical photography, as regards portraiture. It is, we think, generally conceded that thousands of negatives are now taken that, without the aid of retouching, would be exceedingly unsatisfactory. We are not here referring to the whims and fancies of sitters, and their desire to have the lines and wrinkles wrought by time reduced or taken entirely away, but to the quality of the pictures themselves, whether from faulty lighting or, maybe, from ill-judged exposure, for, notwithstanding the rapidity of gelatine plates, a very large proportion of the portrait negatives now taken would be better if they had a fuller exposure. In the previous article we mentioned that it was not till the late sixties that the retouching of negatives became general—or was acknowledged. But we are quite aware that some few portraitists, for years previously, did some work on their negatives, but they kept the fact to themselves, and it was only done to a limited extent, and with water colours.

Seeing that nowadays so much depends upon retouching for the excellence, or otherwise, of the finished picture, it may be well, we think, to direct attention to the quality of much of the work that is turned out by those who style themselves retouchers. As will probably have been noticed in the answers to correspondents' column, we have, during the past few weeks, had to reply to quite a number who have sent us specimens of their work as retouchers, and as operators, for our opinion thereon, and it is the examination of these that suggested this article. The portraits, almost without exception, show that the senders have really no idea of what is required in high-class retouching. Evidently they have no knowledge whatever of drawing or facial anatomy. Their chief idea seems to have been to put on a lot of work where it was not required, and omit it where it was, the result being to make the face flat and somewhat smooth-looking. In doing this they have destroyed the rotundity of the face as well as the likeness of the sitter, and, as a result, what might have been made a fairly-good portrait was utterly ruined as a portrait of a living individual. The object seemed to be with some to produce not a picture of the human face divine, but something like the wax figures one sees in the hair-dressers' windows. It is true that some who have sent specimens of their work have received no tuition, but they do not appear to have realised what are the essentials of good retouching.

If one takes the trouble to stop and examine the portraits exhibited in the shop windows and show-cases of second and third-rate portraitists we shall see much of the same lack of knowledge of retouching prevailing in the specimens shown; most of the modelling and rotundity of the faces are worked out, and the life and character of the individual destroyed and rendered inanimate looking. These portraits clearly show that those who did the retouching had no conception of either drawing or anatomy, and that is really the case with a very large proportion of those who pass as retouchers. The work is done by them almost mechanically, the prevailing idea seeming to be with them to make everything as smooth and flat as possible. It is said by some that the public demand that kind of thing, but we very much question if they do, because we do not see it in the work issued from the highest-class studios. There is no gainsaying the fact that a great portion of the public do like the lines and wrinkles wrought by age to be somewhat subdued, and the vainest amongst us, perhaps, eradicated altogether, but this the skilful retoucher can do without really losing the likeness or destroying the model-

ling. In fact, in some cases, the likeness can really be improved by the retoucher. That, however, cannot be done except by those who have a good knowledge of the anatomy of the face and also of drawing, and retouchers of this class can command good salaries in high-class establishments.

In the previous article we alluded to the fact that the more skilfully the sitter was lighted by the operator the less work there would be for the retoucher to do on the negative. That should be patent to all, though it would seem that this point is far too often overlooked. Operators now appear to rely more upon the retouching than upon their own personal skill as photographers. So much importance do some photographers attach to retouching that they must have the face elaborately worked all over, whether it really requires it or not. A retoucher who works for the trade some time ago told us that he could often produce better results with comparatively little work skilfully done than when he has elaborately worked the face all over, but he said that his customers, as a rule, were not satisfied unless the faces were entirely covered with pencil, for unless that were done they did not think they got good value for their money. We have just remarked that a likeness, as a likeness, may sometimes be improved in the retouching, but that is scarcely likely to be done by one who has never seen the original, and that is the case with many who have to do the work.

In the previous article we alluded to what a friend told us of what he saw when on a visit to one of the leading photographers in Germany—namely, that the negatives had but little or no retouching upon them, owing to the care and skill bestowed upon them in the lighting, etc. Our friend tells us that the operators in that establishment always preferred to do what little retouching their negatives required themselves, rather than entrust the work to the hands of others, as they best knew what it was, and what it was not, desirable to do with the portrait.

We have written this and the former article with a view to stimulating photographers and retouchers of what—if we may use the term without offence—may be classed as second or third rate ability to improve their work alike on the technical and the artistic side. It must be confessed that a vast proportion of the present-day work in portraiture is by no means a credit to twentieth century photography, considering the excellence of everything now available, and purchasable ready for use.

THE PUBLIC RECOGNITION OF ART PHOTOGRAPHY.

MR. STRAUSS'S reply to our leaders on art photography and the St. Louis Exposition is such as we expected, but we fear that, with many others, he has made the mistake of taking our remarks as signifying our condemnation of placing photography among the fine arts. A more careful perusal should convince them that the oppcsite was what we meant to convey. Photography will, we are sure, ere long be ranked among those processes which are capable of producing works of fine arts, but at the present moment, except in the hands of a very few workers, we prefer to classify it on a less ambitious basis. There is too great a tendency now for the photographer, who has produced a pleasing picture to claim for himself the title of artist and the right to have his production classified as a work of fine art.

More especially is this to be noticed in the case of those whose working shows what is called a daring originality. We have suffered, and still suffer, from such efforts in this country, and no doubt America can claim a similar advantage. We say advantage, for to the student and observer it is an advantage, as being magnificently illustrative of a small amount of newly-acquired knowledge by the would-be artist. In his struggles to escape from a continual sameness of treatment he will ignore the inborn state of indolence of the mind, and spoil his effort by throwing on the mind a burden of novelty which is more than it will permanently tolerate. The consequence is that either the mind is robbed of its peace, and so one of the great aims of art is killed, or else the worker, recognising the destructive element he has introduced into his production, will not continue to attempt such violent contrasts. An affection to old habits and customs is natural to all of us, and when novelty crushes this affection so heavily that the indolence of our disposition is too strongly opposed, the pleasing effect of novelty is destroyed. It is so with the general mass of photographic workers; they have only recently awakened to the great possibilities of photography as a method of artistic expression, and in their eagerness to grasp its advantages they overstep the margin of control and bring on themselves "the contempt of the more serious THINKERS."

It is because we believe that there are possibilities in photography for the production of masterpieces that we speak thus, not because we wish in any way to discourage the production of works of art by its means.

It has been, and always will be, our pleasure to encourage such work, and had we been appealed to by Col. Ockerson for an opinion as to the desirability or not for a separate building for photographic productions, we should have recommended that a separate building be employed, but probably for a different reason to that which Mr. Strauss and his co-partners would have put forward. Our remarks on the desirability of a knowledge of artistic anatomy and of the philosophy of expression have, we fear, been taken somewhat too literally—it was on account of the sense of power that such knowledge gives that we pleaded its acquisition, and not so much because of its direct application. Mr. Strauss's remarks as to the utility of such knowledge for landscape work is irrelevant—it is obvious that we were talking of portraiture only at the time. "Artistic genius" can never, we think, "overcome the barriers due to lack of educational opportunities"; but the pre-existence of this genius will make the task of conquest much easier. Again, such a fortunately gifted person would quickly become conscious of his own ignorance, and would immediately set himself the task of perfecting those, in his case, inborn qualities of which Mr. Strauss speaks. It is possibly because many may fancy they have this genius and so do not trouble to start from the bottom and work up to the top slowly and steadily, that they are unconsciously *μηδὲν ἐργαζόμενοι, ἀλλὰ περιεργαζόμενοι.*

But we must, we fear, terminate this correspondence, and in bidding Mr. Strauss and his colleagues good-bye, we assure them that we shall be delighted to assist them on some future occasion, and sincerely trust that all their wishes and hopes will be happily realised.

PRESENTATION to the Secretary of the West Surrey Photographic Society (Clapham Junction).—Last week Mr. W. H. Wilshere, the energetic and painstaking secretary of this prosperous Society, was presented by the president, on behalf of himself and the united members, with a smoker's silver suite, consisting of cigar-case, cigarette-case, matchbox, and mouthpiece, enclosed in a suitable cabinet. On the cigar-case was engraved "Presented to W. H. Wilshere by the members of the W.S.P.S. 1902," the other articles bearing his monogram only. There was a splendid meeting, and several speeches made. Mr. Wilshere thanked the members for such a beautiful token of the good feeling which existed, and, he trusted, always would exist between them. His health was drunk in a suitable and appropriate fashion, and a memorable evening closed with singing and cheers.

PHOTOGRAPHIC WORK AT GREENWICH OBSERVATORY.

According to the recently issued report of the Astronomer Royal, which was presented at the Annual Visitation, the astronomical photographs form a leading feature of interest, more especially the eclipse pictures obtained last year by Mr. Dyson in Sumatra and Mr. Maunder in Mauritius. These photographs show a considerable amount of detail in the corona, and a noteworthy and highly-suggestive point is that a region which showed marked signs of disturbance in both the corona and prominences was afterwards found to lie almost immediately above the largest sunspot of the year 1901, so that a connexion between the two phenomena is very reasonably suspected. A number of enlargements of the plates taken for the Astrographic Catalogue were on view at the visitation. These plates are first enlarged on glass to double the original linear scale, and paper prints are then made by contact from the enlargements. It is found that these prints contain practically all the stars on the original negative, and, since the same region of the sky is photographed in duplicate on two overlapping plates, it is not difficult to distinguish true stars from accidental specks. All the plates required for both the catalogue and chart for the region allotted to Greenwich (from Declination 64 to the North Pole) have now been taken; 77 per cent. of the plates for the catalogue have already been completely measured, containing about 132,000 stars, or seven-and-a-half times as many as the Bonn Durchmusterung, which was the most comprehensive catalogue of the region hitherto existing. The stars on the chart plates, which receive an exposure of forty minutes, are only counted, not measured. The plates counted up to the present extend from Declination 65 deg. to 70 deg., and contain some 200,000 stars, or twenty-six times as many as the Bonn Durchmusterung. If we assume that the same star density extends over the entire heavens, then the combined chart will contain about thirteen millions of stars, and the combined catalogue upwards of three millions.

About 160 photographs of Nova Persei were taken during the year; sixteen of these were long-exposure photographs, taken with the large reflector attached to the Thompson equatorial. The exposure of these ranged up to six hours, and they clearly show the wonderful expanding nebula, discovered last September, by Professor Ritchey, whose appearance changed perceptibly from week to week. Twenty of the photographs of the Nova taken with the Astrographic equatorial were used for a determination of its parallax and proper motion, by comparing its position in different months with those of suitable stars in its vicinity. The result, though negative, is highly significant, for it shows that the parallactic shift is practically insensible, probably not more than 1-20 of a second, which implies a distance corresponding to at least sixty years of light passage, and possibly much more, so that there is nothing impossible in Professor Kapteyn's hypothesis that the apparent expansion of the nebula was simply due to the outward passage of the light from the Nova, illuminating in succession more and more distant regions of nebulosity, and so rendering them visible to us. The distance required by this hypothesis is 290 light-years, so that the outburst we witnessed last year may have taken place in the reign of James I. Photographs of the sun were obtained at Greenwich on 149 days in 1901. These, in conjunction with the series taken in India and Mauritius, leave only six days in the year without a record. The year has been one of extraordinary quietness, 80 per cent. of the photographs showing the sun entirely free from spots. This quietness has extended into the first half of 1902, though the appearance of two considerable groups, and the fact that the spots have appeared in high solar latitudes, are regarded as indications that the actual minimum is past, and a marked increase in activity may be expected in the near future. An important series of sixty-eight photographs of Neptune and his satellite was obtained with the Thompson equatorial. The satellite is exposed for twenty minutes, while the planet is given twenty short exposures of one second each, and concealed by an occulting shutter for the rest of the time. The images of planet and satellite are therefore comparable in size, and admit of accurate measurement; it is expected that these photographs will add materially to our knowledge of the satellite's orbit.

ART IN PHOTOGRAPHY.

[Reprinted from the "Journal of the Photographic Society of Philadelphia."]

A few minutes ago I was tearing along the narrow metal tracks from Washington on that magnificently equipped train, "The Royal Blue," and I thought of the ingenuity expended by man in the perfection of such true mechanism, and I wondered why "Art," which has for its rarest qualities sources infinitely more varied and wonderful, does not attract greater attention, more prolonged thought and study, and become something tuned to a more universal respect. Is it because a picture might be painted, a statue might be carved, a photograph might be made, and all of the three might be patiently faithful to Nature, and yet destitute of the qualities of art, and be wholly unworthy to occupy a place in any well-chosen collection? It is now universally conceded that mind takes precedence, and has power over matter, and I will now show how the spirit must be the keynote, the ruling factor in Art, especially in Photographic Art. The beauty of outside nature, influences of harmonies of colour and grandeur of lines, vast horizons, splendid skies, and edges of a fairy sea—if these have not touched thee—either made thee tremble or warmed thy soul to an ecstacy, then thou knowest not Art nor the Spirit of Art. The Graphic Arts are equally capable of expressing two opposite states of the human mind, the positive and the artistic. Work done in the positive state of mind has for its single purpose the recording of fact and truth; work done in the artistic temper may record a great deal of truth incidentally, but that is not its main purpose, and I shall endeavour to partially show you that our work should be primarily conceived to convey æsthetic pleasure. It is from this view of the individual effort, within the circumstance of time and place, that I should like to follow out a few thoughts (glimmering ones, perhaps, for I have little time for well-developed cogitation), which will permit us to see more distinctly the value of personal development and freedom of the will, as opposed to a mechanical and therefore fatal result. I am positive that great days are to be for our profession. We can reveal so much—do so much—the painter, the etcher, and the draughtsman cannot do. With my lens I can portray absolute truth in a central point and blurr off into idealism that which I wish subdued. Our representation may be abridged and transposed, but we are urged to it by a desire to enter into the intimacy of Nature, and in establishing that relation we have to bring into use the faculties of perception, attention, and memory. Our organism records impressions after the original excitement of them has passed. (And please remember that persistence in this ability to record becomes part of our culture as the faculty becomes stronger and stronger.) I now propose to ask you as to the way in which things that interest us through the sight are seen. The untaught, in looking at a common New York City street scene, sees perhaps the most striking object passing, a gaudily gowned woman, a steaming automobile. I see something else; I see life; I see movement; I see the intenseness of the vivid activity; the spirit of tremendous commerce. If I can portray

these I shall do well. Ah, yes! it is logic of free life that is the logic of Art and the spirit of it, and it must be like that logic of using our eyes in which we make most wonderful combinations of momentary adaptation, by co-ordinating innumerable memories and by rejecting those that are useless and antagonistic. Remember and remember again that chemicals, plate, and paper are not light, life, and colour, nor air, nor shade, nor distance, nor atmosphere. These we make: we create; they must flow instinctively from our spirit and not primarily from the developing bottle. Be careful to eschew a constant vagueness. It is better to be caught right out in going wrong when you have had a definite purpose, than to shuffle and slur so that people cannot blame you because they do not know what you are at. Hold fast to distinct form in Art. And you all know, and several of our friends of the "New School" elsewhere, how necessary this is, when glycerine, etc., etc., seems to tempt one to those stupid blurrs.

Do not think too much of style, new style, or any other style, but set yourself to get out of you what you think beautiful, and express it, as cautiously as you please, but, I repeat, quite distinctly and without vagueness. Always think your plan out in your head before you begin to get it on the paper. Do not begin by slobbering and messing about in the hope that something may come out of it. You must see it rather than concoct it, whether the design be of your own invention or Nature's. Art that is right does all that it desires to do, and all that it does, does well. You will find, as you advance in the knowledge of Art, that its laws of self-restraint are very marvellous; that its peace of heart, and contentment in doing a simple thing, with only one or two qualities, restrictedly desired, and sufficiently attained, are a most wholesome element of education for you, as opposed to the wild writhing, and wrestling, and longing for the moon, and tilting at windmills, and agony of eyes, and torturing of fingers, and general spinning out of one's soul into fiddle-strings, which constitute the ideal life of the modern artist. I am quite aware such names as White, Kasebier, and Stieglitz and Day deserve rightly their recognition; but remember their work is not the only work, that if it is tinted with Art, it is also tainted with blurr and fog. I shall not deny that much of it is excellent, but rather affirm; but be sure if the people are sick, its leaders also have need of healing. Art will not grow and flourish—nay, it will not long exist—unless it be shared by all people; and for my part I do not wish that it should. I am aware you are at variance on these matters, and, let me tell you, constant friction will destroy you, and I beg of you to desist and choose your own paths in the world of Art rather than follow the hysterical and often rather bombastic advice of the "cult," and, above all, and this I know you are doing, do not let your "Art" be "cornered" as a commercial commodity sometimes is. Kindly note that when I said just the ability to record, I did not mean the mechanical recording of a typewriter or a phonograph, but that other rare and indefinable Art instinct Mr. Day once described so well, as elusive as quicksilver and intangible as perfume, a gift of the gods. Examples might help you, and might mitigate the harshness of such general statements as the pressure of time obliges me to make.

One example.—Have you not been surprised by the new beauty of the landscape when Nature has made her photograph of it, reversed in the mirror of the lake? The mountains, the sky, the clouds above in their new aspect, appear reinforced; the gradation of colour, the sense of modelling, the receding flanks of the mountains, the more evident poise of the cloud in mid-air, all have theiradded charm, and the Spirit of Art impregnates the scene. This remember always, form before colour, and outline, silhouette before modelling; not because these latter are of less importance, but because they cannot be right if the first are wrong. Now, upon all these points you may be as severe with yourselves as you will, and you are not likely to be too severe.

What a great artist he is who extends the area of expression in daily life, who redeems something else into the great harmony; who teaches us how to put a new colour on things, or to give them a new form or attitude, in the drawing-room, or the street, or on the platform, to give what has been banished its sane and simple utterance, or, what we secretly admire, its frank performance; who finds us a word, a gesture, a manner of life, which supplies the expression we have so long needed, and delivers to light and air one more little petal of our souls. How well worthy of our ambition are triumphs in this great field—which appeals so closely to every human being. Very faith in this for each one impels me to speak according to my knowledge, feeble as it may be, and rash as the words may sound; for every man who has the cause at heart (and I know all you of the "Ancient and Honourable" Photographic Society of Philadelphia have) is bound to act as if it depended on him alone, however well he may know his own unworthiness; and thus is action brought to birth from mere opinion. Nevertheless, so different is the position of Art in our daily lives from what it used to be, it seems to me (and I am not alone in my thought) that the world is hesitating as to whether it shall take Art home to it or cast it out. I do not mean to say that all the work we do is done without any pleasure, but I mean to say that the pleasure is rather that of conquering a good spell of work (a courageous and good feeling certainly), or of bearing up well under the burden, and seldom, very seldom, it comes to the pitch of compelling the workman, out of the fulness of his heart, to impress on the work itself the tokens of his manly pleasure. Then again, I believe most people receive very little impression indeed from any pictures but those which represent the scenes with which they are thoroughly familiar. The aspect of this as regards people in general is to my mind much more important than that which has to do with the unlucky artist; but he also has some claim upon our consideration, and I am sure that this lack of the general sympathy of simple people weighs very heavily upon him, and is apt to make his work feverish and dreamy, or crabbed and perverse, and his pocket empty. Appreciation of Art! Why is there not more? There is plenty for food and money, but poor "Art" is always rather a Cinderella. And then again we are immersed in beauty and have no clear vision. Just think, the ancient Greeks regarded mountains as places fit for penance and prayer; but our modern society in general goes to the mountains not to fast, but to feast, and leaves their glaciers covered with chicken-bones and egg-shells. Connected with this want of any sense of solemnity in mountain scenery, is a general profanity of temper in regarding all the rest of Nature, that is to say, a total absence of faith in the presence of any spirit therein. Whereas the mediæval never painted a cloud but with the purpose of placing an angel in it, and a Greek never entered a wood without expecting to meet a god in it, we should think the appearance of an angel in the cloud wholly unnatural, and should be seriously surprised by meeting a god anywhere. Therefore it is that I stand before you to say that the world has in these days to choose whether she will have Art or leave it, and that we also, each one of us, have to make up our minds which camp we will or can join—those that honestly accept Art or those that honestly reject it. Once more let me try to put into words what these two alternatives mean. If you accept it, it must be part of your daily lives, and the daily life of every man. It will be with us wherever we go—in the ancient city, full of traditions of past time; in the newly-cleared farm, where no man has dwelt for tradi-

ions to gather round him; in the quiet country-side as in the busy town—no place shall be without it. You will have it with you in your sorrow as in your joy, in your work-a-day hours as in your leisure. It shall be no respecter of persons, but be shared by gentle and simple, learned and unlearned, and be as a language that all can understand. It will not hinder any work that is necessary to the life of man at the best, but it will destroy all degrading toil, all enervating luxury, all foppish frivolity. It will be the deadly foe of ignorance, dishonesty, and tyranny, and will foster good will, fair dealing, and confidence between man and man. It will teach you to respect the highest intellect with a manly reverence, but not to despise any man who does not pretend to be what he is not; and that which will be the instrument that it shall work with, and the food that shall nourish it, shall be man's pleasure in his daily labour, the kindest and best gift that the world has ever had. And I will close in the words of your great writer: "What we call these millions of men are not yet men. Half engaged in the soil, pawing to get free, man needs all the music that can be brought to disengage him. If Love, red Love, with tears and joy; if War with his cannonade; if Trade with its money; if Art with its portfolios; if Science with her telegraphs through the deeps of space and time—can set his dull nerves throbbing, and, by loud taps on the tough chrysalis, can break its walls, and let the new creature emerge erect and free—make way, and, sing pæan! The age of the quadruped is to go out—the age of the brain and of the heart is to come in," and if I have done one iota to bring this about to-night, I rest satisfied.

ARTHUR HEWITT.

PHOTOGRAPHIC PERMANENCE AND THE AMATEUR PHOTOGRAPHIC EXCHANGE CLUB—1860-64.*

[Paper read before the Franklin Institute, and reprinted from its Journal for May.]

(Being the Address of the Retiring President.)

II.

A word in regard to the origin and character of the club will serve to show the basis of reliability for data furnished by it. Its history, carefully written by Coleman Sellers, now Doctor, was published several years ago,† and it will not be necessary therefore, to go into details as fully as might be otherwise desirable. It originated in a desire on the part of some amateurs to obtain copies of a peculiarly good stereograph of a "cattle picture," taken by Robert Shriver, of Cumberland, Md., without actually begging the pictures. They proposed, therefore, to exchange pictures of their own for them. At the suggestion of H. T. Anthony, not then a member of the firm, but an enthusiastic amateur, a club was formed, limited to twenty, without formal constitution or regularly elected officers, or form of election of members, all matters being regulated by correspondence and common consent, with most perfect harmony. Among the rules were the following:—

"(1) None but amateurs in the art shall be recognised as members, and the number shall not exceed twenty.

"(2) No member shall forward for exchange any work not his own.

"(3) Every member shall forward each other member on or before the 15th of January, March, May, July, September, and November, at least one stereoscopic print, a copy of which has not been sent before, or its equivalent mounted and finished.

"(4) Should any members desire to exchange with any others oftener than bi-monthly, they can do so by agreement.

"(5) Anyone failing to send one print bi-monthly shall be struck off of the book of the party he so fails to send to, unless satisfactory reason is given for his default.

"(6) All photographs must be properly labelled with a descriptive name, the name of the artist, and the date of the printing, and they must be guaranteed not to fade for two years; and if toned by experimental process, must be marked 'Experiment.'

"(7) Two unmounted prints shall be equivalent to one mounted and finished of the same size. Two-card or quarter-plate shall be equivalent to one stereoscope, and two stereoscopic to one whole plate."

Among the members were H. T. Anthony, Lewis M. Rutherfurd, the astronomical photographer; F. F. Thompson, of Wall Street; Augustus Wetmore, C. Wager Hull, John M. Masterton; Prof. O. N. Rood, the eminent physicist; Prof. Emerson, of Troy; in Philadelphia, Constant Guillou, Coleman Sellers, F. T. Fassitt, S. Fisher Corlies, Prof. Fairman Rogers, E. Borda, Dickerson Sargent; in Washington, Titian R. Peale, and Rev. Dr. Charles Hall; in Pittsburg, Capt. T. J. Brereton; in Cumberland, Md., Robert Shriver; in Boston, Dr. John Dean, and in Baltimore, George B. Coale, and others perhaps in the later years, as the rule in regard to numbers readily relaxed to admit a desirable additional member. The exchange prints in possession of each of the members of that club constitute unique collections in the character and variety of the subjects and workers, and are perhaps the best authenticated prints of that date, with reliable data, on many desired points. The specimens presented for your inspection were taken, almost at random, from my own collection. They will be found generally in most excellent condition, showing no more the effect of time than a collection of engravings might do. They have been kept, not with very special care, in pasteboard boxes, and have been handled in use as stereographs, perhaps more freely than ordinary photographs.

Prof. O. N. Rood, for many years of the Columbia University, New York, writes: "A short time ago I examined all my old photographic prints and found them in perfect order; I also examined the prints received from members of our club; they were as good as new. But I have photographic portraits of Dr. John Torry, the chemist, and of Dr. B. A. Gould and others, that have nearly faded out, though not nearly so old as ours."

Robert Shriver, President of the First National Bank, Cumberland, Md., reports his, so far as yet in his possession, in good condition, exceptions due to bad washings and hypo. Dr. Coleman Sellers states "a great many of these are in an excellent state of preservation, running uniformly through the work of the various members of the club, and they have not been given any special care other than that they have been kept in separate cases and labelled, the cases being open at one end."

F. T. Fassitt reports that prints on albumen paper afford greatest claim for permanency. Prints made of the Sanitary Fair, 1864, hung exposed to changes of light and weather in his library since then, have retained all their brilliancy, without the least sign of deterioration.

But there was a great deal done by members of the club, outside of the rules and simple exchange of prints, in way of exchange of ideas and experience, with permanent results in some cases upon photographic practice. Thus alkaline development of dry plates was first suggested by Borda in place of the universally practised acid development. The great problem of that day was the production of a dry-plate process that would equal in rapidity and results the collodion wet-plate process, and require the minimum of trouble in practice. The virtues of beer, solid milk, albumen, tannin, and many other

* Concluded from p. 431.

† Anthony's "Photographic Bulletin," 1888.

substances were tested and reported upon. The tannin process seemed to be the survival of the fittest. In this connection Borda also suggested warm development. Many of the prints exhibited are from tannin negatives, and the negatives and stereographs on glass by that process show its possibilities. It is exceedingly simple and certain, and, according to a method contributed by myself, plates can be prepared up to the last stage, of flowing with a solution of tannin—fifteen grains to ounce of water—in broad daylight. But a far more interesting fact, just put in my possession, bearing on photographic permanency, are the prints, here exhibited, from tannin negatives, on plates prepared in 1863, and exposed in 1898. The plates made by him—Mr. Shriver writes—"had been hid away in an outer room, where they were subjected to extremes of heat and cold, but were kept perfectly dry. They come up in development as good as I could have expected if the exposure had been made in 1863, instead of thirty-five years later." The prints exhibited will be found to compare favourably with those from the best gelatine dry-plates of to-day. He adds very pertinently: "Here, then, was an answer to the query, 'How long will dry-plates keep?' Good for thirty-five years, and perhaps indefinitely, if made by the 'tannin' process." Apropos at this point is an interesting experience of Dr. Coleman Sellers, in regard to the permanence of the impression in the camera before development. A dozen tannin plates furnished by him to a friend were returned in three weeks as exposed. After several had given no results upon development, he re-exposed one of the plates and obtained an excellent negative. From a series of experiments, subsequently made, he concluded that between the time of exposure and development, every day that intervened diminished the chance of success. He regards the effect of exposure "as a strain put upon the parts of the film according to the intensity of the light that fell upon each particular moment of surface, but this strain would gradually be relaxed if not fixed by an immediate development, and there was no chemical action on the plate, but mere physical action that was temporary in its character." To return to the club prints—and among these are included some by Joseph M. Wilson, of the same period—they will be found to be exclusively on albumen paper, and, except when marked experimental, as a rule toned in alkaline gold bath, and fixed in separate bath. The paper in many, perhaps most, cases was albumenized by the members themselves, as commercial albumen paper in early days was not as uniform in quality as at present, and poor prints were apt to be attributed to the paper, and often with right. Many of the members of the club had the advantage, several years before its publication, of one of the greatest improvements in albumen printing imparted to them by H. T. Anthony, namely, the fuming of the well-dried sensitized paper with ammonia. It eliminated many sources of failure. Considerable variety of tone and of surface is observable in the prints: some are somewhat discoloured, but few more so than a collection of engravings under the same circumstances would exhibit, whilst very few show symptoms of fading, and in slight degree. The print of the full-moon, by Rutherfurd, it will be noticed, shows no discolouration or change of any kind, whilst the white mount has very perceptibly discoloured.

It has hung, framed, in a well-lighted room for years. In some prints little specks of mold appear upon the face, which can be rubbed off without apparent injury to the print. This seems to originate in the paste, as the labels on the back in some cases show the same effect, even when the prints are free from it. The mold does not necessarily involve the albumen of the print. The portrait shown, which hung upon a damp wall, was half of it loosened from the mount by a mass of mold, and yet, at present, scarcely shows the outline of it, after being soaked off from the mount and thoroughly washed. In the selection, readily made, from a collection of commercial prints of the same date as those of the club, many will be seen to have almost faded out of sight, among them some by makers justly of highest reputation, as Langenheim, of Philadelphia. These might be explained as toned with the old combined bath, before its bad character had been established. Of the foreign views, the French have deteriorated most; and the Italian, of which least was expected at the time, show less change; and the English and German are as a rule well preserved. The collection shows that albumenized paper can be made to yield results not only unsurpassed in beauty of tone and rendering of the best qualities of the best negatives, but, with proper care in the production, unchanged after forty years, and promise of remaining so for forty years to come. A first-class albumen print may then, indeed, at present be regarded as the standard of permanence, not on *à priori* ground, but as an experimental fact. The departures from permanence exhibited may be explained in many cases by the defects and uncertainties of the process at that early period, now eliminated, and in other cases by the want of care at all stages, especially in toning and washing. The uniformly high permanence of the club prints may be attributed to the character of the workers, their extreme care in manipulation and in the processes employed, and the limited number of prints made at a time, which made greater care possible. There is no argument in this for a return to albumen paper, but surely a suggestion that for record purposes albumen prints might well be included with those of platinum and carbon, which are so generally exclusively recommended or demanded. The practical lesson of the prints is that permanence is perhaps not so much a matter of process as of conscientious care in carrying out the conditions necessary for permanence with any process. Even the blue-print process, in the specimens here exhibited, that have been exposed to light and many conditions unfavourable to permanence, compares favourably with the best processes in this respect, whilst the platinum prints, with pure whites, when made about twenty years ago, show discolouration, due most likely to the paper. This simply shows that it is unsafe to argue too far on *à priori* grounds from the permanence of platinum as a metal to the permanence of prints based upon it, where so many complex conditions are involved, conditions still matter of discussion by Chapman, Jones, Haddon, Jacoby, and others, in explanation of admitted deterioration of platinum prints in some cases. The duplication of prints for record purposes by several of the most approved processes, made by persons of established character for conscientious care in printing, with a record of the essential details of the process employed in each case, might contribute something to the character of the record.

The albumen process, as the prints show, has no superior for photographic expression, rendering all the good qualities of a negative. It is a perfected process: simple, easy, not more troublesome than any printing-out paper, and with little practice, certain in its results. Its fine surface is not easily abraded, and it permits warm solutions and warm water at all stages without the least risk of injury. The paper ready for sensitizing is a commercial article of uniformly excellent quality. It is without offensive gloss. Matt and glassy albumen paper, ready sensitized and of good keeping qualities, have been recently advertised by a German firm, and have been commented on favourably for certainty and excellence of results, said not to be distinguishable from those of platinum. The demand for albumen paper in this country, according to a reliable estimate, is only about five per cent. of that of ten years ago. Its use is confined to those who still demand it, and to cheap commercial work on a large scale, in this, especially stereographs.

The loss of popularity is due in part to the requirement of

negatives of the highest class, and in a measure adapted to it. Negatives that might yield very valuable prints with some of the more recent papers would be absolutely worthless with albumen paper. The developing papers, too, permit practice of photography by many who would otherwise not find time to indulge in it, and economise time for the professional. It is in connection with record work, however, that albumen paper has some claim to be considered.

CHARLES F. HIMES, Ph.D., LL.D.

PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM.

17TH ANNUAL MEETING AT CAMBRIDGE, JULY 7TH 12TH, 1902.

II.

BURY ST. EDMUNDS.

By Montague Rhodes James, Litt. D.

The centre of attraction at Bury St. Edmunds must always lie in the remains of its abbey. The patron saint of it, Edmund King of East Anglia, was shot with arrows by the Danes, and afterwards beheaded in 870, probably at Hoxne in the same county. After various translations, from the site of the martyrdom to Bury, to London under stress of another Danish inroad and back again to Bury, his body rested there until the abbey was dissolved by Henry VIII. It was tended and honoured at first by priests or clerics, who were not monks. Monks of the Benedictine Order were first brought in by Canute, and it was in his time that the abbey began to show some indications of the splendour it attained in later centuries.

The remains now visible consist of (1) two great gate-houses, one of the Norman period (called the Norman Tower, which serves now as a bell tower for St. James' Church), the other of about the year 1337, known as the Abbey Gate. Both are unrivalled specimens of their respective styles, Norman and Decorated. These gates are set in (2) the precinct wall, much of which remains on the north side of the abbey.

The way in which the spanning of the River Lark by the wall is managed is very noteworthy. The contrivance is known as the Abbots Bridge. (3) Inside the precinct the principal remains are those of the church, a vast Norman building, rivalling Ely Cathedral in size. Parts of its west front, of the piers of the central tower, and of the transcept remain, but only the slightest traces of the stones are left. (4) The cloister and other conventional buildings are just traceable, but in their present condition afford few subjects for the photographer.

The two old parish churches of the town, St. James' and St. Mary's are on the edge of the abbey precincts. Both are well preserved Perpendicular buildings. We are tempted to regret that they were so fine as they are, for had they been smaller and humbler it is probable that some part at least of the abbey church would have been spared for the use of the townspeople.

St. Mary's has a noble roof, some fine tombs, and a very pretty north porch. St. James' possesses in the S.W. corner of the nave a window of fine old glass, made up of portions of several different compositions. There are several scenes from the story of Susanna and the Elders, and part of a Jesse-tree, or pictorial pedigree of our Lord. The glass belongs to the first quarter of the sixteenth century, a period little represented in English glass save at King's College, Cambridge.

One of the few Norman houses in England is to be seen at Bury. It is known as Moyses' Hall, and is believed to have been a Jew's house; it now contains the archæological and natural history collections of the Bury and West Suffolk Society. There are other fragmentary remains of ancient architecture, notably a fine Early English door at the Guildhall, and a beautiful corner-post on a house just opposite to the Abbot's Bridge. The town is also rich in eighteenth century houses of an excellent type.

Long Melford has as beautiful a village green as can easily be found. The hospital at the upper end of it, founded by Sir William Cordell, is worth a visit; but the glory of the place is its splendid Perpendicular church. In this there are considerable remains of painting (especially in the Clopton Chapel), and also of painted glass. The latter is of an unusual type, representing, as it does, a number of the friends and members of the Clopton family. The most perfect of the figures have, unfortunately, been collected and put together in the east window.

At Lavenham, the beautiful old Guildhall should not be missed. The tower of the church is probably the finest in all Suffolk, and in the interior the late screen work of the Spring and De Vere pews is of a kind not very commonly to be met with.

ELY CATHEDRAL.

By kind permission of the Very Rev. C. W. Stubbs, D.D., Dean of Ely.

Twelve centuries and more is the tale of years in the history of Ely Minster. In the "Liber Eliensis" (a Chronicle begun by Monk Thomas in the twelfth century, a copy of which in twelfth or early thirteenth century handwriting is still preserved in the Chapter Muniment Room) it is said that a church was founded in 607 by St. Augustine, in the Isle of Ely, at Cratendune, a mile south of the present site. But beyond that bare statement we have no evidence of the existence of any such church. In 673, however, the first Ely minster was founded by St. Etheldreda. An account of her life is given in Bede's Ecclesiastical History, Book iv. (chapters xix., xx.). The Princess Ætheldryht (Etheldreda—Aldreda—Aldreth—Audrey) was one of the four daughters of Anna, King of the East Anglians, married (1) in 652 to Tonbert, Earldorman or Prince of the South Girvii, or Fenmen, receiving the Isle of Ely as her dowry, and (2) in 658 to Egfrid, son of Oswy, King of Northumbria, receiving as dowry large Northumbrian estates, which, however, under the advice of Wilfred, Bp. of York, she gave up to religious uses. About twelve years after her betrothal to Egfrid, when she had become Queen of Northumbria, she resolved to retire from the Northern Kingdom to her estate in the Isle of Ely, there to devote herself to a life of seclusion and prayer in a monastery founded by herself. This she did in 673. The first Ely Monastery was a double house of monks and nuns. Queen Etheldreda was the first abbess. She died in 678, and was succeeded by her sister, Sexburga, widow of Earconbert, King of Kent. In 695 her body, placed in a white marble sarcophagus, was translated to the Saxon church on the present site, and there, or within a few yards of that place, it remained for nearly 900 years a centre of pilgrimage and reverence. In 870 the Isle was ravaged by the Danes, and the church and monastery were destroyed. William of Malmesbury states (De Gest. Pont. ff.293) that King Alfred in 878 founded a college of priests on the vacant site. Certainly, in 970, King Edgar, by the advice of Bp. Æthelwold, of Winchester, re-organised the Ely Monastery, under the Benedictine rule, and gave back to it all the lands with which it had originally been endowed. Brihtnoth was appointed first abbot. In 1071, the abbey, which had espoused the cause of the Ætheling Edgar, after a long defence under Hereward, surrendered to William the Conqueror. In 1103 the building of the present cathedral was commenced by Abbot Simeon, brother of Walkelin, Bishop of Winchester and a kinsman of the Conqueror, and was continued during the twelfth century.

In 1106 the second translation of St. Etheldreda's body took place to the Norman choir, which had just been completed. in 1109 the Diocese of Ely was created, the revenues of the abbot being used for the endowment of the See, so that henceforth the Prior was the head of the monastery. The great West Tower with its transepts (the southern one alone now remaining) belong to the end of the twelfth century. Much of this work is due to the fifteen years of Geoffrey Ridel's Episcopate (1174-1189). The Western, or Galilee Porch, seems to belong to the Episcopate of Eustace (1198-1215). It is a perfect example of the fully developed Lancet style. In 1235 the building of the presbytery was begun by Bishop Hugh, of Northwold. These six easternmost bays are of the very purest, and most beautiful English Gothic of the thirteenth century. "Nowhere," says Professor Freeman, "can we better study the boldly clustered marble pier with its detached shafts, the richly floriated capitals, with their round abaci, the yet richer corbels which bear up the marble vaulting shafts, the bold and deeply cut mouldings of every arch great and small. Lovelier detail was surely never wrought by the hand of man." Into this noble presbytery, on the 15th October, 1252, in the presence of King Henry III. and his son, and many of the leading nobles and prelates of the kingdom, the shrines of the foundress and of the three other abbesses, and the reputed shrine of St. Alban, were removed a few feet eastward from their position in the Norman choir, and the whole church in ground plan, completed as we have it to-day, was dedicated to St. Mary, St. Peter, and St. Etheldreda. But although the cathedral was thus finished in the thirteenth century, as far as its length and breadth were concerned, as it now stands, in the next century a necessary reconstruction of the central crossing of the building changed entirely, not only the external outline, but the whole general effect of the church within. For, on the 22nd February, 1322, the central Norman tower fell, a catastrophe which, through the supreme constructive genius of Alan de Walsingham, became a blessing in disguise, and led to the building of the octagon tower and lantern, a feature which gives to the interior of Ely Minster its unique beauty and grace, queenly beyond words, and to the exterior that characteristic outline, which has no fellow in any of the churches of England, or, indeed, of Christendom. The stonework, begun in 1322, took six years to build, and was finished in 1328; the woodwork, begun at once on the completion of the stonework, took twice the time, and was not finished till

1342. The sculptured corbels, midway up each of the eight vaulting shafts of the octagon, contained representations of incidents in the life of St. Etheldreda. The three beautiful decorated arches east of the octagon, now used as the place of the ritual choir, which took the place of the Norman arches shattered by the fall of the tower; the elaborately canopied oak stalls (the 50 carved panels of scenes from Old and New Testament scenes are by Abeloos, of Louvain, a modern wood-carver); the suberb Lady Chapel, with its priceless sculptured work, one of the finest specimens of decorated architecture in the kingdom; the sub-structure of St. Etheldreda's shrine, and among the monastery buildings Prior Crauden's Chapel, a perfect gem of beauty and originality, are all Alan de Walsingham's work. The wooden pyramidal spire, which in all probability crowned Bishop Geoffrey's western tower, gave way in the fifteenth century to the present stone octagonal tower flanked with corner turrets of a late decorated type, crowned again with a wooden spire, which has since happily vanished. Bishop Alcock's Chapel, at the east end of the North Choir Aisle, was constructed 1486-1500, and Bishop West's Chapel at the corresponding place in the south 1515-1534. In 1770 the ritual choir with Walsingham's stalls was moved from under the octagon to the extreme east end, to be again moved to its present position in 1847. Between 1757 and 1770, the massive Norman stone screen, which for eight centuries has stood across the Nave, was ruthlessly destroyed, and a few years later the roof of the upper hall of the Galilee Porch was removed, and the western opening of the tower arch filled with a modern window, thus effectually blocking the view of the three great Lancets forty feet further west, through which up to that time the setting sun must day by day through so many centuries have flooded the long Nave with its evening light.

The park on the south side of the cathedral is a well-wooded enclosure, and one of the most beautiful of all cathedral precincts. A fine view of the cathedral can be obtained from here. On the south side of the park is an artificial mound, called Cherry Hill, a good view of the adjacent country may be had from the summit, particularly towards the east, south, and west.

DIMENSIONS OF THE CATHEDRAL.

EXTERIOR.

	Feet.
The whole length, from West to East	537
The length of the Transept, from North to South ...	190
Height of the stone turrets of the Western Tower ...	215

INTERIOR.

The whole height from the floor to the centre of the Lantern	142
Height of the vaulted roof of the Choir	70
Length of the Lady Chapel (now Trinity Church) ...	100
Breadth of the same	46
Height to its vaulted roof	60

St. Ives, Hunts.

By H. I. Hankin, ex-Mayor.

St. Ives, situated on the River Ouse, is a picturesque market town of great antiquity, dating from early Saxon times. Slepe, under which name it appears in Domesday Book, acquired the name of St. Ives from St. Ivo, a Persian Bishop, who preached throughout England, finally settled at Slepe, and died there about the year 600. His remains were afterwards found and taken by the monks to Ramsey. On the spot where St. Ivo's remains were discovered a church was built by Abbot Œdnoth, and in the year 1017 a priory was founded by Earl Adelmar and inhabited by Benedictine monks from Ramsey. In 1207 the church and buildings were burnt, but were rebuilt, the monastery continuing to exist till after the Dissolution, when, in the reign of Henry VIII., the site was granted to Sir Thos. Audley. Until recently portions of the old priory walls were existing, but the site is now occupied by a modern residence belonging to Mr. Warren, immediately opposite the magistrates' courts.

Visitors entering St. Ives from the station are first impressed with the extent of the Cattle Market, which is of modern construction. The original Charter for the market was granted by King Edward I., in the year 1290, and since that time it has always ranked as one of the largest markets in the kingdom. From earliest date it was held in the streets, until 1886, when the new market was opened near to the station, upon ground which was part of Oliver Cromwell's estate. Relics of Cromwell are few, the house in which he resided having been pulled down and a row of private residences erected upon the site of the northern side of the Cattle Market, known as Cromwell Terrace. At his "Green End" Farm there is still one of the original barns to be seen, the walls being of immense thickness, with long, narrow loopholes and heavily buttressed. Until a very short time ago there was no public memorial of Cromwell in the county; but in 1899 the writer, during the first year of his mayoralty, started a public subscription for that purpose, with the result that £1,200 was raised and a statue erected upon the Market Hill, and unveiled October 24th, 1901. The statue is finely executed in bronze, depicting Cromwell in the dress of a farming squire of that period, and does great credit to the skill and ability of the sculptor, Mr. F. W. Pomeroy.

St. Ives was incorporated as a borough in 1874, the Corporation consisting of a Mayor, four Aldermen, and twelve Councillors, who also act as Urban Authority. The Council Chamber is above the entrance to the Corn Exchange, where a large corn and seed market is held every Monday. On the south side of the Market Hill is the Free Church, the tower and spire of which is 156 feet high, built in 1864. Many of the hotels and inns are ancient, and some still retain the old and picturesque balconies around the yards.

At the west end of the town is the Parish Church, dedicated to All Saints, a fine edifice of stone in the Norman and Perpendicular styles, consisting of nave, with clerestory, aisles, chancel, porches, and tower at the west end, surmounted by a spire (182 feet high), and pinnacles, eight bells, and clock, with Handel chimes. The west doorway, with its rich spandrels and niches, although dilapidated, is a good specimen of the period. Above the doorway is some good ornamental panelling, and above that a four-light window with fine tracery. The spire, which has twice been blown down, was taken down and rebuilt in 1879, at a cost of £800, under the supervision of Sir A .W. Blomfield. In the south aisle is a double piscina of Early English character. The interior has recently been much altered by the erection of a fine screen and organ, and by the niches being filled up with statuettes of the saints. The Register of 1634, containing the signature of Oliver Cromwell as Parish Warden, is still to be seen in the vestry. The various memorial windows, tablets, and charities would take too much space to describe, although one charity should be mentioned, owing to its curious method of distribution. In 1678 Dr. Wilde bequeathed to the town a sum of money, to be spent in the purchase of Bibles for twelve persons (six male and six female) annually, the overplus of the charity to be spent in blankets and necessaries for the poor. The Bibles were to be cast for with dice in the chancel. The terms of the will have been strictly complied with yearly until 1899, when the ceremony was conducted in the vestry instead of the chancel.

Approaching the Bridge, we pass on the west side the Manor House, with its seven gables. In years past this house was very ornamental, with carved figures between each gable and faced with carved oak beams. The interior walls were all panelled with carved oak, and one of the rooms still remains in its original state, with an exceptionally fine carved chimney-piece, on which the initials I.W., and date 1616, are visible, evidently referring to the family of Williams, who were closely connected with Cromwell, and large property owners in the town at that period. The present owner, Mr. H. Wadsworth, is always willing for visitors who are fond of antiquity to inspect this room.

The Bridge, built by the Abbots of Ramsey, is a stone structure, spanning the Ouse with six arches, three pointed and three semi-circular. Two of the arches were rebuilt in 1716 by the Duke of Manchester, who also widened the wharf (now known as the Quay), in 1724. Near the centre and over one of the piers is an ancient building, the lower portion of which was used as a chapel; the upper portion was destroyed by fire in 1689, and was said to have been used as a light-house for persons navigating the river. Adjoining the bridge, on the south side, is a long causeway (known as the New Bridges), on 31 arches; it was erected in 1822 by the Duke of Manchester, to afford communication with villages on the south side in time of flood.

Leaving St. Ives by the "Meadow," and proceeding by the banks of the river towards Hemingford Grey, a picturesque village one and a half miles to the south-west, St. Ives can now be seen in its full beauty and many photographic snapshots obtained, notably the west view of the Bridge, the Holt, the Church, the Brick Kilns, the Thicket, and nearer to Hemingford, the fine Old Watermill, which stands upon the site of one erected in the reign of Richard I., by Reginald de Grey. Hemingford Grey was granted to the Church of Ramsey, with several other manors, by King Hardi Canute. The Abbot and Convent afterwards granted it to Wlfwin, son of Alfwin, to hold for his life, and afterwards revert to the Church; but all the estates of Wlfwin being seized after the Norman Conquest by King William, were granted to Alberic de Vere, who, possessing the whole by force, left it as an inheritance to his heirs; thus, in the reign of Henry III., Reginald de Grey became owner of the manor. Passing the "Three Gate Pit" on the right, we come to St. James' Church, an ancient structure in Norman and Early English styles, with a fine embattled tower and pinnacles. There was formerly a spire surmounting the tower, but this was blown down into the river during a storm in 1755. The east window contains remains of ancient glass.

Continuing on, we pass "River View," the residence of Mr. W. Dendy Sadler, whose old world garden is a delight to all lovers of floral beauty. Next we come to the old moated "Manor House," at one time a place of importance; the inner walls are of great thickness, and are pierced with Norman doorways and windows. This was the birthplace and residence of the famous Misses Gunning, celebrated for their beauty. Maria, the eldest, married the Earl of Coventry in 1752, and Elizabeth married, first, the sixth Duke of Hamilton in 1752, and secondly, the fifth Duke of Argyll in 1759; she was created Baroness Hamilton in 1776.

Proceeding on, we pass on our right the "Six Gate Pit" (where several Royal sturgeon of great size have been caught) and approach "Battcock's Island" and Backwater. This backwater is one of the most beautiful spots upon the river, with trees overhanging and meeting to form a canopy of delightful shade.

Hemingford Abbots is so called from the ancient lords of the fee, the Abbots of Ramsey, to whom it was given by Bishop Ethelric in the reign of King Canute, and in whose possession it remained until the Dissolution. The church is dedicated to St. Margaret, the nave roof being curiously painted. In the chancel are memorials of the Dickens family, of whom Charles Dickens, LL.D., was for forty-seven years rector of the parish. The altar piece, which is a painting of the Loaves and Fishes, was given by Mr. Dickens.

Houghton Water Mill is the next picturesque spot on the site of the original building erected in early times by the Abbots. Houghton Church, dedicated to St. Mary, has a lofty spire, rising from an octagonal lantern on a tower of considerable elevation, containing five bells. The chancel is Early English, and contains an elegant piscina, also three stone seats of same period. In the centre of the village is a monument of polished granite to the memory of the late Potto Brown, a local philanthropist, who did an immense amount of good to the poor, and was deservedly held in high esteem.

Rules of the Convention.

1.—The Association shall be called "The Photographic Convention of the United Kingdom."

2.—The object of the Convention shall be the advancement of Photography, and of the interests of Photographers. The annual subscription shall be 5s., and become payable on the 1st of January in each year.

3.—The election of new Members shall rest with the Council on the nomination of an existing Member, and the Council shall have power to remove from the roll of Membership any existing Member for such cause as may seem to the Council sufficient.

4.—The Members of the Convention shall assemble annually in a town to be fixed upon at the previous General Meeting.

5.—The Council shall be elected annually at the General Meeting held during the Convention, and shall consist of forty General Members, not more than twenty of whom shall be London Members, and five Members from the locality where the meeting will be held the following year. The Council shall have the sole management of the affairs of the Association, and—except during the meeting of the Convention—shall meet in London; five to form a quorum. A meeting of the Council shall be held each year in January to receive a report from the Local Committee, and to confirm the arrangements for the ensuing meeting.

6.—The election of Council shall be by ballot, and the outgoing Council shall prepare a list containing the names of Members nominated by the retiring Council to serve on the new Council, and also the names of any Members nominated by any of the Members of Convention who have paid their subscriptions for the current year. The list shall be circulated a fortnight before the meeting to Members who have already paid their subscription, and shall be distributed to others at the time of payment of their subscription. The list issued by the Council in the manner aforesaid shall be the balloting list, and if any Member desire to vote for any other Member whose name is not in the list, he or she may do so by striking out some name that is on the list, and substituting the name of the Member for whom he or she wishes to vote. Each Member voting must give his or her name—on handing in the voting paper—to the President at the Annual General Meeting.

7.—The Local Members of the Council, elected under Rule 6, shall appoint a Local Committee to make all arrangements for the meeting of the ensuing year, subject to the approval of the Council.

8.—The officers shall be elected annually, and shall consist of a President, General Secretary, and Local Secretary. The officers, with the exception of the Local Secretary, shall be elected by the Council. No President shall hold office in two consecutive years, but the Treasurer and General Secretary shall be eligible for re-election.

9.—The election of Honorary Secretary shall take place at the first meeting of the Council held in London after a Convention Meeting. The Local Secretary shall be appointed by the Local Committee. The General and Local Secretaries shall each have power to appoint an assistant.

10.—The President shall preside at every meeting of the Convention or its Council at which he is present, and shall be an ex-officio Member of all Committees and sub-Committees. In his absence from any meeting of the Convention or Council, a chairman for that meeting shall be elected by the Members present. The President elect shall be an ex-officio Member of the Council. Past Presidents, who remain Members of the Convention, shall be Vice-presidents, and shall be ex-officio Members of the Council.

11.—The Council shall have power to appoint Members to fill up any vacancies that may occur in the Council. Should any Member elected on the Council not have paid his Annual Subscription before October 1st, his seat on the Council shall be vacant.

12.—The Local Secretary shall be an ex-officio Member of Council for three years.

13.—All papers intended to be read during the Convention must be sent to the Secretary at least two days before the date proposed for their reading, in order that the Council may be fully acquainted with their contents, and, further, that the said Council have the power to decline any papers they consider unsuitable.

14.—The writers of papers must limit the length of their paper to a period not exceeding half an hour, and that preference be given to those authors of papers who are present to read them.

15.—Two auditors shall be elected yearly at the General Meeting—who shall not be Members of the Council—to audit the accounts of the Convention.

16.—Alteration of any of the Rules can only be made at the General Meeting; notice and nature of such alteration must be given in writing at least one clear day previous to the General Meeting.

THE YORKSHIRE PHOTOGRAPHIC UNION.

Officers, 1902-1903.

President:—Mr. Percy Lund.

Vice-presidents:—Mr. Godfrey Bingley, Leeds; Dr. Hollingworth, Hull; Mr. J. H. Rowntree, Scarboro'; Dr. Paterson, Sheffield.

Hon. Treasurer:—Mr. Alex. Keighley, F.R.P.S.

Societies Comprising the Union:—Batley Photographic, Bradford Photographic, Brighouse Photographic, Cleveland Camera Club, Dewsbury Photographic, Halifax Camera Club, Harrogate Photographic, Heckmondwike Photographic, Holmfirth Photographic, Huddersfield Photographic, Hull Photographic, Ilkley Photographic, Keighley Photographic, Leeds Camera Club, Leeds Photographic, Pudsey Photographic, Rodley Photographic, Scarboro' Photographic, Sheffield Photographic, Skipton Photographic, Wakefield Photographic, Yeadon Photographic, York Photographic.

Hon. Business Secretary:—Mr. Ezra Clough, 10, Farncliffe Road, Manningham, Bradford.

Lantern Slide Section.—Hon. Sec.:—Mr. W. H. Houghton, King's Mill Lane, Huddersfield.

Print Portfolio Section.—Hon. Sec.:—Mr. W. H. Atkinson, Cemetery Lodge, Batley.

Jury of Selection.—Mr. Godfrey Bingley, Mr. Percy Lund, Mr. Alex. Keighley, F.R.P.S., Mr. Percy Sheard.

Lectures, 1902.

Secretaries are requested to kindly note the following regulations:—

Invitations to lecture should be sent to the lecturers. Stamped envelopes should, in all cases, be enclosed for reply.

The expenses of each lecturer must be paid to him on the evening of the lecture, and it is expected that the society will provide hospitality, when the return journey is impossible, or inconvenient, on the same night.

Each lecture to be acknowledged in club syllabus as "Yorkshire Photographic Union Lecture."

There is no restriction on the number of lectures which a society may endeavour to secure from this list.

It is understood that the society making the engagement provides the lantern, if required, and that no charge to the public is made for any Union lecture. A reading lamp must always be provided for the use of the lecturer when a lantern is necessary.

Revisions and additions to this syllabus may be necessary from time to time—particulars may be obtained from the hon. secretary.

In addition to lectures, there will be two sets of lantern slides and two portfolios of prints issued by the Union for circulation, dates for which may be arranged with the hon. secretaries of the respective sections.

List of Lecturers, 1902.

The figures in parentheses indicate the number of times the lecturer is prepared to repeat his lecture in a session.

Addyman, J. W., 15, East Parade, Leeds. "A Fishing and Camping Tour in Norway."—(2) Lantern required.

Atkinson, W. H., Cemetery Lodge, Batley. "Flower Photography."—(6) Use of backed plates. Isochromatic and ordinary plates. Natural arrangement of flowers. Sundry hints on flower work. Lantern required. 40 or 50 slides.

Bagshaw, Walter, Esq., J.P., Moorfields, Birkenshaw, near Brad-

ford. "Photo-Micrography."—(3) Apparatus—Illumination—Transmitted, reflected, oblique, and critical light—Dark ground effects—Polariscope—Focussing—Exposure—Low power Photography without Microscope—Low, medium, and high powers—Use of eye-pieces, bull's eye, iris, diaphragm, substage condenser, oil immersion lenses, etc. Lantern required. 40 slides.

BEANLAND, REV. JOSEPH, M.A., 7, Claremont, Ripon. Choice of the following two subjects (6 or 8) :—I.—"Platinotype Demonstration." Development and Modifications (special attention)—Toning and After-treatment. Small gas stove and two whole-plate developing dishes required. II.—"Ruined Abbeys of Yorkshire." Kirkstall, Fountains, Byland, Whitby, Bolton, Guisborough, Marrick, Rievaulx, Jervaulx, Easby, Mount Grace, Eccleston, Kirkham, St. Mary's (York), Ellerton. Lantern required. About 100 own slides.

BEEVERS, W. A, Welcombe, Cleveland Road, Huddersfield. "Platinotype."—Demonstration.—(3) Gas stove, enamelled pan, and 1 by 1 dishes required.

BOURKE, R., 7, Marlborough Terrace, Belle Vue Road, Leeds. "Carbon" (single transfer).—(2) A demonstration of the single transfer, with some historical notes. Gas stove, hot and cold water required.

BINGLEY, GODFREY, Thornichurst, Headingley, Leeds. Choice of the following seven subjects (6) :—I.—"Lantern Slide Making." Making lantern slides by contact and reduction. Developing, printing in clouds, binding and finishing slides, with a few examples shown on the lantern. Lantern and a few dishes required. 20 or 30 slides. II.—"Warwickshire, Gloucestershire, and the Wye Valley." Warwick, Kenilworth, Stratford-on-Avon, Stoneleigh Abbey and Park, Alcester, &c. Gloucester, Tewkesbury, Frampton, Berkeley Castle, etc. Chepstow, Tintern, Raglan Castle, Symond's Yat, Ross, Hereford, etc. Lantern required. About 200 slides. III.—"The Dales and Coast of Yorkshire." Showing places of interest in Airedale, Wharfedale, Wensley, and Yoredale, Swaledale, etc., York, Beverley, and Ripon Minsters, numerous abbeys, and the coast from the Tees to Bridlington. Lantern required. About 200 slides. IV.—"London to North Cornwall." Districts shown :—London, Hampton Court, Henley, Salisbury, Winchester, Christchurch, Bournemouth, Swanage, Dorset Coast, Villages in West Somerset, Ilfracombe, Clovelly, Bude, Boscastle, Tintagel, Exeter, &c. Lantern required. About 200 slides. V.—"East Anglia and Adjacent Counties." Lincoln, Norwich, Yarmouth, Cromer, Beccles, Caister Castle, Stalham Broad, Salhouse Broad, Wroxham, etc., and several interesting districts in the counties of Herts. and Bucks. Lantern required. About 200 slides. VI.—"Near the Border, and over." Durham, Newcastle, Hexham, Alnwick, The Cheviots, Edinburgh, St. Andrews, Arbroath, Stonehaven, "Thrums," Perthshire, Ayr, Dumfries, ect. Lantern required. 200 slides. VII.—"Oxford and Cambridge." Oxford, Iffley, the Thames, Abingdon, Dorchester, Henley, Cambridge, Ely, etc. Lantern required. 200 slides.

BURRELL, B. A., F.I.C., 5, Mount Preston, Leeds. Choice of the following two subjects :—I.—"Chemicals used in Photography." II.—"Weights and Measures." Will give either two lectures of I., two lectures of II., or one of each. Lantern required for II. About 12 slides.

CAMP, SPARHAM, 22, Upper Albert Road, Heeley, Sheffield. Demonstration — "Negatives and Prints, their modification and improvement."—(2)

CHAPMAN, E. HESLOP, 24, Sholebroke Terrace, Leeds. "Kallitype."—Demonstration.—(4) Brief sketch of the chemical action of the process, followed by the coating and preparation of the paper—printing—development, etc. Two 12 by 10 dishes, and a small gas stove required.

CROSSLEY, H., Calverley View, Rodley, near Leeds. "Bromide Enlarging,"—(3 or 4) Bromide enlarging for beginners—Negative—Exposure—Paper—Developer and Development—Fixing—Toning, by various processes, including copper—and Mounting. Lantern and dishes required.

ELLIFF, PHILIP, 21, Wade Lane, Leeds. Choice of the following two subjects (4) :—I.—"Ceramic Photography." Ceramic photography, with examples of photo. enamels, china, etc., and furnace for firing same. Coal gas supply and few small dishes required. II.—"Burnt-in Lantern Slides, by the Pepper Process."—Demonstration. With examples and furnace for firing same. Slides made by this process are absolutely permanent. No cover glass being required, one hundred can be packed in less room than fifty ordinary slides—for Record and Survey work, two very important considerations. Gas supply and few small dishes required.

HEAPS, THOMAS, 25, Holker Street, Keighley. Choice of the following five subjects (6) :—I.—"The Dry Plate: its Development." A lecture designed to help beginners to understand the chemical reactions and the tools they use in the production of a negative. Lantern required. 40 slides. II.—"Whitby—Photographically." Lantern required. 100 slides. III.—"Lantern Slide Making, by Contact or Reduction." Lantern required. 50 slides. IV.—Demonstration—"Gum-Bichromate." V.—Demonstration—"Ozotype."

HEYWOOD, EDGAR ALAN, 16, New Briggate, Leeds. "Light and Lenses."—(4) Practical Experiments. Wave and Emission Theory, Spectrum Analysis, Colour Values. Refraction—Reflection. Astigmatism—Lenses (simple and compound). Achromatic and Spherical aberration. Manufacture and grinding of Lenses. Application of the various forms to photography. Lantern required. 50 slides.

HIBBERT, T. G., 142, Steade Road, Sharrow, Sheffield. Demonstration—"A Simple Method of Toning P.C.P."—(2).

HOLLINGWORTH, J., M.R.C.S., 168, Holderness Road, Hull. "Photo-micrography."—(2) Lantern required. About 40 slides.

HOLMES, WILLIAM, 24, Arundel Street, Wakefield. "Wanderings in the West Riding of Yorkshire."—(3) Places of interest in Dentdale, Chapel-le-dale, Ingleton, Clapham Caves, Ribblesdale, Wharfedale, Airedale, Nidderdale, the Valleys of the Ure, Ouse, and Calder. Lantern required. 150 to 160 slides.

HOMBURG, ALBERT, 51, New Briggate, Leeds. Choice of the following five subjects (3) (October, November, and March only):—I.—"Flash-light." (45 slides). II.—"Travels in Germany." (130 slides) III.—"How to Make Lantern Slides." IV.—"Paper and Other Films." V.—"Taking and Making Cloud Pictures." Lantern required for lectures Nos. I., II., IV., and V.

HOWDILL, CHARLES B., A.R.I.B.A., 7, Oxford Row, Leeds. I.—"Colour and Colour Photography."—(3) Theory of Light and Colour—Description of the Joly, Sanger, Shepherd and Lumière processes of Natural Colour Photography, illustrated by numerous slides. Lantern required. 50 slides. II.—"Kirkstall Abbey."—(3) A lecture practically illustrating Photographic Record Work, dealt with both historically and archæologically. The majority of the lantern slides being from negatives taken by members of the Record Section of the Leeds Camera Club. Lantern required. 80 slides.

KEIGHLEY, ALEX., F.R.P.S., The High Hall, Steeton, near Keighley. Choice of the following three subjects (6) :—I.—"A Tour Round an Old Garden."—A pictorial subject. Showing the pictorial possibilities sometimes to be found within a very limited area. Lantern required. About 150 slides. II.—"Principles of Art Applied to Photography." The principles of composition, chiaroscuro (light and shade), and general fitness of details and accessories, explained by the aid of numerous illustrations. Lantern required. About 100 slides. III.—"Artistic Mounting and Framing." Dealing altogether with the principles which should guide one in the selection of suitable mounts and frames, illustrated by numerous specimens. Lantern required. About 20 slides.

LAYCOCK, J. W., Westfield, Keighley. Choice of the following four subjects (3) (in October and November only) :—I.—"The Rhone Valley, Roman and Revolutionary France." II.—"Western France and the Pyrenees." III.—"The Riviera." IV.—"Tours in Germany, Austria, The Cevennes, Italy, Normandy, North Central France." Lantern required. From 40 to 50 slides in each set.

LEAROYD, J. INGHAM, Rydal Mount, Halifax. Choice of the following seven subjects (6): I.—"A Run to Norway," (2 hours). II.—"A Scamper on the Continent," (2 hours). III.—"Belgium, Rhine, and Switzerland," part of above (1½ hours). IV.—Rhine, Switzerland, and Italy," part of above (1½ hours). V.—"Various Continental Views," part of above (1½ hours). VI.—"Home and Foreign Views," (1½ hours). VII.—"Denmark," slides made from photos., prints, etc. (1¼ hours). Lantern required. 150 to 200 slides.

LUND, PERCY, The Country Press, Bradford. 'Choice of the following four subjects (6) :—I —"The Woodlands: Trees as a Study for the Sun-Artist." Illustrated with about sixty examples of the lecturer's own work. Apparatus—Best Time of Day—Curious Trees—Beauties of Trees in Detail—A Course of Study for the Novice—The Woodlands at Different Seasons—and under varying atmospheric conditions. II.—"Nature Poets and Nature Pictures." Illustrated by about fifty original lantern photographs, accompanied by selections from poems descriptive and appreciative of Nature. A Comparison between Photography and Poetry—Study of Poetic Thought a Valuable Aid to Pictorial Expression—Thomson—Gray—Wordsworth—Bryant—Tennyson—Extracts from Nature Poets, illustrated by Photographs. III.—"The Field Days of a Sun Artist." With about seventy lantern pictures. How to Enjoy Sketching with the Camera—Where to Go—Hints on Apparatus—Mistakes of the Amateur Photographer—Wasted Opportunities—Reminiscences of Field Days—Among the Mountains—In Flat Countries—Among the Trees—Rustic Models—Etc. IV.—"The Story of a Streamlet." With about sixty lantern pictures. A Pictorial and Descriptive Record of the life of a Mountain Streamlet, from its source through varying scenes, to its outlet in the ocean, with photographic and poetic notes. The Spring—The Mountain Tarn—Moss-hags—Over the Granite—"The Place of its Steep Descent"—Cataract—"Here Smoking and Frothing"—Pastoral Scenes—Alluvial Flat—"Dead Man's Pool"—Orchards—Stepping Stones—The Village

Church—Chain of Lakes—Homes of Notable People—The Great Lake —"To Join the Brimming River"—The Mill—Tidal Limits—The Sea.

LYGO, J. HUDSON, 16, Parker's Road, Broomhill, Sheffield. Demonstration—Elementary Carbon, for beginners."—(2) Small gas stove and dishes required.

MACKAY, ROBERT, 69, Albion Street, Leeds. "Bells, and Bell Lore."—(3) With lantern slides illustrating quaint and curious bells and bell inscriptions.

MARGERISON, SAMUEL, Calverley, near Leeds. "What we see in an old Church."—(4) Description, with lantern illustrations, from a wide area, of the ecclesiological and architectural features of our village churches. The slides include photographs of many of the rarer objects of interest met with in ancient churches. Lantern required. About 90 slides.

NEWSTEAD, P. E., Eccleshill, Bradford. Choice of the following two subjects (4):—I.—"The Light Side." Illustrated readings from a selection of my humorous writings. Lantern required. II.—"Flash-light Work." Good and Bad Flash-light Work—Examples in the Lantern—Demonstration—What Developer to use, etc. Lantern required.

SAUNDERS, J. V., M.A., Hymers College, Hull. "Knightly Effigies and How to Photograph Them."—(2) Historical Sketch of a knight's equipment, with illustrations. Points to be noted and photographed. Photographic notes on subjects shown. Lantern required. About 30 slides.

SHAW, H. DIXON, F.C.S., B.Sc., Bond Street, Dewsbury. Choice of the following four subjects (4):—I.—"Some Experiences in Africa with the Yeomanry." Lantern required. 150 slides. II.—"Bromide Enlarging."—Practical demonstration. III.—"Intensification and Reduction."—Practical demonstration, on both plates and papers. IV.—"Gold Toning, with the Alkali Salts." Dishes, etc., required for II., III., and IV.

SHEARD, PERCY, White Lea, Birstall, near Leeds. Choice of the following three subjects (4):—I.—"Cairo to the First Cataract." Lantern required. 90 slides. II.—"Decorative Photogaphy." Photographic application to the embellishment of every-day furniture. Suggestions only, of a non-technical character. Lantern required. 20 slides. III.—"The Alteration or Improvement of Negatives." Brief indications of simple methods, resulting from personal experience. Illustrated by examples in various stages.

SKILBECK, J., 29, Delph Mount, Leeds. "Platinotype," Hot, Cold, and Brush Development—with Glycerine.—(4) Small gas stove and three whole plate (or larger) dishes required.

SKIRROW, J., 9, Cecil Avenue, Bradford. "A Visit to the Fiords of Norway."—(2) Lantern required. 80 slides.

STOCKDALE, R., M.A., 17, Mount Preston, Leeds. "Carbon Process Demonstration."—(3) An elementary demonstration of the working of the Carbon Process. Sensitising, developing, single and double transfer. Few dishes and hot water required.

THISTLETHWAITE, GEO., Linton House, Fairweather Green, Bradford. Choice of the following three subjects (4):—I.—"Lakeland, with Cycle and Camera." II.—"Wensleydale—an Inexpensive Tour with Cycle and Camera." III.—"1,000 Miles in Wharfdale, with Cycle, Motor Car, and Camera." Humorous account of how we discovered these parts. Lantern required. About 100 slides each.

THOMAS, C., 4, Brighton Grove, Pellon Lane, Halifax (not eligible on Friday evenings). "The Carbon Process."—(2) Short History—Development of Prints—Sensitising, etc.

WHITELEY, MRS. G. W., Park View, Trinity Street, Huddersfield. "A Tour in the Mediterranean, by two Ladies."—(2) Slides by Mrs. H. G. Brierley. Lantern required. 60 slides.

LONDON and Provincial Photographic Association.—On June 12th the meeting will be open to any member who has anything of interest to bring forward, and on June 19th Mr. A. L. Henderson will show a series of lantern views, illustrating his recent visit to Portugal. Visitors are always welcome at the meetings.

MR. JOHN H. AVERY writes us as follows from Fez, Morocco:—"Just a few lines to let you know where I am. Once more I am back in the land of the great African Sultan, and I am having a real good time. The large dark-rooms are being built in the Palace, and, when finished, the Sultan will be able to photograph. He was very pleased to see me again, and goodness knows when I shall return; but it may be soon: one never knows exactly what a Sultan is going to do, or when he is going to do it. The natives do not take kindly to the camera; in fact, it is almost impossible to use it in Old Fez without causing trouble. The Palace is very fine, not a bit like the one at Marràkesh. In the ground we all play cricket, that being the sport at present in favour, and I am fast becoming a great player. Being on the Sultan's side, I am saved the trouble of batting; he very kindly bats for the whole side, and he rests whilst the other side take their innings. It is jolly hot here now. To-day it is 94deg. in the shade, and I understand it will soon go up to 110deg. in the shade. Then I become very tired."

LANTERN SLIDES OF VOLCANOES.

WITH reference to the recent remarks in our pages on the subject of volcano photography, Messrs. Newton and Co., of 3, Fleet Street, London, E.C., draw our attention to the following set of volcano lantern slides which appears in their catalogue. The set of slides is made from direct negatives taken by Professor H. J. Johnston-Lavis, Professor of Vulcanology in the University of Naples:—1. Lava Streams of Vesuvius, 1886, in the Val d' Inferno, from the top of the great cone. 2. Hollow Dyke (the first described, and the formation of which was followed), Eruption of May 2nd, 1885. Vesuvius. 3. New Lava crusted over, but flowing beneath with numerous spiracles over its surface. June 15th, 1891. Vesuvius. 4. Details of Spiracles of No. 3. 5. Somma and Vesuvius, as seen from the East from Terzigno. 1887. 6. Some distance above main bifurcation of Val. Von Buch. 7. Upper termination of the Vallone between 450 m. and 750 m. contour line. 8. End of Vallone di Pollena at the ridge of Somma, looking across the Atrio del Cavallo to Vesuvius. 9. A Crusted-in Lava Tunnel, containing flowing lava. Openings in top of arch give exit to vapour. Feb. 6th, 1886. 10. Cone-forming stage with ejections of lava cakes. Shows influence of wind in making cone asymmetrical. Cone of Eruption of Vesuvius. Jan., 1889. 11. Cone-forming stage with ejection of lava cakes. Cone of Eruption of Vesuvius, 1889. 12. Cone of Eruption of Vesuvius in cone-forming stage, with ejection of lava cakes. Autumn of 1888. Vesuvius. 13. Cone of Eruption of Vesuvius in cone-forming stage, ejection of lava cakes. Spring of 1888. 14. Cone of Eruption at its maximum development at the end of April, 1889, as seen from the edge of 1872 crater, and looking towards the N.E. 15. Eruptive Cone of Vesuvius, as seen from the edge of the 1872 crater, looking towards the E. 16. Cone of Eruption of Vesuvius, from the edge of the 1872 crater, and looking towards the E. 17. New Bifurcate Crater, looking across both in their axis towards E.S.E. The more distant one only is active at intervals of several minutes with ejection of dust, sand, lapilli, and blocks of old lava rock. Vesuvius, Aug. 7th, 1886; between explosions. 18. Vesuvius with snow cap. Seen from Castel del Uovo. Naples. 19. Cone of Eruption in full perfection at the end of April, 1889, as seen from the edge of the 1892 crater, and looking towards the N.E. 20. Cone of Eruption of Vesuvius, as seen from the edge of the 1872 crater, looking towards due E. 21. Earthquake Phenomena. Earthquake of Ischia, 1883. Gateway on N. side of the island, showing rotation of both cap stones in same direction. 22. Rotation after fracture of one Column, and fall of the fellow one. Earthquake of Ischia, 1881. At Casamicciola. 23. Monte Epomeo Ischia, with two landslips, caused by earthquake of 1883, as seen from Mezzavia. 24. Ruins of a Volcanic Region. Pumice, tuff, and rhyolite dykes. Island of Ponza, looking towards N., from just below Campo Inglese, Zannone in the distance. 25. Columnar Trachyte. Finest example known. Looking towards E. from north end of the I. of Palmarola. Ponza group. 26. Monte Nuovo) formed in two days in 1538) with half of the Lake Avernus and Temple of Apollo, from the northern cliff of Avernus. 27. Lake Lucrinus, Monte Nuovo, Monte Barbaro-Cervara, as seen looking to the N.E., from above the Stufe di Nerone. 28. Monte Barbaro, the Starza foreshore of Armstrong's Works, built thereon at Pozznoli, as seen from the top of the great shear legs. 29. Part of the Starza with the great Trachyte Streams of Monte Olibano, as seen from near the Hotel, G. Bertagne. Pozzuoli. 30. Weathering of volcanic tuff by saline solutions (sea water). Il Fungo, Lacco Ameno, Ischia. 31. Globular Basalt. Aci Castello, Sicily. 32. Columnar Dolerite. Grotto della Palombe, Etna (near Acireale). 33. Mr. Narlian's Villa, in 1887, that was bombarded with volcanic projectiles from the crater of Vulcano (the cone of which is seen beside the house less than a kilometre distant). August 3rd-4th, 1888. 34. Summit of the Island of Stromboli, with the smoking crater at one side, at the upper end of Lo Sciarra, 1887. June. 35. Summit of the Island of Stromboli, with the crater at one side at the moment of an explosion of lava cakes. Sept., 1889; two years after. 36. Interior of crater of Vulcano, seen from N.W. edge on September 21st, 1889; commencement of an explosion. 37. Another explosion in a less early stage. 38. Same explosion as last—about 30 seconds later. 39. Explosion from Vulcano as seen from steamer on its way to Messina, at sunset of September 23, 1889. 40. Panorama of the island of Vulcano, as seen from the Mte. della Guardia Lipari, in 1887. 41. Mud spring, Krisuvik, Iceland. 42. Boiling water spring, Krisuvik, Iceland. 43. The Almanagja rift, or line of collapse, of the crust of the lava lake of Thingvalla. 44. Looking south over the collapsed and drifted crust of the Thingvalla lava lake, with the water lake and volcanic islands beyond. View from the Logberg in the sight of the old Parliament of Iceland. 45. The Myrdals Glacier, with terminal moraine and snow-field of the Myrdals Jokull, Iceland. 46. Old submarine basalt cone cut into natural archway at Dyrhölaey (Portland), S. Iceland. 47. A bird mound on the Skalm lava, S. Iceland. 48. Broken cone and lava field of the W. Skaptar Stream, Iceland. 49. A breached scoria cone that gave issue to a flood of lava. Skaptur, W. Stream, Iceland. 50. Arrangements of scoria cones on great W. dyke of the Skaptur eruption. Lava field on either side. 51. Row of minute

cones joining two large ones along the W. dyke of the Skaptur eruption. 52. Panorama of lava fields of the Skaptar. 53. Skaptar lava fields with conical hills (pointed and truncated in the distance). 54. Fire and water. The Skaptadalr filled with lava, the Skaptar river meandering over surface. 55. View towards the three great Southern Jokulls from the Solfatara, near Ofœruhofdi on the Fjallabaksvegr-sydri. Typical Icelandic scenery. 56. Corded lava—foot of Hecla. 57. Columnar (radiating) basalt in Hruni. 58. Perched rocks on the Almanagja rift. 59. Rift. The Stapagja with snow at bottom. 60. Same taken from the interior. 61. Globular basalt. Cape Reykjanes. 62. Dolerite lava, with structure etched out by natural sand blast. Road from Reykjanes to Stadr. 63. Blob cone spiracle on lava close to main road near Olafskard. 64. Rocher du St. Michael La Puy, Central France. An old tuff-choked volcanic neck denuded. 65. Puy de la Vache (Auvergne). Breached cone (typical). 66. Ditto, with another neighbouring cone. 67. Typical trachyte dome of the world, Le Puy Sarconi, Auvergne. 68. Suc de Monac, near St. Julien de Chapleuil. Typical denuded columnar trachyte cone. 69. Very long Basalt Columns, Les Orgues d'Espaly Le Puy.

CORONATION PHOTOGRAPHY.

In a letter to the "Times," Mr. J. Bentall Endean makes the following suggestions:—Of the many millions of His Majesty's loyal subjects, few will be privileged to be witnesses to the Coronation in Westminster Abbey, and but comparatively few to be spectators of the State pageants. If it be possible for large photographs to be taken officially by State servants of the actual ceremonies in the Abbey during their performance, will His Majesty graciously give his consent and command for this to be done? Vast numbers would thus be enabled to realise something of the dignity and grandeur of the crowning of our Kings, and with satisfaction to gaze on the facts thus visibly recorded, with mechanical veracity that none can impeach. Is it possible for an electric, automatic, revolving, recording, photographic apparatus—or more than one—to be so placed in Westminster Abbey that it shall automatically record the Coronation ceremony during its progress and in its entirety? Further, were the photographing of the processions and the crowds to be taken in hand systematically, by an organised band of photographers, with cameras of equal field, the operators being so placed along the routes that the fields shall align and the photographs be truly consecutive and in equal perspective, these would form Imperial historic pictures. Each side of the routes might be so photographed, and the pictures thus obtained would furnish future Britons with precise pictorial details of Court and popular life, manners, and costumes at the time of the Coronation of His Majesty King Edward VII. I see no difficulty in the scientific carrying out of these suggestions. I believe the time will come when the electric pencil of the artist in London will cause simultaneously another pencil to trace the identical sketch in New York, or in any other place wherewith electric communication exists.

New Books.

"Ausführliches Handbuch der Photographie." Die Grundlage der Photographie mit Gelatine-Emulsionen. Wilhelm Knapp, Halle a/S.

This volume of Dr. Eder's valuable handbook will appeal to a considerable number of English readers, as it deals with the basis of photography with gelatine emulsions. Twenty to thirty years ago the study of gelatine emulsions was pursued in this country with great assiduity by a number of expert photographers, and some of these now stand at the head of our most important dry-plate factories. The influence of their work in the production of the highly sensitive plates of the present day may be traced throughout this volume. In the historical introduction the use of gelatine as a medium is traced back to Poitevin in 1850, who added iodide of potassium to a solution of gelatine and sensitised the film in a silver bath. Hadow described a similar process in the Journal of the Photographic Society in 1854, but the first mention of an emulsion with silver salts in gelatine was by Gaudin, on August 20th, 1853. In 1861 he gave a more detailed description of his process, which was with silver iodide, with excess of silver nitrate, and in September, 1871, R. L. Maddox published in the British Journal of Photography his note on the preparation of a gelatino-bromide emulsion. The work of the men who improved the process is described, and it will be seen what an important part many English photographers contributed to it. The volume deals very comprehensively with the properties of the various compounds of silver with the haloids and ammonia, the characteristics of gelatine and the selection of suitable varieties, the nature of the latent image, the preparation of emulsions and the influence of various substances upon them, the preparation of orthochromatic emulsions and their sensitisation for various parts of the spectrum. Dr. Eder's treatise on the sensitometry of photographic plates is also included in the volume.

"Clouds and Weather Signs." By Commander D. Wilson-Barker, R.N.R. Illustrated by Cloud Photographs. 32 pp. Price, 1s. London. Office of "Knowledge," 326, High Holborn. W.C.

Commander Wilson-Barker, in the preface to his book, says:—"The object of this short notice of Clouds is to attract attention to a much neglected study. The unquestionable beauty and variety of cloud forms make them worthy of interest and observation for their own sakes; but their study is also of great utilitarian value. The clouds exercise enormous influence in the science of weather forecasting, to which, indeed, they may be said to furnish the key, and they may have more to do with the health and comfort of individuals than we suppose. Of late years, cloud observers have made increasing use of photography; by its means all forms and types of cloud are reproduced. It may be well to warn amateurs of the special difficulties encountered in cloud photography; in early work of this kind many failures are almost sure to result. I would suggest the use of the slowest plates procurable, "mechanical" or "process" by preference; developing should be slow at first, finishing off with a more powerful developer. Polarising apparatus and screens are a great help in cloud photography, but they are not universally available, and the amateur will do well to try his luck with the simplest apparatus to hand."

The book may be best described as a study of cloud-forms, illustrated by some very beautiful photographs; beyond the few hints given in the quoted preface the author says nothing about the photographic aspects of his subject, and for this we tender him our thanks. Writers of text-books on special subjects to which photography may be allied are far too prone to dilute their chapters with glaring puffery and the reiterated twaddle of the shilling handbook. Commander Wilson-Barker is guilty of none of these shocking things. He quietly takes us into a little world of observation and study that has been penetrated by but few, and points out to us, in clear language, the significances of the constantly-changing masses of vapour hanging in the "airy blue." The book must interest all; and those whose daily lot is governed to any extent by meteorological influences should have it at hand for reference.

Messrs. Marion and Co., Ltd., 22 and 23, Soho Square, London, W., are issuing the "Russett" series of postcards sensitised with a "self-toning" compound. After being printed out by contact in the ordinary way, the picture is fixed in a weak solution of hypo, and an image consisting of a brown deposit is the result. For use with the postcards Messrs. Marion also issue specially cut masks and discs in a variety of shapes. Postcard photography is becoming increasingly popular, and we welcome these introductions of Messrs. Marion and Co. as tending to simplify the hobby and increase the volume of innocent pleasure which photography is so capable of producing.

New Apparatus, &c.

Solaraxe. Sold by Fuerst Bros., 17, Philpot Lane, E.C.

From Messrs. Fuerst Bros. we have received a sample of their patented anti-halation backing, which they have named "Solaraxe." It is a red solution that may be applied either with a brush or by flowing it over the back of the plate in the same way as collodion or varnish is applied. The latter is the quicker way. The solution, in which, evidently, ether is the solvent, drys in a minute or so, and gives a matt surface, which, when examined from the glass side—when it is applied to plain glass—seems to have as nearly as possible the same refractive index as the glass itself, so that it should be a perfect protection against halation. We found that when the coating was wetted under a gentle stream from the tap, without wetting the gelatine film, the coating could be easily removed. This new backing should prove a great convenience to photographers.

The New Goerz Lenses.—Manufactured and sold by C. P. Goerz, Holborn Circus, London, E.C.

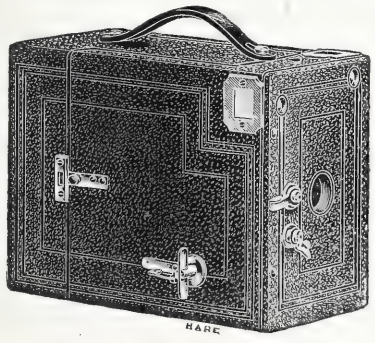
Mr. C. P. Goerz, of Berlin, has submitted to us through his London Agency specimens of three new lenses of recent introduction. Perhaps the most remarkable of these is the Hypergon Double Anastigmat, Series X, f/22. Its chief characteristic is the extremely wide angle of its covering power, which approximates to 135deg. The surface the lens will cover is not readily appreciated when expressed in this form, but by comparison of the focus with the diagonal of the plate upon which it may be used, the performance of the lens is remarkable. The specimen before us is of 3in. focus, and it is listed to cover at f/31 a plate 8½in. by 10½in. The diagonal of the picture is 13½in., or 4½ times the length of the focus of the lens. This result is obtained by very simple means. The lens is not achromatised, being composed of two hemispherical meniscus elements. Spherical aberration is corrected by means of a small stop, and the operator, after focussing, must either make the adjustment for the actinic focus by racking in the lens 1-50 part of its focal length, or by using a smaller stop for the exposure. With a lens of such extremely wide angle the illumination is necesarily reduced considerably at the margin of the plate, but the difficulty is met by a very ingenious adaptation of the old star stop. A wheel in the form of a star is attached to a hinge, so that it may be placed in front of the lens as occasion may require. The wheel is driven by pressure of an indiarubber ball, which projects a stream of air through a fine tube against the vanes of the wheel or star-stop. This obstructs the light which otherwise would fall upon the centre of the plate. It follows

that the exposure must be considerably in excess of that required for the normal aperture of the lens. In an article by Herr Emil von Hoegh, which appeared in the "Archiv für Wissenschaftliche Photographie," in April, 1900, this lens appears to be foreshadowed, for he draws attention to the possibility of eliminating astigmatism in a doublet composed of two single meniscus lenses for a field of 60deg. It was a revival of an old idea, and the present lens is a practical expression of it. We have tried the lens, and obtained very good results. For architectural subjects at very close quarters it should be of great value, but it must be borne in mind that the perspective of such a lens, when used for the full extent of its covering power, must inevitably appear abnormal. The lens of greatest angle which we have hitherto used covers a circle 2½ times as wide as the focus of the lens. With the Hypergon this diameter is approximately doubled, which is a remarkable achievement.

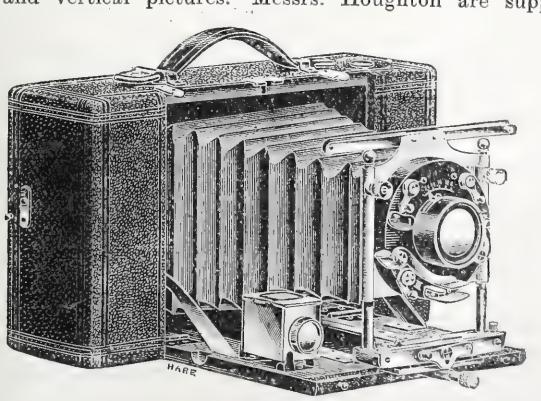
Of still more recent introduction are the Goerz Double Anastigmats, Type B, Series 1b, and Series 1c. The two series resemble each other in all respects excepting aperture, the Series 1b being of twice the rapidity of Series 1c, but from this it must not be inferred that Series 1c is a slow lens, for the aperture is f/6.3. The lenses of this type are of symmetrical construction, being formed of two components, each consisting of a double convex and a double concave lens, with an intermediate air-space. The outward appearance of the lenses immediately attract the eye by compactness and excellence of finish. The specimens submitted to us are each of 150mm. or 5⅞in. focus, but although the mount of the more rapid lens (which works at f/4.8) has a diameter of 2¼in., its length is but 1⅜in. The advantage in equal illumination of the plate by bringing the components so close to each other is considerable. Upon trial of both the lenses we find the claim that they will sharply cover at full aperture 4in. by 5⅛in., and with small stops 4¾in. by 6¼in., fully substantiated; in fact, with small stops we find these sizes exceeded. The quality of the image is excellent, both in respect of definition and plasticity. The more rapid series should be of especial value to professional photographers for portraiture, and its flatness of field will be found a great recommendation for its use in the optical lantern, and for enlarging and copying. It is claimed that the quality of its apochromatic corection specially adapts the lens for three-colour work in portraiture and landscape photography, as the great rapidity of the lens brings the exposure, with the red screen, within reasonable limits for such purposes. The Series 1c, with aperture f/6.3, has been specially constructed to meet the demand for a modern lens at a moderate price, but although these lenses are slightly more rapid than the well-known f/6.8 series the latter will still remain a favourite for purposes where great covering power is requisite.

The Scout and Ensign Cameras. Sold by George Houghton and Sons, 88 and 89, High Holborn, London, W.C.

From Messrs. Houghton we have received brief descriptive particulars of their three latest introductions in daylight-loading, roll-film, hand

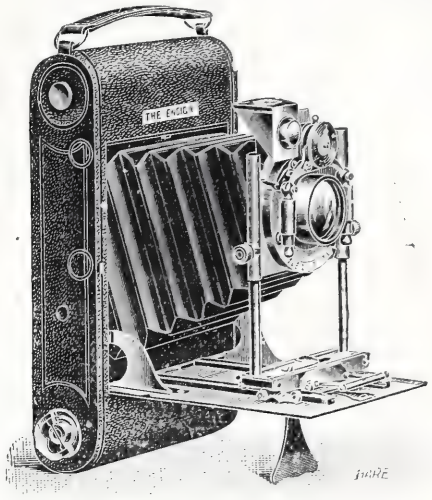


cameras. The general characteristics of the instruments will be apparent from the illustrations:—The No. 2 Scout is on the lines of the Scout No. 1, but takes a picture 3¼ by 2¼, and is fitted with two view-finders and three stops. Either six or twelve exposure films can be used in this camera. The Ensign, Model B, is similar in apearance to the Model A Ensign, but has the advantage of a rising and folding front for both horizontal and vertical pictures. Messrs. Houghton are supplying it



fitted with Goerz, Cooke, Dallmeyer Stigmatic, Beck-Steinheil, and other lenses. A plate-adapter can be supplied, thus enabling the owner to use glass plates whenever desired. The Ensign, Model C, is another form of folding camera, taking pictures on films 5 by 4 size, or on plates 4¼ by 3¼. The camera is fitted with rising front, R.R. lens, rack and pinion, brilliant finder, and shutter working between the lenses.

Messrs. Houghton also send us a sample of the "Ensign" Roll-Film Daylight-Loading Cartridge. The "Ensign" films are made for them by Mr. Austin Edwards, and are coated with his "Double Instantaneous" Emulsion. The spools are made in both six and twelve exposures, and in sizes suitable for all roll-film cameras. We have made a practical trial of the "Ensign" film in the camera, and have pleasure in testifying to its good qualities. It is clean and quick, yields vigorous images in development, and is altogether an admirable pellicular negative medium.



The "Crystalate" dish is also among Messrs. Houghton's recent introductions. This is a light but strongly-made vessel, having the appearance of ebony. It is handy and pleasant to use, and appears to be impervious to the developing solutions.

The Birmingham Photographic Company, Criterion Works, Stechford, near Birmingham, send us samples of their dark-room pin. Formerly this was made of brass; now a non-rusting wire, which is stronger and gives a better point, is employed for it. A box of eighteen of these pins may be had for sixpence. They are of convenient shape, and answer the purpose admirably.

The "Bos" Sensitised Albumen Paper. Sold by H. E. Bullen, wholesale photographic dealer, 17, Thornecombe Road, East Dulwich, London, S.E.

Albumen paper, like threatened men and other institutions, lives long: and here is Mr. Bullen, apparently firm in the faith that this beautiful printing surface will always find a warm place in the affections of professional photographers. And no wonder, for the ease of manipulation, the physical nature of the surface, and the depth, richness, and beauty of the toned image in albumen printing strongly appeal to the economical instincts of the practical worker, and invariably please his patrons. Mr. Bullen sends us three very beautiful specimen prints on the new paper. In a surface print we could not possibly have better examples of richness, evenness, and delicacy of tone. The prints are made from negatives by Mr. George Hana—a master of dainty effects in *chic* feminine portraiture—and to judge by the quality of the specimens, the "Bos" albumen paper has a future before it. Nowadays formulæ for the toning of albumen prints so seldom appear in these pages that we make no apology for appending the instructions for the "Bos" papers:—Wash prints thoroughly before toning, to release all free silver. This is very important, especially when the borax or acetate baths are used. The following baths have been found most suitable:—Acetate Bath (for sepia or purple tones).—Chloride of gold, 1 grain; acetate of soda, 30 grains; water, 8oz. Add 1oz. kaolin, which should remain undissolved at the bottom of the bottle. This bath should not be used until twenty-four hours after making up. Will keep for a considerable time. Replenish with the following:—Chloride of gold, 15 grains; acetate of soda, 1oz.; water, 15oz. Borax Bath (for purple blue tones).—Chloride of gold, 2 grains; borax, 90 grains; water, 15oz. Dissolve borax separately in 1oz. of hot water, then add remainder of cold water, and finally the gold chloride. This bath will not keep for longer than an hour. The hypo bath should be as follows:—Hyposulphite of soda (best), 10oz.; water, 100oz. (5 pints). It is essential that these quantities should be accurate, as too strong a bath produces blisters, while too weak a bath causes partial fixation. It is also important that the temperature of this bath and all other solutions should be kept at about 70deg. Fahr. After fixing, and prior to the final washing, transfer prints to the following salt bath:—Common salt, 8oz.; water, 160oz. (1 gallon)

In a note to photographers, Mr. Bullen says:—"Mr. Joslin, the expert manufacturer of "Bos" sensitised paper, after ten years' experience and experiment, has succeeded in solving all difficulties in producing a perfect sensitised paper; and I feel sure that many will be re-converted to the use of what must be admitted to be the superior medium, now that they can rely on obtaining it in perfect condition and with the minimum of trouble."

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK

June	Name of Society.	Subject.
14.....	West London Photographic ...	Leatherhead.
14.....	Birmingham Photographic	A Half-day Excursion to Westwood Park and Ombersley, by Mr. Harry Goode.
14.....	Liverpool Amateur.....	Excursion to Bromboro'.
14.....	Brentford Photographic	Burnham Beeches.
14.....	Ashton-under-Lyne Photo.....	Ramble to Bakewell (for Haddon Hall). Leader, Mr. Thomas F. Kershaw.
18.....	North Middlesex Photographic	*Some Details of Carbon Work.* Chas. Beadle.
18.....	Borough Polytechnic.....	Monthly Outings Competition.
19.....	London and Provincial.....	Nomination of Officers, &c.
19.....	Camera Club.....	Last Evening of the Session.

CAMERA CLUB.

On Thursday, the 5th inst., Mr. H. C. Richards, K.C., M.P., addressed the Club on the subject of "Old London," the chair being taken by his Grace the Duke of Newcastle, who opened the proceedings with a few well-chosen words with regard to Britain's wonderful metropolis. He said that there was nowhere in the world a city so interesting, unless it was Paris, and just at this time, when we were making preparations for a great national event, the City of London had become the cynosure of the Empire and its Colonies. Old London was rapidly disappearing, and however we might reject this from an antiquarian point of view, the change was inevitable and was brought about by various causes, the growth of population being, perhaps, the principal. He, himself, he was sorry to say, knew little about Old London, and therefore he was looking forward to the lecture with great pleasure.

Mr. Richards then began his lecture by saying that London had ever had a fascinating interest for him. He was a true Cockney, in that he was born within the sound of Bow bells, and, as a young man, spent many a pleasant Sunday in exploring the byeways of the Great City. It was not Englishmen who troubled themselves much about Old London, but the Americans were never tired of looking up its antiquities. His friend, the Vicar of St. Helens, Bishopsgate, had told him how as many as 300 persons would be shown over that old church in one day. They were all Americans; speaking the American language. The very street-names of London were full of interest, as might be seen by a reference to a lecture by Dean Stanley as long ago as 1850.

The lights were then lowered, and the first picture, a woodcut of London Stone, was thrown on the screen. This, probably the oldest relic of London as it was in Roman times, was a miliarum, or milestone, from which the three great Roman roads radiated. It represented about 1,800 years of London's history. Anyone standing at the private entrance to the Mansion House would be on the site of the old Roman Citadel, by which ran the stream known as the Wallbrook, i.e., the brook by the wall. There was no place in the world where the traffic was so great as past the Mansion House, London, and this spot could fairly be called "the hub of the universe."

The lecturer next dealt with Saxon London, and pointed out that the Saxons did not care for walled cities, and spread themselves out along the river-side. We could trace them wherever the word "hithe" occurred; thus Greenhithe and Rotherhithe were both places of Saxon origin. St. Botolph was special patron of the city gates, and there were four city churches dedicated to him. Next were shown woodcuts of Roman remains, such as locks and keys, and some daggers, which gave the lecturer an opportunity for one of his frequent sallies—"'Is this a dagger that I see before me,' as Bacon remarks."

London in the thirteenth century had no fewer than 400 churches, and Besant thinks that they were founded, not because of the exceptional piety of the citizens, but more probably as propitiatory offerings, dictated by a fear of the plague. In the fourteenth century one-third of the population of London was swept away by pestilence, a far worse visitation than that of 1665, which had been so much written about. Next were shown two of the earliest known maps of the City of London. There was an earlier one, which for a long time was kept at Seville, but some-one stole it, and it has never been seen since. The lecturer hoped that it would be some day returned to its lawful owners, and would be copied for the benefit of the various public libraries—"Honesty is the best policy," a friend of his had remarked, adding "I have tried them both."

Cheapside embraced the history of London for 1,000 years. (Various pictures from old prints were shown here, exhibiting the overhanging houses so common at one time in London.) The origin of ladies being given the inside of the pavement might be traced to the custom in Old London of throwing refuse from the top windows into the roadway. Up to the year 1734 each house bore a sign, such as "The Bible," "The Pig and Whistle," etc.; then numbering began, and ultimately became universal. Pictures of the old Royal Exchange and Westminster House brought in references to the State trials and the present Houses of Parliament, where, at Coronation time, the lecturer said, he should have the privilege of getting a shilling lunch for five shillings. Wren's plan for rebuilding London after the fire of 1666 was shown, and it was curious to reflect that two of the changes which he recommended were only adopted in our own day, namely, Holborn Viaduct and the Thames Embankment.

London Bridge and the Church of St. Saviour next came under review, and a mention of the waterwheels erected by a worthy Dutchman for supplying the City with water gave opportunity for a few jocular remarks as to the Dutch in South Africa. Pictures followed of Old St. Paul's, Bow Church, Cornhill, Temple Church, St. Thomas's Hospital, etc. All these afforded opportunity for jokes about the London County Council and various modern institutions. The misplacing of the slides, some being shown wrong side before, and others upside down, as well as their very poor quality, also gave rise to much hilarity.

The discussion was opened, in an unexpected and informal manner, by Mr. Lyon, who spoke from the lantern-platform, where he had had the somewhat unthankful task of showing the pictures. He said that although the lecturer had described many very interesting spots, there were certain important spots to which he had given no heed whatever. He alluded to the "spots," or rather want of "spots," on the lantern slides, which had led to so many eccentricities of presentment that evening. For these errors he disclaimed responsibility. The slides were so numbered that he had to begin at No. 50 and end at No. 1, and the few that were spotted were marked in the wrong place. If Mr. Richards would leave his pictures at the Club, he would get them properly spotted for him, so that next time they were shown they would not elicit from the frivolous those remarks which they had heard that evening.

Sir Benjamin Stone said that there was no such thing as Vanishing London or Old London. London had, in the nature of things, always been changing, and it was changing under our eyes to-day. The rough illustrations by which the lecture had been illustrated reminded us of what a power we had in photography of preserving the images of those buildings which were passing away. He recommended the Camera Club members to take every opportunity of photographing London for the benefit of posterity. Such pictures, fifty years hence, would be highly valued.

Mr. Humphery called attention to the wonderful old staircases and other relics of Old London, which might be found by searching Soho and other neighbourhoods.

The discussion was unfortunately cut short by the necessity of the lecturer leaving the Club at an earlier hour than he anticipated, but before he left he received a most hearty vote of thanks, which was carried with great applause. A few words from the chairman terminated the proceedings.

Patent News.

The following abridged description is specially drawn for the British Journal of Photography by Messrs. Hughes and Young, patent agents, 55 and 56, Chancery Lane, London, W.C., who will give advice and assistance free to our readers on all patent matters:—

Patent Applications.—No. 11,954.—William Brown, St. Thomas's Square, Salisbury. "Improvements in carriage and storage of photographic negatives on gelatine films."

No. 11,983.—August Huck and Ludwig Fischer, Chancery Lane. "Process for rendering aluminium and its alloys fit for the direct production thereon of photographic or other printed pictures."

No. 12,046.—Andrew Wollensak, Chancery Lane. "Improvements in photographic shutters."

No. 12,414.—Edmund Legros and William Reginald Winder, Fleet Street. "An improved method of effecting photographic exposures and apparatus therefor."

No. 12,419.—Charles Arthur Barrett and Robert William Page, Chancery Lane. "Improvements in apparatus for taking and producing photographs."

No. 12,420.—Karl Martin, Strand. "Improvements in photographic Gauss objectives."

Patents Illustrated.—No. 2,637.—Photography; separating flexible cards, etc. Patentees: W. G. Perks, Clanafon, Hayle, and H. G. M. Fletcher, Connorton Downs, near Hayle.

Relates to means for separating photographic films, cards., etc., applicable to cameras. The pile of films is pressed forward by a spiral spring, the top of the pile being kept back by a disc mounted on an axis and the bottom by a spring lever. A notch is cut in the periphery of the disc, and part of it is there bent back, forming a helical tongue, which enters between the first and second films when the disc is rotated, thus setting free the film, which springs forward into position.

No. 2,683.—Photography. Patentee: S. McLaughan, 450, East Tenth Street, Los Angeles, California, U.S.A.

Printing.—Relates to a photo-engraver's or photo-etcher's printing-frame. The plate to be etched is placed on an elastic bed supported on trunnions in the frame. Over this the negative is placed, and is then pressed down by the transparent plate of the upper frame. The pressure is applied to this frame at two trunnions by hooks, which are pulled

down by turning the eccentric by means of the handle. Wedges are adjusted to raise or lower the trunnions of the elastic bed, and thereby adjust the pressure of the negative on the plate to be etched.

No. 2,699.—Photo-mechanical printing. Patentees: G. F. Wetherman, Burnham Cottage, and G. Holzhausen, 3, Cecil Villas, Cecil Road, both in Enfield.

Relates to an improvement on the Collotype process to render the printing surface more permanent, and is applicable to polychrome printing. A print is taken from a negative on a plate, or the like, coated first with a mixture of silicate of potash, tannin, and beer, and then with a sensitive layer containing gelatine, calcium chloride, and bichromates of potash and ammonia.

Commercial & Legal Intelligence

At the Carnarvon Assizes, on Saturday last, James Leach, photographer, of Colwyn Bay, and formerly of Carnarvon, brought an action against the Pictorial Stationery Company, London, to recover the sum of £73 2s. Mr. E. J. Griffith, M.P. (instructed by Messrs. Nee and Gordon Roberts, Carnarvon), appeared for the plaintiff, and Mr. Ralph Bankes (instructed by Messrs. Purchase, London), for the defendants. Mr. Griffith, in opening the case, said that the claim was for sixty-two negatives at a guinea apiece. The plaintiff also asked for £10 10s. travelling expenses incurred in taking the photographs. This made a total of £75 12s. The defendant, however, had paid £2 10s., thus leaving £73 2s., the amount now claimed. The defendants admitted that there was an agreement to supply photographs, but they maintained that the plaintiff had not adhered to the agreement. They said that the work of the plaintiff was not of the quality they required, that it was not completed in reasonable time, that they were entitled to reject what they did not want, and that 10s. per photograph, which was the price they paid for the five photographs they accepted was sufficient. Counsel read a large number of letters which had passed between the plaintiff and defendants. In these the plaintiff was instructed to take views of Penmaenmawr, summit of Snowdon, Capel Curig, and other places in Carnarvonshire, with Colwyn Bay, showing plenty of life." The first letter was written by the defendants to the plaintiff on June 20th, 1901. They required views of Snowdon and the district. They stipulated that the work was to be quite equal to specimens enclosed. In the month following the plaintiff worked as hard as he could upon the photographs, thirty-one of which, up to a certain date in September, had been specially ordered by the defendants, though the plaintiff was at liberty to provide others. A great deal of expense had been incurred by the plaintiff in taking the photographs. In all, he had made thirty-four professional visits to different places, and for all this he was only charging £10 10s. In December Mr. Keep, the managing director of the defendant company, paid a visit to Carnarvon and saw the plaintiff at his studio. He took away a number of photographs, and not a word of complaint was made; but in January the plaintiff received a letter stating that the company had accepted five of his photographs, and offered him £2 10s. for all the trouble he had taken. James Leach, the plaintiff, gave evidence in support of counsel's statement. Witness was severely cross-examined by Mr. Bankes with reference to certain letters he had written to the defendants. In one of these he said, "I have almost given up business in this rotten hole (Carnarvon). It is my intention to go to Colwyn Bay, which is the coming place in Wales. It has been a false step on my part to come here, as the people here are certainly the most low, drunken, filthy wretches in the world, and treacherous beyond any. Why, the Boers are not in it with them." In another letter he stated that he would do first-class work and straightforward dealing, but not the Carnarvon Christian style of treatment." Isaac Slater, photographer, Llandudno, said that he had examined the photographs prepared by the plaintiff for the defendants, and considered that they were up to the average. If he got an order to take a view of the summit of Snowdon he could not guarantee in what time he could execute the work. A photographer might have to go up many times before he would be successful in taking a photograph. It was very difficult to take a photograph of some of the places mentioned in the letters written to the plaintiff. He (witness) had been five times to Capel Curig with the object of taking a photograph, but each visit was fruitless. John Wickens, photographer, Bangor, tendered evidence to show that 90 per cent. of the plaintiff's photographs were equal to the specimens which the defendant company had sent to the plaintiff. He thought that a guinea per negative was a very reasonable charge to make. Mr. Ralph Bankes, addressing the jury for the defence, commented upon the letters which the plaintiff had written to the defendants denouncing the people of Carnarvon, and said that a man who described his neighbours as low, dishonest, and traitors, could not be altogether relied upon. The plaintiff had never sent the defendants any proofs of his photographs, and though it was agreed that the photographs should be finished by a definite time, at the end of November not one had been delivered. The defendant wished to have the photographs by a certain date, but when they were received it was too late, and under the circumstances the defendants were entitled to reject what they did not want. Mr. W. Keep, managing director of the defendant company, gave evidence. He said that among the sixty-one negatives sent to London by the plaintiff there were several views which he (witness) had never ordered. It was absolutely necessary for him to have the views by a certain time, in order that he might show them to his customers, but when he paid a visit to Carnarvon and saw plaintiff he found that the prints were unfinished; consequently he had to find prints where he could to show his customers. The usual price charged for prints was from 5s. to 10s. Cross-examined: In a letter written to the plaintiff, the latter was blamed in part for the delay. Mr. Griffith: Who else do you blame? Do you blame Providence? The Judge: The Clerk of the Weather. J. Kinsley, photographer, Carnarvon, said that some of the photographs—and he had seen fifty-one—were good and some were bad. Cross-examined: He admitted that 75 per cent. were good. The judge, in summing up, said that the transaction was not a businesslike one; there was a looseness in the way the matter had been carried out, and this might have accounted for the difference between the parties. The jury awarded the plaintiff £50 damages.

News and Notes.

The Hove Camera Club's Annual Exhibition will be held on November 27th, 28th, and 29th.

NOTICE of Removal.—The Lumière N. A. Company, Ltd., give notice that on June 16th next they will remove their offices to No. 4, Bloomsbury Street, New Oxford Street, London, W.C. (near the British Museum), where they have secured larger and more commodious premises. To this address all letters and communications should be directed on and after the above date.

PATENT Office Fees.—In the House of Commons, on Monday, in reply to Sir J. Leng, Mr. Gerald Balfour said: "It is not at present in contemplation to reduce these fees. If the Patent Bill now before the House becomes law, a considerable increase in the staff of the office must follow, and the work done—which should be of material benefit to the inventor—will cause so large an expenditure of money as very greatly to reduce the present surplus."

THE Professional Photographers' Association.—The following were elected members of the Association at the committee meeting on June 6th:—Chas. E. Speight, The Studio, London Road, Kettering; Lizzie Caswall Smith, Gainsborough Studio, 305, Oxford Street, W.; George Alfred Wyatt, 13, Preston New Road, Blackburn; F. A. Stafford Johns, 2413, Grange Road, Birkenhead; Edward James Moorhouse, Central Studio, 103, King Street Egremont, Cheshire; William Henry Warburton, Harris Promenade, Douglas, Isle of Man.

A CORRESPONDENT writes:—"Photographers are warned against a man, a German, who speaks French, but little English. He will probably seek employment as an operator and retoucher. He has in his possession a quantity of lenses and a camera (stolen goods), which he is trying to dispose of. He has also a number of negatives of stage artists, which he would probably use as specimens to obtain employment. He is about thirty years of age, slight build, active in movements, black hair, pale complexion, very full eyes, bad teeth, sometimes moustache shaved off. Information asked for."

AN American visitor to London is so impressed with the building of the Coronation seats that he is determined to snap-shot them to astonish the natives on his return. He says: "The way London builders erect a scaffold makes me marvel. I look upon the scaffolds as the most picturesquely fantastical structures London has to show. They are things of real beauty to a builder. And, as regards solidity and safety, I have seen whole towns built without one structure anything like as thoroughly put together as the least secure of London scaffolds. I am making a collection of snap-shots of the best I see, and I think they will be the most interesting photographs I take home."—"Invention."

THE Photographic Club, Anderton's Hotel, Fleet Street, London, E.C.—The following notice has been issued to members:—"Since the formation of the Photographic Club in 1879, scarcely a process, or modification of a process, has been allowed to pass without being discussed in that sociable and pleasant manner which has always characterised its proceedings: conducted, as they are, in a way to be interesting both to the elementary and advanced students of photography. The Club possesses one of the finest photographic libraries in extence; has a large quantity of useful apparatus; a choice collection of interesting objects, illustrative of the photographic methods of the past; and is in a good position financially. Its meetings are held every Wednesday evening, at eight o'clock. Annual subscription, 10s. 6d.—T. W. Derrington, hon. sec. and treasurer, 85, Trinity Road, Wimbledon, S.W."

THE secretary of the Decimal Association has received the following letter from the Association of Trade Protection Societies of the United Kingdom:—"4, Bridlesmith Gate, Nottingham, June 9th, 1902.—To the Secretary, Decimal Association.—Metric System.—Sir,—At the fifty-fourth annual meeting of this Association, held at the Hotel Cecil, London, on Wednesday, May 14th—the said Association numbering eighty-six societies, having in the aggregate about 40,000 members, who are merchants, manufacturers, and traders, carrying on business in various parts of Great Britain—the following resolution was unanimously adopted:—'That this meeting is of opinion that the time has now arrived when the decimal system of coinage and the metric system of

weights and measures should be compulsorily adopted throughout the British Empire. In forwarding this resolution on behalf of the above Association, we beg respectfully to urge the great importance of this question, especially important in view of our commercial relationship with foreign countries who use the decimal system.—We are, Sir, yours obediently, GEORGE M. CHAMBERLAIN, president; ROBT. MELLORS, secretary."

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

KODAK, LIMITED, v. COLUMBIA OPTICAL AND CAMERA COMPANY.

To the Editors.

Gentlemen,—Our attention is called to the report of this case in which the judgment is recorded against us. We have no wish to dispute the ruling of the Court, but think that the photographic public, who know us well, and even Kodak themselves, now that the case is over, will acquit us of any intention of wilfully attempting to pass off our "Columbia Film," a paper-backed stripping film, for the Kodak celluloid film. We cannot dispute the judgment, and are only asking you to enable us to correct the inference to be drawn from it. The negligence of the manufacturers of our film in having used a few (only) old Kodak spools for winding the films has led us into this trouble and expense. The film is marked "Columbia Film," the cases are marked "Columbia Film," and they are catalogued, ordered, and invoiced as "Columbia Films." Having said thus much, we are quite content to leave the matter to the judgment of the trade and the public as to our real culpability in this matter.—Yours truly,

F. E. BUCKLAND.

The Columbia Optical and Camera Company, 42, Goswell Road (near Aldersgate Street Station, Metropolitan Railway), London E.C.

June 7th, 1902.

"BIBBY'S QUARTERLY" AND THE PHOTOGRAPHIC PROFESSION.

To the Editors.

Gentlemen,—I hail with delight the correspondence appearing between Mr. Walter Barnett and the Editor of "Bibby's Quarterly," as it shows up once more the innumerable attacks which the professional photographer has to withstand and thus bring once more into prominence the desirability of every professional photographer becoming a member of the P.P.A., thereby strengthening a body that is helping professionals to resist such attacks, both individually, as in the present case, and collectively, by means of the P.P.A. organisations.

Wavereers should remember that every professional photographer who has the welfare and honour of his profession at heart, will strengthen his own position by joining us, and this in its turn will help to strengthen our profession as a whole.—Yours, etc.,

H. EDMONDS HULL, M.P.P.A.

June 6th, 1902.

THE SINCLAIR CHANGING BOX.

To the Editors.

Gentlemen,—Since sending you the letter, published in your issue of last week, respecting the Sinclair Changing Box, a local dealer, through whom the apparatus was obtained, has received a post-card from Messrs. Rae Brothers, in reply to a letter sent at my request. They say that, "if your customer works our box, per the instructions, he will have no difficulty. We sell them in dozens every week." Why Messrs. Rae Brothers could not take the trouble to reply to me in the first instance I cannot understand. I think most people would have expected some reply under the circumstances.

I would be very pleased to hear from users that the changing box in question is really an excellent and most serviceable piece of apparatus, and I have no desire to do injustice to Messrs. Rae Brothers. I cannot see that, under the circumstances, I can be blamed for asking you to publish the letter relating my own, and others' experiences with the changing box, and sold by them. I considered that the matter was of some general interest, and my letter was not written merely to vent a personal grievance. I might add that I have just learnt that the changing box referred to in my previous letter has been sold (I have dropped rather more than half its cost on the transaction, but that is a detail), and I trust that the purchaser, having first studied the directions well, although I do not know that they necessitate much study, will find the apparatus most serviceable and in every way satisfactory; in fact, the "simplest, the lightest, the best."—Yours faithfully,

J. A. REID.

Cutcliffe Grove, Bedford.

June 6th, 1902.

To the Editors.

Gentlemen,—In reply to letter of your correspondent in last week's issue, we beg to state that on both occasions on which he wrote we posted him full printed instructions. As to his other remarks, the extracts we send herewith, from your own and other photo papers, are quite sufficient to disprove his remarks. Extracts:—

BRITISH JOURNAL, Vol. XLII., No. 1823.
"Amateur Photographer," Vol. XXI., No. 549.
"Photogram," Vol. II., No. 16.
"Photo. Notes," "Glasgow Evening Times," No. 5,876.
"Photographic News," Vol. XL., No. 35.

No alteration of any kind has been made on these boxes since introduced, as we have found them quite efficient.—Yours, etc.,

RAE BROS.

[We have only space for the extract from our own columns.—EDS. B.J.P.]

EXTRACT FROM THE "BRITISH JOURNAL OF PHOTOGRAPHY."

A NOVEL CHANGING BOX.

"This has quite recently been introduced by Messrs. Riddell and Rae, of St. Vincent Street, Glasgow. It forms at once a reservoir and a dark slide. There is a flexible bag at one end, from which the back plate can readily be drawn up and transferred to the front, ready for exposure. There are no sheaths employed, and the plates may be inserted just as they come from the makers, care, of course, being taken that all the faces are to the front. A query will arise as to how the second plate is prevented from getting damaged by the light which falls upon the front one during exposure. But here comes in the ingenuity of the system, for when the front plate has been exposed an opaque shutter is withdrawn, and the plate falls back, for which ample room is afforded by the releasing of the pressure behind, and which permits of the back plate of the series being transferred to the front, and separated from the others by the opaque shutter now returned to its place, when the tension of the spring at the back is restored. The whole thing occupies little more thickness than a dozen plates of glass, for there are no sheaths. The cuts show both the plain side, with its bag, and also the method by which the pressure of the spring is released, and simultaneously the number of the exposure recorded. Very little practice suffices to educate one into the transference of plates with ease and celerity."

CINEMATOGRAPHIC DEFINITION WITH THE GRÜN LENS.

To the Editors.

Gentlemen,—In your notes referring to my paper, read at the Camera Club, a slight misconception has arisen in regard to what I said in the necessity for sharpness in cinematographic films. My actual words were "That the movement is a great help to the cinematographer, as subjects in rapid movement of which the individual pictures would not be sharp, appear sharp when projected." This is a fact of which all cinematographic operators are quite aware, and it does not follow that a film need not be sharp, as all dealers are desirous of having their films as sharp as possible; but a picture, such as the Derby, could not possibly give sharp individual pictures of galloping horses when taken at the speed generally used, if a much higher speed were used, as an enormous quantity of film would be needed, increasing very largely the cost of production of the film. In reference to the remarks on the films which I exhibited, I particularly stated that my films were exhibited as scientific demonstrations, not as specimens of perfect films. If it were desired to take a perfect film, many precautions would be taken which were impossible when the film was taken from the pit of a crowded theatre. The mere fact of being able to get a picture at all was sufficient for my purpose, and many parts of the film, being purely experimental exposures for ascertaining the maximum and minimum rates of speed, were naturally wanting in proper relationship and movement. The correct speed, lighting, and other details, being now ascertained, future exposures

would probably give much more satisfactory results.—I am, dear Sirs, yours faithfully,

E. F. GRÜN.

The Hall, Southwick, Brighton.
June 6th, 1902.

THE GRÜN LENS.

To the Editors.

Gentlemen,—At the Camera Club meeting, Earl Rosse and several members questioned me on the point as to whether my fluid lens would be affected by change of temperature, Mr. Von Hoegh having stated that an alteration of two degrees would render the lens useless. To settle this point, I have made a series of experiments, using "The Abbe Refractometer," as supplied by Messrs. Zeiss.

The following are results; they were taken twice and found to correspond exactly:—

Temperature 16 C=60·4F.	Refractive index 1·478
18°C	1·485
23°C	1·483
30°C	1·48205
35°C	1·48105
39°C	1·48103
40°C	1·48101
48°C	1·47801
50°C	1·47720
55°C	1·4750
75°C—167°F	1·4670

Between 16°C=60·4 F and 75°C—167° F. There is therefore a difference of ·021—

I am,
Yours faithfully,
E. F. GRÜN.

The Hall, Southwick, Brighton.
June 4th, 1902.

CALCIUM CARBIDE.

To the Editors.

Gentlemen,—In reading your photographic Journal, I happened to drop across the article on Acetylene gas lighting, by G. W. Beach, Esq., of the British Acetylene Gas Syndicate. He stated the formula, for the preparation of gas, as—

$$C\ Ca^2 + 2\ H_2\ O = C_2\ H_2 + 2\ Ca\ O.$$

This formula does not express the reaction which takes place, and also the two sides of the equation do not balance, the formula for the preparation being:—

$$Ca\ C_2 + H_2\ O = C_2\ H_2 + Ca\ O.$$

Or more clearly as—

$$\begin{array}{c|c} Ca & C_2 \\ O & H_2 \end{array}$$

Calcium carbide being CaC2, not Ca2C, as there is no substance with the formula Ca2C.. Taking Mr. Beach's formula, we get—

$$C\ Ca_2 + 2\ H_2\ O = CH_4 + 2\ Ca\ O.$$

$$\begin{array}{c|c} C & Ca_2 \\ H_4 & O_2 \end{array}$$

CH_4 being methene, or commonly marsh gas.—Yours, etc.,

E. SINKINSON.

Ambergate, near Derby.
June 4th, 1902.

FOCAL PLANE SHUTTERS.

To the Editors.

Gentlemen,—With reference to the letter from Messrs. Thornton-Pickard, Ltd., appearing on pages 457 and 458 of your current issue and to the remark made therein upon super-imposed negatives, which, in conjunction with the context, can apply only to myself, and is an insinuation that the pictures used in the advertisements of the Anschutz camera have been manipulated for the purpose, I beg to inform you that this statement is entirely false, and I must ask you to publish prominently a disclaimer in your next issue.

Failing your doing this I shall be compelled to take such steps as I may be advised.—Yours faithfully,

C. P. GOERZ.

4 and 5, Holborn Circus, London, E.C.
June 6th, 1902.

PHOTOGRAPHY AT THE EISTEDDFOD.

To the Editors.

Gentlemen,—It has been decided to hold in connection with the National Eisteddfod of Wales an exhibition of Photographs, and the committee have asked me to try to make arrangements for a small collection of pictures suitable for the purpose. I shall be very glad if you will do me the favour of making the matter known in your journal, and also would you mind writing me with some of your valuable advice as to the best way of securing the loan of such pictures as shall be representative of our art up to 1902. Perhaps you could suggest some names to whom I might make personal application. It is not intended to hold any competition in this section, as the committee are anxious to carry out the chief objects of Eisteddfodau, which are educational.—Yours faithfully,

JOHN WICKENS.

Studio Royal, 43, High Street,
Bangor, May 30th, 1902

[Perhaps Mr. Wickens' best plan would be to write to the Secretary, Royal Photographic Society, 66, Russell Square, London, who might arrange for the loan of part of the Society's permanent collection.—EDS. B. J. P.]

PHOTOGRAPHY IN THE ROYAL PARKS.

To the Editors.

Gentlemen,—In the interests of accuracy, perhaps you will allow me to point out that the writer of the paragraph in your last issue on "The Parks and the Camera," is quite in error in stating that the photographer is limited to the use of a hand camera in the Royal parks. That limitation applies only to Sundays; on every other day of the week the holder of an official permit can use a stand or hand camera at will. I have before me one of the permits, called a "License to Take Photographic Views," and it may not be uninteresting to give the exact wording, which is as follows:—"The Commissioners of His Majesty's Works and Public Buildings hereby permit the Bearer ..... of ..... to enter the Royal Parks and Gardens with his Camera, etc., for the purpose of taking Photographic Views during twelve months from this date. The Photographing of Persons or Groups is not permitted. This Card, which must be produced on each occasion, is available on Sundays for Hand Cameras only."—Yours sincerely,

H. C. SHELLEY.

PICTORIAL POST CARDS AND THE POST OFFICE.

To the Editors.

Gentlemen,—I have just published a series of views on post cards (P.O.P. prints pasted on), and, to my surprise and disgust, I find the post office officials require a penny stamp affixed instead of the usual halfpenny. Their explanation is, that a post card shall not have anything adhered to it, except the postage stamp. I wrote the Postmaster-General and explained to him how seriously it affects the sales of such cards, and his reply is, that he does not feel justified in altering the rule.

Now, if any photo, or number of photos, under two ounces in weight can go in a wrapper or an open envelope for a halfpenny, I fail to see why such red-tapeism should exist in regard to these now very popular cards, and a line which the trade has found to be lucrative.

Why should the printer and collotype worker, whose publications can go for the halfpenny postage, have the bulk of this trade, when we find the public much prefer the real thing, but refrain from buying owing to the increased postage? I should think this is a matter the P.P.A. might take up with advantage to its members and the trade generally. I should like to hear other readers' opinions and how it affects their trade.—I am, yours, etc.,

PICTORIAL.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY, 24, *Wellington-street, Strand, London, W.C.*" *Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

PHOTOGRAPHS REGISTERED:—

C. Wehrley, 8, Windsor Road, Penarth, S. Wales. *Photograph of one Ship falling on another in Dock.*

J. A. Horsburgh, 4, W. Maitland Street, Edinburgh. *Photograph of Revd. Dr. J. C. Russell.*

W. Bushnell, The Studio, Bank Street, Malvern. *Photograph of Peace Celebration.*

A. Seaman, 61, Wostenholme Road, Sharrow, Sheffield. *Four photographs of Smedleys Hydropathic Establishment.*

SITUATION IN THE COLONIES.—"ABROAD" writes: "Will you please tell me the best way to get a situation as printer, etc., in one of our

Colonies?"—In reply: Try the effect of an advertisement in this Journal.

THE CITY AND GUILDS EXAMINATIONS.—"TRELLA" writes: "Can you please tell me where I can get particulars of the examinations held in photography, the subjects and textbooks required to study from, etc.?"—In reply: In our Almanac for 1902, or of Messrs. Whittaker and Co., White Hart Street, Paternoster Square, E.C.

WHITE INK.—B. H. asks for directions for making a "white ink," suitable for writing on the dark portions of photographs and dark mounts, etc., which would not rub off, as he finds Chinese white diluted with water is not permanent.—In reply: In place of thinning the Chinese white with water, use a thin solution of gum. You will find that the ink will not then rub off.

WAGES IN LONDON.—W. E. R. asks: "Are wages any higher in London than elsewhere? If so, about how much, proportionately?"—In reply: We do not thing there is much difference between the wages paid in London from those paid elsewhere. Perhaps the highest-class operators and retouchers may command higher salaries than they do in provincial towns.

MASTER AND SERVANT.—"ALPHA."—(1) As the printer is paid weekly he is a weekly servant, and therefore is only entitled to a week's notice, unless, indeed, there was an agreement to the contrary when he was engaged. (2) He cannot be discharged without notice unless he wilfully misbehaves himself or refuses to obey your lawful commands.

RECOVERING PLATINUM RESIDUES.—"F. B. W. would be glad if you can tell him how to recover platinum from old developing baths."—In reply: Make the bath hot, and then add a solution of sulphate of iron; that will precipitate the metal. Let it subside, and wash with several changes of water. Then add a little hydrochloric acid and wash again. You will then have pure platinum, which may then be dried, or dissolved in *aqua regia*.

STAINED ENGRAVINGS.—"MILDEW" writes: "Will you kindly inform me how to remove mildew stains from engravings?"—In reply: If the prints are stained by the mildew they will have to be bleached. That is done by treating them with chlorine. We, if the prints are valuable, should advise you to put the work in the hands of a professional print-restorer, as a novice attempting to do it may utterly ruin the engravings.

BOOKS WANTED.—H. T. writes: "Can you recommend a standard work on posing and lighting, or any books that treat on these subjects thoroughly? Also, do you know who is the best authority on "working up" platinotypes and enlargement, and what books there are on the subjects?"—In reply: Robinson's "The Studio, and What to Do in It," 2s. 6d.; "Artistic Lighting," Inglis, 4s. 6d.; "The Art of Retouching, Finishing, and Colouring Photographs," Johnson, 2s. Any of these works may be obtained through any of the dealers. On pages 632-3 of the Almanac you will find a list of the principal text books on photography.

FILM PHOTOGRAPHY.—R. G. SHAW writes: "Would you kindly tell me what is the matter with this film (enclosed); it took nearly all day to print? A chemist told me that I over-exposed it. I did not see how I could, because it was taken instantaneously with a Brownie Kodak as the man was going about thirty miles an hour and he has not moved. Will you please send the film back again, as it is rather a curiosity? It was taken on Whit Monday afternoon, about 4.30, faint sunshine, exposure about 1-50th of second."—In reply: The film has been badly fogged by light. In all probability the light in your dark-room is not a safe one.

LENS QUERY.—"TROOPER" writes: "Will you please say the lens you would advise me to get to take a full-length figure (cabinet size) at a distance of 14ft. from camera, with open aperture, if desired? I am at present using for this purpose a lens marked 'Darlot, Paris, No. 30,074," with 3in. flange; but to get sharp focus, I have to use smallest stop. Can you give me the value of this lens? Kindly give full particulars and probable cost."—In reply: To take a full-length portrait, cabinet size, in the space of 14ft. you will require a lens of not more than 9½in. or 10in. focus. The price, if by one of the best makers, is about £12. We can give no idea of the value of the lens you have; the size of the flange is no criterion of its value.

KEEPING FILMS FLAT, ETC.—G. W. asks: "(1) What is the best way of keeping (Kodak) films flat? I think they are put into a solution of glycerine after washing, but not certain. (2) Also, what is the best way of rubbing down the print (P.O.P.) on to the mount, as I find with blotting paper that I get such a lot of the fluff stuck into the print, and, when dry, am unable to move it?"—In reply: (1) A little glycerine is often used to prevent the films from curling as they dry. After they are taken from the last washing water, place them for a few minutes in water to which glycerine has been added in the proportion of about 1oz. to the quart. (2) A fluffless blotting paper is supplied by all the large dealers, which you might try, or, failing that, try ordinary writing paper.

RIGHT TO SHOW SPECIMENS.—G. G. says: "A month or so ago I took a group of three ladies (very pretty girls), and have made an enlargement of it for a specimen for the shop window. Now the people object to its being shown, and are threatening law unless I take it out at once. Can they compel me to do so? It has, I know, been decided that the negative is the photographer's property, and surely he can make what use he likes of it?"—In reply: You are acting illegally. It has been decided that the negative is the property of the photographer, and it has also been decided that it is illegal for him to make use of it, except to the order of the customer. That has been settled in the Court of Chancery, and injunctions granted, with costs, against photographers who have made use of the negatives against their wishes.

SMALL CAMERAS.—C. ANDREWS writes: "There is a camera patented and made in Berlin which takes a portrait, 'midget' size (small head and bust), by artificial light, in a few seconds, direct on specially prepared post or other cards, and delivers same finished in about ten minutes. I have seen this process at the Paris Exposition, and subsequently on the Boulevards. The cameras are also in use in the United States, where there is an agent for their sale. But I cannot find one in London, nor ascertain the name of the Berlin manufacturer. I have been told you might be able to enlighten me."—In reply: We have not seen particulars of the camera to which you refer, but you might be able to obtain them of Mr. Romain Talbot, Kaiser Wilhelmstrasse 46, Berlin.

FRENCH APPARATUS.—"DEALER" writes: "I understand most cheap hand cameras are made in France; I mean the styles that sell from about £1 to £2 10s. Can you tell me: (1) Is this so? (2) Can you give me names and addresses, or where I can find same? (3) Would they supply so small a quantity as three dozen mixed-priced ones? (4) If 'No' to (2) or (3), where could I get them in England? I wan them called by my own fancy name, and with my name and address affixed. (5) Would such firms as (a) Fallowfield, Houghton, or Marion's be the best, or firms like (b) Tylar's, Butcher's, etc., suit my needs better?"—In reply: (1) The cameras are made, some in France, some in Germany, and many in America. (2) We do not know the addresses of the makers. (3) We should say you would be able to obtain that quantity. (4) We are not sure on this point, but imagine there would be no difficulty in the matter. (5) Any of the firms, no doubt, would meet your requirements, so probably would Messrs. A. E. Staley and Co., 35, Aldermanbury, E.C.

COLLODIO-CHLORIDE PAPER.—"PHOTO WORKER" writes: "In a recent issue of the JOURNAL I notice one of your correspondents is complaining of cracks in a certain brand of collodio-chloride paper, and has asked your opinion as to their cause. I may say I have been using a deal of the same make of paper, both in glossy and matt surfaces, and have at times been much troubled in a similar direction; but on careful examination of the paper immediately on its arrival from the agents it will be found the cracks are already there, which conclusively proves it is no fault of the printer. I may say my employer has returned several quires to Thom and Wiggin, who acknowledge the fault, but say it must have been caused in transit. My idea is that it has been carelessly packed, as the cracks usually appear on every other sheet. Hoping this will clear 'Othello's' manipulator from undeserved blame, I now wish to ask if any of your numerous readers could inform me where I can procure white glossy collodio-chloride paper, as I have tried many firms, and have been unable to obtain same."—In reply: We should think the paper may be obtained from the Paget Dry Plate Company, or from Chas. Zimmerman, 10, St. Mary-at-Hill, E.C.

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THE BRITISH

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*** *The Editor can only be seen by appointment.*

*** *We do not undertake to answer letters by post.*

EX CATHEDRA.

Dr. Grün's Lens. The letter from Dr. Grün, which we published last week, concerning the effect of temperature upon the fluid lens which he has invented, gives some very interesting information, but we fail to see that it answers Herr von Hoegh's statement. In the paper upon the apochromatic planar, which we published on the 9th May, Dr. Rudolph gives a series of measurements showing the difference of focus for four different colours of the spectrum, and he likewise exhibits it by diagram. If Dr. Grün would publish similar tables and diagrams, showing the variation in focus, due to difference in temperature, in comparison with the ideal focal plane, we should have definite information exhibiting at a glance the extent of the error introduced. The specimens placed on view at the Camera Club show what may be done with the lens. They are far in advance of those produced by Dr. Grün some time ago, and we know that they have been of great interest to several photographers, who see possibilities of new work with lenses of such exceptionally large aperture. It cannot, however, be ignored that some of the photographs leave much to be desired in precision of definition, and it remains to be proved how much of this is due to the lens and to various external causes, such as variation of temperature, motion, etc.

The Parks and the Camera. Last week we published a letter from an esteemed friend and confrère, Mr. H. C. Shelley, with reference to a paragraph in the previous issue of this paper upon the use of stand cameras in the parks. Mr. Shelley has evidently failed to appreciate the scope of the paragraph in question, as we were not referring to the "Licence to take Photographic Views" obtained from the Commissioners of His Majesty's Works and Public Buildings, but to the privilege to use a camera in the parks, which attaches to the photographic "Red Book," issued by the Affiliation of Photographic Societies. We think it is undesirable to extend this privilege to stand cameras for obvious reasons. Every member of an affiliated society can claim a "red book," and the control which the Commissioners may exercise is thus weakened. Only the man with a serious desire to photograph in the parks would probably make application for a licence, and we quite agree that it should be granted in such cases, for it is reasonable that the wishes of the few should be considered, when the sentiments, or convenience, of the many are not seriously affected. But we think there would be an obliteration of the feeling, that the privilege of a licence must depend upon respect for the enjoyment of other visitors, if every member of an affiliated society could claim to use a stand camera by possession of a "Red Book." We pointed out that respect for regulations might be disregarded, and it is more than probable, under such circumstances, that the privilege to use a hand camera, which the Affiliation of Photographic Societies has secured for its members, would then be withdrawn. If it can be shown that the Affiliation of Photographic Societies could exercise control as efficiently as the Commissioners, our objections would be removed.

* * *

Exhibition Juries. The remarks of "Cosmos" concerning the selection of photographers for judging at our photographic exhibitions receive a somewhat striking confirmation in a recent article in the "Photographische Chronik." Last autumn a commercial and industrial exhibition was held in one of the principal cities in Germany, and a special section was devoted to photography. The awards made by the official jury gave rise to considerable discontent, and two of the exhibitors telephoned to Herr Grundner, inquiring if he would undertake to examine the pictures and give an opinion upon the awards. Like a prudent man, he declined unless a committee of three could be formed to undertake the work. Herr Schultz-Hencke and Professor Bruno Meyer consented to act in conjunction with Herr Grundner, and the result of their visit to the exhibition is published. Taking the pictures which received the awards of the official jury and the

order of merit in which they were placed by the three censors, whose names as photographers command respect in Germany, we have the following interesting comparison:—

Awards of the official jury ...	1	2	3	4	5	6	7	8
Censors' order of merit ...	3	7	1	6	5	2	8	4

It will be seen that both juries agreed only as to one exhibit—the fifth. Further inquiry disclosed the fact that the official jury was composed of a music conductor, a Court musician, and a well-known photographer, of recognised ability, who had retired from business for some years and turned his attention to other pursuits. It appears that the awards were not made purely upon the ground of merit, but that other considerations had weight with the jurors. Certain exhibitors were favoured because they belonged to the State Association, and in some cases, where this condition was fulfilled, priority of social position had decided the matter. We hear something of private influence in the makin of awards at our own exhibitions, but we have not arrived at this stage of favouritism. We recommend English photographers to keep a sharp eye on exhibition juries, and to insist that they be composed of none but photographers of high standing, whose names command respect.

* * *

Three-colour Work in Portraiture. In our "Ex Cathedra" notes of the 11th April we drew attention to a very beautiful specimen of three-colour photography by Dr. Miethe, which was issued as a supplement to "Das Atelier der Photographen." It was the portrait of a girl sitting in the open, with a distant background of green foliage, shading herself with a red sunshade. Dr. Miethe has had numerous letters addressed to him on the subject of this photograph. Some inquired, even, if the picture had been coloured. In reply to those who wish to ascertain if the process is one within the reach of the professional photographer, Dr. Miethe, in a supplementary article, expresses his opinion in the affirmative. It is evident that the beauty of this photograph depends upon the careful selection of the subject, presenting, as it does, a striking contrast between the red tints of the sunshade and the green tints of the foliage. But Dr. Miethe is also to be congratulated upon the very careful selection of the light filters and the excellent panchromatic emulsion he has prepared. The inks used by the printer must also have received special attention. Returning, however, to the question of the practicability of producing three-colour portraits, Dr. Miethe thinks the time is at hand when it should be worth the attention of the professional photographer. The sensitivness of the plates fits them for studio work, with rapid lenses under favourable conditions, and the collotype process should give excellent prints, if the number required is not large. For book illustration the process print is, of course, the most useful. We have heard, for many years past, complaints of the degradation of professional photography through the facility with which presentable work may be done with gelatine dry plates. In the collodion days, when scrupulous care in manipulation was necessary, the number of successful workers was fewer, and the prices more remunerative. The three-colour process gives plenty of scope for individual skill, and if there is any real desire for more difficult work, which will command higher remuneration, and at the same time attract the public to the studio, we think professional photographers who wish to distinguish themselves might with advantage turn to three-colour portraiture.

Photographic Permanence. That portion of the paper read before the Franklin Institute by the retiring president, which appeared on page 467 of our last issue, should be read by all amateurs and professionals of the present day with interest. Much of the address was devoted to the work of the Amateur Photographic Club, 1860-64, and special reference was made to the permanence of the prints circulated by its members. Dr. Himes says that Professor O. N. Rood writes him, "I also examined the prints received from members of our club; they were as good as new." Coleman Sellers states, "A great many of these are in an excellent state of preservation, running through the work of the various members of the club." F. F. Fassitt "reports that prints on albumen paper afford greatest claim for permanency. Prints made of the Sanitary Fair, 1864, being exposed to changes of light and weather in his library since then, have retained their brilliancy, without the least sign of deterioration." Reference is also made to other prints on albumen paper made about the same time. One is specially referred to, a print of the full moon by Rutherford, which shows no change, although the mount was very perceptibly discoloured. These prints were all the productions of amateurs, but mention is made of others produced by some of the first-rate professionals that have almost faded out of sight. The author of the paper says that the high permanence of the club print is to be attributed to the character of the workers and their extreme care in the manipulations, and the limited number of prints dealt with at a time, which made greater care possible. In summing up this portion of his subject, Dr. Himes says, *"The practical lesson of the prints is that permanence is perhaps not so much a matter of process as of conscientious care in carrying out the conditions of permanence with any process."* The italics are ours. It will be noted that these prints have been done some forty years. It would be interesting to learn what proportion of the prints produced by amateurs, and for that matter many professionals, at the present time will be as good forty years hence as they are to-day? We put this query not because the present-day papers may not be capable of yielding them if the same care and attention is bestowed upon their manipulation; but is it given? In face of the thousands of unchanged silver prints, forty, and upward, years old, it may be asked, with all the theoretical and practical knowledge acquired since they were produced, is twentieth century photography, as regards permanency, what might be expected either amongst amateurs or professionals? Here is another interesting point, alluded to by Dr. Himes in his paper, with regard to the keeping quality of dry plates. He mentions that Mr. Shriver found some tannin plates that had been stowed away, forgotten, in an outer room, where they were exposed to variations of temperature, but were kept perfectly dry. Yet they developed just as good as if they had been exposed in 1863, instead of thirty-five years later. Evidently the retiring president of the Franklin Institute is a photographer of the old school, but he has no reason to be ashamed of the results produced by it.

* * *

Duty-Free Pure Alcohol. Photographers are not so largely interested in the price of alcohol as they were in wet collodion days, because, for the majority of purposes for which it is employed in photography, the methylated answers as well as the pure spirit. There is, however, a prospect of the pure spirit being obtainable for manufacturing purposes free from the present heavy duty. When the Finance Bill was under discussion in the House of Commons on Wednesday last week, Mr. Haldane moved a new clause with the object of

providing for the use of pure alcohol in certain manufactures without the imposition of the spirit duty, and the Chancellor of the Exchequer agreed with the clause, so there is every prospect of a duty-free, pure, spirit being had in the near future. At the present time several manufactures in which methylated spirit cannot be employed are heavily handicapped on account of the prohibitive price of the pure alcohol on account of the heavy duty upon it. Hence the trades, to a great extent, have gone to Germany, where duty-free alcohol is allowed for manufacturing purposes, of course, under certain restrictions. Were it not for the duty pure alcohol might be sold here for the same, or less, than the methylated article, because the wood naphtha, of which ten per cent. has to be added, is really dearer than the alcohol itself. In the manufacture of collodion for the wet plate process the methylated spirit would not do much harm if a rectified or refined naphtha were permitted in the methylating. But this the Inland Revenue will not allow. Samples of all the naphtha used in methylating have to be submitted to the authorities, and unless they are of a very crude kind they are rejected. For some time after methylated spirit was first allowed to be sold duty-free it could be obtained of a strength of .805, equal to commercial absolute alcohol, but after a time this was not allowed to be sold, and now the strongest methylated spirit obtainable is from 60 deg. to 65 o.p., about .830 to .825. This by itself is not strong enough for a good collodion for the wet collodion process, even if the wood spirit in it were good. Hence .805 is generally used for the plain collodion, and .830 for the iodising solution. Were it not for the duty on the alcohol iodised collodion could be sold for less than half its present price, and still carry as much profit to the makers. In Germany, we believe, methylated spirit is sold duty free, and without restrictions, and this contains but five per cent. of wood spirit, and of a good kind, whereas ours contains ten per cent. of a very crude sort, with the addition of a certain proportion of mineral spirit, which is specially harmful for many photographic purposes. It is true that methylated spirit may be had without this latter addition, but then the purchaser must first obtain a license from the Excise. It costs nothing, but the holder is bound to give a bond, and to purchase the spirit from an authorised methylator and in quantities of not less than five, or ten, gallons at a time. He is also, at all times, open to a visit from the Excise officer. We doubt not that when the duty-free spirit is allowed, if it is allowed, the restrictions upon its purchase will be very stringent indeed, so that small users must not expect too much.

Competition for the "Galileo Farraris Award."—The committee for the Galileo Ferraris Award," which was instituted in 1898, being composed of the representatives of the Executive Committee for the General Italian Exhibition held in Turin in 1898, of the Chamber of Arts and Commerce, of the R. Academy of Science, and the R. Industrial Museum in Turin, have determined to open an international competition for the award of said prize on the occasion of the unveiling of the monument to that illustrious scientist in Turin in the latter half of the month of September next. The award is of 15,000 Italian lire (£600), together with the compound interest thereof accumulated since the year 1899 up to the day of the award, and it shall be granted to the inventor of some practical application of electricity, from which some noteworthy progress may arise. Competitors may produce either pamphlets, schemes, and drawings, or machines, apparatus, and contrivances concerning their invention. The jury, composed of the aforesaid committee, shall have full power to cause practical experiments to be made upon the inventions entered for competition, and upon the relative apparatus, contrivances, and machines. Competitors are to file their application and deliver their works, machines, apparatus, and whatever appertains to their invention, not later than six o'clock p.m. on September 15th, 1902, at the office of the Secretary of the Committee, care of the Administrative Committee of the First International Exhibition of Modern Decorative Art, in the buildings of the Chamber of Commerce and Art, 28, Via Cappellette, Turin, Italy.

ABOUT BACKGROUNDS.

The present being the season when portrait photographers usually overhaul their "properties" for repair or renewal, it will not be inopportune to discuss a subject which may be truly said to be of growing importance. Time was when a photograph was by many considered perfect only when the background was of a uniform flat, dead tint, devoid of gradation, and free from pictorial suggestion, the only available help in the latter direction being some atrocious third-rate theatrical scene-painting, setting at naught all canons of taste and fitness. A few pioneers showed the great improvement that was possible by the artistic use of light and shade in the plain background, though, in this connection, it must be admitted that some of the greatest painters of the present day do not disdain to use a flat and uniform background to their "head"-size portraits, and this has been advanced as an apology for flatness in photographic backgrounds, quite disregardful of the fact that the two cases were not comparable, the effect of contrasting colours in an oil-painting tending to destroy the effect of monotony of tint. There is, however, nowadays, a pleasing contrast to this state of affairs in the really excellent and artistic variety, and extensive variety, in the character of the backgrounds purchasable at most of the large photographic emporiums—backgrounds plain, plain shaded, clouded, and pictorial, the latter often being made in imitation of those adopted by the great British painters of a century or more ago.

As the question of the type of pictorial background to adopt is so much a matter of taste, it would scarcely become us to press our own views upon our readers. We can scarcely avoid making one remark with regard to a type including an extensive outdoor view, such as a landscape or seascape, with distant horizon. These as still painted usually have a grave defect in that the line of the horizon is almost always placed ridiculously low. Now, it is a well-known axiom in drawing that the horizon is placed at the height of the eye. It therefore follows that, assuming a sitter of average height, the horizon line should be just about running across the head. This might vary according to a sitter's height, but only to a slight extent. Hence, if a portrait be taken with the horizon line placed about the height of the hips, it is false to all canons of correct drawing, and could only be correct if the artist were seated when viewing his subject. Again, too, the placing of the horizon would be less incorrect if the subject were a little child. This incorrect placing of the horizon obtains in almost all the scenic paintings both from America and the Continent. We may here interpose the remark that it is to America we owe the introduction of high-class paintings for this purpose. They were, and are, rather costly, but in our view are well worth the price charged. Nevertheless, they have initiated a school of painting, and imitators or disciples now abound, and their products are obtainable at a very much lower price, and of a quality by no means contemptible, so much so that no one can now offer as an excuse for bad work the high price of good backgrounds.

As one further remark, only from an artistic standpoint, we may say that among leaders in portrait photography there is of late a tendency to employ pictorial backgrounds decidedly dark in tone, and when plain grounds are used to keep them dark, and finish in an oval or circle rather than "vignette," a style of finishing very much less adopted now than a few years ago.

We have paid particular attention lately, when visiting studios, to note the method of storing and hanging these necessary adjuncts, and we find that there are two more plans adopted—first, the stretching upon a frame, which

is moved either by hand or mounted on feet with castors, or, secondly, rolled up upon wood or two rollers, which are brought into use either by being placed in one or other of the frames now made for the purpose, or merely suspended and unrolled when wanted. Referring to the rolling method first, we may describe one adaptation which greatly pleased us. The lath upon which the linen fabric was nailed was supplied with hooks, which could be attached at will to a line and pulleys, and drawn up or down to an exact height as required. It will be readily seen that by this plan the difficulty of the wrongly-placed horizon that we referred to can be, and at little cost, rectified almost to any extent, as also can any particular portion of the picture be so brought into position with regard to the sitter as to make the most harmonious composition in line, or *chiaroscuro*. This, though a very simple matter, is one of cardinal importance.

As to stretching upon a framework (there being a ground on each side), it was explained to us that the objection to those built up with feet and castors was the room they occupied, so that, unless the studio were capacious, they were always in the way, as, even if an attempt to nest them were made, they could not be brought nearer to one another than the length of the foot, which projected from 15in. to 18in. on each side, this being the minimum distance apart. A particular advantage attaching to this mode of mounting is the facility with which the whole could be moved to any required angle, and so render it possible to have a dark or medium tint from one and the same background, according to whether it was turned to face to or from the dominant light of the studio. One objection urged against the mounting on frames was that they were so easily damaged or dinted if accidentally knocked against or pushed by a hard object—a piece of furniture or a sitter's elbow, for example, such dint remaining for days or weeks, and spoiling any picture it was used for. This objection had good grounds for being sustained, but a method that has more than once been described in these pages satisfactorily remedies matters. It is simply to prepare the framework beforehand for receiving the ground by first covering it with calico, and pasting thereon (on each side, of course) three successive layers of white lining paper. When the three coats are thoroughly dry, there remains a strong, tough, semi-elastic groundwork, more like strong cardboard, to act as a backing for each pound. It must be a very strong blow which would cause a dint in this material. A caution may be given here. When pasting the paper upon the calico one layer must be applied on each side before putting on a second. If all three coats were put on one side before treating the other the stress after drying would be so great as to permanently warp and twist the framework. One operator informed us that it was his intention to use, instead of the paper on calico, very thin pieces of wood very little beyond a veneer in thickness. He expected by this method equal stability with a possible diminution of weight, though with regard to the latter we doubt the correctness of his conclusion. We have as briefly as possible put before our readers a description of the practice of our leading photographers in the direction of backgrounds, and we trust that will be found of real value to all whom it may concern.

A Chance for Photographers.—At no period within the time of photography has London contained so many foreign notabilities as it does just now—crown princes, princes, grand dukes, dukes, etc.—all representing the different foreign Governments at the Coronation. Of course, they are duly importuned for sittings by the leading enterprising photographers, and many will be accorded, and a good harvest some of the more fortunate amongst them will reap. A complete album of portraits of the representatives of the different nations, at this notable event, would be a great commercial success, if the prints were from the original negatives and were made by a permanent process.

"DEALERS' AMATEURISM."

"Logic," in our issue of May 30th, puts forth a query which, properly, should be altered as referring to photographic dealers. All chemists may be dealers, but all dealers in photographic requisites may not be chemists. This question of the dealer (chemist or otherwise) turning his attention to departments of business directly affecting the professional photographer, *e.g.*, the development of negatives, printing, and enlarging, and so on, as our correspondent puts it—"himself photographing objects of interest, getting the same in the papers and selling same, posing as an amateur," etc., etc.—is one which crops up from time to time. The annoying and crowning offence is, we suspect, that the said dealer or chemist obtains better terms (heavy discounts is an exaggeration) from the makers, and that this extra discount counts as so much extra profit on the work done. "Logic" goes on to ask if such a man, "calling himself an amateur," is honest? Well, now, in this matter of honesty, is it wise to start throwing stones? We happen to know one amateur who habitually stamps his mounts, "Augustus Smiles Snodgrass, Amateur Photographer, Coppice Crescent, Bayswater," or words to that effect, and is very keen on doing anything that turns up, and getting pay for it. This causes some amusement amongst his friends, but we have never heard of a professional being any the worse off on his account. There may be a slight moral obliquity on the part of this amateur, but not particularly heinous. What of the amateur who exhibits enlargements made from his negatives by eminent professional enlargers in his own name, with nothing to indicate that the work throughout is other than his own? We have heard of such individuals, but they are not a type. We know another amateur, a bank manager by profession, who prints and sells numbers of very fine prints from negatives of English landscape taken by himself, but you will look in vain through the portfolios of Valentine and of Wilson for similar subjects, and consequently we may say that no professional suffers by the work of our friend. This amateur has struck out for himself in a particular line, pleases himself entirely as to what he takes and when, and charges a fair price for work which, as a matter of fact, no other person could do quite in the same way. This may not be the purest amateurism, but there is no trace of dishonesty about it. There are many amateurs who habitually photograph off the beaten track of the professional; they over-run their county, and, it is safe to say, enrich many an album. Are photograph collectors to be confined to the portfolios of professionals? Surely not. The fact is the professional is often at fault, if the term is applicable, himself for the majority of the charges preferred by "Logic." The man who, dealer or professional, "photographs objects of interest, gets them occasionally in the papers, and sells copies, etc.," is fairly smart and up-to-date, and deserves what *kudos* and financial benefit may accrue; he succeeds because he is first in the field. The dealer rarely does much in the region of professional photography in places where the local professionals themselves are fully alive to what is going on around them. This applies not alone to the photographing of "objects of interest, etc.," but even to such work as may be done for the amateur in the way of developing, printing, retouching, and the rest. The difficulty or bone of contention comes about in a very simple way, as a rule. The dealer (often a chemist) finds his sales unsatisfactory; sees his cameras "eating their heads off," so to speak—deteriorating, in fact; notes that there are little openings which the local professionals have not touched, or do not show any inclination to trouble about. He therefore makes a little plunge himself, and, if a smart business man, with an eye for sub-

jects, does very well, and gets himself talked about—an easy enough thing to do. The professional photographer takes little or no notice of this until a dull time comes, and he has rather more leisure than he cares for; then he, figuratively, wakes up to the fact that the dealer is doing a bit on his own account, encroaching, perhaps, on his preserves. It cannot be denied that a large number of professional workers show scant respect for their amateur brethren, and do not take a deal of trouble to conceal their contempt, but they must be perfectly aware that the amateur often has money to spend on his hobby, and, properly handled, may prove a profitable customer; if he is, by this course of action, thrown upon the hands of the dealer, the latter naturally does the best he can for himself, and is encouraged and induced thereby to go in for departments of photographic practice which otherwise he would have left alone.

THE CITY AND GUILDS OF LONDON EXAMINATIONS IN PHOTOGRAPHY.

The following particulars of the Examinations to be held in 1903 are taken from the official handbook of the Department of Technology, published by Messrs. Whittaker & Co., Paternoster Square, London, E.C.]

The Examination in Photography will consist of two parts:—Section A., Pure Photography, and Section B., Photo-Mechanical Processes. Candidates may be examined in *either* of these two sections.

Ordinary Grade.

The examination in the ordinary grade of either section will consist of a practical and a written examination.

No candidate will be admitted to the written examination who has not previously passed the practical examination.

To enable candidates to qualify for the written examination in the ordinary grade, local practical examinations will be held at convenient times in the session preceding the written examination. A practical examination may be held in any town where there is a class registered by the Institute, or in such other places, distant ten miles from the class, where at least five candidates notify, through the local secretary, their wish to be examined. The local examinations will be held under the personal supervision of examiners nominated by the local authority, subject to the approval of the Institute. The date at which a local examination is to be held may be fixed at any time between January 1st and March 7th that may be arranged between the secretary of the local committee and the local examiner, provided that at least fourteen days' notice is given to the Institute of the date fixed for such local examination; and the local secretary will be required to forward to the Institute, within eight days after the holding of such examination, under the signature of the local examiner, the names of any candidates who may have satisfied the examiner of their practical knowledge of photography. The subjects of the test are given in the syllabus of each section.

The candidate for the practical examination in either section may elect to make his negative in collodion or gelatine, and his print may be produced by any of the methods in ordinary use. He will also be allowed to supply, if he so desire, his own apparatus, chemicals, etc., or he may use those provided by the local examiner. The fee for the practical examination only will be two shillings and sixpence. The fee for the written examination is one shilling.

SECTION A.—Pure Photography.

I. Syllabus.—(1.) The local practical examination will include the following tests:—To focus, expose, and develop a negative of a person or landscape; to print, tone, fix, and mount an ordinary print.

(2.) The written examination will include questions on such subjects as the following:—

1. The elements of photographic optics. The photographic camera and its adjuncts, lenses, diaphragms, shutters, shades, etc.

2. A general knowledge of the practice and theory of the wet-plate process.

3. The practice and theory of the gelatine dry-plate process, exclusive of emulsion making; the composition of and defects in gelatine dry plates; the defects of gelatine negatives, their causes and remedies.

4. Various methods of developing, fixing, intensifying, and reducing negatives, with a general knowledge of the chemicals employed.

5. Silver printing by print-out processes, including vignetting and printing in clouds, toning and fixing; contact printing on gelatino-bromide paper.

6. Retouching and spotting; mounting prints.

7. The lighting of the dark room.

8. The studio and lighting of the sitter.

SECTION B.—Photo-Mechanical Process.

(1.) The local practical examination will include the following tests:—

To focus, expose, and develop a negative of a drawing in line or wash; to prepare or etch a zinc or copper plate (a) for a process block, (b) for a photogravure plate; to make a collotype plate or a photo-litho transfer.

(2.) The written examination will include questions founded on the following subjects:—

1. Cameras and lenses for copying and process work, ruled screens, prisms, reversing mirrors, the appliances in ordinary use for electric and artificial lighting for photographic purposes, and the apparatus employed in photo-mechanical processes.

2. A practical knowledge of collodion (wet and dry), and gelatine dry plate photography.

3. A general knowledge of various methods of developing, fixing, intensifying, and reducing negatives.

4. A general knowledge of the properties of gelatine, albumen, fish glue, bitumen, resin, inks, etching solutions, and other chemicals and materials used in photo-mechanical work.

The principles and practice of at least two of the following processes:—

5. Photogravure.

6. Block making—line, half-tone, and three colour.

7. Photo-lithography.

8. Collotype.

The written examinations in the ordinary and honours grades will be held on Wednesday, April 29th, from 7 to 10.

Honours Grade.

Candidates for honours in either section must have previously passed in the ordinary grade of that section.

The honours examination is both written and practical.

The fee for the honours examination (written and practical) in either section is three shillings and sixpence.

For the year 1902, practical examinations will be held in London only, unless ten candidates at least apply to be examined in the same section (A or B) at some other centre.

SECTION A.—Pure Photography.

(1.) Written Examination.—Candidates will be expected to answer more difficult questions in the subjects for the ordinary grade, and, in addition, a knowledge will be required of—

1. The theory of the photographic image, of development, fixing, intensification, and reduction.

2. The theory of light as applied to photography, including a general knowledge of spectrum and orthochromatic photography.

3. The principles of photographic optics.

4. The theory and practical use of sensitometers for testing the speed and gradation of plates; and also their uses in printing processes.

5. The principles and practice of the preparation of gelatino bromide and gelatino-chloride emulsions.

6. Collodio-bromide emulsions, their preparation and use.

7. Platinotype and carbon printing other methods of printing with bichromates and with iron salts; enamels.

8. Enlargements and lantern slides.

9. Applications of photography to scientific and technical purposes.

(2.) Practical Examination.—Candidates will be required to show proficiency in conducting, in presence of the examiner, any of the following practical operations:—

1. To develop gelatino-bromide plates previously exposed (correctly or otherwise) by the examiner.

2. To reduce or intensify gelatino-bromide negatives.

3. To print, tone or develop, fix, and mount a silver, platinotype, or carbon print.

4. To test a sample of glass or fabric to be used in lighting the dark-room.

5. To test the sensitiveness and gradation of a plate.

6. To find the focus of a lens either corrected or uncorrected, or to examine a lens as to its suitability for different photographic purposes.

7. To copy a drawing or engraving.

8. To make an enlargement from $\frac{1}{4}$ plate.

9. To make a lantern slide by contact or in a camera.

The practical examination will be held on Saturday, May 2nd, between 2.30 and 6.30, and at other times, if found necessary.

(3.) Specimen Work.—Candidates will also be required to send in not later than April 22nd, not fewer than three or more than six negatives, not less than quarter-plate size nor more than whole-plate, together with mounted prints made from each of them by any ordinary photographic printing process or processes that the candidate may select. The negatives and prints must be accompanied by a statutory declaration made by the candidate to the effect that the selection of the subject and the whole of the work (except the manufacture of the plates, sensitive paper, and mounts) involved in the production of the negatives and prints has been done by the candidate without assistance from any other person and within the twelve months preceding the date of the examination. Forms for the declaration may be obtained from the Institute.

SECTION B.—Photo-Mechanical Processes.

(1.) Written Examination.—Candidates will be expected to answer more difficult questions in some of the subjects of the ordinary grade, and, in addition, to show a practical knowledge of the principles and operations in one or more of the following processes:—

1. Photogravure.

2. Line negatives and line blocks.

3. Half-tone negatives and half-tone blocks.

4. Chromotypography (negatives and blocks for three-colour process).

5. Photo-lithography.

6. Collotype.

(2.) Practical Examination.—Candidates may be required to show proficiency in practical operations in one or more of the above processes, numbered 1, 2, 3, 4, 5, 6, including the preparation of negatives suitable for each class of work, from (a) pictures in colour, (b) drawings in monochrome, (c) originals in black and in tints, (d) natural objects.

Candidates in section B may select the particular branch of practical work in which they desire to be examined.

In order that candidates may know what apparatus and material they will be required to provide for the practical part of the examination in section B, full information as to the practical tests may be obtained from the Local Secretary on Friday, May 1st, for the examination to be held on the following day.

The practical examination will be held on Saturday, May 2nd, between 2.30 and 7.30, and at other times if found necessary.

II. Full Technological Certificate.—Certificates are awarded on the results of each of the above examinations. For the full technological certificate the candidate must qualify as stated in Rules 41-42.

III. Works of Reference.—For the Ordinary Grade: "Instruction in Photography," Abney (Sampson, Low, and Co.); "Ilford Manual of Photography," Bothamley; "Science and Practice of Photography," Chapman Jones (Iliffe); "Wet Collodion Photography," C. W. Gamble (Hazell, Watson, and Viney); "Art and Practice of Silver Printing," Abney and Robinson (Sampson, Low, and Co.); "Materia Photographica," Leaper (Iliffe). For Honours, in addition to the foregoing: Section A.—"Optics of Photography," Traill Taylor; "Chemistry of Photography," Meldola (Macmillan); "Treatise on Photography," Abney (Longmans); "The Chemical Effect of the Spectrum," Eder; "La Photographie," by A. Davanne (Paris); "Platinotype," by Abney and Clark (Sampson, Low and Co., London). For reference: "Traité Encyclopédique de Photographie," Fabre (Gauthier-Villars); "Ausführliches Handbuch der Photographie," Eder (Knapp); "Handbuch der Photographie," H. W. Vogel (Oppenheim); the "Dictionary of Photography," Wall and Bolas (Hazell, Watson, and Viney); the "Annals of Photography," in "Photography Annual." "Photographic Optics," O. Lummer, translated by S. P. Thompson; "Elementary Telephotography," E. W. Marriage; "Telephotography," T. R. Dallmeyer; Section B.—"Modern Heliographic Processes," Ernst Lietze (Nostrand Co., New York); "Collotype and Photo-Lithography," Schnauss (Iliffe); "Photogravure," Wilkinson (Iliffe); "Photo-engraving, Half-tone Enamel Process," Whittel (Scovell Co., New York); "The Half-tone Process," Verfasser (Percy Lund); "Half-tone on the American Basis," Cronenberg and Gamble (Percy Lund); "Photo-engraving," Farquhar (Dawbarn and Ward); "Photo-lithography," Fritz and Wall (Dawbarn and Ward).

THE PRINTING OF MODERN ILLUSTRATED OR DECORATED BOOKS.

[Abstract of a Paper read before the Society of Arts, and reprinted from its "Journal."]

Two things which considerably affect printed matter are "leading" and "spacing." Lines are spaced out in depths by the use of leads, and the intervals placed between the words laterally are expressed simply by the term "spacing." As an apprentice, I was taught that spacing should be regulated according to the width of line, whether the matter was leaded or solid. Very close or wide spacing are both objectionable. The first is confusing to the eyesight, and the words seem to run into one another; whilst the second is apt to induce a sort of jerkiness in reading, that is, jumping from one word to another, and has the effect of what we printers call "pigeon holes" of white. Wide spacing tends to disintegrate the solidity of the whole page. Sometimes a yawning gap is observed down the middle or side of a page, or what has sometimes been termed by authorities a "river of white" flowing down the page. This can be obviated, although it is very troublesome in narrow widths of type. As a general rule, narrow widths in type-setting do not require the lines to be spaced out by the use of leads, but the same type that would look well set solid, i.e., without leads, in narrow measures would require to be spaced out with leads if printed in long or wide measures. This assists the eye in taking up the continuity of the lines. If the page is a large one, solid matter is best in columns—not running across the whole width of the page. As an instance, I would refer anyone to the

"Pall Mall Magazine" of the present time. Formerly, it was printed in the full width of the page, which made it somewhat difficult to read; but lately it has been printed in two columns, which renders it much more comfortable to read. This comparison applies also to book printing. Margins should be arranged so that the greater proportion will fall on the fore-edge and on the tail or foot, especially on the latter. We find this so in the illuminated manuscripts and in the early printed books. In the books printed for William Pickering in the middle of the last century a feature was made of these points, as likewise in those books that were printed for Henry Stevens.

The notion that the two facing pages of the open book should be taken as the unit is perhaps one explanation of the reason; but there are many others that may be advanced in support of the practice. One would be that in the old MSS. the greater margins would be adapted for decoration, such as borders or other designs of an ornamental character, which often overflowed into the margin. Another is that the extra width at the side served for annotations or marginal notes. Besides, the deeper margin at foot permitted the book to be handled without obscuring the reading matter, and in the event of a book being re-bound, which does happen sometimes, those two edges which have been subjected to the most wear and tear have enough to spare, should it be necessary to trim them, to make them tidy. These margins are, in some few cases, perhaps, too exaggerated. To arrive at some sense of proportion is not a rule of thumb, but one must be guided by the size of type employed and the size of the page. Books of a large size, such as a quarto, demand more margin than an octavo. This considered, the next thing is to adopt a type area which will bear some relation to that of the paper, and the united margins of tail and head should be more than those of the back and fore-edge combined, so as to allow the greater depth at foot. The smallest margin should be in the back of the book, so that when the volume lies open there would be some sense of connection between the two facing pages. In fine books, the double margin between these two pages should be, roughly, equal to the fore-edge, so that the three parallel margins are practically the same. The head margin is best with a trifle more than the back, and that on the tail should be the largest of all. Taking, for instance, the total area of a crown octavo page (which measures in height 7½in., by 5in. wide), a fair proportion, as regards width, would be about one-third margin to about two-thirds print; but in height the proportion of margin should be slightly more. If one were to take a book in which the margins have been so arranged that the print falls in the dead centre of the paper, it would be apparent that something was wrong, and even though the margin was equal all round, the general effect would be that the top had more than the foot, and the back more than the fore-edge. This alone should persuade the most inexperienced that it is necessary to increase the outer and bottom margins in order to counteract this effect. I ask you to compare any two books printed with the different kinds of margins now specified. The effect of margin is just now being admirably demonstrated to the "man in the street" on the London County Council hoardings in the Strand, hard by the new streets now being formed. The innovation is certainly a good one, and should be an object-lesson, for it shows that a surrounding margin will improve even a huge broadside. It is worth while to remark at this point that the printing of posters has improved in a general way during the last few years, and some really good broadsides are occasionally to be seen—one of a decorative character was that of the London School Board during the past two sessions, announcing the Continuation Schools. Possibly the fashion for the collection of such things gave an impetus to broadside printing, just as it did to bookplates when that cult came into vogue.

The question of paper is also very important, and one which this Society has already set itself the task of investigating. For durability that made by hand is the best, but this kind is not used for the average illustrated book, especially that in which the half-tone process is adopted. Paper which is made exclusively of linen and treated with animal size should stand the test of time, but one cannot answer for the cheaper kinds of hand-made papers. For an *édition-de-luxe* the question of paper need not be considered very much, because in a limited number of copies the total cost is no large amount, and such editions usually command their price. Certain illustrated works may be printed on these hand-made papers, but the illustrations must be of a purely outline character in order to print clearly and sharply. Designs of decorative character are suitable, and one need only refer once more to some of the Kelmscott Press volumes to see with what degree of success such designs have been printed. Many of the machine-made papers of the present day are mere shoddy, and it is seldom possible to obtain from stock a decent all-rag printing paper. Such a paper can be made by a few special mills, but I feel very dubious about some of these so-called rag papers being made exclusively of that material. In the machine variety many kinds exist, and a good many of these are to be shunned at once if the durability of the book is to be studied. Half-tone block work demands an absolutely smooth surface, which is an unnatural one, and is only obtained by unduly rolling or calendering, or even coating the surface with some foreign substance, usually of a mineral nature. Either kind is objectionable, but especially the latter. The best half-tone process blocks, from a pictorial point of view, are those produced by the use of the finest possible screen. This screen or almost imperceptible network, is employed in photography to break up the surface, as it were, in order to impart the necessary medium for varying tones or shades of the picture. To obtain the best results in printing from these blocks it is necessary to print on an absolutely smooth paper; in fact, the higher the surface, the better the printing is brought out. So far, no way out of the difficulty has been discovered. Type on this class of paper looks poor and weak, and it is best, if possible, to give half-tone blocks a different treatment from that of the text: that is, to make separate plates of these illustrations; and if they happen to be of a small kind, group them together to form distinct pages. These can be printed on the necessary but objectionable paper, and the text on a more natural one. Perhaps the solution of this difficulty will be found in some after-treatment of the sheets when printed, and some experiments which I have made in this direction have been fairly successful; but I am trying at present to develop a more simple way, which will rid us of the obnoxious features of this paper. These loaded or mineral-coated papers have some other bad features, and one particularly is that of weight. If we take any two books of the same bulk and size, one being printed on this so-called art paper and another on ordinary paper, especially that of an antique laid character, an extraordinary difference is observed in the weight. Unfortunately, this is not all, for the glare and shininess is bad for the eyesight, and even the mere handling is objectionable. Besides this, there is the perpetual anxiety for the ultimate condition of this kind of paper, because we well know that the artificial facing is of a perishable nature, and must sooner or later decay and possibly become discoloured. With regard to press-work, this is a general term for printing off, whether by hand or by power. The hand press has done wonders in its time, but the power press has spoiled the hand pressman, for he

would sooner be a "machine-minder." I am no conservative in this respect, for it is no secret that the old painstaking pressman is practically extinct, and if a lad is apprenticed to a firm where both methods are employed, he counts the days and months that must elapse before he can "mind a machine." All good work was done by hand at one period, for the reason that there was no alternative; but there is no need for the general printing office to cling to old methods, for printing machinery has so vastly improved nowadays that equal results can be obtained, provided the workman is intelligent. In fact, it is possible to do all that modern conditions require on a power machine, and, on the other hand, it would not be possible to obtain everything from the hand press, even if the men could be found to undertake it. This applies particularly to the printing of books illustrated with half-tone blocks. For small offices or private presses the hand-press serves admirably, and will do all that is required.

I well recollect the late Gleeson White, in a paper which he read on "Drawing for Process Reproduction" before this Society some few years ago, remarking that modern printing had come to stay, and that its conditions forbade a return to the more archaic methods. This opinion I cordially endorse, but what I consider is necessary is for us to adhere to some of those principles which our predecessors laid down, and to avail ourselves of modern methods in their application. The conditions of our time demand this, and what we have to do is to create fresh standards, without being slavishly influenced by any definite or dogmatic canons. A reference, however, to the old masters of printing will certainly help us to formulate and set up new ideals. But to do this it is imperative that the co-operation of author, publisher, printer, and bookbinder be obtained. This was insisted on by Henry Stevens in his little pamphlet, "Who spoils our New English Books?" The treatment accorded to the making-ready or preparation for the printing of wood-cut blocks, and of those made by process is quite different, especially for those by the half-tone method. Formerly the degrees of light and shade were obtained from the wood-cut by lowering the block in certain places where light effects were desired, and the solids were left standing in the original height. We have the authority of Papillon, the French authority of the eighteenth century, for this. With the introduction of engraved wood blocks, another method had to be employed in order to secure the different degrees of tone, and these gradations were brought out by overlaying with various layers of very thin paper cut to the required size and shape. This was first assisted, where necessary, by underlaying the block itself. This having been done, the overlays are made from, say, three pulls taken on a fairly hard paper; the light or high tints being cut out in the first case, and in the second and third pulls the medium tones and solids would be also cut out, and such pieces then affixed respectively to the first one. By these means the full results of light and shade are obtained when this overlay is put into the exact position. It is, of course, necessary that the workman should have some artistic appreciation before a good result is obtained. With half-tone illustrations quite another method must be employed. It is absolutely necessary that the block be very truly underlayed, in order to bring it up to the exact type level—some prefer a trifle higher—and also that it be equally level at the four corners, without any rocking on its base of wood or metal. This having been done satisfactorily, little or no overlay is required for the proper printing of these illustrations. Given the proper ink and paper, with a hard and sharp impression, this is all that is necessary. Any drag or slur on the impact of the printing surface with the impression cylinder of the machine is most detrimental to the finished print. I have referred to the beauty and depth of "colour" of the black ink used by some of the old masters. The printer formerly made his own ink, and he was a wise man in his own generation. Nowadays the modern printer buys all his ink, and as a rule the secret of what is called "the art and mystery" of printing lies very largely in the ink. In these days of chemicals one hardly knows how inks are made, because they have to be adapted to the modern requirements of shining paper and process blocks, and what are considered full or good effects are only arrived at by the use of some stimulant, usually a chemical or mineral, and then one never knows the ultimate result. I have seen, by the use of improper inks, some very alarming results. For good paper, whether hand-made or otherwise, it is essential that a fine carbon ink be used. Any so-called bloom or sheen is usually obtained by the use of a metallic or other substance, which is sure sooner or later to develop some chemical action. For plain type printing a perfectly pure pigment must be used, but, unfortunately, for the satisfactory working of half-tone blocks the ink has to be very considerably doctored for fast running machines. A comparison of the bulk of impressions with the engraver's proof is not always a fair one, because an ink giving good results for single proofs would be quite unworkable on a machine that may only be running at an average rate. A good deal has been written and said about the "sixties" in the annals of illustration. In some respects I think the glamour connected with this period is not always deserved. True, there were many capable artists, and many came to the front. Much of the work was well designed, but it was not always well engraved—at least, that is my opinion—and some of it would have been better if it could have been processed, which of course was not possible at that date. Having ventured this opinion, I will go further, and say that very many of the books of that period were anything but the "fine art books" they profess to be. I say this to the detriment of my own craft, for I cannot help thinking that with proper consideration the general get-up of many of these volumes could have been better designed, and, what is more, better printed. In surveying the English illustrated book of the first half of the nineteenth century—that is, from the time of Bewick up to the sixties—I find that a great many books of representative character emanated from the Chiswick Press. These books are both of pictorial and decorative character, and many were done in conjunction with William Pickering, the publisher, who died in 1854. The shape and form of these books was only arrived at after a great deal of deliberation and experiments. This the late Henry Stevens tells us in his little brochure already mentioned, which I would advise all to read, for it will be to their advantage. In this little work he respectively applied the lash to the author, publisher, printer, and binder, and much of his trenchant criticism was deserved. To render full justice to the new school of engraving, it was necessary to employ special methods in printing, and it is a tradition of the Chiswick Press that overlays, the use of which has already been explained, were first used in that establishment, though I have read of a French claim to that innovation. At any rate, Mr. Whittingham was one of the first to practise overlaying, and to bring it to perfection, so much so, that it is said that Bewick was fairly delighted with his treatment of wood engravings in printing. Mr. Whittingham's tombstone in Chiswick Church records that he "attained considerable eminence in his art, particularly in the printing of wood engraving."

We must all regret the decline of wood engraving, for, in connection with type printing, it was the true method of illustration. It was capable of giving much decorative expression

that can scarcely be hoped for in any mechanical process. It is, however, some consolation to know that methods of reproduction have improved so much that it is possible, with a due regard to the altered circumstances, to obtain good substitutes for hand-engraved work. In some cases, facsimile line work may be even better rendered by process. If we wish to see how far process has succeeded, we have only to refer to the reproductions of the work of two such very different artists as Mr. Hugh Thomson and the late Aubrey Beardsley. Here are the two extremes of method in drawing. In dealing with process work, I propose only to consider such blocks as can be printed with type, and not the other methods which require quite a distinct and separate treatment in printing—such processes falling under the heads of photogravure, lithography, or those using gelatinous films. The closing years of the nineteenth century saw the rise of process work, which created the almost universal demand for illustrated literature that could be both expeditiously and cheaply produced by the various methods in vogue. Photography does not lie, though it may distort; therefore I consider that there is no degradation in the reproduction by mechanical means of drawings in line. When we consider this advantage, and the fact that any block for printing purposes can be produced quickly, and at a nominal expense, it is easy to account for the great demand for blocks mechanically produced. In former times the artist was somewhat at the mercy of the engraver, for, whether the original picture was drawn on the wood direct, or photographed thereon, as was the custom in the latter part of the century just closed, everything depended on the engraver—for it was he who gave the expression or interpretation to the artist's work. It is true that artists were sometimes engravers too, but such cases were rare. Naturally, some of the very best examples of wood engraving extant are those which were both drawn and engraved by the same individual. With regard to the blocks executed by the half-tone method, which reproduce surfaces rather than thin lines, either direct from nature—that is, from a photograph taken direct from an object, or from drawings made in wash—there is room for difference of opinion. Without doubt, there is not the artistic merit in these productions that may be found in the other process, but I think we shall all agree that this method has greatly improved during the past few years, and that the high-water mark of excellence has been very nearly reached. The results, so far, are mechanically very ingenious and most marvellous, even if we do not think the general effect artistic. Such blocks are very much improved if afterwards engraved on by hand, as in the case of many of the illustrations appearing in some of the American magazines, but this requires much practice and considerable feeling if it is attempted; otherwise the labour is in vain. Vignetting of half-tone work is a thing that our cousins seem to have brought to greater perfection that we have.

CHARLES T. JACOBI.

OXFORD Photographers and the Cambridge Convention.—The Photographic Convention of the United Kingdom, which made such a stir among Oxford photographers last year, when it visited this city, will this summer honour Cambridge with its presence, and according to all accounts there is every prospect of a good meeting in the town of the sister University. It is generally hoped that a number of local photographers who took part in last year's convention will keep up their connection with the meeting by paying a visit to Cambridge from July 7th to 12th, for it is wonderful how many local residents have never had an opportunity of comparing the two University towns, although they lie so comparatively close together. What with the fine weather and the energy thrown into the affair by Mr. Norton, last year's meeting at Oxford was considered one of the most successful that the convention has ever held. This appears to have so aroused the friendly rivalry always existing between Oxford and Cambridge, in city as well as University affairs, that the latter are moving heaven and earth to outdo our efforts last year.—"The Oxford Times."

DIFFICULTIES OF PICTURE-MAKING BY PHOTOGRAPHY.

[A Paper read before the Edinburgh Photographic Society, and reprinted from its "Transactions."]

EVERYONE who attempts seriously to face the work of picture-making by photographic means finds himself continually pulled up short by the limitations of his materials. At the very outset of his career he meets the limitations of light, and a plentiful crop of under-exposed negatives soon convinces him that the photographic plate cannot, like a cat, see in the dark. I need not say any more of this limitation here. The only rules that can be laid down are such as are issued by many plate-makers, while the only application of these rules is that which comes of many experiments and many failures. Nor is it my intention to say anything of the limitations of colour, beyond warning the would-be photographer not to be carried away by its fascinations, but before exposing to try and translate the colour-tones of his subject into monochrome, and thus judge of its suitability in that respect. Rather do I wish to call your attention to-night to the limitations in the choice of a subject, and in the power which a photograph has of expressing the individuality of the artist—two limitations which, I think, press with peculiar weight upon the photographer. The art of photography is a very much less plastic art than that of the painter. The painter may move mountains and divert the course of streams; he may transplant trees or build castles in the air to suit his fancy; he may prune away all foliage, or, like the Indian conjurer, he may by the magic of his brush call graceful branches into life to adorn his handiwork; but for the photographer the branch that grows before the plate is the branch that he traces upon the plate, and the river that flows through the meadow remains true to the course that Nature intended for it. This impossibility of in any degree materially altering his subject imposes upon the photographer a very much stronger necessity of choosing his subject carefully. His choice is much more limited than that of the painter, for he can only take those bits that compose themselves. But the question still remains, what subjects are to be chosen? Nature abounds in beauties, but not all are suitable for the camera. How then am I to choose? And it is when I come to try and answer this question that the full difficulty of my subject presses upon me; for it is all a matter of taste, and about taste it is proverbial there is no arguing. We talk of a canon of taste, but none of us can define it. Those who feel it for themselves know what it is without any definition, and for those that know it not there are no words that will suffice to explain it; and in addition to those who know there are those who merely think they know. Some men are kings in the realm of beauty, others are merely pretenders, but in the words of the old Jacobite rhyme:—

"Which is Pretender and which King,
God bless my soul, that's quite another thing."

But though it is impossible to lay down any absolute rules in matters which must always have a final appeal to arbitrament of taste, we may, I think, get some assistance by considering the points in which the beauty of a picture differs from the beauty of Nature. Nature is so lavish in her beauty, so broad and magnificent in her effects, that any attempt to reproduce her features must necessarily fail. A small canvas, limited as it is by its size and its flatness, can never really reproduce the breadth and the depth of Nature. The best that the artist can do is to suggest these elements. A compromise must be introduced, and so we find ourselves often compelled to suppress detail in order to emphasise effect. Then again a picture is confined by its edges; Nature has no bounds, and the result of this is that while Nature may paint a thousand pictures on her canvas, and allow one picture to overlap another until

there is what an artist would call a hopeless incongruity and confusion, the limited size of a picture calls out above all things for unity. It is the failure to realise that Nature makes no such demand for unity, but may run her pictures into one another in hopeless confusion, that is at the root of so many unpictorial photographs. People forget that everything which is beautiful in Nature is not necessarily suitable for pictorial reproduction; nay, more, that that very blending of a thousand beauties which is in Nature so infinitely soothing may, if literally embodied in a picture, become distracting to the very verge of madness. Just as in Nature every bird sings his own song, and each bee hums his own note among the flowers, and all that confusion of sounds which have no musical relation to one another is beautiful which in art would be indescribably horrible. So then it comes to this: the beauty of Nature may be, and usually is, found in profusion, the beauty of a picture must, whatever else fails, be found in unity. And this word unity may be applied in many ways. One main high-light, one chief shadow, suppression of detail to prevent the eye from roving, unity of conception, unity of line, that is all the lines of a picture so harmonising that they lead the eye naturally to one principal point. Again we talk of massing our lights and shades, but that is also part of the same idea of unity; we mass our lights and shades, in order that they may take their proper position in the whole pattern of the picture. In short, while Nature has other ends and aims to fulfil beyond the mere expression of beauty, it is the one reason which a picture has for its existence; rob it of its beauty, and it becomes a mere daub; and so it calls for a finish and completeness which is in no wise necessary, and which, as a matter of fact, is but rarely found in Nature. And by that word finish I do not mean so much a delicacy in the manipulation of minutiæ as a certain completeness and satisfying power in the conception of the picture, not so much a putting in of everything as a leaving out of all that distracts. A good picture should not leave the impression that all has been said that can be said, but rather that nothing has been said that does not help to elucidate its main idea. In fact, it should always be felt that there is something left to the imagination of the critic, something suggested by the artist, but not fully expressed. Having then grasped the idea that the beauty of a picture must consist of two things, grace of form and unity of conception, let us try and apply these theories to the practical work of choosing a subject.

Imagine that you are walking through a wood with your camera on the look-out for some good subject. You pass many beautiful bits, but you do not stop. The woods are always pleasing, but there is nothing here to tempt you to take one bit more than another. But as you walk you suddenly come upon one tree which stands out distinct from its neighbours by reason, it may be, of its size, or because it is somewhat isolated, or it may be a silver birch among dark-trunked trees. In any case, whatever the reason may be, there is something about it which suggests to you that it will make a principal feature that will stand out more prominently than its surroundings in your picture. It may be that you are wrong, and on closer examination you find that it fails to satisfy your taste. Prominent though it is, it may want in grace, or there may be no standpoint from which to get a good view. Or beautiful though it may be in itself, perhaps its surroundings are distracting and unpleasing, and so you pass on. But it is some such distinctive quality as I have described that will in all probability first attract you to your best subjects—something that will form one chief mass of either light or shadow in your picture. Or again, you may be attracted, not by the distinctive qualities of size or position or colour in your subject, but by some peculiar grace, the beautiful droop of a branch, or the pleasing line of a trunk. In this case, as your subject contains no prominence in itself except its own peculiar grace and beauty, it falls to you, as giving expression to that beauty, to obtain for it some artificial importance in your picture. You can do this by so choosing your lighting that your principal feature stands out in peculiar prominence, or by so choosing your standpoint that the surrounding lines of the picture naturally lead the eye to the principal point, or by so turning your lens that your main subject occupies what is termed the strong point in your canvas. The ideal picture will be carried out on the lines of all these three methods to perfection, but, as a matter of fact, when you come to choose your point of view, you will find that in almost every case this is impossible. The point of view from which your subject is best lit will in all probability be a point in which the surrounding lines distract rather than support, or the point at which the lines harmonise will be a point from which it will be impossible to place your subject strongly on the plate without including on one side or the other some distracting or unpleasing object. And so the necessity for some sort of compromise is introduced. But how this compromise is to be effected is a matter which cannot be carried out by rule. I can only give you two hints. In the first place, of the three lines which I have indicated, and between which you have to find the happy mean, the last is the most important. If your subject is weakly placed on the plate, no other virtue will altogether atone for the fault. And my second hint is this: Do not despair because the lines of your compromise are not revealed to you at once. Let your motto be, Time enough yet, not in a spirit of procrastination, but in a spirit of study. If possible, visit your subject day after day. Free your mind from the trammels and limitations of the photographic art, and consider how you would treat the subject if your were a painter and had at your command the full freedom of the brush, and having thus formed in your mind's eye your ideal picture, try and find the point of view which most nearly approaches thereto. Most of us have to wait until we get home before we can see the result of our holiday work, but if you have a dark-room at your disposal, you will find a trial exposure of great help. A rough untoned and unfixed P.O.P. print placed on the mantelpiece of an evening, and studied while you are enjoying your smoke and your whisky, you will find greatly aid you in reducing your abstract ideas to some concrete form. Very often some slight effect of lighting in a rough print will give you the longed-for inspiration. Then when the inspiration comes, seize it at once. You have got your subject, do the best you can with it.

But how am I to do the best I can with it? How am I to obtain for my work that individuality which will distinguish it from the work of any other photographer who may make an exposure from the same point of view? If you were to choose a subject and settle upon the point of view, and then ask six artists to paint it from that point, you would have six very different sketches, each bearing something of the individuality of the artist who painted it. Unless we photographers can obtain some means of putting a like individuality into our work, I am afraid that we must abandon all claim to call our work more than a pleasant hobby, a means of producing pretty things, a useful adjunct to the man of science, a good process of reproduction—any compliment, in fact, that you choose, except that of including it among the arts. So that the next question I am going to discuss seems to deal with the very life and existence of the artistic photographer. Are there then any means by which we can hope to produce such

a result? In a small degree, in a very small degree, I fear, and yet in a degree sufficiently large to justify the photographic art in raising its head above the mere mechanical process, we can, I think, find such means in the much discussed, much abused, and often badly done process of faking.

As to how far faking is allowable, I have not time to-night to discuss to any length. I shall content myself with stating shortly my own views, which are, that you may fake to any extent you like, provided that you do it in such a way that it cannot be found out. The laying on of colour on a photograph is abhorrent to me, not because you are departing from what purists call "pure photography," but because it is impossible to do so without being found out. The texture of colour laid on with the brush is so entirely different from the texture of the photographic deposit that you get a hybrid, a thing neither photograph nor painting, an obviously faked thing. But if the retouching has been properly done on the negative, there is none of this incongruity of texture. The colour is all laid on with the same style of touch, viz., the peculiar style of the photographic deposit. This then is my one test of successful faking. Whatever alterations may have been made, and whatever means may have been employed to effect these alterations, the final print must show a unity of style, and for this reason I strongly recommend that all retouching, except the mere spotting out of blemishes, be done on the negative.

There are several methods of retouching the negative. Some people use matt varnish on the glass side of the negative, others tissue paper; others put retouching medium on the film side; while others use paper negatives which can be pencilled on. My own usual method is matt varnish. Covering the whole back of the negative with the varnish, I remove it from those well-defined parts which I wish to print more deeply. It is impossible to remove the varnish so as to leave anything but a sharply-defined line. Where it is desired that the deeper shadow shall gradually blend with the lighter parts, it is necessary either to darken everything on the negative with pencil except the part that is desired to print deeply, or else to make a transparency and work on it. Pencilling on the varnish is very simple, calling for no technical skill. I merely pencil lightly over the parts the printing of which I desire to restrain, rubbing the pencil marks with a stump or the end of the little finger from time to time. By this means a very great amount of extra density can be produced wherever desired on the negative, with no heavy demand on the skill of the operator. The difficulty does not lie in the mechanical work, but in deciding what is to be retouched. And in attempting to answer this question, I again find myself face to face with the same difficulty which I met in the matter of choosing a subject. I can lay down no rules, for it is a matter of individual taste, and the real deciding factors are matters of which I know absolutely nothing, namely the individual demands of your particular subject and your own individual temperament. I can merely suggest certain lines of work which I myself have found useful lines, which are of necessity vague and capable of infinite variation.

In the first place then I would say, aim at some definite effect rather than a general reproduction of the beauty of Nature. In other words, aim at unity of conception. And I would amplify this by saying that you will find two things of the greatest assistance to you in realising that unity of conception. The first is your recollection of the impression conveyed to you by the subject at the time you made the exposure, or by any subsequent study you may have given. Do not make the mistake made, I think, by too many photographers, of thinking that because the lens has gone to Nature for you, your mind is relieved of all responsibility in that respect. The production of an artistic photograph requires as careful a study of Nature as the production of a successful painting. The other thing which, I think, you will find of assistance in realising your conception is any suggestion which you can obtain from the study of untouched print of your subject. Almost every print of a well-chosen subject will contain some suggestion of a definite effect, and, personally, I find that I can get the best out of any print by following the lines of and emphasising any such suggestion. Placing the untouched print before me, I examine it, considering how with the mechanical means in my power I will be best able to alter the existing lines of the picture. I go through all the necessary processes, considering how I will cover the whole with matt varnish, and then remove it from this part, and pencil over it in that part, until I have made up my mind exactly what I want to do, and then I set to work to carry out my ideas. Often these ideas are wrong, and the result of all my cogitations are thrown aside as useless, and the negative put past, to come out again, it may be, some years later, when the inspiration which was denied before may then be given me.

There is one other line which I may suggest, and which may help you in the conception of the effect which you desire. It is always well to so manipulate your lights and shades as to work in the direction of concentration. A friend of mine, whose criticisms of my photographs I always value, says that every picture should have a hole in it, that is, some central mass of light round which the darker shadows of the picture group themselves, suggesting a hole through which the high light reaches the eye. And this has always seemed to me a singularly happy expression. For if there were really a hole in the picture, it would be a means by which you could see through it to that which lies behind it. And this metaphorically is just what you want to do. You wish to see through the mere nature forms which are represented to the beauty which lies behind them, to see something, in short, of the spirit of the beauty which you are depicting. There is always a certain sense of mystery given by such a concentration of the high lights. And this idea of concentration is only another way of expressing the old idea of unity of which I have spoken. If I have harped upon this word unity until you are weary of it, I crave your pardon. I have done so because I feel that it cannot be too strongly emphasised. I have said that the beauty of a picture should consist of two things, grace of form and unity of conception. The grace of form should be obtained for you in the choice of your subject, and it is accordingly with unity of conception that you are most concerned when the time comes for retouching, and so, upon second thoughts, I shall not apologise for thus harping upon the word unity. It is the very heart and soul of a picture.

And now one word in closing. The careful following of the most elaborate rules of composition will never in itself make a picture. There must be something more. You must set to work, not so much in the spirit of one who desires merely to get a good photograph, as in the broader spirit of one who worships at the shrine of Nature. Let your love and not your camera draw you to your subject. Remember that you will succeed best in that class of subject which moves you most in Nature, and so you will be furthering your study of the true art of photography if you spend an hour in gazing at a scene which appeals to you, even though it be utterly beyond the scope of your camera, for you will be learning to enter into the inner circle. Others who merely study the rules of composition, and talk the art jargon of massing their lights and shades, and obtaining their delicate half-tones, may, if they choose, claim an acquaintanceship, it may even be an intimate acquaintanceship, with Nature, but you will be far on the road

to friendship, and unless you can attain to these terms, you will always fail to give full expression to the true spirit of Nature, for to none but a friend will she reveal her secrets.

H. Stewart Wallace, W.S.

SURFACE COLOUR.

[Reprinted from "The Physical Review," May-June.]

So many misleading statements appear in the text-books on optics regarding the phenomenon of surface colour, exhibited by certain strongly absorbing media, that it may be well to point out certain facts which are not always brought out as clearly as they should be. We frequently find the statement that these substances reflect most strongly those colours which are absent in the transmitted light, or which, as we more frequently say, are most strongly absorbed. One of the more recent of the advanced text-books refers the phenomenon to total reflection, the explanation being that for waves of certain wave-lengths the refractive index is less than one, and that therefore at a certain angle there will be total reflection for these waves, and consequent surface colour. As a matter of fact, the dispersion curve runs below unity only in the case of a very few substances, consequently total reflection is wholly inadequate as an explanation. Moreover, the selective reflection occurs at normal incidence.

In the first place, the statement that the most strongly reflected light corresponds to the light absorbed is erroneous. Take cyanine as an example. The centre of the absorption band is very near the D line, but the surface colour is not a yellow, but a deep plum colour, not so very different in hue from that of the transmitted light. If we examine the spectrum of the reflected light, we find a very dark band in the green, the centre being not far from wave-length .0005. The distribution of intensity in the rest of the spectrum is not very different from what it would be in the case of reflection from glass, which shows that the peculiar colour of the dye is not so much due to a very powerful reflection of certain waves, as it is to its almost complete refusal to reflect a certain region of the spectrum. If we remember that the reflecting power depends on the refractive index as well as on the co-efficient of absorption, we can easily explain this behaviour.

The intensity of the light reflected at normal incidence by a transparent medium is given by the formula:—

$$R=\frac{(n-1)^2}{(n+1)^2}$$

As n, the refractive index, varies with the wave-length, the reflecting power will be different in different parts of the spectrum. The formula calls for a stronger reflecting power in the violet than in the red, the variation being greatest for substances with high dispersion and low mean refractive index. An experiment has recently been described by B. Walter to illustrate this type of selective reflection. Using the method of repeated reflections originated by Rubens and Nichols for the isolation of long heat waves, a remnant of blue violet light is obtained. The medium used by Walter was oil of cassia, above the surface of which a silver mirror was mounted. The sun's image, after five reflections from the surface of the oil (the light being thrown back and forth between the surfaces as shown in Fig. 1), was found to be coloured a deep blue.

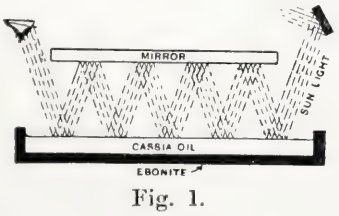


Fig. 1.

Though the formula calls for just such an effect, I have failed absolutely to obtain a trace of it, though I employed six reflections, or one more than Walter. The image was very faint and of a neutral grey colour, with no suggestion of blue.

In the case of absorbing media, the refractive index varies over a much wider range than it does in case of transparent substances, consequently greater variation in reflecting power with changing wave-length is to be expected. Moreover, the absorption influences the reflecting power directly, the formula for media of this nature being:—

$$R=\frac{n^2+n^2\chi^2+1-2n}{n^2+n^2\chi^2+1+2n}$$

In the case of a substance such as Hoffman's violet, the refractive index of which is unity for a certain wave-length, the amount of light of this particular colour reflected at normal incidence will be:—

$$\frac{\chi^2}{4+\chi^2}$$

It is clear that this will increase as χ increases, and will equal zero if χ is equal to zero, as it is in the case of transparent media.

Taking the values of n and χ for cyanine obtained by Pflüger in the different parts of the spectrum, we can calculate the percentages reflected in the cases of the different colours. The curve shown in Fig. 2 was obtained in this way; it shows very

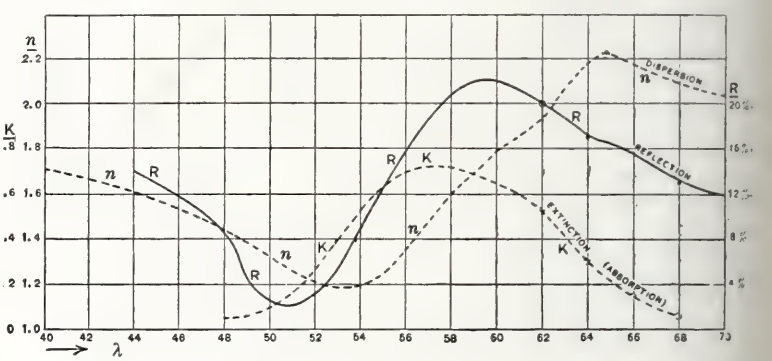


Fig 2

clearly the cause of the peculiar surface colour of the dye. Starting at the red end of the spectrum, we find that the intensity of the reflected light increases with decreasing wave-length, due to the joint increase in n and χ. The increase continues for some distance after n begins to decrease, owing to the continued increase of χ. After reaching a maximum at $\lambda = .00059$, it turns and descends, rapidly attaining its minimum at $\lambda = .0005$, where we have very small values of both n and χ and consequently very small reflecting power. Beyond this point the rise is due almost entirely to the further increase in n, since χ is practically equal to zero in this portion of the spectrum.

Scarcely two per cent. of the incident light is reflected at $\lambda = .0005$, causing the dark band seen in the spectrum of the reflected light, alluded to at the beginning of the paper.

An excellent way of showing the variable reflecting power of a film of cyanine is to compare it with glass, in different parts of the spectrum. A little of the melted dye is pressed between two plates of hot glass, which are separated when cold. A spot is selected where the film has a good optical surface, and this spot is left on the glass, the rest being cleaned off. By holding the plate in the spectrum formed by a prism or grating, the reflecting power of the two surfaces can be studied. In some parts of the spectrum the cyanine reflects more strongly than glass, in other regions the reverse is true, while at wave-length .0005 the cyanine refuses to reflect to such a degree that the film appears as a black spot on the blue field reflected by the glass.

It is interesting to note the difference in the surface colour of the dye when the reflection takes place at the surface in

contact with the glass. A very convenient way of showing the yellowish-green colour in this case is to press out a film of the molten dye on one surface of a prism of 8 or 10 degrees angle.* In this way the light reflected from the dye can be obtained uncontaminated with the light reflected from the first glass surface. The method is analogous to that employed by Lippmann in mounting his colour photographs. The calculation of the curve of reflected intensities under these conditions makes a good exercise for the student.

PROFESSOR R. W. WOOD.

New Books.

"Der Platindruck." By Baron Arthur von Hübl. Halle a/S.: Wilhelm Krapp.

The excellent series of monographs known as the "Encylopädie der Photographie," has recently been improved by a new edition of Baron von Hübl's treatise on Platinotype. The author remarks in the introduction that the investigations of recent years have not led to any modification of opinion as to the formation and nature of the platinum image in platinum black; but since the publication of the first edition of the work fresh experiments have led to unexpected conclusions as to the nature of the image formed by platinum in the presence of mercury. These experiments have given the clue to the process by which sepia prints can be made by cold development. The author has therefore revised the portion of the work dealing with this branch of the subject, and brought it up to date. We look upon Baron von Hübl's treatise as the best handbook to platinum printing.

Messrs. B. J. Edwards and Co., Castle Bar Works, Ealing Dean, W., have issued a new price list. It is very tastefully printed, and the numerous half-tone illustrations are from interesting negatives and are well produced. The booklet—for such, indeed, it is—contains articles on the Edwards' plates and films—iso, non-iso, cathodal, photo-mechanical, anti-halo, etc. There are also notes on the dark-room, development, colour screen and apparatus sundries, film carriers, etc. It is altogether a very useful list, and Messrs. Edwards are to be congratulated on the excellence of its get up and the practical nature of the contents.

"Picturesque Views of Shrewsbury," published by Messrs. Adnitt and Naunton, of that town, consists of sixteen views of the charming capital of Salopia. They are printed in Collotype, and the album forms a pleasant souvenir of a delightful but not too well-known beauty-spot of Britain. The photographs are by that admirable master of the camera, Mr. W. W. Naunton, and the album is published at 1s.

MR. W. END, photographer and picture-framer, of the Sunningdale Studio, Sunningdale, writes: "Re Stained Engravings.—If 'Mildew,' who put a query in last week's BRITISH JOURNAL OF PHOTOGRAPHY, June 13th, will communicate with me, I can undertake to remove any damp spots or stains from engravings without injury to same."

"DAGONET" in "The Referee" addresses the following letter to the Commissioner of Police:—"Sir,—Will you kindly let me have a policeman all to myself outside Opposite-the-Ducks. I want one with a trained eye for camera-carriers, Kodakers, and snap-shotters generally. Listen to what has befallen me, Sir. You will understand why I ask for this special protection. One morning last week a nice, smiling gentleman walked into my house and said he should like to take a few photographs. I thought, of course, he wanted them for his private collection, so I said, "Oh, very well; but don't ask me to pose for you. Take me as I am.' He replied, 'With pleasure. Go on with your breakfast.' I was rather pre-occupied, so I didn't pay much heed to what he was doing, though I noticed he was following me about. But when he packed up his apparatus and said: 'Thank you; I have you and your canary, your family, your friend from Ireland, your dog, your tub garden, your pony, Faust Up-to-Date, and Giddy, your goat. I have taken you eating an apple, watering your garden, editing "Living London," and having your fortune told; and the pictures will all appear in the "Sporting and Dramatic News" on Saturday, June 21st'—well, then, Sir, I flew in a rage and assumed a threatening attitude. Instantly he set light to some powder; there was a blinding blaze, and then a volume of smoke. I believe it is called the 'flashlight process.' When the smoke had cleared away, the photographer had disappeared. Like Mephistopheles, he had vanished in smoke and flame. I am quite sure, my dear Sir Edward Bradford, that with your rooted objection to being photographed (how hard I tried to induce you to be taken for 'Living London'!), you will sympathise with my protest against this assault and battery 'by the instantaneous process.' An Englishman's home is no longer his castle. It is the instantaneous photographer's battlefield. Sir, by our common objection to publicity and the camera, I ask you to grant me special police protection."

* A suitable prism can be made in half-an-hour by grinding down a piece of thick plate window glass. A strip of thick glass cemented along one edge will be all that is necessary to make the glass take the required form. Grind on a piece of glass with very coarse emery at first, then use finer grades, polishing with rouge at the end. Small scratches do no harm, and a high polish is not necessary.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

June	Name of Society.	Subject.
21.....	Birmingham Photographic	A Half-day Excursion to Packington and Packington Park.
21.....	Camera Club.....	Ramble—Appledore and Northam.
21.....	Woolwich Photographic	Cobham (Ladies' Day). Leader, C. Churchill, F.R.P.S.
21.....	Southampton Camera Club.....	Ramble—North Stoneham Park.
23.....	Southampton Camera Club...	Debate upon the relative merits of the various Printing Processes.
26—28.....	Brentford Photographic	Bosham.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JUNE 5TH.—Mr. T. K. Grant in the chair.

Mr. A. L. Henderson showed a piece of apparatus that he had recently acquired. It was described by Mr. T. E. Freshwater as the lens and prism belonging to a camera obscura. It was usually mounted on a tripod, the top of which had a hole cut in it to receive the flange which carried the lens. At the focus of the lens was fitted a drawing-board to receive the image, and a black cloth over the whole darkened the interior sufficiently to enable the artist, who often used it, to sketch in the principal details of his picture.

Mr. A. L. Henderson made some observations upon his formate toning-bath, and took exception to the fact that certain unsuccessful experiments had been made with a modified formula, for which he accepted no responsibility, the non-success of the experiment being attributed to his bath. He thought that the publicity given to this failure, without full details of the modification in the bath employed, had brought about an undue criticism of the proper formula, and he spoke very strongly against the class of experimenting of which this was a specimen.

Mr. A. Haddon pointed out that the formate bath produced good results undoubtedly, but not with every brand of paper. Some of the English papers gave very unsatisfactory tones, while others gave excellent tones with the formate formula. The difference was not due to the formula, but to the organic salt associated with the chloride of silver in the paper.

Mr. A. Mackie confirmed this statement. He found that up to the fixing stage Ilford paper gave beautiful tones with formate, but the hypo changed them to very miserable tones.

Mr. Henderson, replying to a question whether he washed his prints before toning with the combined bath, said that he recommended treatment with salt and water first, but, as a rule, he put the prints directly into the combined bath.

Mr. Haddon, referring to lead in the toning-bath, quoted Mr. Bothamley as saying that when once lead entered paper it was very difficult to remove, and that the lead in time caused a change in the colour of prints toned with baths containing it.

Mr. Drage spoke of some prints toned with formate and hypo, without gold, that after two years were still as good as ever.

JUNE 12TH.—Mr. A. Haddon in the chair.

Mr. T. E. Freshwater showed some photomicrographs of the dust and ashes thrown up by various volcanoes. The photographs, made by polarised light, showed that the dust in several cases consisted of powdered quartz. Some of the samples that he had examined were found to consist of particles of glass, and opaque matter, which probably were oxides of iron. The dust from Mont Pelée, deposited on Barbados, some 200 miles distant, had been analysed and found to contain a large amount of magnetic iron, while crystals which the polariscope revealed were particles of felspar, etc. It was curious that although picked up in Barbados, the wind at the time was moving in an opposite direction, but an explanation seemed to lie in the fact that the matter was thrown so high that another current, proceeding in a contrary direction, carried it to Barbados.

Dr. Ed. F. Grün gave a description of his

FLUID LENS,

first taking a photograph of the meeting in ten seconds, by the light of seven ordinary gas-burners. He said that he had considered whether by an alteration of a lens it would be possible to increase its aperture or decrease its focal length so as to increase its rapidity to such an extent that an exposure might be reduced to a fortieth or a fiftieth of what would otherwise be required.

Cedar oil was introduced into the air-space between the combinations of a rectilinear lens with a consequent reduction of its focus to about an eighth. Dr. Grün had some success with this modification, used in a theatre, but the chromatic corrections were impaired and its rectilinearity was upset. Further experiments were made, with a view to improving the initial results, and particularly in the direction of obtaining a fluid sufficiently colourless, and of high refractive index, with low dispersive power, to answer the requirements. The fluid now used has scarcely any appreciable effect upon the chromatic correction of the lens, at the same time increasing the refraction of transmission of light.

Several lenses have been converted in the course of the experiments.

For cinematograph purposes the lens used is one of 1¼in. diameter, with a back focus of 1¼in. It is a doublet, cemented lens, of ordinary type in front, and a back combination made specially for Dr. Grün, and having a bi-convex crown in front and a concavo-convex flint at back, with the fluid between. This lens works at an aperture of f/1.2. For other pictures a lens of 3in. diameter and 4in. focus, with an aperture of f/1.4 is used. Dr. Grün showed on the screen a large number of slides taken without special facilities, and without knowledge, in various theatres. There were also views of Brighton Pier and other places taken late at night with exposures far short of those which would, under the usual circumstances, be required. In some cases the photographs could not be taken at all. Dr. Grün also stated that colour photographs had been made with the lens with an exposure of two seconds. Lenses made after Dr. Grün's specification are now commercially obtainable.

A vote of thanks was passed to Dr. Grün.

CAMERA CLUB.

The Coronation and its incidents tinctured the proceedings of the Camera Club last week. First there was an announcement from the hon. sec. that both on Coronation Day and the day of the Royal procession the Club would be open to ladies, and that those members who found a difficulty in getting refreshments for their lady friends at the crowded restaurants would find every accommodation at the Club. And, secondly, there was the principal business of the evening, in the form of a lecture by Mr. Cyril Davenport, who took for his subject the British Regalia.

Mr. Davenport is no stranger at the Club, for he has frequently been kind enough to lecture here. His remarks are always valuable for the amount of erudition which they display, and he illustrates them by slides so carefully prepared and coloured that it is quite a pleasure to look upon them, apart from their connection with the subject in hand. Upon this occasion, before the slides were shown, he gave a short introduction to his lecture, in which he pointed out that the King was as much king before his coronation as he was after, the ceremony being a formal acknowledgment of his position as head of the State. The ceremony peculiar to this country is the oldest coronation ceremony in the world, and its principal episode is the anointing of the monarch with the holy chrism. With regard to the ritual observed, and all the details of the very elaborate ceremony, they are fully set forth in the "Liber Regalis," a book dating from the fourteenth century, which is preserved in Westminster Abbey. The vestments worn by the King are practically the same as those prescribed for a bishop celebrating mass, but they are adorned with certain emblems which identify them with kingly use. As well as a priestly dignity, he also holds a soldierly one, hence the presence of the sword and spurs. The orb is the exclusive emblem of the sovereign.

In past times the regalia was kept in Westminster Abbey, but in the fourteenth century the monks who had charge of it abused their trust, broke into the treasure chamber, and did a great deal of damage, for which burglarious proceeding they were marched off to the Tower of London. Next the regalia was housed in the Chapel of the Pyx, until the time of the Commonwealth, when, by order of Parliament, the chests were broken open and the emblems of Royalty utterly destroyed. On the Restoration of Charles II. an entirely new regalia was made, the old models being as far as possible reproduced. From that time the connection of the Regalia with Westminster came to an end, but as a kind of acknowledgment of the Abbey's control over it, the various articles are deposited in the Abbey just before a coronation, and this course will be followed on the forthcoming occasion.

Mr. Davenport's slides commenced with photographs of some of the great seals, showing various sovereigns in their state robes, for by this means the shape of the crown, orb, sceptre, etc., are much better understood than by reference to the coinage, which, from that point of view, is not so reliable. After these seals Mr. Davenport showed beautifully-coloured drawings, in the form of lantern slides, of the various vestments. Next came the Ampulla, or Eagle of Gold, which holds the holy oil, or chrism, together with the golden spoon. The head of this bird is attached to the body by a screw joint, so that the interior can be charged with the oil, which is made to flow out of the beak into the spoon. There are several recipes for making this oil, which apparently comprises some expensive constituents, for the chemist who last made up the prescription was paid £200 for his work. According to tradition, this golden bird was given to St. Thomas à Beckett by the Virgin Mary. The photograph of this bird, together with other photographs, were taken specially by the lecturer, who had the unusual privilege of taking the articles separately from the receptacles in which they are usually deposited. The pictures included the various crowns, rings, bracelets, and spurs, which are seen *en bloc* in a huge cage in the Jewel House at the Tower of London.

Mr. Davenport, of course, referred to the audacious attempt to steal the regalia by Colonel Blood and his bold companions in the reign of Charles II., upon which occasion the keeper of the jewels was knocked on the head, and the crown doubled up for more convenient carriage. The conspirators were happily caught before they had left the precincts of the Tower; but for some undefined reason Colonel Blood was not punished, but was granted a pension of £500 per annum by the King.

In the discussion which followed the reading of this very interesting paper Mr. Lyon called attention to the circumstance that the lecturer had expressed a doubt whether the gloves would appear during the coming Coronation ceremony. He ventured to put the lecturer right upon this point, and he was able to say that the gloves would be worn. More than this, a member of the Camera Club would have charge of these gloves, in the person of the Duke of Newcastle.

Sir Dominic Colnaghi raised a laugh by describing how his grandfather obtained a seat in the gallery of the Abbey on the occasion of the last Coronation, although he had no business there. He went to the door, and, on being challenged, said he had a silver key. This would not do; but a golden key, in the shape of a guinea, prevailed, and he passed in and saw the whole ceremony very well.

After Mr. Davenport had answered several questions with regard to minor points touching upon the regalia and the Coronation ceremony, the proceedings closed with a hearty vote of thanks to the lecturer.

SOUTHAMPTON CAMERA CLUB.

The members of the above Club held their fortnightly meeting at the Philharmonic Hall on the 9th inst., when Mr. G. Vivian presided. The object of the meeting was a print competition, with "Landscape and Seascape" as the subject. Mr. De Silva was declared the winner, and awarded the certificate of merit for a fine pair of pictures from the New Forest, entitled "Forest Stream" and "By the River." He was closely followed by Mr. Evans, in a generally very keen and satisfactory competition. Arrangements were then made for an outing, which took place on Wednesday, the 11th inst., the rendezvous being Salisbury, permission having kindly been given by the Dean for the members to photograph within the Cathedral and its precincts. Full advantage was taken by those present, and in the time at their disposal no less than 100 plates, of various brands and sizes, were exposed to receive coveted images from the grand architectural pile.

THE PHOTOGRAPHIC SURVEY AND RECORD OF SURREY.

At a meeting held on Friday, June 13th, in the Lecture Hall, Central Library, at the Town Hall, Croydon (by kind permission of the Libraries Committee), the election of the following gentlemen as permanent officers of the above Association took place:—Mr. W. W. Whitaker, B.A., F.R.S., F.G.S., chairman. Local vice-chairmen: Messrs. Hector Maclean, F.R.P.S. (president Croydon Camera Club); J. Bulbeck (vice-president West Surrey Photographic Society). Hon. treasurer, Mr. W. W. Topley, 3, Marlborough Road, Croydon. Hon. curator, Mr. J. Stanley Jast, Central Library, Town Hall, Croydon. Hon. secretaries: General, Dr. Hobson, B.Sc., 1, Morland Road, Croydon; survey, H. D. Gower, 55, Benson Road, Croydon. A committee consisting of the above-named gentlemen, with the addition of Mr. W. P. D. Stebbing, F.G.S. (Geologists' Association), and Mr. G. R. Beckett (hon. sec. South Norwood Photographic Society) were appointed to meet on July 1st next for the purpose of drafting rules of the Association, and to be duly submitted to the Council.

CROYDON CAMERA CLUB.

A specially interesting photograph was handed round at the conversational meeting on Wednesday, 11th inst., consisting of a view of the lately discovered underground prehistoric cave at Waddon. The negative was taken by means of the magnesium light, by Councillor Noaks. The president (Mr. Hector Maclean) on the same occasion showed and explained a new form of hand-camera, which carries forty flat films. In make and design it seemed to leave nothing to be desired. The camera in question is known as the Ilford hand-camera, and should it in practice be found to be reliable in the changing of the films, it will, without doubt, become exceedingly popular, as it combines simplicity with efficiency, and is made to stand hard wear.

The annual river excursion, in charge of Mr. Ben. E. Edwards, was fixed for Saturday, July 26th, when Teddington, Hampton Court, and Chertsey will be visited.

At the conclusion of King Lewanika's visit to Yeovil his Majesty was photographed by John Chaffin and Sons, of Yeovil and Taunton, at the residence of the Mayor, Sidney Watts.

The Professional Photographers' Association and the Cambridge Association.—The following invitation has been addressed to members of the P.P.A. by the hon. sec. of the convention:—"As a fellow member of the Professional Photographers' Association, I have much pleasure in forwarding you particulars of the forthcoming convention at Cambridge. It has frequently been said that the want of cohesion amongst photographers is mainly due to the few opportunities they have of meeting. A number of professional photographers are members of the convention, and I am sure you would find a few days spent in their congenial society, and the many opportunities afforded for the interchange of ideas, mutually advantageous. I shall be glad to forward any further information, and hoping for the pleasure of hearing from you, I remain, dear Sir, yours truly, F. A. Bridge, hon. sec. and treasurer, P.C.U.K."

The Value of Portraits.—We have frequently of late referred to the high prices that pictures sometimes realise at auction sales as illustrating the increasing art tastes. But over £11,000 pounds for a single portrait is certainly a high price to pay. On Saturday last a picture by Geo. Romney, of the wife of General Sir Eyre Coote, was knocked down for 10,500 guineas. This, we think, is a record price for a portrait, or certainly by this artist, talented though he was. It was a large painting, it is true; but it was of no one of any great notoriety. At the same sale-rooms, a few days before, some miniatures were disposed of, and several unsigned portraits were sold at £50 and £60 each. A frame of portraits of nine ladies and gentlemen of the time of George III., and a series of six miniatures by Plimer of different members of his family, brought the respectable sum of 317 guineas. To fully realise the art value of these pictures it should be borne in mind that the persons portrayed were all of no particular note.

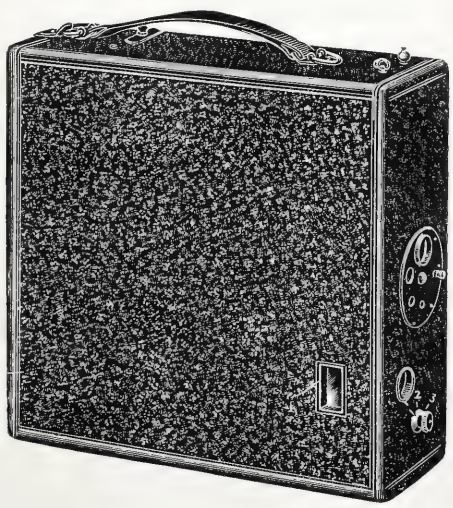
New Apparatus, &c.

The Isolar Non-Halation Plate. Agent: Chas. Zimmermann and Co., 9 and 10, St. Mary-at-Hill, E.C.

The phenomenon we know as halation—that is, the spreading of the image of a bright object over the adjacent parts of a negative, which occurs under some circumstances—was noticed at a very early period of photography, and reference to our back volumes will show that its cause and prevention have been subjects constantly inherent. It is now generally recognised that there are at least two causes, the more frequent being the reflection from the back inner surface of the plate of actinic light which has passed through the film, the other being reflection from particles of the film itself. The usual remedy for the first-mentioned kind is backing the plate in such a way that the light passing through the film is absorbed instead of being reflected; but though, when properly carried out, backing is efficacious enough, some trouble is involved in applying the backing, and perhaps still more in dealing with it after it has performed its part. A plate that possesses the advantages of a backed plate, without its inconveniences, is therefore a desideratum, and for the Isolar plate it is claimed that halation of every kind is effectually prevented. In the manufacture of the plate, between the glass and the sensitive film, a layer is introduced which is transparent, but of a colour which prevents the passage of actinic light. By this means the necessity for a backing is obviated, as no actinic light reaches the back of the plate, while at the same time the progress of the negative can be judged in the course of development in the usual way. Further, the sensitive film itself is stained yellow, by which halation arising from reflections from within the film itself is avoided. It will be obvious that to render such a plate of practical use some means must be provided of removing the stain from the film and its substratum, but this is automatically done in the ordinary course of treatment if a developer containing an ordinary amount of alkali be employed and the plate be fixed in an acid fixing-bath. If a developer containing no alkali, such as ferrous oxalate, or very little, such as amidol, be employed, some traces of the stain may remain after fixing, but it is easily removed by immersing the plate in an alkaline solution and again in the fixing-bath. Our own experiments with the plate have not been exhaustive, but have been sufficient to convince us not only that the claim made for it, that it is not subject to halation, is just, but that the manipulation is free from any complication whatever. We chose for comparison an ordinary plate of acknowledged soundness, and, having made a preliminary test to ascertain the relative exposures required, chose a critical subject and made three exposures: the ordinary plate unbacked, the ordinary plate backed, and the Isolar plate. The negative on the unbacked plate was practically useless from halation, but the other two negatives were very similar, and both were entirely free from halation, and of good quality in every respect. The Isolar plate is manufactured by the Actiengesellschaft für Anilin-Fabrikation of Berlin. The plates may be obtained coated with either orthochromatic or ordinary emulsion. The speed is given as 24 Warnerke.

The Aptus Panoramic Magazine Hand Camera. Manufactured and sold by Sharp and Hitchmough, 101, Dale Street, Liverpool.

For 30s. Messrs. Sharp and Hitchmough supply the photographer with a camera which takes panoramic-shaped photographs on glass supports. The instrument holds sheaths to the size of the half of a half-plate, that is 6½in by 2⅝in. It is fitted with a lens of 7in. focus (approx.), and thus, with a judicious choice of subject, and taking care that near objects



are removed a considerable distance from the camera, photographs in panoramic perspective and without distortion may be obtained. Either 12-plate sheaths or 24-film sheaths may be used in the camera, which is fitted with an indicator of exposures; rotating diaphragms to the lens; finder; time and instantaneous shutter. The camera weighs 2lb. 8oz., and measures 10in. by 9in. by 3in It is excellent value for the money, and the changing system is simple and reliable.

Messrs. Elliott and Sons, Ltd., Barnet, Herts., recently gave us the opportunity of practically testing the latest make of their Extra Rapid plates. These are listed in the following approximate speeds:—200 H. and D., 256 Watkins, f/128 Wynne. At f/11, and with the shutter working at 1-20th of a second (approx.), we produced fully-exposed views on the river at 6.30 in the evening at the latter part of May. The plates yield a well-graded image, fine in the grain, are easy to develop, and are obviously rapid enough for all studio and landscape purposes.

A sample of the Barnet P.O.P. has also been sent us for use. This gave us admirable prints, which readily took a rich and even tone. Users of gelatine chloride could not desire a better printing surface. The Barnet plates and papers are of high class throughout.

Commercial & Legal Intelligence

The Austin-Edwards Monthly Film Negative Competition.—The prize camera for the current month has been awarded to Rev. T. Gough, Grammar School, Retford, Notts., for his negative, "Italian Street Scenes."

Another Suicide by Cyanide of Potassium.—After writing "Good-bye for ever, Tim," Thomas Smith, a footman in service at Ennismore Gardens, Kensington, drank enough cyanide of potassium to kill a dozen men. Suicide during temporary insanity was the verdict returned at a coroner's inquest.

Wyrall, Ltd.—The above-named Company has been registered with a capital of £2,000 in £1 shares (1,000 6 per cent. preference). The objects of the Company are to take over the business of a photographic artist, etc., carried on by E. C. Wyrall, at 10, Grosvenor Road, Aldershot. Minimum cash subscription, 500 shares. The first directors are T. F. Wells and E. C. Wyrall. Qualification, £25. Registered office: 10, Grosvenor Road, Aldershot.

Messrs. J. J. Griffin and Sons, 20-26, Sardinia Street, Lincoln's Inn Fields, W.C., write:—"It is a pleasure to us to send to you copies of recent issues of the 'Plate-Makers' Criterion,' and to point out that we are the sole agents for the British Empire for the photo-engravers machinery manufactured by the Ostrander-Seymour Company, of Chicago, and that we shall be very pleased to send fully descriptive and priced catalogues, or any other information regarding these machines that may be required by photo-engravers or those experimenting in the work."

Re A. D. Thomas, 60, Chandos Street, Strand, cinematograph exhibitor.—The statutory meeting of the creditors concerned under this failure took place at the London Bankruptcy Court, before Mr. Walter Boyle, Assistant Receiver, on Monday. The statement of affairs filed by the debtor disclosed liabilities amounting to from £5,000 to £6,000, and assets estimated to produce £35. The debtor states that he commenced business about seven years ago, and he ascribes his insolvency to insufficient capital and to the temporary falling off of interest in animated photographs relating to the Boer war. In the absence of a quorum of creditors the meeting was adjourned.

The China Permanent Photographic Company, Ltd.—The above-named Company has been registered with a capital of £2,000, in £1 shares. The objects of the Company are to purchase from Fred Shippey a secret process of photographing on china, porcelain, or other substance under glaze, known as electric photography under glaze, to develop the same, and as photographers generally; and as manufacturers of artificial stone, opal, opal glass, enamel and enamel ware, slates, slabs, plaques; as oil and colour men, dealers in artists' materials, medallions, meerschaum, vulcanite, etc. No initial public issue. Managing director, A. Smeed. Registered office: 1, Gresham Buildings, Old Broad Street, E.C.

Useful to Photographic Tourists.—The Board of Agriculture give notice that the Ordnance Survey have recently published new folding pocket-maps of Llandudno and Scarborough and the country round, on the scale of one inch to the mile. The maps are printed on thin, tough paper, in covers, price 1s. each. They are useful for general topographical purposes, and should also prove serviceable to cyclists and pedestrians, since they show the principal roads in colour, indicating their character, and whether metalled or not, footpaths, contours, rivers, towns, villages, railway stations, and local boundaries. Copies of these maps may be obtained from the local agents, or through any bookseller, from the Ordnance Survey Office, Southampton. Copies may also be ordered through head post-offices in towns where there are no agents.

Explosion in the Strand: A Well-known Optician Injured.—On Saturday afternoon last an explosion occurred at 433, Strand, the premises occupied by Mr. Alfred Apps, a gentleman who has for many years occupied a position as optical instrument maker to several of the Government departments, as well as maker of induction coils for Röntgen-ray work. While in his workshop a portion of the floor blew up, and Mr. Apps was so severely injured that his removal to the adjacent Charing Cross Hospital was necessitated. There was, however, no alarm of fire, and in a statement given by Mr. Apps himself it would appear that the explosion was due to coal gas having become ignited underneath the boards, and had nothing whatever to do with the processes of electrical manufacture. Fortunately, beyond sustaining injuries to his left foot, Mr. Apps is unhurt.

Warwick Competitions.—The following is the list of awards of the Warwick Competition for the current month:—£1 prize each: W. J. Bellamore, Paget Place, Penarth ("Deer Park, Kentchurch"); A. Black, Bowers Avenue, Nottingham ("Gateway at Furness Abbey"); E. W. Burch, 9, Elizabeth Street, Eaton Square, London, S.W. ("In the Orchard"); E. Collison, Grantham Vicarage, Lincs. ("Grantham Parish

Church"); W. M. Graham, Netherby, Stevenage, Herts. ("White Stichwort"); H. Holden, 5, Sandford Road, Moseley, Birmingham ("Horse jumping"); J. Ludlam, 15, Grasmere Street, Leicester ("A Wet Afternoon"); F. E. McGibney, 14, Harcourt Street, Belfast ("Chapel Interior"); Miss H. Reston, photographer, Edge Lane, Stretford ("A Portrait Study"); L. Ussher, Town Office, East London, S.A. ("Take puppy too, Daddy").

KODAK, LTD.—We are informed that a payment of 1s. per share (free of Income Tax) will be made on July 1st, in respect of ordinary shares and of 1½ per cent. (also free of Income Tax) in respect of preference shares to shareholders registered at the closing of this Company's transfer books, the 17th May last. The payment on the ordinary shares is the equivalent of the ordinary interim dividend of 2½ per cent. (of which 28-91sts is being paid by Kodak, Ltd., and 63-91sts by the Eastman Kodak Company, of New Jersey), together with a bonus of 2½ per cent., the whole of which is being found by the Eastman Kodak Company, of New Jersey. The payment on the preference shares is the equivalent of the usual interim quarterly dividend at the rate of 6 per cent. per annum, and is being paid by Kodak, Ltd., and the Eastman Kodak Company, of New Jersey, in the proportions above stated. The proportion of the dividend paid by Kodak, Ltd., is declared as of the date when the resolution for the reduction of the Company's capital was sanctioned. The net interim dividend on October 1st will be paid upon the capital of the new Company.

THE Thornton-Pickard Catalogue.—With a copy of their new catalogue, the Thornton-Pickard Manufacturing Company, Altrincham, send us the following particulars of it:—"We have pleasure in sending you copy of our new complete illustrated catalogue, which, you will notice, is much larger than any we have hitherto published, containing more illustrations and fuller information respecting the various cameras and shutters which we manufacture. You will notice that we are introducing for this season a number of entirely new cameras, namely:—The "Imperial" Outfit (described on page 21), which has been brought out to meet the demand for a really first-class camera at a cheap price, and the whole outfit in the half-plate size retails at the low price of four guineas. The "Ruby Triple Extension" Camera (described on page 30), which is a new adaptation of our well-known standard pattern "Ruby." It is built on the same general lines as the "Ruby" Camera, with the advantage of a triple extension. The half-plate size has an extension of 22in. You will also notice the "Automan" Cameras, of which the principal feature in each is an entirely new movement in photographic cameras. By mere pressure on the spring catch, to open the camera, the baseboard not only falls into position, but the front, with lens and shutter attached, automatically erects itself at the "infinity" focus-point. There are three patterns of the "Automan" Cameras, namely:—The "Oxford," which takes glass plates and cut films in plate-holders. The "Roll Film," which takes roll films in daylight-loading cartridges, and which is also provided with a plate-adaptor for the use of glass plates. The "Focal Plane," which takes glass plates and cut films in plate-holders, and which is also fitted, as its name implies, with one of our new pattern focal plane shutters. This camera is capable of use for every class of work conceivable, and exposures can be given from 1-1,000th of a second up to any length of time desired. You will further find, on page 60 and also on inside of back cover, particulars respecting our new prize competition. We would also call your attention to the great reduction in the prices of our shutters. Notwithstanding this great reduction in price, the same high standard of excellence is still maintained." The catalogue contains a dozen illustrations in half-tone.

THE Sale of Poisons.—Before the Kingston-on-Thames County Magistrates last week, Joseph Hutchinson, seed and artificial manure merchant, appeared to answer three summonses for selling a poisonous vegetable alkaloid known as nicotine, without having his name and address on the bottle; for selling the poison to an unknown person; and for failing to make an entry of the sale in a book kept for the purpose, contrary to the provisions of the Pharmacy Act, 1868. Mr. Vaughan Williams, barrister, appeared to prosecute on behalf of the Pharmaceutical Society; and Mr. T. G. Dobbs, solicitor to the Traders in Poisons Protection Society, appeared to defend. Mr. Vaughan Williams, in opening the case, said the poison the defendant was charged with selling was contained in a compound known as "The XL All Vapouriser Fumigator," used for the destruction of insects in greenhouses. In a 2oz. bottle there was sufficient nicotine to poison hundreds of persons. George Henry Steer, of the Pharmaceutical Society, deposed to visiting the defendant's premises at Cobham, on May 5th, and purchasing a bottle of the fumigator. It was supplied to him by the defendant's brother, who did not know him, and the defendant's name and address were not on the bottle. Harry Moon, clerk to the Registrar of the Pharmaceutical Society, deposed to receiving the bottle from the last witness and sending its contents to be analysed. There was a label on the bottle containing the following notice:—"Tobacco is generally considered to have somewhat poisonous properties, and the juice of tobacco which collects in the stem of a pipe is well known to be poisonous. This compound contains the concentrated nicotine of tobacco, and should be kept in a safe place and out of the reach of children." By Mr. Dobbs: A special commission had been appointed by the Privy Council to inquire into the sale of poisons for purposes connected with agriculture. Mr. Thomas Tickell, analyst, spoke to examining the compound, and said it contained over 20 per cent. of nicotine, sufficient, in his opinion, to kill between 500 and 600 persons. In 2oz. there were 186 grains, and one grain of nicotine would be fatal to two or three persons. Mr. Dobbs, in defence, urged that an article of this kind, which was sold for trade and technical purposes, had been held to be exempt from the provisions of the Pharmacy Act. If it were not so, the businesses of many tradesmen would be ruined, and it would be vesting a monopoly in poisons in the hands of chemists, a thing that the Legislature never contemplated. The magistrates considered the case proved, and fined the defendant £2 on each of the three summonses, including costs. They consented to state a case. —"The Morning Post."

VICAR'S Company Promotions.—The Rev. Alfred Allen Barratt, M.A., vicar of Holy Trinity, Claygate, applied for his discharge at the Kingston-on-Thames Bankruptcy Court yesterday. It was reported that the liabilities were £3,336, and the estimated assets about £469. Lord Foley proved for £3,148. It was explained that the debtor had been connected with the promotion of a number of limited liability companies, none of which had paid any dividends, and some of which had ceased to exist. One of these companies was called Photo, Ltd., of which the debtor was managing director. The Official Receiver reported that the debtor had contracted liabilities when he had no reasonable means of discharging them, and that his bankruptcy was brought on by rash and hazardous speculation. Mr. Cooper Willis, who appeared for Lord Foley, the petitioning creditor, opposed the application for discharge on the ground that the debtor's examination had disclosed the fact that he had been guilty of fraud. In May, 1898, he approached Lord Foley, who was one of his churchwardens, and induced him to invest money in Photo, Ltd. Lord Foley gave a guarantee for £3,400, which was placed to the credit of the debtor at the Surbiton branch of the London and County Bank. All of this money, with the exception of £400, appeared to have been devoted to the purposes of the Company, and about £121 was claimed by the bank as interest, but about £278 appeared to have been misappropriated by the debtor to the payment of his own private account. The answers which he had given showed that he had paid personal debts with moneys that should have gone to Photo, Ltd. Mr. Mellor, who appeared for the debtor, said that Lord Foley was aware of this at the time, and there was also the fact that the money was afterwards returned. Mr. Cooper Willis: But it was fraud all the same. Judge Walsh said he was afraid that he could not entertain the charge of fraud if Lord Foley knew what was being done. Mr. Cooper Willis said he would withdraw the charge of fraud, and would ask his Honour to refuse the discharge on the ground that the debtor's general conduct, as disclosed by his examination, was not straightforward and honourable as befitted a clergyman of the Church of England. Mr. Mellor said the charge of fraud was preposterous, and for the rest he urged that it was not a bad case of rash and hazardous speculation. Judge Walsh said he thought the charge of fraud ought never to have been made, though the debtor's explanations were a bit lame. Still, he thought the debtor had laid himself open to very severe censure for meddling in company promoting, and that censure was not lessened by the fact that he was a clergyman. Apart from this, it was shocking to have it conclusively proved that a gentleman receiving emoluments for religious ministrations should continue to incur liabilities when he knew that he was insolvent and could not meet them. He had decided, therefore, to suspend the discharge for three years.—"The Morning Post."

News and Notes.

ROYAL Photographic Society.—Technical meeting, Tuesday, June 24th, at 8 p.m. Mr. E. Sanger Shepherd will read a paper on "Graduated Light Filters."—The exhibition of photographs by Mr. W. Smedley Aston will also be on view until the end of July.

LONDON and Provincial Photographic Association.—On Thursday, June 19th, Mr. A. L. Henderson will show a series of lantern slides illustrating his recent visit to Portugal. Visitors (especially foreign and colonial) are always welcome at the meetings at the White Swan Hotel, Tudor Street, Fleet Street, E.C.

BY special permission of the Prince and Princess of Wales, the frontispiece of the Souvenir Coronation Bazaar in aid of the Hospital for Sick Children will consist of a photograph of Prince Edward, by Mr. Richard N. Speaight. The souvenir will be unique of its kind, as it will consist entirely of photographs of the children of the patrons and stall-holders. The committee hope to add upwards of £500 to the bazaar funds by its sale, as Messrs. F. and R. Speaight, of 178, Regent Street, who are compiling the work, are giving their services, and have offered to hand over the entire profits.—"The Times."

AMONGST the Coronation novelties issued by that alert student of the times, Mr. W. Tylar, 41, High Street, Aston, Birmingham, is a negative of his Majesty the King in State robes. Thus loyal photographers may strike off prints of Edward VII. to their hearts' content, and without fear of copyright restrictions. Mr. Tylar's other novelty is a Coronation bible photographically reduced. This tiny volume, measuring, roughly, about 1¼in. square, contains the whole of the sacred writings, and is so legible that parts of it may be read with the naked eye, and the whole under a small magnifier.

SEFTON Park Photographic Society, Liverpool.—The fourth annual exhibition will be held in the High Schools, Arundel Avenue, Sefton Park, Liverpool, on Tuesday, Wednesday, Thursday, Friday, and Saturday, October 28th to November 1st, 1902. Entry forms and fees only to be sent to Mr. Geo. Birtwhistle, hon. sec., 7, Gainsborough Road, Sefton, Park, Liverpool. The following are the open classes:—Landscape and Seascape. Portraiture and Figure Studies and Still Life. Architecture. Hand Camera Work (direct prints). (Camera must have been held in the hand during exposure.) Lantern Slides. Champion Class.—One print, any size, which must have previously gained an award. The winner to present to the Society an unframed copy of the winning picture.

THE Knole Pictures.—The collection of pictures at Knole is known to be one of the finest and most interesting in the Kingdom. Lord Sackville has from time to time generously lent examples for public exhibition in London, and he has now given permission to Mr. C. E. Corke, of Sevenoaks, to reproduce some of the more important. The famous Gainsborough of Miss Linley and her brother has already been done in this manner. The Hoppner picture of the three Sackville children—George, afterwards fourth Duke of Dorset, and his two sisters—and another Hoppner—the whole-length portrait of Arabella, the third Duchess of Dorset, and mother of the three children—are being reproduced; and others, by Reynolds, Van Dyck, and Monnier, are to follow. —"The Times."

THE employees of the firm of Messrs. Alfred Ellis and Walery went for their annual excursion on Saturday, June 14th, and, despite the inclemency of the weather at starting, a very enjoyable day was spent. The party, numbering twenty-six, met at Paddington for the 9.5 saloon train to Henley, where the steam launch "Marian" awaited to take them up the river to Pangbourne. A photographic snapshot competition taking place, cameras were very much to the fore *en route*. A splendid lunch was provided on board by Mr. Shepherd, of Henley, which was thoroughly appreciated by those participating in the choice dishes prepared. Pangbourne was reached by about 2.20, the party alighting to spend a couple of hours ashore. The Home Farm, Sulham, was visited, and a delightful time spent in the woods, the weather being very kind during the whole of the time spent on shore, the sun so far favouring the party with about 1½ hours of its welcome presence. The launch was reached by 4.30 for the homeward journey. Tea on board; a short stay at Henley, with light refreshment at the Broad Gates Hotel; and taking the saloon train home again at 9.15, arriving at Paddington by 10.15. But before separating at the station "Auld Lang Syne" was sung, and three hearty cheers were given for Mr. Alfred Ellis, for the very enjoyable time spent.

CORONATION Festivities and Peace Commemoration at the Crystal Palace.—The arangements made at the Crystal Palace for the Coronation are on a large scale. The programme, which will extend over several days, includes a grand Coronation ball, a British and an American concert in celebration of the proclamation of peace and the coronation of the King, and Venetian fêtes and firework carnivals, when the facilities afforded by the gardens and grounds for illumination and decoration will be fully taken advantage of. These Venetian fêtes will be held on Thursday, Friday, and Saturday, June 26th, 27th, and 28th, and they will be brought to a conclusion each night by a display of fireworks, when the set pieces which Messrs. C. T. Brock and Co. have prepared for the Coronation will be fired. The Coronation ball will be held on Wednesday, July 2nd, with the approval of his Majesty the King, and under the presidency of Mrs. Arthur Paget, in aid of King Edward's Hospital Fund. Twelve thousand square feet of parquet floor will be laid in the Central Transept. Four large drawing-rooms will be built in the South Transept, two being furnished by Gillow's in Louis XVI. and English style as a special gift to the Hospital Fund. From these a huge bank of flowers and plants will rise to the Royal box. On either side of the drawing-rooms the beauties of an English and an Italian garden will be displayed. Private boxes will be daintily draped, several in the colours of the regiments of the officers who have taken them. Mr. Forbes-Robertson has designed a charming programme, and a handsome souvenir of unique description is in preparation. Special trains will be run from Victoria to the Palace. The Peace Celebration of Saturday, July 5th, will be similar in character to that of the great Patriotic Fête held at the Palace on the termination of the Crimean War. In the afternoon, at the British and American Festival Concert, on Handel Festival scale, the two nations will be represented by the greatest and most eminent vocalists of the day. The British Quartette will include Madame Albani, Madame Clara Butt, Mr. Ben Davies, and Mr. Santley; and the American, Madame Ella Russel, Madame Belle Cole, Mr. Ellison van Hoose, and Mr. David Bispham. As at the Handel Festival itself, the great feature of the concert will be the marvellous effect produced by the gigantic choir. The orchestra will number nearly 500 picked instrumentalists. The services of the London contingent of the famous Handel Festival choir and orchestra, and the full band of H.M. Coldstream Guards have been requisitioned, and the performers will number over 3,000. In the regrettable absence of Mr. August Manns through indisposition, Dr. Frederic Cowen will conduct, and Mr. Walter W. Hedgcock will be the organist. The programme will include a performance by the colossal choir of the National Anthem, "Rule, Britannia," the American National Hymn; also the same Coronation Anthem by Handel, "Zadok, the Priest," that is to be sung at the Coronation service at Westminster Abbey, the trio and chorus, "See, the conquering hero comes!"; also a selection from Sullivan's "Te Deum," and the same composer's "Song of Peace." The orchestral band of 500 performers, combined with the full band of Coldstream Guards, will perform Cowen's "Coronation March" and Tschaikowsky's "1812 Overture." On this day also the Naval and Military athletic meeting is to be held. The directors of the Crystal Palace Company have presented a gold cup, to be called the "Coronation Cup," as a trophy for an annual sports competition among his Majesty's forces. The competition will resolve itself into a trial of strength between the Navy, Army, Militia, and Volunteers. There will also be in the evening a physical display by the National Physical Recreation Society—chairman, Lord Charles Beresford. The Colonial and Indian Troops in London for the Coronation have accepted invitations to be present, and, as on the other nights, a grand display of fireworks will be given. The International Polo Tournament, held under the auspices of the London Polo Club, for the Coronation Cup, is fixed for Tuesday, Thursday, and Saturday, July 8th, 10th, and 12th.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

THE CONVENTION.

To the Editors.

Gentlemen,—We have pleasure in advising you that Mr. J. M. Dickinson, one of our representatives, will have a large showroom at the Lion Hotel, Cambridge, during Convention Week, where several photographic novelties will be on view, and he will be pleased to see any conventioners who will do him the honour of paying him a visit. If you could find space for a notice to this effect in your next issue, we shall be obliged.—Yours truly,

MARION AND CO., LTD.,

22 and 23, Soho Square, London, W.
June 16th, 1902.

PHOTOGRAPHING CORONATION DECORATIONS AND ILLUMINATIONS.

To the Editors.

Gentlemen,—Although there will be a striking sameness about the character of the Coronation celebrations of most towns, at the same time there will be plenty to interest the individual townsman in the proceedings in his own particular town. Personal interest and connection mean much. The fact will apply equally well to photographs of Coronation proceedings. Excepting those of London, invested with the central interest of the presence of the King to be crowned, they will not generate very keen interest. But every townsman will take an interest in the celebrations of his own town. He may know the mayor, is certain to know some of the councillors, possibly is one himself, or has had a hand in arranging some item in the proceedings. In any case he is reasonably certain to be about, taking a general interest in things on Coronation Day. It is the photograph from this man's point of view that will be interesting to himself and his fellow townsmen. It will require some care in selection, and should be stamped with the individuality of the town in some way or other. A photograph of a crowd, however big and dense, in the main square will not do. There will not only be bigger crowds in larger towns near, but the infinity of detail in the picture, in which nothing distinctive can be picked out, makes it no better than a photograph of a big pin-cushion stuck full of pins. But if the town possess a special anything, from a popular member of Parliament or a respected mayor, to an efficient fire brigade, let it be photographed in the procession when passing the most characteristic building in the town. A man with a little go and good sense about him can make good capital out of his results. Naturally and humanly, no one in power objects to being shown taking a prominent official part in what must be regarded as the leading event of a lifetime. We may have got a bit tired of Coronation detail, but all trouble and tiredness are redeemed when we realise that, after all, we are celebrating the Coronation of the most popular King of the most powerful empire that the world has ever seen, an empire so vast that the celebrations circle the earth. An enlargement in black and white, if markedly characteristic of the local scene and sentiment, would probably find an honoured place on the walls of the council chamber, or museum, and prove in course of time a record of historical value.

There is no doubt that many an interested photographer, after having taken his pictures in the course of the day, will regret upon seeing the illuminations—which will appeal more strongly to us probably than the daylight decorations—that they are beyond his power. But are they? We venture to suggest that they are not, although the range is very much narrowed, and the trouble of taking the picture greater. The practical lines we advocate are the following: Selection should be made a few days beforehand of the best spot, that is, of the spot where the preparations for illumination promise to be the best. It may be the front of the town hall, the gas company's offices, the electric-power house, or the docks. The best position for the camera should also be selected, in a favourably situated window by preference, for the street at such a point is certain to be too crowded for our purpose, as the element of time comes in as an important factor. Having selected the scene, and the point from which it is to be taken, the camera should be erected during daylight, and the building or scene taken, at the full aperture of the lens, with an exposure a little under the correct time, in order to gain a very thin, slightly under-exposed, negative. The slide of the dark-slide should then be pushed back again, and the whole

allowed to remain in exactly the same position until the illuminations are fully on. Then, after stopping the lens down to f/12 or f/16, the slide should be again withdrawn for the exposure for the lights. The result should give the nearest photographic representation to the whole night effect of the illuminations, and will probably prove satisfactory. The object is to gain a negative that will give a print dark enough to suggest night. The open aperture of the first exposure, in its slight lack of crispness, will add to the effect, by giving the less clear-cut outlines of things as seen at night. If the lens be so good a one as to give a crisp effect at open aperture, it should be thrown just a trifle out of focus to effect the same purpose. The print would be a dismal failure, of course, in itself, as far as the first exposure is concerned, but the added tracery of the lights in the second will make a picture of it. As the eye will naturally concentrate its attention upon the lights, they should be sharp and clearly defined, hence the stopping down before the second exposure. If one has adopted the alternative case of slightly obscuring the focus, care must be taken at the start to mark the point of sharpness for the second exposure, so as to leave the slide undisturbed in the camera for it. What the length of the second exposure should be there are no available and reliable data to go on. But it would be a very simple matter to experiment the night before upon a street lamp or electric light. Indeed, to be as certain as possible of a successful result, it would be better to rehearse the whole proposed proceeding beforehand. All that is wanted is a frontage at the same approximate distance, with a street lamp in front of it.

Other possibilities by a modification of this combination will suggest themselves to many workers, such a one, for instance, as showing up the detail of a bonfire, with the people around it. In this case it would be a longer exposure on the bonfire alight, in which the people around would not show much, if at all, supplemented by a second magnesium flash a little too low in intensity, in order to give the surroundings as they would appear by night. Preliminary trials in this—as far as the bonfire is concerned, anyway—are out of the question, unless the photographer be devoted enough to his purpose to make a small bonfire of his own to experiment upon the previous night. The foregoing is merely a suggestion of practicable method; experienced workers will doubtless be able to modify the plan to advantage in a variety of ways.—I am, yours, etc.,

PHOTO LOYALIST.

June 13, 1902.

THE TREATMENT OF RESIDUES.

To the Editors.

Gentlemen,—It must surely be of some interest to every working photographer, be he amateur or professional, who uses any quantity of photographic matter, to have an idea of the rough means of saving whatever can be recovered from his waste liter of papers and solutions, and a few notes on the subject may possibly be a slight guide to those who have not hitherto thought of the matter.

No doubt, to most of the readers of this journal any elementary notes on this point will seem superfluous, and to many, indeed, such notes will not appeal, since, in view of the small amount of chemical waste passing through their hands, they have never given a thought to the idea of recovering any residues. Yet the rank of the great army of photographic workers is every day being recruited with such varying candidates that there are always some new hands and beginners wishful to gather whatsoever crumbs may fall from the older hands who have worked in dark room and laboratory and learned from books or experience. Firstly, then, in the case of old fixing baths, and old solutions of hypo, the first proceeding is to add a small quantity of strong solution of sulphide of potassium to the store of old hypo; this store should be kept in a deep jar. In adding the sulphide we shall get the silver precipitated as a dense brown flocculent mass, and this, after being well stirred up, should be allowed to settle. This sulphide of silver must be collected on a filter and allowed to dry. If we wish to go farther we may mix the filtrate with equal weight of two parts of carbonate of soda and one part of nitrate of potash, and fuse the mass in a crucible.

For old toning and fixing baths, as those containing sulphocyanide, we must mix with a little hydrochloric acid and sulphate of iron, and metallic gold will be precipitated mixed with hydrous perchloride of iron. This, on being collected and dried, can also be fused in a crucible.

For acid fixing baths (as platinotype, etc.), we add ferrous developing solution, and get platinum formed, but this is mixed with more or less iron, and the iron will have to be eliminated by the use of sulphuric acid and by thorough washing.

Solid residues, such as print trimmings, etc., must be burnt, and the ashes mixed with carbonate of soda and nitrate of potash, as above, and fused.

In the case of the silver of plates, films, etc., they should be dissolved in hydrochloric acid, to which, after a time, an equal quantity of sulphuric acid is added, and heat applied. Whatever silver forms at the bottom of the vessel should settle and be collected. By mixing this with charcoal and sawdust, and heating to redness, we shall reduce a globule of pure silver in the crucible.

There are, of course, other methods of reducing and collecting residues and their elementary constituents, but for the non-chemical amateur I think these means are about the simplest and best.—I am yours, etc.,

FREDERICK GRAVES.

THE PHOTOGRAPHIC CAMP.

To the Editors.

Gentlemen,—I think the following letter shows such a kindly spirit of fraternity that I ask you to publish it:—

"Corinium House Studio, Evesham.

"Dear Sir,—I have read in B. J. of your proposed camp between here and Stratford, and I am writing to say that if I can be of any service to gentlemen of our profession I shall be happy to render same, or if my dark room or printing room is of any use, they, too, shall be at your disposal.

"Wishing you a very jolly time, yours fraternally,

"Fred Gegg."

I have ascertained that the offer applies to all, whether amateur or professional.—Faithfully yours,

WALTER D. WELFORD.

Warwick Lodge, 166, Romford Road, London, E.

"THE TYMA."

To the Editors.

Gentlemen,—It may interest your readers to know, especially those living in the South of London and use the S. E. and C. Railway and L. B. and S. C. Railway, that demonstrations of the "Tyma" are given every Thursday afternoon from 1.30, and amateurs are invited to bring their exposed spools (6 exposure) and see them developed free of charge without a dark room.—Yours faithfully,

F. STANLEY AND CO., LIMITED.

Railway Approach, London Bridge, S.E.,
June 12th, 1902.

EXPOSURE METERS.

To the Editors.

Gentlemen,—Re query Exposure Meters in your issue, June 6th., B. J., Wynne gives the following table on latest list of plate speeds for April:—

Speed No. on boxes.	20 F.	30 F.	40 F.	60 F.	80 F.	120 F.	160 F.	240 F.	320 F.	400 F.
Imperial	28	32	39	45	56	64	78	90	111	128
Marion	32	39	45	56	64	78	90	111	128	156
Cadet	39	45	56	64	78	90	111	128	156	181

As Marion and Cadett profess to give the H. and D. Standard speed Nos., they ought to be the same. As this may be of use to your correspondent, please publish it.—Yours, etc.,

W. R. KENNAN.

Arcachon, France.

THE NEW PATENT LAW.

To the Editors.

Gentlemen,—We trust that you will find space in your columns to give publicity to the fact that a new law for the protection of industrial property, including patents and trade marks, in Spain has recently been passed, and came into operation on the 7th inst. Under the new law, so far as relates to patents, very important alterations have been made, and it is advisable that inventors having interests in Spain should at once make themselves familiar with the existing provisions. The working conditions of patents have been very greatly modified, and a period for compulsory working has been extended to three years. In addition, the time for payment of taxes has been extended under a fine, while at the same time it is provided that inventors paying up their taxes in advance obtain discount on the same ranging from 5 per cent. to 20 per cent. It is also provided that applicants who have made prior applications in other foreign countries for patents must make application in Spain within twelve months, failing which any patent granted will be limited to five years. There are other important alterations in the existing law which are too lengthy to be dealt with in a letter of this nature. The regulations relating to trade marks also include many important provisions. The definition of a trade mark is extended, and under the new law is very much the same as that prevailing in Great Britain. The maximum term for registration is limited to 20 years instead of being unlimited, as was the case under the old law. It is also provided that taxes shall be paid every five years, failing which the registration will lapse. The rights of trade mark owners are clearly and definitely defined, and penalties imposed. There is a provision that trade marks registered under the old law shall be regarded as having been registered

under the new law, and all such marks must be renewed within a certain period, failing which the rights of the owners will lapse. It is, therefore, necessary that manufacturers who have registered their trade marks under the old law in Spain should be informed that unless they take steps to have them renewed according to the provisions of the new law their rights will cease. There are other regulations providing for the registration of commercial names and titles, particulars of which can be obtained by persons interested on a perusal of the law, a copy of which will be found in the Patent Office Library, or on application we shall be glad to supply any of your readers with further details as to the alterations which have been made.—We are, Sirs, your obedient servants, J. E. EVANS-JACKSON AND CO.

Bristol House, 19 and 20, Holborn Viaduct,
London, E.C., June 11th, 1902.

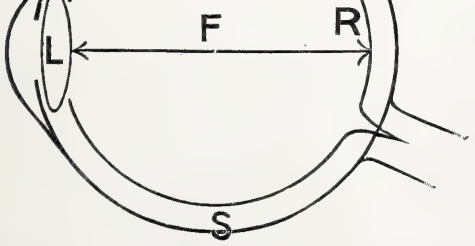
THE SUN AND MOON NEAR THE HORIZON.

To the Editors.

Gentlemen,—In a recent issue I notice a reference to that curious phenomenon, which, as you correctly state, has given rise to more discussions and false conclusions than any other—viz., the appearance of the sun and moon when near the horizon. That they do appear larger in this position than when high up in the heavens there can be no doubt; yet, as the photographic camera shows no difference in their respective sizes in these different positions, it is evident that atmospheric refraction cannot account for the phenomena. We must, therefore, look for a subjective explanation of it, and that is the reason why we are told by some text-books that the sun and moon seem larger on the horizon, because we judge their size and distance from that of other well known objects in the line of sight, or because, showing less detail in that position than higher up (owing to the atmospheric absorption), they seem to be much further away, and therefore larger, as their angular size still remains the same.

The former explanation, which is most generally given, is yet quite unsound, for if we look at the moon when it is standing high in the heavens, through trees or across the roofs of houses, it still does not appear any larger, and the latter explanation, which is given in Müller-Poullet's "Optics," is likewise faulty, for everybody knows that we see far more detail on the moon when it is rising than when higher up.

There is, however, another physiological explanation, much simpler than either of those mentioned. I came across this about two years ago in a German paper, but have unfortunately forgotten the name of its discoverer. It is simply this, that our eye-balls alter their shape slightly when we move our head in different positions. Supposing in this diagram F to be the focal distance from the back of the eye-lens, L to the sensitive retina, R when the eye is held in a horziontal position. This distance, F is, in the average human eye, about 17 mm. Now, if the whole eye-ball were hard and fast, this distance would remain unaltered, in whatever position the eye is turned. But the sclerotic, S, which forms the eye-ball, is only about 1 mm. thick, and not very rigid, and consequently, when the eye is turned upward, the weight of the front part of the eye and the so-called vitreous liquid between the lens and the retina will compress the eye-ball a little in the direction L R, and therefore shorten its focal distance F. But if this distance, and consequently the equivalent focus of the eye lens, become shorter, then also the image formed on the retina will be smaller and not cover the same amount of retina surface, as in the horizontal position; an object seen in these two different positions will therefore appear of different size. A shortening of the focal distance F by only 1 mm., through looking upwards, would make the moon appear 1-16th to 1-17th smaller, an amount which would be quite appreciable.



That the eye-ball does really alter its shape by its own weight one can easily prove to one's self by trying to read a book when lying on one's back. In this position the focal distance F, would be shortest, whilst at the same time the nearness of the book would require rather a longer distance. Consequently, the eye lens has to accommodate itself to an exceptionally short focus, with the result that very soon one begins to feel pains in the eye, headache, etc. This is probably the reason why reading in bed very often causes disturbed sleep.—Yours faithfully, F. KOLLMORGEN.

June 12th, 1902.

PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM.

CAMBRIDGE MEETING, JULY 7—12, 1902.

To the Editors.

Gentlemen,—Since the issue of the official programme the following additional arrangements have been made:—

Monday, July 7, at 4 o'clock, at the Museum of Archæology, Mr. J. Willis Clark, M.A. (Registrar of the University), will give a short address on "The Town of Cambridge, its University and Colleges."

Monday, July 7, at 2.30, and Saturday, July 12 at 10 a.m., Dr. A. H. Mann (organist of the University) will give special recitals on the grand organ in King's College Chapel.—Yours truly,

F. A. BRIDGE,
Hon. Sec. and Treas.

Eastlodge, Dalston Lane, London,
June 16, 1902.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY, 24, *Wellington-street, Strand, London, W.C.*" *Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

PHOTOGRAPHS REGISTERED:—

W. H. Duncan, City Studio, Midland Street, Hull. *Photograph of Sergeant Trayner, V.C.*

E. E. Lippiatt, 2, Church Street, Leamington. *Photograph of Band of the R.M.A. Photograph of Leamington Coronation Festivities Committee.*

W. J. B.—There is no such book.

E. EDWARDS.—Hardly a matter for comment, but thanks all the same.

RETOUCHING.—"SUNDERLAND" writes: "Will you kindly express your opinion of the retouching of the enclosed prints, and what salary should I expect?"—In reply: The work is very good of its kind. Probably it would secure you a salary of from 30s. to £2 a week.

OPENING IN SOUTH AFRICA.—R. W. B. writes: "I should esteem it a very great favour if you could tell me if there would be any good openings in South Africa for a good all through photographer with about £400 capital."—In reply: Yes, we think so.

OLD KEY.—There is nothing new or novel in your idea. The addition of supplementary lenses to lengthen or shorten the focus of a combination is "as old as the hills." Lenses for the purpose are regular articles of commerce—the planiscope, to wit. The lens you are using for the purpose is not the best that can be employed.

ENAMELLING.—"ENAMEL" writes: "Will you kindly inform me of a quick and effective method of enamelling and mounting quantities of prints (cabinets)?"—In reply: Quantities of prints are done in the same way as single ones. If they are small, several may be dealt with on the same plate, which effects some saving in time. Three or four cabinets may be put upon one plate, for example.

CHARGE FOR A NEGATIVE.—C. H. C. writes: "I am an amateur photographer, and I could not get another amateur or person to give the right 'exposer' on me, so I went to a professional, and he took me, and I asked him to sell me the negative. Now, what do you consider he ought to have charged me?"—In reply: We cannot say: Different photographers have different charges, and they are based upon the sizes. As a rule, professional photographers do not part with their negatives at any price.

BICHROMATE FILTERS.—W. D. writes: "I have bought a bichromate darkroom lamp, but the maker gives no formula for the solution for the tank. Would you kindly give me formula for solution which would be safe to develop, say, Imperial Special Rapid plates?"—In reply: A 6 per cent. solution was originally suggested by Howard Farmer, but for extremely rapid plates the strength may be increased to 10 per cent. with greater safety, but, of course, with corresponding loss of light.

MRS. BROCKHOLES asks whether we can inform her where she can procure sulphocarbamide, as recommended as a new toning-bath in the BRITISH JOURNAL of May 23rd, given as Monsieur A. Hélain,

of the Société Francaise de Photographie. Mrs. Brockholes cannot procure it; she is told such a thing is not known.—In reply: Any good London dealer should be able to supply this, or Messrs. Mawson and Swan, of Newcastle, or Baird and Tatlock, or Hopkins and Williams, of Cross Street, Hatton Garden, E.C.

TONING.—C. E. D. writes: "I am enclosing herewith three prints, and shall be greatly obliged if you can tell me of a toning-bath (separate toning and fixing) which will give a similar tone. So far, I have failed to obtain it, except with a combined bath containing gold, ammon. sulphocyanide, and hypo."—In reply: Similar tones may be obtained with the usual sulphocyanide bath—say, 12 grains of the sulphocyanide to each grain of gold, in 8oz. of water. Of course, the toning must be stopped at the proper stage to get this colour.

PHOTOGRAPHY IN LONDON.—J. CHIVERS writes: "Will you kindly tell me if there is any public building or place of interest in the thoroughfares of London which it is illegal for persons to photograph, as I intend taking my hand camera with me when I go to the Coronation, and do not wish to become amenable to the law?"—In reply: "You may photograph the exteriors of public buildings in London without let or hindrance, providing you comply with the police regulations of not obstructing or interfering with the traffic. By all means use your hand camera in the manner suggested.

AMMONIUM PICRATE.—A. C. writes: "Geo. T. Harris, in BRITISH JOURNAL, page 289, January 10th, 1902, referring to 'light filters,' mentions 'ammonium picrate.' This I cannot trace in any list or in the BRITISH JOURNAL Almanac list of chemicals. I have picric acid in stock, and it may be that this will do equally well. Penrose and Co. only mention picric acid. Can you assist?"—In reply: Ammonium picrate is extremely easy to make in solution, it being only necessary to add dry picric acid to liq. ammonia fort. .880 till it will no longer dissolve. Picric acid gives a much yellower filter than the ammonium salt which tends to orange. The dry salt can readily be obtained from any good dealer in chemicals.

ART PHOTOGRAPHY.—A. B. C. writes: "It is with much pleasure I read your able article on 'The Public Recognition of Art Photography,' and your valuable arguments of the necessity of educational advantages, together with natural ability or innate artistic genius. This is evidently the only true road to success. Many of your readers profit by it. I should be greatly obliged if you could name any publication purchasable that embodies the principles of artistic anatomy and philosophy of expression in a practical manner. I have Harding's 'Principles and Practice of Art,' and Ruskin's 'Modern Painters.'"—In reply: See the answer to "Hope" in the JOURNAL of May 30th.

EXHIBITION PRINTS ON P.O.P.—A. U. writes: "I intend exhibiting in the forthcoming exhibition, and should be glad of your opinion on following:—In the 'pictorial' section I have noticed for several years past that exhibits are finished in all kinds of processes except the every-day process of P.O.P. Do you consider an exhibitor will have as much opportunity of securing recognition in P.O.P.? I ask this as, although I am capable of finishing in all processes, it often struck me that in years to come, unless more is seen of P.O.P. in exhibitions, the public will begin to wonder if P.O.P. was ever used commercially."—In reply: Prints on glossy P.O.P. stand very little chance of catching the "judge's eye" at the principal exhibitions nowadays. Let our correspondent try the effect of the matt variety.

MANAGING A STUDIO.—M. A. SURREY writes: "I was engaged (by letter) to manage a studio, at the above address, at a certain sum, for six months. No agreement was signed, but I had the letter officially stamped (6d.), and as soon as I made this known I was dismissed, even without receiving a week's salary, this person beginning to find fault with everything I did, just for an excuse, I suppose. Do you think I could claim for the full six months? (2) And, again, I had arranged to have some of my own negatives finished here, and prints taken off at trade prices. The negatives, as well as the unfinished prints, are refused me, and by thus detaining same I have lost the orders entirely."—In reply: (1) Very much will depend upon what is contained in the letter you have had stamped. (2) There seems to be no justification for the detention of the negatives, and you may possibly be able to obtain damages for the loss you have sustained. The best advice we can give is for you to consult a solicitor on the matter.

LENS QUERIES.—A. G. H. writes: "Some time ago I bought a rapid doublet lens, to cover 18 by 16 plates, of Mr. C. Burr, optician, London. When I take a group in a straight line, on a 15 by 12 plate (with 11 stop), the two ends of the group are not sharp and crisp like the centre of the group. (1) How can I alter this to make them sharp at the ends? Will unscrewing the back lens a little do it, or will it be best to form the group more in a circle? (2) I intend taking some views of the Coronation procession, with the same lens, using the largest stop; size of plates, 12 by 10; Imperial special rapid speed No. over 200. Supposing it is a nice, clear day, will one-eighth of a second, timed by Thornton-Pickard shutter, be quick enough—that is, not to show any movement? (3) Will one-eighth of a second fully expose the plate?"—In reply: (1) This form of lens has not a flat field like an anastigmat, consequently the group must be arranged to suit the curvature of the field of the lens, bringing the ends of the group a little more forward than the centre. Unscrewing the back lens will be of no avail. (2) It will depend upon the rate at which the procession is moving, and whether it is passing at right angles to the lens or not; if it is, with the eighth of a second's exposure, we should expect a movement to show. (3) Yes, we should say so.

ORGANIC DEVELOPERS.—CHARLES MCGREGOR writes: "(1) I should be greatly obliged to you if you could refer me to some book or original papers in English, French, or German, containing descriptions of the modes of preparation of organic developers. I mean books or papers dealing with this subject in some detail. What books I have come across either do not mention some of them or mention them in too general a way. The following is an example of the difficulty I have. I wished to prepare paramidophenolhydrochloride and started with 45 grams paranitrophenol, which I reduced with tin and hydrochloric acid, excess of the latter being used. After filtering, the precipitation of the tin as stannous sulphide with H_2S took about six hours. This, filtrated, was then evaporated down to very small bulk, till, in fact, the crystals began to come out of the hot solution. During the process of evaporation the colour, from clear, became yellow, then red, to purple, to black. On cooling, crystals separated out, and these were dissolved in alcohol (saturated solution) and precipitated by addition of ether. The crystals now obtained were whitish-green, and the yield was only 11 grams. Evaporation down of the alcoholic filtrate gave about a gram more, but not so pure; and evaporation to dryness of the water filtrate gave a black residue mixed with some crystals, but not more than another gram. What I should like to learn is the precautions to be taken to obtain a much larger yield and purer crystals. (2) Could you direct me to some source of information on the method of making photographic reproductions of diffraction gratings? When I tried this first I thought I had nothing to do but put a lantern plate behind a diffraction grating, and, proceeding in the ordinary way, get the copy. This failed completely. A friend who was working with me suggested using potm. diabrom., so as to get the ridged effect. This failed. We tried dissolving salts from the plate and then soaking in $K_2Cr_2O_7$, and then exposing. This failed. We tried glossy P.O.P. treated in same way and exposed in printing-frame behind the grating, and got a spectrum, which disappeared on putting into water. We then saw what should have been obvious from the first—that this reproduction was produced by pressure. We tried a few more, dissolving out the silver salts with hypo and then soaking in alum to harden, allowing to dry somewhat and then pressing on to the grating. When these came off dry, as they were white and glossy, they gave a really brilliant diffraction spectrum by reflected light. We wished to get one on glass, but as by this method a thick film of gelatine was required to allow of proper contact on pressure, and we could not get a thick enough coating sufficiently clear (always somewhat muddy) we ceased experimenting for the time. Do you think there is any use prosecuting this pressure method? (The P.O.P. replicas made good, cheap 'testers' of the actinic safety of the red lamp.)"—In reply: (1) So far as we are aware, directions for the preparation of paramidophenol have not been published in any work on photography, either in French, German, or English. It might, however, be possible to find the same in one of the newer German chemical works. (2) There should not be the slightest difficulty in getting a clear, thick coating of gelatine on glass if a gelatine such as Heinrich's, Drescher's, or Stoess' emulsion gelatine be used. With a 1-in-8 solution, using distilled water and a little preservative, such as carbolic acid or xylol, it is easy to obtain a film of more than 1-16th of an inch thick when wet, and, with a stronger solution, even greater thickness, with a frame round the glass. We may add that we believe the best replicas and gratings are made by the use of celluloid, and we should advise a trial with this, as it can be softened by heat or even flowed over the grating in the form of a very thick jelly.

*** NOTICE TO THE TRADE, WHOLESALE AGENTS AND BOOKSELLERS.—*A Contents Bill is issued with each number of the* JOURNAL, *and copies may be had on application to the Publishers.*

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*** *The Editor can only be seen by appointment.*

*** *We do not undertake to answer letters by post.*

EX CATHEDRA.

Arrested Motion. Most people of finer susceptibilities experience a sub-conscious feeling of dissatisfaction in looking at a representation of arrested motion, particularly so of arrested violent motion. That is, of course, looking at such as a picture. If it be a photograph to illustrate the speed of a shutter or a plate, the manner in which a horse gallops, the start or finish of a race, and so on, it is another matter. The point of view being different, the feelings called into action are also different. So far from producing any feeling of dissatisfaction, such representations give strong pleasure. But no one will take them to be pictures in the broad and artistic sense. If the aim be at these, motion arrested photographically is a potent weakening factor. The proof is simple. Everyone will probably be ready to admit that the truest proof of excellence in a picture lies in the permanence of the pleasure that it gives. Not only can it be looked at again and again with pleasure, but with increasing pleasure. This is not the case if arrested motion form an element—or, as is generally the case, the main element—in its composition. The skill of the producer may be highly appreciated. But the appreciation of skill is not the essential basis of love in pictures more than in the other directions in which the emotion is felt. The high quality of many a well-known battle scene, full of violently-arrested motion, would seem, on the face of it, to be against our contention. But if the matter be more closely looked into, it is not so. The salient emotions begotten when looking at such scenes graphically presented are noble and high, but they are not the softer artistic ones. They are ones of horror, pity, the humiliation of defeat, the pride of victory. They stir up the soul too deeply to be accounted pleasures, and do not find a place upon walls looked often and sentiently at.

* * *

The Eye's Deficiency. The simple and natural reason for the instinctive mental friction set up by the representation of arrested motion is that it is not of a piece with our experience. No human eye has seen the detail in an express train rushing along at sixty miles an hour, has not even noted it in the body and legs of a horse galloping at a much slower rate. When it sees these made distinctly visible by mechanical aids there is a feel of unreality about them. It is this that the artistic soul resents, as forming elements in a picture avowedly designed to soothe and gratify. A similar objection holds in the case of motion shown, which may have been slow enough to have been easily followed by the eye. It is the permanent break in the natural and immediate continuity of the motion that offends here. The uplifted foot of the walker is for ever raised, the cricketer's bat ever remains in the position in which it caught the ball, and so does the ball in the air. There are some motions that the mind, recognising unconsciously as continuous, resents less in a photograph than others—breaking waves, waterfalls, and sailing ships, for instance. The waves go on breaking eternally on the shore, the river will ever fall over the break in its course, and the ship sails so long and so uninterruptedly that motion and widespread sails are recognised as naturally pertaining to her. Generally the mere representation tends to become the desired picture in the exact ratio that the pictured scene approximates most closely to the actual one, and the effort should always be to bring this about. It will be impossible to do so fully, but that is no reason for not attempting to do it to the limit of opportunity. The closer perfection is aimed at, the better the result, and having a knowledge of what goes to the making of perfection is a great gain in the effort. It is working in a clearer light. In practice, as there is no possibility of controlling the reality and adapting it to its photographic picturing, it is photography that must bend its back and do the adapting. And do it in the true way, too. To go back to the example of the train, a photograph taken of it in the time it is scientifically known the eye takes in its picture would not do. And that from the fact that the brain corrects the blurriness which should from a point of mechanical

optics characterise it, but which the sensitive plate behind the lens cannot do. In short, an express train in motion is, pictorially, an impossibility to the photographer. It is possible to the artist with pencil or brush, because he draws or paints, not the train itself, but the picture of it formed in his own brain. And the more or less closely the brain picture of the one looking at the delineation runs to that in the brain of the artist, the more or less highly does he regard and like the result. This picturing of a picture, and not the reality, is what makes it possible for the artist to represent more pleasingly, not only all forms of motion, but also things at rest. His galloping horses, running brooks, men and women, are not scientifically, photographically, correct, we well know, but we also well know which is the better liked and valued—the false or the true.

* * *

The Psychological Aspect. If the photographer must needs deal with the subject of the train, he must do it in a way that lends itself to this psychological demand. There are plenty of such. The one chosen must depend upon the individuality of the worker. In the first place, why take the train in motion? What difference is there pictorially between it and when at rest, except that the less difficulty in doing work under the latter condition will yield a better result? May not one be struck by other pictorially possible qualities about an express?—the great power and potential energy bound up in a modern engine, for instance. If so, one might take the engine about to start, showing at close quarters its strong and massive build, the beautiful accuracy of its mechanical parts, and the steam escaping at high pressure from the safety valve. Credit will not be gained for such high technical skill from such a picture entitled "An Express About to Start," as from one, "An Express Train, Taken when Travelling at the Rate of 60 Miles an Hour," but, pictorially, the former result will be much the better. There is one further consideration that should weigh in its favour. If there be no other question than proving skill, action is not upon the highest plane. Artists and technicians of the first water subserve all evidence of technical or manipulative skill to a higher consideration, the soul or spirit of the picture. There is no necessity—even if there were space—for dealing in detail with other instances of mistaken pictures of arrested action and motion. By altering the point of view, and remembering the leading idea of adapting photographic means to natural impressions, in place of violating them, even though by the latter the mechanical qualities of photography be brought out to their gilded full, the broad worker will both add to his pleasure and improve his results from an artistic, pictorial point of view.

* * *

Tree and Flower Sprays. Many a sympathetic lover of nature must keenly regret when wandering meditatively along the hedge-side path in the month of June, that the glories of its sprays, flowered and green, are so short-lived. Nature seems so extravagantly wasteful in crowding such a wealth of beauty into so short a time. It would stand spreading out a little more so easily, and we would be grateful for a share later on in the year. But if we must accept things as they are, and be content later with the remembrance, there is no reason why remembrance should not be strengthened and heightened by a hint. Photography offers one means of conveying it. The hint will fall far short of the reality, and fail sadly in suggesting the chief, but so ethereally elusive, elements that gave such zest to the pleasure of the original. The colour and scent of the hawthorn, the golden glory of the laburnum, even the delicate flush of the maturing green, are all beyond the reach of the camera. The forms are all we can hope to preserve. But these are well worth catching. Fortunately the suggestive power of a hint is directly proportioned to its delicacy, and this quality is certainly very characteristic of the forms of sprays of all kinds at this time of the year. The difficulty is to catch it. A picture of the whole hawthorn or laburnum would be too heavy, and offer so much detail, that the imagination would have no scope for action. The photograph of a single spray taken as forming part of the tree or hedge would also be unsatisfactory. It is too high to be caught in simple, natural form, sufficiently large and sufficiently detailed. Or, if lower, there is no suitable background. The sky may be a plain one, but it is too far off for the lens, and too difficult generally to be treated photographically as a background for a delicate spray. In both cases there is always a wealth of extraneous detail that, however effectively ignored by the eye in its process of selection of the best bit, proves too much for the merely mechanical power of the lens. Finally, no one who has not observed closely has any idea of the everlasting movement in tree sprays. There are very few days in the year in which they are still, and the time of day, to boot, in which they are stillest, is, as a rule, in the evening, when the light is not penetrative enough for the detail that we want. The spray must, reluctantly, be cut, and arranged to suit the limits and special demands of photography.

* * *

Lighting and Backgrounds. The arrangement of the incidence of light and the colour of the background are questions for ordinary photographic skill and artistic perception. Two conditions are essential. The lighting must give a crisp light and shadow effect, and the background serve the purpose of an effective foil. More difficult in our experience to express than delicacy of form, and harder to gain than effectiveness of background, is the natural droop of the spray. What is so graceful on the tree looks stilted and formal in the print. Each particular kind of spray has its own particular way of holding itself. Its individuality is largely expressed by it. If this cannot be caught the result looks as unnatural as the portrait of a man we know, and know well, taken in a false pose. To correct this, we would recommend that before the selected bough is cut, a line indicating its curve and direction, from the parent stem to its far end, be drawn upon a blank sheet of paper for further guidance. Everyone, surely, can go as far as this without any lesson in drawing. The next thing is to reproduce the natural curve, with the aid of the line, in the arrangement of the cut bough. And that as quickly as possible, if the seal of advancing death is not to qualify the grace of life in our picture. As this is a matter of minutes only, in practice it is impossible to work unless the stump of the spray be placed in vivifying water—warm water for preference, and with a little finely-powdered charcoal mixed up in it. The difficulty to be got over at this point is to keep the end of the spray stem, if at all long, under water in an ordinary vase or bowl, and at the same time give it its desired growing form. It either carries the vessel over, or, resting against its side, thereby acquires a false bias of direction, and so loses its characteristic shape.

* * *

Uses of Flower Holders. The best arrangement we have found for correcting this is the irregularly folded strip of sheet lead that has been recently placed upon the market as a flower-holder. Many readers have doubtless seen and used it. For the benefit of those

who have not, it is merely a strip, two feet long and an inch or two wide, of the heavy sheet lead that plumbers use in making water-tight joints in roof and window angles. If this be roughly doubled and re-doubled by being folded back upon itself several times, and then squeezed together a little, it will form a solid base, in the slightly-opened folds of which a large number of flower stems can be held. Placed in a shallow china bowl, as a flower-holder it is extremely effective, for the full flower stems can be shown, and the natural droop of the flower head retained. Anyone ought to be able to obtain one from a plumber for sixpence, the plumber being probably very glad to dispose of his waste strips of lead so profitably. By the use of a heavier strip and a little shaping of the soft and yielding metal, a large spray can be given any desired inclination and droop, at the same time that the whole is kept fresh and crisp by its stem being kept under water.

An album of sprays, flowers, and ferns taken in this way offers tempting artistic possibilities to those in love with their graceful forms, but who are repelled by the unpleasing stiffness of their orthodox photographic reproduction in pictures. There is another way in which the idea may be made use of, viz., in making glass positives to be fixed against the smaller top panes of artistically-designed window-frames. Many of these are plain blanks that could do very well with a little suggestive decoration. In many other well-designed and comfortable houses there is an almost criminal touch in the harsh and crude colours of the upper light of some of their windows. If short of this violence, it is rarely that the architect and tenant think alike in the matter of colour and decoration. The offending pane should be taken out, and one of plain glass substituted. Fixed against this, a glass positive, or two, cut to the true size, upon which are printed delicate sprays, ferns, or flowers, would give a wonderfully improved air of delicate and mentally invigorating decoration. If preferred, the pictures could be stained a light canary, amber, or other cheerful colour. These would not do, of course, in a window facing full sunlight or sun heat, but there would be no difficulty in finding windows in every house where these factors need not be considered. As a rule, too, they are the windows of duller back rooms, in which, on that account, a little delicate, artistic decoration is most needed. There is the rough idea, anyway, for the utilisation of the flood of artistic spray glory running riot and to waste in these June days. The reader can select and modify in any way that suits his taste and individuality.

* * *

Snow Waves. Visitors to the last exhibition of the R.P.S. at the New Gallery will remember that, in the scientific section, Dr. Vaughan Cornish showed a remarkable series of pictures illustrative of wave motion. These comprised waves in wet sand set up by tidal currents, waves in dry sand produced by the action of the wind, moving snow waves, and ripples in granular snow. Last month Dr. Cornish dealt with the same subject in a paper read before the Royal Geographical Society, which he entitled "Snow Waves and Snow Drifts in Canada." Although it seems a new subject to most persons, it is not new to Dr. Cornish, for this is the sixth annual paper in which he has explained the results of his original investigations in Snowland. It seems that during the winter of 1900-1901 Dr. Cornish and his wife made careful study of the peculiarities exhibited by snowfall and snowdrift in the provinces of Quebec, Manitoba, and British Columbia, and at this time the fine photographs to which we have called attention were taken. Lantern slides from the original negatives were employed to illustrate the paper. Dr. Cornish pointed out that snow is of two kinds, the moist sort with which we are acquainted in England, which clings together, and can be made into snowballs and snow men, to the delight of careless boyhood; and the dry, powdery snow, which forms when the mercury column gets down to or below zero. The moist snow refuses to be coaxed into waves by the action of the wind, but the dry, non-adhesive snow usually drifts into that form, and closely resembles the waves in desert sand and the sandbanks of tidal estuaries. There is great variety presented in the appearance of the Canadian snowdrifts, and Dr. Cornish attributes this to the circumstance that they are seen in all stages of incompleteness, due to the supply of material not being sufficient to fill in the whole of the "eddy space." He drew a variety of theoretical conclusions from the forms assumed by these drifting powders. In addition to the fine lantern slides thrown upon the screen, a number of bromide enlargements were exhibited after the reading of the paper. We congratulate Dr. Cornish upon these excellent pictures; it would be difficult in these days to meet with any which illustrated so well a new line of research.

* * *

Notable Houses. Something of the "divinity which doth hedge a king" clusters around the memory of any good man who has earned the admiration of his fellows as poet, painter, musician, or author; and a laudable custom, originated, we believe, by the Society of Arts, places a tablet upon the house once occupied by one of these benefactors of humanity. It is good that the careless pedestrian should, by the help of these tablets, recall, if only for a moment, the memory of the great dead. Thus at Hampstead we can look upon the modest cottage once occupied by the gentle poet Keats, in many London thoroughfares we can see where Dickens pitched his tent, and the neighbourhood of Leicester Square gives other opportunities of viewing and photographing the dwelling-places of famous men. Until last summer there was a certain house in Gerrard Street which bore one of these familiar circular tablets with the legend:—"John Dryden, poet, lived here. Born 1631, died 1700." This house, obviously more than two centuries old, was a handsome one, and looked as if it could well bear the stress of another hundred years, but it was pulled down and a modern building, with no particular charm about it, reigns in its stead. It seems incredible that the Dryden tablet should have been affixed to the new house, but this is actually what has been done, so that in the near future, when London smoke has given the brickwork a little toning down, what is now a palpable lie will pass for truth. There are other London houses where the same kind of imposture has been practised, and among them may be named the residence attributed to Hogarth in Leicester Square, to Turner in Queen Anne Street, Marylebone, and to Byron in Holles Street. As London is always being renewed piecemeal, this handing down of tablets from ancient to modern erections, just as if they were heirlooms, will naturally continue, unless someone in authority will arise and protest against it. The case might be met by establishing a rule that, in case of reconstructing a house to which a tablet is affixed, such tablet should be returned to the Society of Arts, so that its wording could be altered to meet the new conditions under which it was exhibited. This suggestion may possibly commend itself to Sir H. Trueman Wood, the present secretary of the society, who is well known to our readers as a past president of the R.P.S., and as one who in many other ways has shown a constant interest in photography.

Manufactured Visions. A strange story of a remarkable hoax is told by the Milan correspondent of the "Daily Telegraph." Much religious excitement had been aroused by the report that the Blessed Virgin had appeared to a young shepherdess on the mountain of Strega, near Ancona, and had bidden her to do her best to collect money from the faithful, so that a church could be erected on the spot. The news spread, and thousands of persons, numbering among them many of the halt, the diseased, and the blind, made their way to the mountain in the hope of miraculous relief from their sufferings. All brought gifts in their hands to place at the feet of the apparition, and the authorities were at their wits' ends how to deal with such an unwonted influx of people, many of whom were in a most helpless condition. Strange lights were seen on the mountain top at night, and so many persons testified to having seen the figure of Our Lady that even scoffers were silenced when disposed to attribute the appearances to hallucination. A few level-headed fellows, who are described as "prosaic policemen," at length suspected some kind of fraud, and their investigations led to the discovery of a magic lantern, whose operators had carefully appropriated the funds intended for church building. We sincerely trust that these impious and mischievous rascals will meet with their deserts, and that in the course of their trial the exact method of carrying out their imposture may be published. Among an ignorant peasantry it would be by no means difficult to raise a superstitious scare, as has been instanced again and again in our own village communities. Even in London itself many such attempts to delude the ignorant have been made, and crowds have collected night after night in order to see an alleged ghost that was wont to appear at the window of a certain house. Given a magic lantern at a window at one side of the street and a white house on the other side, a picture of a ghostly visitant can be flashed on once or twice, and the story of the remarkable appearance will quickly spread over the parish. The celebrated Cock Lane ghost made its appearance nearly a century and a half ago, but it created so much excitement in London that its memory still lives. In this case the perpetrators were assisted by a female ventriloquist, and we are glad to know that they ultimately found their way to the pillory, and well merited imprisonment. We may add, as a matter of interest, that the common way of raising a ghost by means of a lantern is to project the figure on to smoke.

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The Weather. Of all businesses, that of the photographer, perhaps, suffers most from a long continuance of dull and cold weather such as we have recently experienced. He is prepared for this kind of thing in the winter, and hibernates to a certain extent, but when dark skies, accompanied by cold and torrents of rain, present themselves in May and June he is in a bad way indeed. How can he expect his studio and reception-rooms to be gay with spring toilettes when there is no spring? and who cares to be photographed in a waterproof and a blue nose? Many camera workers must have sadly wished, during the past weary weeks, that the mythical being known as "the clerk of the weather" had a real corporeal existence, so that he might be kicked. For he has defrauded us in the most shameful and shameless manner of the most attractive of the four seasons. "Come, gentle spring! Ethereal mildness! come," sings the poet Thomson. And it did come in his day, and rustic swains danced around the Maypole on the village green, without any risk of lumbago or sciatica. Another poet informs us that "Spring unlocks the flowers to paint the laughing soil." But now the key appears to have been lost, and as to laughing, how can the soil be expected even to smile when it is wet through? We have had no spring this year, and the drapers who prepared a stock of spring materials have them still on hand, and the doctors have had no call for spring medicines. What is the reason for these outrageous vagaries of the weather clerk? Some blame the volcanic disturbances in the West Indies. Others wisely shake their heads and talk of a preponderance of icebergs in the Atlantic, as if icebergs 2,000 miles away could have any more effect upon Britain than the lumps of ice of the Bond Street fishmongers have upon the temperature of Regent Street! Others learnedly blame the sun for the abnormal weather, and talk of a sun spot minimum. All we can say is that if King Sol requires lotion for his eruptive countenance he need not spill so much of it over our poor little earth. The fact is that weather prophets are all wrong in their surmises, and the best thing to be done is to make the weather a subject for discussion at all the photographic societies throughout the kingdom, in order to see whether any remedy can be found. It is certainly no good reading papers about lenses, exposures, and developers when there is no possibility of picture-making. The only appropriate subject this (so-called) spring has been the wet process, and of that we have had far too many demonstrations. At the time of writing the barometer shows symptoms of better things, and possibly when these words appear in print the sun, too, will be visible. Let us all loyally hope that he will shine on Coronation Day.

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London Trees. Anyone who is familiar with Paris and other Continental capitals, will know full well that one of their chief attractions is the presence of trees in all the thoroughfares in which trees can possibly be planted. The Londoner is first to remark on this, for London trees are few and far between. There is no room for them in the narrow alleys of the City, and although sentiment has preserved the solitary one in Cheapside, immortalised by Wordsworth, it has been so encroached upon by bricks and mortar, that only its top, peeping timidly above the chimney pots, is visible. But London is far more arborescent than it was a few years back, when there were no trees at all, except in the squares. Now we have them at Charing Cross, Shaftesbury Avenue, along the Embankment, and in various other roads; and by and bye, when they have gathered a little more bulk, they will make a brave show. All of us who have the least artistic feeling are naturally interested in this question of urban tree-planting, and several are asking to-day why the Marylebone Vestry have refused the generous offer made by the Society over which Lord Meath presides to turn Portland Place into a leafy boulevard. Others are lamenting that, in erecting the timber stands for the coming Coronation seats, many trees, especially those in the immediate vicinity of the Abbey, have been ruthlessly cut down, or mutilated. One writer, in deploring this piece of vandalism, intimates that the public do not know what a slow and difficult work it is to replace well-established trees in London. But the truth seems to be that the trees ought to have been bodily removed, and replaced after the streets assume their normal condition. Trees can be thus transplanted without much risk of injury, although our authorities do not seem to be aware of the fact. At the last Paris Exhibition hundreds of trees were thus removed to make room for the temporary buildings then erected. Many of these were from 30 to 50 years old, and they are now back in their former places, and no one would guess, looking at their present luxuriant appearance, that they had ever been disturbed. Again, quite recently, in the course of street improvements in the same city, a double row of large trees has been shifted to new positions, and

are now in all the beauty of their summer toilette. "What is possible in Paris in this matter," writes a "Times" correspondent, "is possible in London." And he pertinently adds that the people whose duty it is to see to these things in our metropolis are far too apathetic about such public duties, while they are enthusiastic about particular fads, such as anti-vaccination, anti-vivisection, temperance, and even ping-pong. We fancy that there is some truth in his indictments.

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Animals on Motion. More than twenty years ago, before the general adoption of gelatine plates, with their advantages of convenience and rapidity, Mr. Muybridge, then of California, produced his wonderful photographs of trotting horses and other animals in motion, by which the various phases of a walk, trot, or gallop can be studied by scientist or artist. Some of the attitudes thus represented were so novel, and so strange, that they were apt to raise a laugh, and thoughtless persons, without any idea of the reasons why such phases were invisible to the eye, foolishly argued that if such attitudes occurred in nature, artists could not go far wrong by introducing them into their paintings of animals. It now transpires, and the curious circumstance has been pointed out by Mr. Muybridge himself, that some of the most peculiar of these phases of an animal's movement were known to Egyptian artists as long ago as the year 4700 B.C. And, in proof of his assertion, he refers to the new volumes of the "Encyclopædia Britannica," in which, in the article "Egyptology," is reproduced a tablet of Mena. Upon this tablet, which is regarded as the oldest written matter known, are two figures of a bull and a deer. Commenting upon this, Mr. Muybridge writes: "A bull striving to attain its highest speed is represented in a phase of movement which, after a lapse of sixty-six centuries, is reproduced in a photo-engraving illustrating some consecutive phases in the stride of a horse published in the "Century Dictionary," under the heading "Gallop," and in the "Standard Dictionary," in its definition of "Movement." With regard to the deer, it is represented as jumping over an obstacle, with its legs flexed in pairs under its body. Of this figure Mr. Muybridge writes: "A precisely similar phase may be found in a series, in the library of the British Museum, demonstrating a jump which sometimes takes place in the rotatory gallop of the deer, which system of motion is always used by the deer, and also by the dog, when, from caprice or necessity, they endeavour to make rapid progress. This distinctive method of galloping was unknown, and, indeed, unsuspected, by us moderns until revealed by photographic investigation of animal locomotion; but it was, apparently, well known to the early artists of Egypt." Verily, "there is nothing new under the sun," not even the wonderful phases of movement delineated by the camera of Mr. Muybridge. We may remind our readers that to Mr. Muybridge must be given the credit of being the first to produce and exhibit what is now commonly known as an "animated photograph." This he did as far back as the year 1879 with an instrument which he called the zoopraxiscope, although at that time such a substance as transparent celluloid was unknown, and his pictures had to be supported on glass.

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Sky Sketches. Reverting to what we wrote a week or two back concerning the "gorgeous sunsets," which were attributed to the volcanic dust in the air after the terrible outburst at Krakatoa, our attention has been called to the circumstance that a number of sky sketches were made at the time by Mr. William Ascroft. Some of these were selected by the Royal Society for reproduction as a frontispiece to the report of the committee on the eruption in question, and of the others more than 500 were sent to the South Kensington Museum, where they are still on view in the mineralogical and geological section of that institution. These will repay careful examination, and the visitor should have in his hand at the time the little catalogue of the pictures, which he can buy at the doors for one penny. From the preface to this catalogue, we learn that these sketches, which the author happily and modestly describes as a kind of chromatic shorthand," were chiefly taken from the banks of the Thames at, or near, Chelsea, and that the first strong afterglow was observed November 8th, 1883, when a lurid light was seen about half an hour after sunset. "It was so extraordinary that some fire engines turned out." It also seems, from references to which the author calls attention, that just one hundred years earlier similar sky effects were noted, following earthquakes in Sicily and Calabria. But it is difficult to say why earthquakes, in which, generally, the raising of clouds of dust is of a far more local character, should have affected the sunsets, except in the immediate vicinity of the disturbance. Dr. Ascroft has not only done service to science in thus making records of effects produced under abnormal conditions of the atmosphere, but landscape artists should be beholden to him for making these notes in colour. He has done the work in the only way it could be done, making these impressionist studies on toned paper in pastels. No other medium would have ensured that quickness of handling which these very evanescent sky changes demanded. He but followed in the footsteps of Martin and Turner, who both, by the way, lived at Chelsea, by the Thames-side, for it is recorded of both these artists, if we remember rightly, that, from a boat, they would make such rapid studies of sunsets in chalks, for after use on their canvasses. In mentioning this we have no thought of putting Martin on the same high level as the great Turner, but he was an artist who is, at any rate, worthy of mention as being a master of broad effect and rich colouring. The photographer can gain much by carefully studying these sketches, for they have all the elements of a picture in them, and he can, at any rate, see how certain arrangements of cloud can be wedded to suitable landscapes. It is a matter for regret that these sky pictures are placed in a very bad light on a revolving screen, an admirable device when there is good illumination from above, but a bad one when dependence is placed on a near window.

NATURE Study.—Prof. Bailey, of Cornell University, gives a weighty answer to the question: "What is nature study?" It is, he says, a point of view, the acquirement of sympathy with, and interest in, the natural world around us. We live in this world, and the better we fit it the better for us. It is for this reason that nature study deserves a place in the school studies of children. Primarily, the object of nature study is not the acquisition of mere information. Nature study is not "method" in the sense that the word is used in pedagogy. In another sense scientific method is of the very essence of nature study, it would seem. A child asks: "How old is the world? How long have men lived on it? Why has a tiger stripes? Why do certain flowers have exactly such shapes and no others?" To answer these questions the child must be made to comprehend the methods at the base of geology, zoology, botany. And in this sense it would seem that method is of the very essence of nature study. The object of such studies is not to make the child a specialist or a scientist. It is to make him a citizen of the world he lives in—to interest him in plants and birds and insects and running brooks. The crop of scientists will take care of itself. Much is often unwisely sacrificed to a so-called "thoroughness"—which in many cases takes the form of a perfunctory drill in mere acts. Accuracy is, of course, a prime requisite of all good teaching; but it is necessary, first of all, to awaken genuine interest. The first essential is direct, discriminating, accurate observation. The next is to understand why, and the third is the desire to known more. The final result should be the development of a keen personal interest in every natural object and phenomenon.—"The Scientific American."

THE CINEMATOGRAPHIC ADVERTISER.

In looking over a pamphlet relating to the building and inauguration of the Crystal Palace, Sydenham, which we lighted upon recently at the British Museum, we found a paragraph which was both interesting and amusing. It told how Dr. Gauntlett, a well-known musical authority in the early fifties, had proposed to the directorate of the yet unopened palace that several organs should be distributed throughout the building, and played, by electrical means, from a single keyboard situated in the central transept. His suggestion was negatived at once, with the observation that the proposer had evidently no conception of the high aims of the institution. "Nothing so trivial as music would be countenanced within its precincts."

It would be impossible, as well as unprofitable, to find out who the particular wiseacre was who gave this absurd reply to Dr. Gauntlett's very reasonable proposal. But we should imagine, from the fact that a grand musical fête was held at the Palace on behalf of the Patriotic Fund, shortly after the building was opened by her late Majesty, that the person in question was not regarded as a reliable prophet, even in his own native Sydenham. Since that far-off time the glass walls and roof of the big building have resounded to the strains of many Handel Festivals, to brass bands without number, to the dulcet notes of innumerable choirs, guilds, and societies, and we must ever remember with gratitude that its splendid orchestral band—now, alas! dispersed—did much for English music during its many years sway under the accomplished bâton of Mr. Manns. It thus came to pass that the building which was not to be spoilt by anything so trivial as music became for many years the temple of all that was best in the art.

We had these things in mind as, the other day, we sauntered along the nave of the big palace at Sydenham. We thought of those high aims with which the building was inaugurated, and how little they accorded with its present aspect. For a long time there was a switchback railway in the grounds, and we believe that we are right in stating that roundabouts and swings are not altogether unknown there. Swings have now invaded the building itself, and within a minute's stroll of the forsaken concert room the visitor can now, for the moderate sum of twopence obtain quite as good a swing as he can at Hampstead Heath on Bank Holidays. There are also side-shows along the length of the nave, each furnished with its leather-lunged advocate, shouting out in raucous tones its particular advantages: "This way! This way, gents, for all the fun of the fair!" It may be necessary, for financial reasons, for the directors of the Palace to thus forsake the ideals of those who came before; but there are many persons who must deplore their action.

There is, however, one side-show at the Palace which turned out to be distinctly worth seeing. Strange to say, it is without a vocal sentinel to sing its praises, and, still more strange, it bears a motto, "Admission free." Thus encouraged, we entered, and found ourselves witnessing an exhibition of animated photography which comprised some interesting and novel features. It soon became apparent why there was no charge for admission—the pictures shown, animated as they are, were, with a few exceptions, advertisements pure and simple. The exceptions proved to be some very good examples of cinematographic work, which were sandwiched in between the others, in order, we may presume, to prevent the spectators quite realising the true lines upon which the exhibition was conducted. The thing was, on the whole, cleverly conceived; but, of course, as might be expected, many of the subscribers—and we suppose it is fair to so describe them—defeated their own object by making the advertisement too blatant. As this form of advertisement is likely to be extended, and as many of our readers are interested in cinematography and its doings, it will perhaps be useful to give a brief description of the lines upon which the exhibition is run.

We may say, by way of preface, that no word is spoken during the show, but there is a piano, which plays more or less appropriate music. After one or two introductory pictures of an ordinary kind, we have thrown upon the screen the fancy title of the next film, "by kind permission of Messrs. So-and-So." This turns out to be an advertisement of Messrs. So-and-So's "Food for infants," and we see a big jar of the food, out of which a fairy coaxes several big babies. Buller's reception at Aldershot comes next, and is closely followed by the famous soap advertisement of "The dirty boy," both scrubber and scrubbed being very animated. Again an ordinary film serves as sandwich, and another title is displayed, "A dainty drink," by permission of Messrs. Blank. This is a decidedly good picture, a large poster being seen, through which is thrust a pair of hands, which tear a big hole in the centre of the paper, revealing a young lady, who drinks the health of the spectators in a glass of Messrs. Blank's speciality. "Her morning bath" is explained by a young lady pouring into her tub some liquid from a bottle supplied by a certain company, after which, as she begins to disrobe, the films come to what some might consider to be a premature conclusion. "The relief of Ladysmith," displayed as a title, leads one to hope that the scene to be shown is an incident in the recent war. But, alas! Ladysmith is personified by a suffering being, who is *relieved* by a present of Mr. Somebody's curative compound. Truth to tell, there is a good deal of sameness in some of these pictures, especially in the advertisements relating to patent medicines, and to drinks of a more attractive kind. Sometimes it is champagne, and sometimes Dr. Somebody's invigorating essence—but usually the dose is delivered to the recipient by a young lady in more or less classical garb. We were glad when the drinks were done with, and mustard took their place, with the rather enigmatical title, "On the road to Klondyke." A half-frozen traveller is seen in the snow, trying to light a pile of faggots. They refuse to burn, until he produces a tin of mustard, which induces so much heat that the sticks burst into flame. The conceit is somewhat weak, but it serves. It is impossible to do much with a bicycle in an animated photograph, but we have here a lady and gentleman, each fooling around with a machine, and gesticulating to one another with regard to their respective merits. They also direct each other's attention to a big poster on a wall behind them, upon which the maker's name is very prominent.

The virtues of a certain carpet-sweeper are extolled by means of a little drama in two acts. In the first one we see a servant raising clouds of dust in a sitting-room by means of an ordinary broom, much to the dismal of an old gentleman taking his ease therein. In the second act, a room occupied by a young couple at dinner is swept with the patent appliance without raising a particle of dust. After a "speed trial" of a new torpedo-boat destroyer, which serves as an admirable testimonial to its builders, the performance is brought to a close by an exhibition of portraits of our military heroes, of their Most Gracious Majesties the King and Queen and the rest of the Royal Family. Such is the latest application of cinematography.

ON THINGS IN GENERAL.

Those readers of this JOURNAL who do me the honour to read my lucubrations may remember the surprise I have expressed at the mere possibility of the existence of a state of mind that permits a photographer to make an enlargement or an exhibition picture of a private sitter, and endeavour to exhibit it against the express wish of the sitter. Such conduct is a scandal and a disgrace to the profession, but it is fortunately punishable by law, though at an expensive rate to both the photographer and his victim. That such imperfectly mentally equipped studio proprietors do exist is a lamentable fact, and incredible though it may seem, there has been since I last wrote two more instances. In the "Answers to Correspondents" on June 13th, we find "G. G." writing as an aggrieved person that he is threatened with legal proceedings, unless he ceases to exhibit a certain specimen, his only excuse being that the sitters are very pretty girls. Again, just a month earlier, on May 16th, "Troubled" is aggrieved because he has been ordered to remove a specimen he made and exhibited, though no definite objection was given, and he wants to know what to do with the picture, as it is too valuable to be destroyed. The Editors very properly reply, destroy it. What could the man think was possible? Had he some idea some other photographer would offer to buy it cheap? If he will take my advice, he will do what the Editors tell him. If he should sell it, and the sale be discovered, the expenses of an injunction would not be covered by a hundred pound bank-note. After all, when we calmly consider the matter, and reflect that a shining light in the Copyright Union holds the opinion that so long as a portrait is taken without charge, the photographer ought to be able to sell it, though the sitter object, we really should not be surprised at "G. G.'s" and "Troubled's" frame of mind. The pity of it!

In common, no doubt, with many others, I have been greatly interested in the recent discussions about Dr. Grün's new lens; but the more Dr. Grün writes and speaks, the more am I inclined to think that the principle of its construction is entirely empirical, and not founded on any of those calculations that have made modern photographic objectives what they are. Dr. Grün's theories, as expounded by himself, are opposed to all accepted principles. For example, he implicitly, if not explicitly, claims for his lenses, working at an aperture of $f.1.2$, that they possess an inherent depth of focus, though if one canon about lenses more than another may be taken as true, it is that the so-called "depth of focus" is a function of aperture, and not of any particular optical construction. Then, again, he states that spherical aberration can be cured by taking the picture on a curved surface. Now this is a very common error made by those who are ignorant of optics. Spherical aberration cannot be so cured, a curved field being a phenomenon of an entirely different nature. Further, he tells us he used cedar oil as the liquid taking the place of the air space. We may be quite sure that the intricate calculations resulting in the construction of the rectilinear type of lens requiring an air lens between two compound glass lenses could not permit the air lens to be replaced by a cedar oil lens without loss of definition. Nothing has been advanced to show that the lens is anything beyond a mere empirical trial, to see what the result would be.

Speaking of lenses leads me to remark on a query by "Inquirer," who asks what lens he should obtain that would be suitable for 15 by 12 or Midget pictures. The Editors truly inform him that he will need a studio of extraordinary length to make Midgets with the lens of 20in. or 24in. focus that would be needed for a 15 by 12. Of course, we all know about the supplementary lenses that can be used to alter the focus of a comparatively short focus lens in the direction of shortening it, but when the case of a long focus, of necessary large diameter, lens for portrait work is considered, there are no lenses obtainable to do the same work. Taking the case under discussion, we should need to reduce the 24in. to, say, at least 8in.; that would need so short a focus lens and of so large a diameter that the corrections would probably be interfered with. The point I would make is this—many photographers would like one lens to do the whole work of the studio if possible. Has not the time come for opticians to tackle the question of constructing an arrangement the exact reverse of the telephoto lens—a lens addition that would shorten instead of lengthening the focus? Possibly it would not pay, as it would lessen the demand for what are always high-priced instruments. Still, the demand will always exist, and if it can be met that man will make the biggest scoop who is first in the field. It must be remembered that these short focus lenses would only be required to cover a small plate.

There is another lens invention promised by another correspondent, who has a method of converting, at the expense of a few shillings, an "ordinary" lens into a wide-angle. Much depends upon what is meant by an ordinary lens. He would be a very clever man who would make a portrait lens into a wide-angle lens for a few shillings, and if a rapid rectilinear type is meant, I confess myself unable to see how the separation of the two lenses to the existing extent can be got rid of so as to include a much larger possible circle of view. We shall see.

There has been a considerable amount of discussion about the use of sulphocyanide toning baths. Now, although a certain amount of toning can be brought about on P.O.P. by one or other of the ordinary alkaline gold toning baths, the results are rarely equal, and often very inferior, to those from sulphocyanide, so that I fear we must consider that the bath has come to stay. Mr. Haddon's complaint of irregularity of action of baths made under identical conditions, I take it, must mean identical as chemists understand the term, not as the average photographer would, and anyone accustomed to making these baths largely knows that a very slight difference of conditions will give products quite dissimilar to the eye, temperature conditions especially.

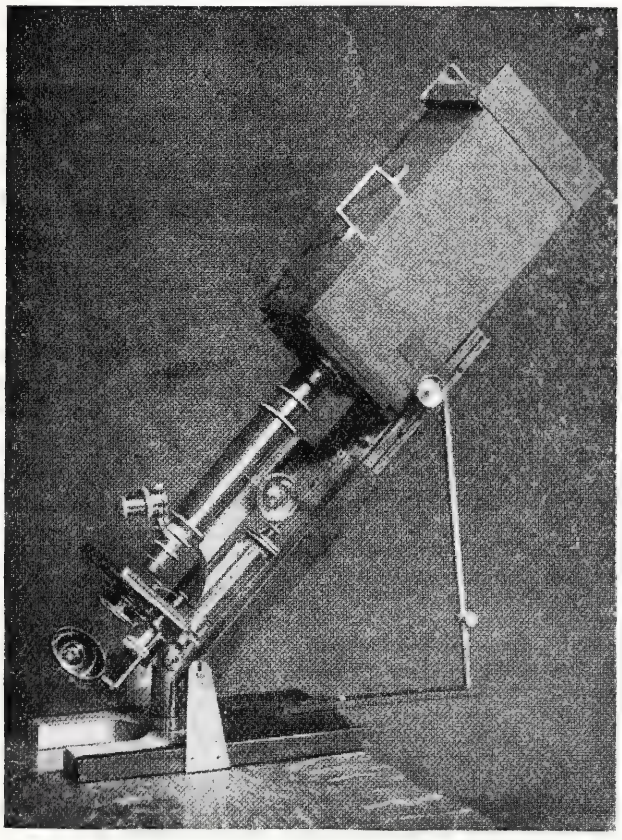
FREE LANCE.

A PHOTO-MICROGRAPHIC DEVICE.

A Paper read before the Section of Photography and Microscopy of the Franklin Institute, at the Stated Meeting, held Thursday, March 6, 1902.]

PHOTOGRAPHY, as a means of recording scientific phenomena, is more used and appreciated every day, and would no doubt be more used than it is if all investigators were fully acquainted with its capabilities, and equipped to obtain satisfactory results without unnecessary expenditure of time and labour. Take, for example, the production of photo-micrographs. Probably most people who use a microscope would like occasionally to fix the image which they see; yet comparatively few do so, because it is generally believed that successful photo-micrography involves the exercise of exceptional skill and experience, special and expensive camera devices, re-arrangement of microscope and illumination, in positions comparatively difficult to accommodate one's self to, and much time lost. Undoubtedly there is much truth in this, as photo-micrographs are generally made. It is true that a very small and light camera can be attached to the tube of the microscope, over the eye-piece; but under these conditions the amplification in the photographs is much less than it appears in the microscope, and the optical

conditions are not of the best. After making a series of photo-micrographs in the usual way, with the microscope on a special stand and the tube disposed horizontally, I recently set myself the problem of providing for the reproduction of the image observed in the ordinary use of the microscope, without any re-adjustment whatever, without touching the microscope or even re-focussing. I made the conditions that nothing should interfere in the slightest degree with the comfortable use of the microscope in the usual way; that it might be used at any desired inclination or tube-length, and with any convenient source of light; that the adaptation and removal of the camera should occupy very little time, and that the amplification in the photograph should always correspond to that in the microscope. After some study I set to work and managed, with a box-lid, two small shelf-brackets, the bed and rack of an old 4 by 5 camera, a box originally made to carry some 2½ by 3 plate-holders, a 10in. focus lens, and some minor odds and ends, to produce the device which I now bring to your notice, and which fulfils all of the conditions I have named.

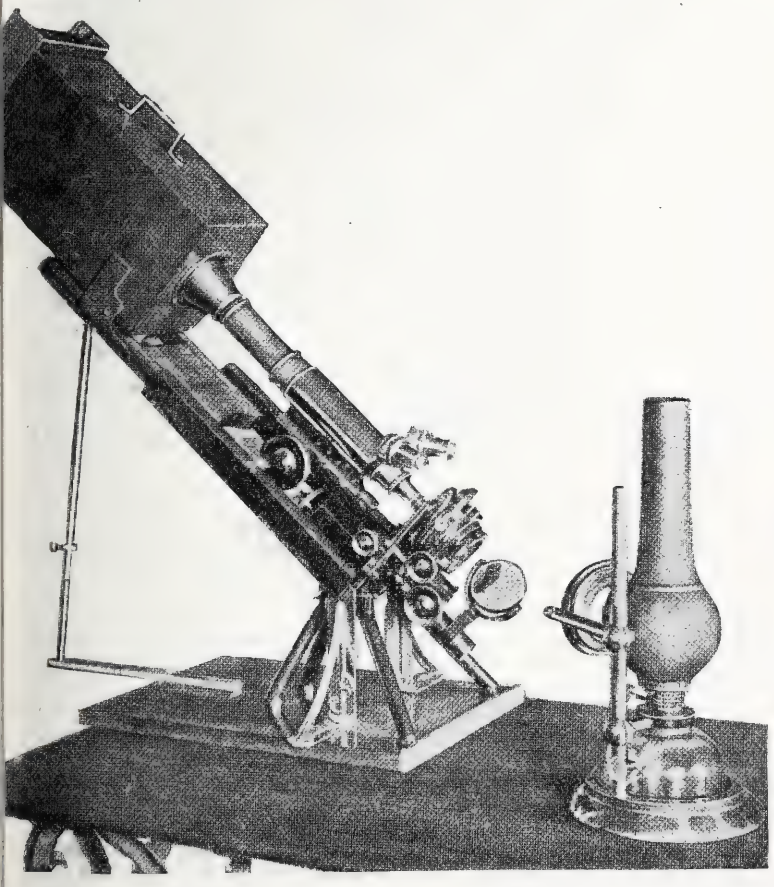


To commence with, we have the box-lid, a clamped piece of ½in. mahogany, about 10in. wide, and 12in. long. The microscope is used on this as a base, on which it is held in place by stops against which it is pushed. This base is necessary to provide a fixed support for the camera attachment without touching the microscope itself. Next we have one of the small shelf-brackets, securely attached to the baseboard on each side of the microscope, in such manner that one of the screw-holes in the end comes exactly opposite the centre of the joint of the microscope. They are separated just sufficiently to clear all the working parts of the microscope. The screw-holes in the brackets are the points of attachment for the camera device, and must occupy such a position in order that the camera may swing from the same centre as the microscope body, and thus be adjustable by a single movement for any desired inclination, from horizontal to vertical. On a double pillar microscope, and even on the Swift portable which I am using, the camera attachment could be adapted to swing from the centres on the microscope itself, and the special base and brackets thus dispensed with; but with the usual horseshoe base "continental" stand the bracket supports are necessary. The total height of the bracket supports for a Bausch and Lomb "BB" stand is not over 3½in., and they are not in the least in the way of anything one ever wants to do with a microscope. A detachable double upright can, however, be used, if preferred, and fastened to the microscope base at a moment's notice.

The camera is a simple box, with a lens at one end and fitting for a plate-holder at the other—the lens of 10in. focus, and the distance from the lens to the sensitive plate, 10in. This length of camera insures an image having the same amplification that would be calculated for that in the microscope, provided that its lens occupies the normal position of the eye above the eye-piece. The 10in. camera and lens are used on the assumption that the position of the objective and eye-piece cannot be altered without altering the character of the image; that the rays forming each pencil of light emerging from the eye-piece are parallel to each other when the microscope is focussed, and that the camera must, therefore, focus parallel rays in order to make a sharp image of the microscope projection at the focal plane without re-focussing the microscope. This assumption is correct under certain conditions, which I shall specify later. I did not have a 10in. focus lens, but had 12in. and 60in. plano-convex lenses. A pair of these cemented together made a crossed lens of about 10in. focus, and I mounted it in an old view-lens tube, so that the flattest side comes towards the eye-piece, but 1in. back from the eye-point, when the mounts almost touch each other. I should not have used this lens mount, because, although it does not affect the focus upon the ground-glass to move the lens back from the eye-point, it does alter the size of the image by bending the outer pencils of the cone of light in towards the middle. One should either use a double-convex lens at the eye-point, or a lens of longer focus above the eye-point, in combination with a correspondingly longer camera, in order to keep the amplification strictly correct. On general principles, I would not select a non-achromatic lens for this purpose, and do not recommend it; but it happens that with some achromatic objectives and huygenian eye-pieces a non-achromatic lens gives the best projection. It does not make much difference whether it be achromatic or not if monochromatic light is used for photographing, which is what I recommend with this method of working. The fact that objective and eye-piece combinations do vary somewhat in this respect makes it a safe rule to photograph with approximately monochromatic light of the brightest part of the spectrum, thereby insuring definition equal to that seen in the microscope.

The camera has a rack and pinion movement on a baseboard having two rigidly attached arms extending forward, and carrying pins to engage in the screw-holes of the brackets, I have cut slots into the screw-holes, so that the pins drop into place, and provided an automatic lock which prevents the pins from being lifted out except when the camera is swung below the horizontal plane. An adjustable telescopic strut and detachable extension to the baseboard supports the camera, and fixes it at any desired inclination. It is in alignment with microscope tube when the camera lens-mount and the eye-piece are concentric with each other when brought together by the rackwork. For optical reasons, strict alignment is far less important than it would be with a camera containing no lens. It takes me from twenty to thirty seconds to attach the camera and adjust ready for an exposure. A colour screen is then [usually] placed between the source of light and the microscope mirror, admitting approximately monochromatic

light of such colour as the objectives are best corrected for. Plate-holder is then inserted, and exposure made, using an isochromatic plate. Photo-micrographs made in this way, ranging from comparatively low amplifications up to 1,500 diameters, cannot be distinguished in character or quality from similar ones which were made after most careful preparation with far more elaborate, expensive, and troublesome photo-micrographic apparatus. Heretofore, I have done this work on a specially heavy table, legs resting upon rubber buffers, heavy marble top also resting on rubber buffers, an inch board resting on coils of rubber tubing. Without these precautions, I had trouble with vibration when the microscope was used in a horizontal position. I have been using the new device on an ordinary table, and have been surprised to find no difficulty whatever with vibration, so far. The microscope appears to be far less sensitive when inclined at approximately 45 deg. angle than when either horizontal or vertical. I exposed two hours on an amphipleura with oblique light from a Welsbach burner, and the lines came out sharp. Most subjects, with central light, require only one to five minutes' exposure, using rapid isochromatic plates.



I have stated that one of my objects was to avoid the necessity of re-focussing the image, which is objectionable, both because of the time it takes and because it alters, however slightly, the character of the image. The conditions under which no re-focussing is necessary are, that the camera lens shall focus parallel rays at the focal plane of the camera, and that the microscope shall have been focussed with an eye that focusses perfectly parallel rays upon its retina. Under these conditions, the rays forming each pencil of light emerging from the eye-piece are parallel to each other, and will therefore come to a perfect focus at the focal plane of the camera. If the microscope were focussed by a short-sighted or an abnormally far-sighted eye, the rays forming the emerging pencils would not be parallel to each other, and therefore would not come to a perfect focus at the focal plane of the camera. Huygenian eye-pieces, and some others, are calculated for an eye that focusses parallel rays, and cannot give the best results to either a short-sighted or an abnormally far-sighted eye. A short-sighted person sees an image which is formed above the correct plane in the eye-piece, and an abnormally far-sighted person sees an image which is formed below the correct plane. A person having theoretically normal sight will focus the microscope correctly, not only for the best image obtainable, but for the focal plane of my photo-micrographic camera. Anyone whose eye is not theoretically normal will have to re-focus on the ground-glass of the camera when using low powers; but when he has done so, the image will be exactly what it should be. My own eyes are short-sighted, and in pursuit of my object I have as nearly as possible overcome this difficulty by providing myself with a compensating lens in a mount which fits loosely over the eye-pieces of the microscope, and makes my vision, for the time being, theoretically normal. As this lens belongs to my eye, and not to the eye-piece, I remove it after focussing. This procedure is equivalent to wearing spectacles adjusted for clearest vision at very great distances, which anyone may do; but the eyes of very young people, with great powers of accommodation, may not even then be trusted implicitly when working with very low powers. With high-power objectives and eye-pieces, hypermetropes, emmetropes, and moderate myopes focus practically all alike. This new outfit is not calculated to supersede some of the very elaborate and expensive photo-micrographic apparatus and devices which have been produced by Zeiss and others for some special purposes. It will not produce photographs of large size, such as can be made with projection eye-pieces and very long cameras, nor include wide angles of view in low powers, such as may be obtained with Zeiss planar lenses without eye-pieces; but it should be far more generally useful, because it can be relied upon to reproduce clearly whatever detail the eye sees in the microscope, and with the least possible cost, either in time, labour, or expenditure for equipment.

It will be evident that the same camera and procedure as to focussing is adapted to making records with telescopes, spectroscopes, and some other optical instruments.

F. E. Ives.

THE AFFILIATION OF PHOTOGRAPHIC SOCIETIES.

[Reprinted from the Photographic Red Book, 1902.]

Officers:—Chairman: The Right Hon. the Earl of Crawford, K.T., F.R.S.; Executive Committee: Robert Beckett, F.R.P.S. (Hackney); C. Churchill, F.R.P.S. (Woolwich); John F. East (Kingston-on-Thames); Walter Kilbey (N.W. London); A. Mackie (London and Provincial); E. Marriage, F.R.P.S. (Woodford); J. C. S. Mummery (North Middlesex); C. H. Oakden, F.R.P.S. (South London); H. C. Rapson (London and Provincial); W. R. Stretton (Photographic Club); Hon. Treasurer: George Scamell, F.R.P.S.; Auditors: F. W. Bannister (Borough Polytechnic); W. H. Wilshere (West Surrey); Secretary: A. W. W. Bartlett, 66, Russell Square, London, W.C.

Benefits and Privileges.

Affiliated Societies are entitled to the following benefits and privileges:—

The loan of illustrated lectures on photographic and kindred topics, sets of lantern slides, lantern lectures, pictures for exhibition, etc.

Permission to photograph in the places specified on page 5, upon production of this issue of the Photographic Red Book, without special application to the various authorities.

Two copies of each issue of the Photographic Journal, in which are published the proceedings of the Affiliation Committee and the transactions of the Royal Photographic Society of Great Britain.

Reduced rates for wall space and admission at the annual exhibition of the Royal Photographic Society of Great Britain.

Members of affiliated Societies joining the Royal Photographic Society of Great Britain receive exemption from the payment of entrance fee, provided they have been for at least two years members of an affiliated Society. The secretaries and delegates of affiliated Societies are empowered to propose and second the nominations of such candidates.

The services of a board of judges in respect of small Society competitions. Details are given on page 24.

Temporary use of the accommodation provided by the various Societies to members away from their own districts. Details are given, commencing page 28.

Management.

Every affiliated Society has a voice in the management of the affiliation through the two delegates which each is entitled to appoint. The general body of delegates meets, as a rule, but once a year, the business in the meantime being conducted by an executive committee appointed under the provisions of Rule 6. The two delegates appointed by each Society need not necessarily be members of he Society they represent. The Royal Photographic Society of Great Britain reserves one-third of the amount of the subscriptions for secretarial, clerical, and incidental working expenses. The Affiliation Committee have the remaining two-thirds entirely at their disposal.

Rules.

(1) Affiliation shall be by the council of the Royal Photographic Society of Great Britain.

(2) All Societies interested in photography, whether London, provincial, colonial, or foreign, shall be eligible for affiliation.

(3) The object of the affiliation shall be to consider and suggest lines of action to the affiliated Societies, and to take any steps it may think fit to encourage or otherwise benefit them. Each affiliated Society shall be entitled to appoint two delegates, who, in conjunction with three members to be appointed by the Royal Photographic Society of Great Britain, shall form the Affiliation Committee, with the right to vote in all matters in which the committee may deal.

(4) The committee shall have the power to make the necessary rules for the conduct of the different branches of its work, and, subject to fourteen days' notice in writing to each delegate, such rules may be altered, added to, or revoked at the annual general meeting or at a special general meeting. All such rules and alterations shall be submitted to the council of the Royal Photographic Society of Great Britain and be approved by it before they come into force.

(5) The committee shall meet at such time and place as the chairman shall decide. On the requisition of ten delegates the secretary shall call a meeting, not less than fourteen nor more than twenty-one days after receipt thereof. At committee meetings nine shall form a quorum.

(6) The committee shall have power to nominate certain of their number to form an executive. The executive shall have power to make such regulations, not inconsistent with the rules, as may from time to time be deemed necessary.

(7) Upon the request of two-fifths of those present at any meeting of the executive, the votes of the committee shall be taken in writing upon any subject, otherwise proxy voting shall be inadmissible.

(8) The subscription shall be one guinea, payable on admission, and subsequently in advance on January 1st in each year. Any Society whose subscription may be three months overdue shall be suspended from affiliation, and if at the end of twelve months the subscription remain unpaid the defaulting Society shall cease to be affiliated, but may be reinstated by the council after satisfactory explanation.

(9) A balance-sheet of the accounts of the affiliation shall be prepared by the treasurer up to December 3rd in each year, and shall be audited by two auditors. The annual general meeting of the committee shall be held during January in each year. At this meeting the balance-sheet, duly audited, and the chairman's report of the year's proceedings shall be submitted, and officers, consisting of a chairman, treasurer, and two auditors, shall be elected for the current year.

Interchange of Lectures.

The committee are enabled to publish below the names of a number of members of affiliated Societies who have signified their readiness to lecture before other affiliated Societies in exchange for a similar courtesy to their own from a member of the Society obliged by them. This system of exchange has been the means of lending much additional interest to many programmes, and the committee trust that full use will be made of the lectures here offered. The number of lectures available is still small, but it is hoped that every Society will endeavour to make an offer of the services of at least one of its members, and so assist the committee in organising a body of lecturers to whom the Societies may look for help in the not easy task of filling up their programmes. The committee feel that it is perhaps superfluous to intimate that everything should be done to render the visits of these lecturers as pleasant as possible, by receiving and looking after them during the time that they are devoting to the Society whose wants they are attending to. Expenses should, of course, be tendered in all cases. Special allusion is made to the reception of lecturers, because instances of neglect have been brought to the notice of the committee, who feel sure that they have only to briefly refer to the few isolated cases of negligence to ensure the correct treatment of lecturers in future. Applications for the lectures specified below should be addressed to the Society under whose auspices the offers are made, and the applicant should state what is offered in exchange. It is understood, of course, that the committee accept no responsibility whatever in regard to these offers, and that they may be modified or revoked at the pleasure of the Societies making them.

Offers have been received from the following:—

Blairgowrie and District Photographic Association.—Mr. John B. Maclachlan.

Brentford Photographic Society.—Mr. A. R. Read, jun., on (1) The First Principles of Pictorial Composition; (2) The Practical Side of Pictorial Composition.

Cornish Camera Club.—The hon. sec. on "Enlarging"; and others.

Dover Sciences Society.—Lectures on Natural History and kindred subjects.

Ealing Photographic Society.—The hon. sec. is prepared to receive any suggestions from other Societies involving reciprocity.

Eastbourne Photographic Society.—Mr. J. J. Hollway, Mr. H. S. Bullock, Mr. Ellis Kelsey, Mr. H. Habgood, and Mr. E. J. Bedford are prepared to lecture.

East Kent Natural History and Photographic Society.—Mr. A. Lander on "Colour Photography," "Telephotography," etc.

Edinburgh Photographic Society.—Suggestions will be considered.

Fakenham Literary, Field, and Camera Club.—The hon. sec., on a variety of subjects.

North-West London Photographic Society.—Mr. Walter Kilbey is prepared to deliver his affiliation lecture on Focal-Plane Shutter Work, and to bring apparatus and additional slides. He also offers the following lectures:—"A Week-end on the Continent," "Through Northern France with a Hand Camera," and "Some Green Bits in the Emerald Isle." Mr. A. J. Reid on "Sunny Memories of Normandy."

Plymouth Photographic Society.—Mr. W. C. Johns on "A System of Lantern-Slide Making by Contact and Reduction."

Rotherham Photographic Society.—Mr. James Leadbeater on "Lightning, and How to Photograph It."

South London Photographic Society.—Mr. Frank Goddard.

Sunderland Photographic Association.—Mr. T. Fitzgibbon Forde on "Trimming, Mounting, and Framing."

West Surrey Photographic Society.—Mr. W. H. Wilshere on "Photography at the Zoo," with slides. Others might be arranged.

Woodford Photographic Society.—Mr. Ernest Marriage, F.R.P.S., on "Architectural Photography." Mr. H. T. Malby, F.R.P.S., on "Flower Photography" (affiliation lecture, with additional notes and slides), and "Rambles through Epping Forest," with slides. Mr. J. P. W. Goodwin on "The Making of Enlarged Negatives." Mr. J. T. Ashby on "Pictorial Composition," with slides.

Woolwich Photographic Society.—Mr. W. H. Dawson on Chemical or Architectural subjects.

Places to Photograph.

The following information has been kindly furnished by the secretaries of the affiliated Societies, and it is hoped that its publication may prove of use to a large number of the members:—

Airdrie.—Monkland Glen, Calder Glen, Cleddans.

Arbroath.—Abbey (free), cliffs, coast scenery.

Beaconsfield (Bucks.).—Burnham Beeches, three miles. Stoke Pogis Church, five miles. Burial Place of William Penn, three miles. Milton's Cottage, Chalfont, four miles.

Birmingham.—The Warwickshire Avon flows through or by the towns and villages of Stoneleigh, Warwick, Stratford, Bidford, Evesham, Pershore, and Tewkesbury, and affords innumerable opportunities for pictorial work. The district teems also with photographic subjects of all descriptions, and not least from an historical standpoint.

Blairgowrie.—The district is full of "pictures." Cluny Loch, Muirton of Ardblair, Meekleour Village, Craighall House and Grounds are a few of the more important places. Craighall Grounds are open to the public on Tuesdays and Fridays. On other days (Sundays excepted) a permit can be obtained at the Railway Station for a small sum, which is handed by the proprietor to Perth Infirmary.

Brentford (Middlesex).—The River Brent, the Canal, the Thames from Strand-on-the-Green to Isleworth, Greenford, and Perivale. Fine evening effects may be obtained at Isleworth, especially at low tide.

Brierley Hill.—Dudley Castle (free), Halesowen Abbey and Church.

Bury St. Edmunds.—A good photographic district, no prohibitions.

Canterbury.—The Cathedral and town.

Cardiff.—The Castle and Grounds. Permission at the Bute Estate Office (admission 1s.).

Carlisle.—Wetheral, Wreay, Lanercost, the Castle, and Cathedral.

Cheltenham.—Gloucester Cathedral, Tewkesbury Abbey.

Chester.—Eaton Hall (the residence of the Duke of Westminster), Hawarden, the Cathedral, the River, Walls and City, St. John's Church.

Croydon.—Croham Hurst, West Wickham Woods, Addington Hills.

Derby.—Chatsworth, Haddon, the Peak District, Dovedale, Lichfield Cathedral, Darley Dale, and Matlock.

Dudley.—The Castle and Grounds (free).

Dundee.—Arbroath, Abbey and Cliffs, Fife Coast, St. Andrews.

Eastbourne.—Michelham Priory, Hurtsmonceaux Castle, Parish Church (Norman work), Alfriston and Valley of the Cuckmere, Beachy Head, Cliffs, and Birling Gap.

Exeter.—Cathedral, Bishop's Palace and Deanery, Rougemont Castle, Powdorham Castle, old churches, old buildings, and halls. River Scenery on Exe, Teign, Daw, and Dart. Country residences, Dartmoor, Teignmouth, Dawlish, Exmouth, Torquay.

Fakenham.—Walsingham Abbey Ruins, five miles (G.E.R. Station at Walsingham). Apply to H. Lee-Warner, Esq., J.P., The Abbey, on Wednesdays only. East Barsham.—Fine specimen of a Tudor Manor House, three-and-a-half miles; apply to W. R. H. Garland, Esq., The Manor House, East Barsham. Thorpland Hall, two miles.—Tudor, with very fine chimneys. Apply to Rev. J. Lee-Warner, at the Hall. Houghton St. Giles, four miles, one mile from Walsingham Station.—The Church contains a fine old illuminated rood screen. A beautiful little wayside Chapel, now belonging to the Benedictine order, later decorated style of 14th century; formerly a resting-place for pilgrims on their way to the shrine of Our Lady of Walsingham. Apply, for Church, to Rev. H. A. Wansborough, Rector of Walsingham. Great Snoring, four miles.—Fine ornamental brickwork of Rectory; built by Sir Ralph Shelton. Apply to Rev. R. P. Roseveare, Rectory, Snoring. Various old manor houses and picturesque river scenery. Particulars from secretary at any time.

Glenalmond (Perthshire).—The Perthshire Highland, the Sma' Glen, many ancient monuments, Crieff, Dunkeld, Falls of Menzie, etc. No permits required.

Hove.—Alfriston, Bramber, Barcombe Mills, Shoreham Harbour, up the Arun from Arundel, the country round Bosham, some good Churches in neighbourhood, especially Old and New Shoreham (Norman). Apply to the Vicar.

Ipswich.—Particulars of excursions gladly supplied by the secretary of the Ipswich Soceity.

Isle of Man.—Numerous Glens, the best being Glen Maye, Glen Auldyn, Sulby, Ballaglass, Dhoon, Glen Helen, and upper parts of Grondle. Fine coast scenery between Port St. Mary and Peel (including the Calf of Man), at Garwick Beach, and from a rowing boat between Laxey and Dhoon.

Isle of Wight.—Throughout the island.

Kingston-on-Thames.—The river, Hampton Court and Park, Richmond Park, Oxshott Common.

Leicester.—Bradgate Park and Ruins.

Newcastle-on-Tyne.—Jesmond Dene, Tynemouth, River Tyne and shipping, the Upper Tyne, and surrounding country.

Oxford.—The various colleges and halls, churches and museums. Panoramic views of Oxford from the cupola of the Sheldonian Theatre and the roof of Bodleian Camera.

Ramsgate.—Seascapes, and, at a short distance, Canterbury, Minster, Sandwich. Cattle studies in the Marshes. Permission readily obtainable.

Rotherham.—Roche Abbey, seven miles, open to public on Monday and Thursday. Conisbro' Castle, eight miles, open daily; no fee except to inside of Norman Keep, which contains two notable fireplaces and chapel.

St. Albans.—The Abbey (apply the Dean), Hatfield House (very special permit only), town and neighbourhood rich in architectural and natural beauties.

Severn and Wye.—The Wye Valley from Ross to Chepstow.

Slough.—Burnham Beeches, Windsor Castle (Inspector Stephens, at the Castle), Eton College (the Bursar), Stoke Poges, Dropmore.

Southport.—The streets, parks, and gardens, and Ormskirk, Sefton (old church), Parbold, Appley Bridge.

Southsea.—By road: Porchester Castle (ruins) and Norman church (permit of vicar). Hayling Island.—Good landscape work and Early English church. Bosham.—Quaint old fishing village (Early English church). Titchfield.—Place House, Leigh Park. By rail: Southampton.—Docks, shipping, yachts, and the Solent. Beaulieu.—Abbey ruins; the New Forest. Netley.—Abbey ruins and beautiful surrounding country. Bursledon.—Good shipping studies at low tide. Winchester.—Cathedral, Castle, Cross and old streets. Chichester.—Cathedral (Red Book). Market Cross and old gates. The Canal and Goodwood. Arundel.—The Castle and Deer Park (permit of Duke of Norfolk). Views on River Arun. Bognor and Littlehampton. Cowdrey Castle (ruins), and beautiful country round. Midhurst, Petersfield, Rogate, Harting, and the South Downs. By water: Shanklin, Ventnor, Newport, Ryde, and Cowes. Bournemouth and Southampton. Fine shipping and yachting views. Portsmouth and Southsea teem with places and objects of historic interest, new and old battleships in harbour, the Town Quay (fishing boats and colliers). No camera is allowed in Portsmouth Dockyard without an order from the Admiral's Superintendent.

Stonehouse (Devon).—St. George's Church (apply Vicar), Royal Naval Hospital (apply Inspector-General), Royal Marine Barracks (apply Officer in Command).

Stratford (London, E.).—Epping Forest, Wanstead Flats and Park, Whipps Cross, Waltham Abbey (permit from Vicar), Waltham Cross, and Temple Bar.

Sunderland.—The Docks and shipping.

Swansea.—Old castle of Oystermouth, Pennard, Penrice, etc., the Gower Peninsula and coast.

Tunbridge Wells.—Penshurst Place, Hever Castle, Chiddingstone Ruins, Bayham Abbey, and the Commons.

Weymouth.—Portland, Radipole, Moreton, Lulworth, etc.

York.—The Minster, St. Mary's Abbey, the City Halls and Bars, Kirkham Abbey, etc.

The following information is compiled from various sources. The secretary will be glad to be notified of any inaccuracies:—

London and District:

Bethnal Green Museum.—Secretary, Science and Art Department, South Kensington, S.W.

Botanical Gardens, Regent's Park.—The secretary.

British Museum. The Chief Librarian. Applications must specify the objects to be photographed, and the name and address of the photographer.

Bushey Park.—Production of Red Book.

City Companies' Halls.—The respective Clerks.

Green Park.—Production of Red Book.

Greenwich Park.—Production of Red Book.

Guildhall.—City Lands Committee, Guildhall, E.C.

Guildhall Art Gallery.—Library Committee, Guildhall, E.C.

Hampton Court Park, Gardens, and Green.—Production of Red Book.

Hyde Park.—Production of Red Book.

Highgate Woods.—Production of Red Book.

Houses of Parliament.—Lord Chamberlain's Office, House of Lords, S.W.

Imperial Institute—The secretary.

Kensington Gardens.—Production of Red Book.

Kew Green.—Production of Red Book.

Kew Gardens.—The Director. Photographing is not allowed on Sundays, Christmas Day, Good Friday, and Bank Holidays.

Kilburn, Queen's Park.—Production of Red Book.

National Gallery.—The Director. Professionals only are allowed to photograph.

Natural History Museum Gardens.—Production of Red Book.

Parliament Square Gardens.—Production of Red Book.

Primrose Hill.—Production of Red Book.

Parks and Open Spaces under the control of the London County Council.—No permission is required for the use of hand cameras. The London County Council, Spring Gardens, S.W., grants permits for twelve months for the use of stand cameras.

Public Record Office.—Secretary, Public Record Office, Chancery Lane, W.C.

Regent's Park.—Production of Red Book.

Richmond Park and Green.—Production of Red Book.

St. Bartholomew's Church, Smithfield.—Fee, 2s. 6d.

St. James's Park.—Production of Red Book.

St. Paul's Churchyard.—Production of Red Book up to 12 noon.

South Kensington Museum.—Secretary, Science and Art Department, South Kensington, S.W.

Tate Gallery.—The Keeper, National Gallery of British Art, Millbank, S.W.

Tower of London.—The Constable of the Tower.

Victoria Tower Gardens.—Production of Red Book.

Zoological Gardens, Regent's Park.—Upon production of the Red Book for current year.

Provinces:

Aston Hall, Birmingham.—Mr. Whitworth Wallis, Art Gallery, Birmingham.

Beverley Minster.—The Rector.

Burnham Beeches.—Production of Red Book.

Cambridge College.—The Masters or Fellows, except for Trinity College, where the book at the Porter's Lodge is signed.

Chatsworth House.—The Duke of Devonshire.

Chepstow Castle.—Admission 4d.

Christchurch Priory.—The Rector.

Coulsdon Common.—Production of Red Book.

Farthingdown.—Production of Red Book.

Fountain's Abbey.—Fee 1s.

Haddon Hall.—Fee 6d., in addition to admission fee.

Hardwick Hall, Derbyshire.—The Duke of Devonshire.

Hastings Castle.—Fee 3d.

Jervaulx Abbey, Yorks.—Admission 6d., no restrictions.

Kenley Common.—Production of Red Book.

Little Moreton Hall, Cheshire.—Fee 1s.

Ludlow Castle, Shropshire.—Entrance fee of 4d. covers photography.

Manchester, Chestham's Hospital and Library.—The Master.

Oxford Colleges.—The Master or Dean.

Raglan Castle.—Fee for photographing 2s. 6d., and admission fee 6d.

Ramsey Abbey.—The Rector.
Riddlesdown.—Production of Red Book.
Rievaulx Abbey, Yorks.—Admission 1s., no restrictions.
St. Mary's, Warwick.—The verger, fee 2s. 6d.
Selby Abbey—Fee 6d., and a copy of all photographs taken.
Stokesay Castle, Shropshire.—Fee 6d.
Tewkesbury Abbey.—Canon Robinson. Fee for photographing, in addition to admission fee.
Tintern Abbey.—The Warden, fee 6d.
Virginia Water.—Captain Campbell, Holly Grove, Windsor Park.
Warwick Castle.—The Estate Office. Fee for photographing, in addition to admission fee and permit, applies to courtyard and grounds alone. Special permission from the Earl of Warwick is required for interior work.
West Wickham Common.—Production of Red Book.
Windsor Green Park.—Captain Campbell, Holly Grove, Windsor Park.

The Cathedrals.

The following authentic information respecting the cathedrals has been furnished by the authorities at the request of the committee:—

Bristol.—The dean gives permission to holders of the Red Book, on production of same, excepting from 10—11 a.m., and after 4 p.m. No fee.

Canterbury.—Application to the head verger at the cathedral. Fee 2s. 6d.

Carlisle.—Application, personally or by letter, to the Dean.

Chichester.—The Dean gives permission to those holding the Red Book.

Durham.—The Dean will permit holders of the Red Book to photograph on showing the book, but the usual fees for particular parts of the building must be paid.

Exeter.—The Dean, or Canon in Residence, will give written permission.

Hereford.—The Dean will permit holders of the Red Book to photograph on showing same to the verger.

Lichfield.—The Dean gives permission to those showing the Red Book to the head verger.

Lincoln.—The Dean or Canon in Residence grant permits for four weeks. Sixpence (covering the four weeks) must be paid to the Visitors' Fund if the holder of the permit desires to photograph elsewhere than in the nave.

Llandaff.—Permission of the Dean for the interior. No permit is required for the exterior.

London, St. Paul's Cathedral.—Written permission from the Dean.

London, Westminster Abbey.—The Dean grants permission only in very rare cases and under exceptional circumstances.

Manchester.—Special permission of the Dean.

Norwich.—Permission at a fixed fee; full particulars of the Sub-Sacrist.

Oxford, Christ Church.—The Dean.

Ripon.—There are no fees for the nave, but a charge of sixpence for the choir is made, and the presence of a verger is necessary.

St. Albans.—The Dean grants permits subject to the payment of admission fee of sixpence, east of the nave, otherwise there is no charge.

St. David's, South Wales.—Permission on condition that copies of photographs taken be presented to the library.

Salisbury.—The Dean or Canon Residentiary. No stipulated fee, but customary to contribute to the Fabric Fund.

Southwell, Notts.—Applications must be made to the Dean.

Truro.—Application must be made to the Canon or verger. Fees 2s. 6d.

Wakefield.—The Archdeacon writes that no fees are charged and no permits are given. For some years a good deal of building will be going on, and the risk of photographing amid the scaffolding must be the photographer's.

Winchester.—The Dean writes that he will permit holders of the Red Book to photograph on showing same to the verger. The condition that sixpence be deposited in a box kept for the purpose, and that the photographer enters his name and address in the Visitors' Book must be observed.

Windsor, St. George's Chapel.—Written permission, to be obtained of the Dean, is necessary.

Worcester.—The Dean or Canon in Residence. No fee.

The committee have no authoritative information in respect of the course to be followed in seeking permits to photograph at the following cathedrals, and applications should therefore be addressed to the Deans:—Bangor, Bath and Wells, Chester, Ely, Gloucester, Liverpool, Newcastle, Peterborough, Rochester, Saint Asaph, and York.

Judges of Competitions.

The committee have promises of the services of the following board of six judges. This board is prepared to meet three or four times per annum to adjudicate upon competitions arranged by affiliated societies. The exhibits must be sent to the secretary, with full details of the competition, and it is to be understood that the judges will follow the rules adopted by the conference of judges.

The following is the Board now acting:—John A. Hodges, F.R.P.S., Alexander Mackie, E. Marriage, F.R.P.S., J. C. S. Mummery, C. H. Oakden, F.R.P.S., and W. Thomas, F.R.P.S.

Sequence of Exhibitions.

Included amongst the particulars, given elsewhere in the Book, will be found some information respecting the dates of the exhibitions organised by the affiliated societies. The particulars are by no means complete, but, so far as they go, it is expected that they will be useful to other societies when they are deciding upon the dates of their exhibitions where the same include "open" classes. Several instances of inconvenience to exhibitors and secretaries, caused by a want of knowledge of the dates already selected by the societies, have again manifested themselves to the committee ,and it is in order to avoid this inconvenience that an attempt has been made to publish the approximate dates adopted by societies for their exhibitions. There are numbers of well-known exhibitors whose work might be obtainable at many more exhibitions than at present were it not for the frequent clashing caused by the indiscriminate choice of dates, above alluded to.

It is believed that a reminder of the advantages that would result from a little mutual give and take may produce a good effect. To facilitate the matter yet further, secretaries of Societies are requested to send to the affiliation secretary, as soon as possible after the choice has been made, the dates upon which they propose to hold their exhibitions. He will publish these in the Photographic Journal for the information of other Societies.

New Lectures and Slides.

The affiliation is in want of new slides for circulation amongst the Societies, and an appeal is made to every holder of this book to do what he can, either individually or through his Society, to increase the number of sets at disposal. The committee will be glad to receive sets on loan for a period, or small contributions of slides that may be brought together to form a miscellaneous collection. The secretary will be glad to enter into communication with anybody willing to fall in with the above suggestion.

Programmes.

The secretary will be pleased to receive a copy of every programme and exhibition prospectus issued by affiliated Societies. Some Societies also make a practice of sending copies to the other affiliated Societies. The idea is one that commends itself, and there is no doubt that its general adoption may be a means of affording help to those whose duty it is to arrange a programme of lectures, and a means of attracting exhibits from people who might otherwise never hear of a particular competition.

Lectures Available for Circulation.

Telephotography. By Mr. Ernest Marriage, F.R.P.S.

Home Portraiture. By Mr. P. R. Salmon, F.R.P.S.

The Focal Plane Shutter and its use. By Mr. Walter Kilbey.

English Gothic Architecture. By Mr. Mann and Mr. T. A. Coysh.

Hints on Hand-Camera Work and Development for Beginners. By Mr. C. G. Emery.

Lantern-Slide Making. By Mr. John A. Hodges, F.R.P.S.

The Life and Work of George Tinworth. A set of 74 slides, reproduced from his panels, accompanied by descriptive notes by the late Mr. F. W. Edwards, F.R.P.S.

Practical Landscape Photography. By Mr. G. T. Harris, F.R.P.S.

Orthochromatic Photography. By Mr. E. Sanger Shepherd, F.R.P.S.

Negative Making. By Mr. Chapman Jones, F.I.C.F.C.S., F.R.P.S.

Architectural Photography, Technically, and Pictorially Considered. By Mr. H. W. Bennett, F.R.P.S.

Portraiture. By Mr. Harold Baker.

Elementary Photographic Optics. By Mr. R. Child Bayley, F.R.P.S.

Intensification and Reduction. My Mr. J. McIntosh.

Hand-Camera Work. By Mr. W. Thomas, F.R.P.S.

The Carbon Process in Practice. By the Autotype Company (Specially written for the Affiliation.)

The Photographing of Flowers. By Mr. H. T. Malby, F.R.P.S.

Defects and their Remedies. By Mr. E. Dockree.

Methods of Control in Photographic Printing. By Mr. G. J. T. Walford.

Elementary Chemistry for Photographers. By Mr. C. F. Townsend.

Linen and its Production. By the Brechin Photographic Association.

Lectures on the following subjects will, it is hoped, soon be ready for circulation:—

The Management of Photographic Chemicals. By Mr. Thomas Bolas.

The Ozotype Process. By Mr. Thomas Manly.

Photo-Micrography. By Mr. T. E. Freshwater, F.R.P.S.

Negotiations for lectures on the following topics are in hand:—

The Selection of a Printing Process.
The Processes of Colour Photography.
Zoological Photography.
Composition, Light, and Shade.
Platinotype Printing.
Stereoscopic Photography.
Gum-Bichromate Printing.

The copyright in the above lectures is the property of the Affiliation of Photographic Societies. It is impossible to secure the regular and satisfactory lending of the lecture unless the regulations indicated below are strictly complied with. Secretaries of affiliated Societies are, therefore, in their own interest, asked to give them their very careful attention.

Lectures and slides are lent to affiliated Societies on the following conditions:—

1. That they shall not be copied, printed or published, but shall be read or shown before the Society on the date fixed for the purpose, and shall be forwarded to the address and in the manner indicated by the secretary of the Affiliation.

2. That the accompanying slides or examples are repacked securely in the order in which they are intended to be shown, and that any injury which they may have received previous to reception, not already indicated, be at once notified to the secretary, and the attention of the carriers called to the injury, if such appear to have occurred in transit.

3. That no letters or communications intended for the secretary be inclosed with the lecture.

4. That when it be necessary that one slide remain long on the screen the light be lowered to lessen the risk of damage.

The Affiliated Societies,

Royal Photographic Society of Great Britain. Aldershot and District Camera Club. Abroath Amateur Photographic Association. Architectural Association Camera and Cycling Club. Ashton-Under-Lyne Photographic Society. Beaconsfield Camera Club. Birkenhead Photographic Association. Birmingham Photographic Society. Blairgowrie and District Photographic Association. Bolton Mutual Photographic Society. Borough Polytechnic Photographic Society. Brentford Photographic Society. Brierley Hill Camera and Field Club. Brixton and Clapham Camera Club. Bromsgrove School Photographic Society. Burnley Camera Club. Bury St. Edmunds Camera Club. Cardiff Photographic Society. Carlisle and County Amateur Photographic Society. Cheltenham Amateur Photographic Society. Chester Society of Natural Science (Photographic Section). Chiswick Camera Club. City and Guilds of London Technical College, Finsbury Photographic Society. Cornish Camera Club. Cripplegate Photographic Society. Croydon Natural History and Scientific Society (Photographic Section). Derby Photographic Society. Derby School Photographic Society. Devonport Camera Club. Dover Sciences Society. Dudley Camera Club. Dundee and East of Scotland Photographic Association. Ealing Photographic Society. Eastbourne Photographic Society. East Kent Natural History and Photographic Society. Edinburgh Photographic Society. Exeter Camera Club. Fakenham Literary, Field and Camera Club. Farnham Royal Photographic Society. Glasgow Photographic Association. Glenalmond Photographic Club. G. E. Ry. Mechanics' Institution (Photographic Section). Hackney Photographic Society. Hamstead Scientific Society (Photographic Section). Hastings and St. Leonards Photographic Society. Hove Camera Club. Isle of Man Camera Club. Ipswich Scientific Society (Photographic Section). Isle of Thanet Photographic Society. Isle of Wight Photographic Society. Kingston-on-Thames and District Photographic Society. Leicester and Leicestershire Photographic Society. Liverpool Amateur Photographic Association. London and Provincial Photographic Association. Mid-Cheshire Society of Art. Monklands Photographic Society. Newcastle-on-Tyne and Northern Counties Photographic Association. North Lindsey Camera Club. North Middlesex Photographic Society. Northampton Natural History and Field Club (Photographic Section). North-west London Photographic Society. Oxford Camera Club. Photographic Club. Photographic Society of Ireland. Plymouth Photographic Society. Polytechnic Photographic Society. Preston Scientific Society (Photographic Section). Redhill and District Camera Club. Richmond Camera Club. Rotherham Photographic Society. St. Albans Photographic Society. Severn and Wye Amateur Photographic Association. Sheffield Photographic Society. Southampton Camera Club. South London Photographic Society. Southport Photographic Society. Southport Y.M.C.A. Camera Club. Southsea Amateur Photographic Society. Stonehouse Camera Club. Sunderland Photographic Association. Swansea Photographic Society. Thornton Heath Photographic Society. Tunbridge Wells Amateur Photographic Association. West Surrey Photographic Society. Weymouth Photographic Society. Widnes Photographic Society. Wolverton Literary and Scientific Society (Photographic Section). Woodford Photographic Society. Woolwich Photographic Society. Yorkshire Philosophical Society (Photographic Section).

Colonial Photographic Societies.

Amateur Photographic Association of Victoria. Dunedin Photographic Society. Hawke's Bay Camera Club. Maritzburg Camera Club. Northern Tasmanian Camera Club. Photographic Society of India. Photographic Society of New South Wales. Queensland Amateur Photographic Society. South Australian Photographic Society. Wellington Camera Club.

PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.—SECOND ANNUAL MEETING.

Notice is hereby given that the second annual meeting of members will be held at the Royal Photographic Society's Rooms, 66 Russell Square, London, W.C., on Friday, July 4th, 1902, at 8 p.m. The committee will meet at 7 o'clock.

The following will be the business to be transacted:—

(1) To receive the Report of the Committee.
(2) To receive the Statement of Accounts.
(3) To receive recommendations of Committee re Fire Insurance.
(4) To amend Rules 5, 6, 7, and 10, as under:—

PRESENT FORM.

5. Subscription.—The annual subscription shall be 5s., payable on admission. Subsequent subscriptions shall be payable in advance on July 1st in each year. No member shall be entitled to any of the privileges of membership if his subscription shall be three months in arrear, and the Committee shall have power to terminate the membership of anyone whose subscription is more than six months in arrear.

6. Ordinary Meetings.—The Ordinary Meetings of the Association shall be devoted to the discussion of matters concerning the welfare of Professional Photographers and the profession only. They shall be held on the first Fridays in February, April, June, October, and December. The Committee may call Extraordinary Meetings when they may think it advisable.

7. Annual General Meeting.—The Annual General Meeting shall be held in the first week in July for the purpose of receiving the Report of the Committee and the Balance Sheet for the past year, the election of Officers, and such other business as may require the decision of a General Meeting. Notice of the meeting, together with a ballot paper, shall be sent to every member not less than fourteen days before the date of the Meeting. A Special General Meeting shall be called by the Committee at any time. A Special General Meeting shall ge called within fourteen days of the receipt by the Hon. Secretary of a requisition signed by ten members, stating the purpose of the Meeting. Every member shall receive seven days' notice of a Special General Meeting, and no subject shall be discussed thereat but that for which the Meeting was called.

10. Officers.—The Honorary Officers of the Association constituting the Committee, shall be a President, Vice-President, Treasurer, Secretary, and twenty ordinary members of Committee, not more than ten of whom shall be London members. They shall have power to appoint an Assistant Secretary, who may be paid. At meetings of the Committee five shall form a quorum.

SUGGESTED FORM.

(Alterations in italics.)

5. Subscription.—The annual subscription shall be 5s., payable on admission. Subsequent subscriptions shall be payable in advance on July 1st in each year. *The subscription of members joining after the 31st of March shall not be again due until the 1st of July of the year following.* No member shall be entitled to any of the privileges of membership if his subscription shall be three months in arrear, and the Committee shall have power to terminate the membership of anyone whose subscription is more than six months in arrear.

6. Ordinary Meetings.—The Ordinary Meetings of the Association shall be devoted to the discussion of matters concerning the welfare of Professional Photographers and the profession only. They shall be held on the *second* Fridays in February, *May*, and December. *The Annual Dinner shall be held on the second Friday in March.*

The Committee may call Extraordinary Meetings when they may think it advisable.

7. Annual General Meeting.—The Annual General Meeting shall be held in the first week in *October* for the purpose of receiving the Report of the Committee and the Balance Sheet for the past year, the election of Officers, *the appointment of two Auditors of Accounts*, and such business as may require the decision of a General Meeting. Notice of the Meeting, together with a ballot paper, shall be sent to every member not less than fourteen days before the date of the Meeting. A Special General Meeting may be called by the Committee at any time. A Special General Meeting shall be called within fourteen days of the receipt by the Hon. Secretary of a requisition signed by ten members stating the purpose of the Meeting. Every member shall receive seven days' notice of a Special General Meeting, and no subject shall be discussed thereat but that for which the Meeting was called.

10. Officers.—The Honorary Officers of the Association constituting the Committee, shall be a President, *the Past President*, *three Vice-Presidents*, Treasurer, Secretary, and twenty ordinary members of Committee, not more than ten of whom shall be London members. They shall have power to appoint an Assistant Secretary, who may be paid. At meetings of the Committee five shall form a quorum.

(5) To elect a President, Vice-Presidents, and Committee for the ensuing year.

6. To elect two Honorary Auditors.

There will be a meeting of the new committee immediately after the general meeting.

Voting paper for election of president and vice-presidents and members of committee for the ensuing year.

The following members have been nominated and are willing to serve if elected:—President, William Grove; Vice-presidents (three to be elected):—Walter Barnett, William Crooke, Ernest Elliott, and Martin Jacolette.

Committee (strike out all names except the ten London and ten country members you desire to vote for).—London: Walter Barnett, F. A. Bridge, H. J. Dalby, E. Elliott, Alfred Ellis, H. E. Hull, M. Jacolette, A. Mackie, Edgar Scamell, G. V. Simmons, L. Sims, C. H. Skillman, and T. C. Turner. Country: W. Barry, Hull; T. Birtles, Warrington; H. A. Chapman, Swansea; W. Crooke, Edinburgh; W. Gill, Colchester; Frank Moffat, Edinburgh; G. W. Morgan, Aberdeen; H. C. Spink, Brighton; W. D. Valentine, Dundee; G. W. Webster, Chester; W. Werner, Dublin; H. J. Whitlock, Birmingham.

Members unable to attend the general meeting must return this paper, when filled up, to reach the secretary, not later than July 2nd.

PHOTOGRAPHERS' ASSOCIATION OF NEW ENGLAND.

We are asked to give prominence to the following notice to British professional photographers:—

The Sixth Annual Convention will be held at Copley Hall, Boston, Mass., U.S.A., August 20th, 21st, and 22nd, 1902.

Greeting to British professional photographers,—Situated as you are, many thousands of miles from us, our common love for our art makes us all indeed brothers. Your success is very dear to us. We want to see what progress you are making, and to show you our own as well. Let us therefore in future be more attentive to each other. I extend you the glad hand of friendship. Will you accept it?—Cordially yours, Charles W. Hearn.

Executive Committee: C. W. Hearn, President, 394, Boylston Street, Boston, Mass.; Morris Burke Parkinson, First Vice-President, 423, Boylston Street, Boston, Mass.; Geo. M. Bolton, Secretary, 22, Union Street, Rockville, Conn.; S. M. Holman, Treasurer, Attleboro, Mass.

State Vice-Presidents: Maine, W. C. King, Portland; New Hampshire, W. R. Call, Manchester; Vermont, H. E. Cutler, Barre; Connecticut, G. E. Tingley, Mystic; Rhode Island, L. L. Anderstrom, Bristol.

The Photographic Association of New England extends to you a most cordial invitation to exhibit at our Sixth Annual Convention, to be held at Copley Hall, Boston, Mass., August 20th, 21st, and 22nd, 1902.

There is a great desire among our members to see your work, and our Executive Committee believe that if you will assist us in obtaining pictures, thus making our next exhibition international in its scope, that the plan of so doing will more widely extend in the future through Europe and America than it has in the past, until all large societies or associations will exhibit work from all over the world, instead of merely from their own sections, with possibly a few from one or two adjacent countries. We would deeply appreciate the courtesy if photographic publishers abroad would kindly call the attention of their readers to the above, and would here thank them in anticipation of this favour on their part.

We believe this desire to see the work of various countries is universal, and as illustrating this, we would state that our New England Association received last summer an invitation from the Society of Artistic Photography of Moscow, Russia, through its honoured President, Mons. Bachrouschin, to send some work to their convention on February 20th, of the present year, which we are pleased to state was accepted and pictures sent as requested.

The president of this association would be much pleased if the presidents of such societies abroad would lend their assistance by personal application to their members toward obtaining for our exhibition a collection of their best work, which would well represent the standard of photography in their respective countries, in the line of portraits, genre, studies, and landscapes. Two or one picture from eight or ten members of these various classes of work, when possible to obtain, or even a smaller number, would give us the greatest pleasure, and would inspire us with a feeling of great liberality on their part. Our president would gladly use this official position to reciprocate for a like purpose, and even would, after January 1st, 1903 (when his term of office expires), contribute in his individual capacity, besides rendering any other assistance possible. In the absence of any concerted action on the part of any society or body of artists to send them as a whole, we hope to receive many individual exhibits, and cordially invite correspondence with those who may prefer sending their work singly.

In answer to your anticipated inquiry, we would say that all pictures sent for exhibition are (unless otherwise directed) judged by our jury for artistic merits and technique, and pictures possessing these qualities in a high degree are honoured by being exhibited in a special salon of honour. A descriptive list of these honoured pictures, with name of artist, will be published in our own photographic journals, and our efforts will be bent towards securing their publication in those of all European countries. Printed lists of all honoured work will be sent to all foreign contributors who have kindly assisted us in making our convention an artistic success.

We issue to every artist whose work is thus honoured a certificate or some suitable emblem, certifying that such honour was bestowed, so the artist, his friends and patrons will be aware of our appreciation of the excellent work sent us.

In addition to the above, the Museum of Fine Arts, Boston, commenced last year to exhibit for a period of one month all of the honoured work of our convention, which is one of the greatest honours possible for any artist to receive, and serve well to illustrate the high standing which photography has attained in the United States.

The establishment of the "Salon of Honour" by our association has, we think, done much towards the encouragement of artistic photography, as by doing away with medals, where a few receive the greatest honours, and some none at all (which another set of equally as good jurors might select in preference), all parties now who make work of as high merit are equally well treated. The selection of the jury will be carefully made by the president of this association, and will be known only to himself until at least after the award has been made. He also excludes his own work from judgment.

General Instructions for Sending Work for Exhibition.

These instructions are based upon rulings from the Customs Department of the Treasury of the United States, to whom application was made, and, if followed carefully, will avoid all difficulties.

1st. Pictures may be sent framed or unframed, with or without glass. For obvious reasons we advise without glass, with simple, inexpensive frames, as presenting possibly a better appearance for exhibition. We can conceive, however, their being made attractive without frames.

2nd. Have carefully written or printed name or address of the artist somewhere upon *each* picture or frame. Any further information, print or write plainly in French, German, Italian, or English, such as title, etc.

3rd. If pictures are part of a collection sent, the address of the party having charge of the exhibit, and in whose care the full exhibit is to be returned, should be also marked on *each* picture or frame.

4th. Send by mail to the president of this association a correct invoice covering exactly the number of pictures framed and unframed in the box or package, and *who from*. *Also mark* on invoice, "for exhibition at Boston, and to be subsequently returned to ——— (country of origin)."

5th. Mark the box in French, German, Italian, or English, besides the address, and *who from*, "for exhibition at Boston, and to be subsequently returned to ———" country of origin.

6th. Fill out invoice sent by letter.

7th. The expense of transportation to Boston will be paid by our association upon arrival, leaving only the return of the pictures to be

paid by the sender. To make the expense of their return a mere trifle to each exhibitor, we advise a collection of pictures from several exhibitors being sent in one lot.

Correspondence cordially solicited from contemplating exhibitors in French, German, Italian, or English.—Fraternally yours,

CHARLES W. HEARN,
President Photographers' Association of New England,
394, Boylston Street, Boston,
Mass., U.S.A.

Patent News.

THE following abridged description is specially drawn for the BRITISH JOURNAL OF PHOTOGRAPHY by Messrs. Hughes and Young, patent agents, 55 and 56, Chancery Lane, London, W.C., who will give advice and assistance free to our readers on all patent matters:—

PATENT APPLICATIONS.—No. 12,645.—W. Brampton, 77, Culmore Row, Birmingham. "An improved photographic clip."

No. 12,660.—Walter Charles Grubb, 38, Eagle Street, Holborn. "Improvements in photographic cameras."

No. 12,705.—M. Kunht, 45, Southampton Buildings, W.C. "Improvements relating to photographic roller-films."

No. 12,768.—A. J. Boult, 111, Hatton Garden, E.C. "Improvements in or relating to photographic and optical apparatus."

No. 12,792.—August Weiss, 45, Southampton Buildings, W.C. "Improvements relating to photographic films"

No. 12,818.—S. T. G. Fry, 33, Sandstone Road, Liverpool. "A non-explosive and non-inflammable photographic film."

No. 12,973.—C. A. Mercier, Norfolk House, Norfolk Street, Strand, W.C. "Improvements in photographic developing apparatus."

PATENTS ILLUSTRATED.—No. 2,837.—Photography. Patentee: O. Imray, Birkbeck Bank Chambers, Southampton Buildings, London.

Cameras, roller-slides.—Relates to improvements in a panoramic camera described in Specification No. 8,674, A.D. 1900. In this specification a diaphragm or mask is placed between the lens and the focal plane to shade off the edges of the section of the image thrown at any instant on the film. The aperture in the diaphragm is a slit with parallel or with inclined sides; the sides may also be toothed or wavy.

No. 2,843.—Photography. Patentees: Thornton-Pickard Manufacturing Company, G. A. Pickard, and C. G. Woodhead, all of Atlantic Road, Altrincham, Cheshire.

Shutters.—Relates to a stop for holding open shutters such as described in Specification No. 24,319, A.D. 1899, for the purpose of focussing. The shutter-leaves are traversed by the levers, one of which is actuated by the lever and the spring. On the lever is a projection which is arrested. with the shutter open, by the stop when it is in position.

No. 2,997.—Photography.—Patentee: G. Gerlach, 20, Junkerstrasse Berlin, S.W. Prussia, Germany.

Printing. Copying documents, drawings, and the like.—Relates to an apparatus for printing from a number of negatives on a continuous sheet of sensitised paper. The paper is drawn from the spool, passes between a pneumatic cushion and the negatives, and is wound on to a spool turned by a handle. To press the paper against the negatives, the pneumatic cushion is inflated. The negatives are illuminated by electric lamps enclosed in a suitable receptacle.

New Book.

"Encyklopädie der Photographie, Vol. 17." Die Kunst des Vergrösserns auf Papieren und Platten. By Dr. F. Stolze. Halle a/S: Wilhelm Knapp.

The second edition of Dr. Stolze's work upon the art of enlargement upon paper and plates forms a very complete and trustworthy guide to this branch of photography. It treats of the optical conditions, the various sources of light, the most suitable kinds of apparatus fo rdifferent processes, the arrangement of the apparatus, the negative and its defects, the development and treatment of the enlarged pictures. The numerous illustrations will be found of great service in elucidation of the text.

GRUN Lens Syndicate, Ltd.—The above-named company has been registered by Jordan and Sons, Ltd., 120, Chancery Lane, W.C., with a capital of £2,100 in £1 shares. The objects of the company are sufficiently indicated by the title. No initial public issue. Table A mainly applies.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

June-	Name of Society.	Subject
28.....	Liverpool Amateur.....	Excursion to Shrewsbury. Leader, Dr. J. W. Ellis, F.E.S.
July.		
1.....	Rotherham Photographic	Paper by Mr. W. Firth. (Subject to be announced.)
2.....	Borough Polytechnic.....	*A Photographic Talk.* Mr. F. W. Bannister.
2.....	North Middlesex Photographic	Sixth Lantern Slide Competition. Special Competition, Still Life Study "Flowers."
3	London and Provincial.....	Annual General Meeting.
3.....	Röntgen Society	Annual General Meeting.

ROYAL PHOTOGRAPHIC SOCIETY.

JUNE 10TH.—Ordinary meeting. Mr. J. J. Vezey, F.R.M.S., in the chair. Professor Jagadis Chunder Bose, M.A., D.Sc., gave an interesting lecture on

THE STRAIN THEORY OF VISION AND OF PHOTOGRAPHIC ACTION.

The lecturer held that the enormous extent of the photographic empire had not yet been fuly realised. The latent image was by no means formed by the exclusive agency of light, but also by the stimulus of cathode discharge, of Röntgen rays, of emanations from such bodies as radium and uranium, and by electrical and machanical stress. The electric wave which carried the wireless message through space was invisible light, and the detector by which the message was received (the coherer) was nothing more than a photographic plate. The impact of light produced a molecular strain in the exposed substance, and the same malecular mechanism which produced the latent image on a plate actuated also the wireless telegraphic receiver and transmitted the visual impulse. A developable image was produced upon a photographic plate by electrifying a stencil placed up it, the latent image caused by molecular strain being subsequently developed. Similar treatment of a plain sheet of glass also produced a change in the glass, which, though invisible in the ordinary way or under the microscope, was rendered visible by breathing upon the glass. A mechanical model was used to show that a galvanometer needle moved in perfect response to the varying strain produced in the sensitive substance by the action of stimulus. Such a method of investigation of the changes induced by stimulus was superior to development, inasmuch as with the latter only the final effect is seen. The galvanometer, on the other hand, revealed through the agency of its needle all the invisible molecular disturbances which take place on the impact of light or other stimulus. Expressed by curves, there is thus the rise due to the action of the stimulus and the fall produced by the after-recovery from the strain which followed the impact of the stimulus. The curve of response to the stimulus employed, depending on molecular distortion and recovery from the strained condition, is influenced by the important factor of molecular friction. Thus, assuming a sphere depending from a wire to represent a molecule, it was demonstrated that a blow produced a distortion or strain, which was indicated by a pointer. There being no friction, a persistent after-oscilation was set up, but friction upon the sphere being produced by means of some sand, the oscillation was damped. The response to the stimulus of the blow was seen as before, but the recovery from the strained state was protracted, and the more so with the increase of friction, until there was response, but no recovery, the suspended ball being held in its strained position. Now, if conductivity variation produced by radiation is an expression of molecular distortion, these phases should be repeated. Nearly all substances are molecularly affected by radiation; yet there is great difference in the permanence of the after-effect. Recovery is very quick in some cases, and protracted in others. Thus, it is obvious that attempts to develop the after-effect a long time after the exposure will not be successful in cases where there is a quick recovery. The relapse of the invisible photographic image is explained by this theory. Recovery is only a question of time. With some substances it is immediate, while with others, like, Daguerreotype, the latent image disappears in the course of several hours. Instances had been brought to his notice where the latent image on a film had disappeared after a year or so, the film afterwards becoming as good and serviceable as though it had never been exposed. The after-effect can be made more permanent by retarding self-recovery. The application of the theory to many substances, such as muscle, nerve, vegetable life, metals, etc., was then thoroughly worked out and explained by Dr. Bose, whose galvanometer-curves illustrating the course and variation of the stimulus, and its effect, proved most instructive and interesting. The electrical theory of vision was the subject of particular reference, and many natural effects in the eye were fully explained. The lecture was of such length that only a bare idea of its scope can be given, but it will appear in the Society's Journal, no doubt, in due course.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JUNE 19TH.—Mr. J. S. Teape in the chair.

The following nominations for officers and committee were notified and

placed on the board until the annual meeting, when the vote will be taken:—

Trustees: Mr. A. Haddon, Mr. T. E. Freshwater. Committee: Messrs. J. S. Teape, H. C. Rapson, T. K. Grant, A. Mackie, R. P. Drage, R. J. Kindow, Marshall, R. Beckett, S. J. Beckett, J. W. Hodges, and S. Heskins. Curator: Mr. J. W. Hodges, Mr. S. Heskins. Recorder: Mr. E. Featherstone. Hon. Sec. and Treasurer: Mr. W. D. Welford. Librarian: Mr. E. T. Wright. Affiliation Delegates: Mr. A. Mackie, Mr. H. C. Rapson.

Mr. A. L. Henderson gave an interesting lecture on

PORTUGAL

and other excursions in the neighbourhood of the great peninsula. The views were principally of the cities of Cintra, Lisbon, Seville, and Tangiers. A large number consisted of interior views of the handsome churches and castles, some of which, taken by flashlight, again bore evidence of the lecturer's skill in this branch of work. An interesting anecdote was that which told how, finding it impossible to gain admission to the interior of Cintra Castle, he wired to the King of Portugal, who kindly telegraphed the desired permission. The prevailing architecture was, of course, Moorish, and wonderful buildings some of them were. There is an abundance of work for the photographer—work that, as yet, has been never, if at all, touched. Mr. Henderson took one or two telephoto views, but the very wet climate of Portugal and the continuous rain that he experienced caused the distance to be somewhat indistinct. A visit to the Bull Ring gave Mr. Henderson several very clever instantaneous views of the animals worried by the darts in their shoulders and the dragging out of the dead beasts. The trip across the straits in Tangiers was full of oriental interest. Mr. Henderson penetrated with his usual enterprise into all sorts of nooks and crannies, and came away with photographs of the people and the buildings, which also were much admired.

The lecture was one of a series, the remainder of which will be given during the ensuing months. A hearty vote of thanks was passed to Mr Henderson

CAMERA CLUB.

JUNE 19TH.—Thursday, the 19th inst., might be fitly described as an African night at the Camera Club, for the lecture was on British East Africa, by Mr. S. L. Hinde, who holds the office of Sub-Commissioner there, and the chairman was recently the Chief Justice of Lagos, on the Western Coast of the Dark Continent. The title of Mr. Hinde's lecture was "Ornaments and Mutilations of East African Natives," and it was illustrated by a number of most interesting lantern slides taken from his own negatives. His position has given him unusual facilities for moving about among the different tribes, and learning all about their manners and customs. We might sum up these by quoting the ancient aphorism, "Manners they have none, and their customs are beastly." But we must remember that these savage nations have no written history, and it is only by records of their ways and habits that their movements can be traced and the influence of contact with other peoples indicated. Thus, the use of brass wire for purposes of ornament means contact with Europeans, for the native metals are limited to copper and iron. Besides the lantern pictures, Mr. Hinde had on the table before him a number of savage weapons, articles of adornment, and other things which he had brought from East Africa.

The lecturer first showed a map of Africa, and pointed out the district with which he was concerned, remarking that the railway which had been recently completed from the coast into the interior of the country had had, as might be expected, a civilising influence upon the people. It was now necessary to go about 200 miles from the railway to see the natives in their primitive state. The Portuguese were the first to settle in this part of the world, and after three centuries of constant warfare were driven out by the Arabs. The Arabs in their turn have gone, and the King's subjects in British East Africa consist of four different tribes now living in harmony with one another. Clothing is becoming more and more the fashion, owing to European and Indian influence. And the chiefs are very happy if they can array themselves in anything in the shape of a British uniform. It is therefore possible sometimes to see one of these notables arrayed in the coat of a guard on the underground railway. Many of these natives mutilate themselves by cutting out the uvula, and circumcision is the rule among them. They also mutilate the ears by cutting through the lobe and attaching ornaments, so that it is not uncommon to see a man or woman with about 2lb. of beads, or other things hanging from each ear. The natives do not systematically tatoo themselves, but sometimes will mark the abdomen with gashes, and give their skins the appearance of being tatooed by rubbing themselves with pipe-clay, and wiping out a kind of ornamental pattern with the wet finger

The manner of dressing the hair will indicate the tribe to which a man belongs, some of them shaving the head in one way and some in another. The women are made to do most of the hard work. For example, the men of a tribe will arrange to act as porters for an expedition which is, perhaps, going 200 miles into the interior of the country. Each man will take up his load of 60lb. or 70lb., but at the end of the first 50 yards or so, the loads are transferred to the backs of the poor women. The natives chip their teeth to a pointed form by means of a kind of chisel, and finish this method of adornment by rubbing down the teeth with a stone. It used to be thought that pointed teeth indicated canabalism, but this is quite a mistake. The people here do not believe in natural death, but consider that life would go on indefinitely unless it were for the evil influence exercised by somebody. A witch doctor is consulted as to the person who has exerted this influence, and the doctor names in secret the man or woman supposed to be at fault. This unfortunate being is subsequently speared, and afterwards stoned to death. Mr. Hinde discovered this horrible practice quite by accident, but he followed the matter up, and is now doing his best to stop it. Among some tribes a goat is sacrificed in lieu of a human victim.

At this point in his lecture Mr. Hinde showed and explained the uses of the various articles of savage adornment and warfare which he had brought with him, so that their appearance in the photographs afterwards exhibited could be better understood.

In some of these pictures it was shown how terribly pinched are the arms of the natives by bands of wire, and how the holes bored in the ears are frequently torn through by the outrageous size of the articles thrust therein. Sometimes these take the form of a billet of wood, or a large stone, and the lecturer said that if a man were presented with a gallipot he would immediately find a place for it in his ear. Although at the outset of his lecture Mr. Hinde apologised for the quality of his pictures, he had no need to do so. Many of them were excellent photographs, and all were replete with interest.

In opening the discussion the chairman said how interested he was in noting that many of the customs described by the lecturer had their counterpart in West Africa. This was especially the case with regard to the non-belief in a natural death. It was the same with sickness, some malignant spirit or human being was the cause of the malady. It could not otherwise occur.

Mr. Humphery said that the lecturer had taken a load off his mind, for he had a son out in the district administered by Mr. Hinde, and he felt some anxiety as to that young gentleman introducing a black wife into the family circle. But now that he had seen portraits of the ladies, and had looked upon their charms, he felt sure that his son was safe. Mr. Hinde had modestly said nothing about his own work among these savage tribes, but he had in reality accomplished wonders, and he (Mr. Humphery) hoped that when his son returned, about Christmas time, he would be able to tell the club some of his experiences.

Various questions were addressed to the lecturer, which he briefly answered, after which the meeting closed with a hearty vote of thanks to him.

NORTH MIDDLESEX PHOTOGRAPHIC SOCIETY.

JUNE 18TH.—Mr. C. Beadle, the president, gave an instruction lecture on "Some Details of Carbon Work."

He recommended three strengths of solution of potass. bichromate for sensitising the tissue—i.e., a 5 per cent., a 2½ per cent., and a 1¼ per cent. A strong bath should be used for a vigorous negative, and a weak bath for thin negatives. Dusting the tissue with a brush on both sides before immersing in sensitising solution prevented to a great extent air bells forming. Take out of the solution when the tissue has straightened out. Squeegee upon a vulcanite or ferrotype plate, and set in a warm place to dry. If a piece of tissue is wanted quickly, immerse in methylated spirit for a few minutes, blot off, and hang up, when it will be dry in a quarter of an hour. The tissue can be kept sensitised for months if stored in a flat calcium box.

To judge printing without an actinometer, select another negative of similar density and print in P.O.P., side by side with the carbon till it just looks right, when the tissue will be properly exposed.

If the surplus bichromate in the exposed tissue is washed out in plain water and dried it will keep, and can be developed at any time.

To prepare crayon or cartridge paper as a support for single transfer take Nelson's No. 1 gelatine, ¾oz., soak in 9oz. water till soft, melt with heat. Dissolve 9grs. chrome alum in 3oz. water and add it to the gelatine, drop by drop, stirring all the while. Coat the paper with a stiff brush, and when dry coat a second time.

CORONATION Holidays.—Messrs. Elliott and Sons, Ltd., notify that their offices, warehouse, and factory will be closed on Thursday, Friday, and Saturday, June 26th, 27th, and 28th.

PARLIAMENT and Scientific Research.—It is frequently complained that scientific research, with Government financial help, is not encouraged to the same extent in this country as it is in some others—Germany to wit. In the votes on the Civil Service Estimates was one for £37,396 for grants in aid of scientific investigation and other purposes. This seems a large sum, and it would be interesting to know how much of the amount will go towards scientific investigation, and how much to "other purposes." The meagre grant that our new Physical Laboratory receives is several times less than that accorded to similar institutions in Germany. But we fear that if a larger sum were proposed it would be resisted by the greater portion of the economists now in the House of Commons who do not realise the value that greater scientific knowledge would be to the country. For want of it several industries have become lost to this country. Take, for example, the manufacture of optical glass. At one time nearly if not all the optical glass used throughout the world was made in England. Now it is nearly all made on the Continent, largely in Germany, where the improvements that allow us to have improved lenses were worked out through Government financial aid at the Jena factory.

News and Notes.

RÖNTGEN SOCIETY.—Annual general meeting will be held on Thursday, July 3rd, 1902, at 20, Hanover Square. The chair will be taken at 8.30 p.m. Agenda:—Minutes of last meeting. Nominations. Proposed new members for ballot: J. Charters Birch, L.D.S., R.C.S.I., 2, Brunswick Place, North Street, Leeds; Harold E. Gamlen, M.B., B.S., D.P.H., Chadwick House, York Road, West Hartlepool; Duncan Otto Macgregor, M.B., C.M., Victoria Infirmary, Glasgow. Annual report and balance-sheet. Election of officers for the ensuing year.

THE South London Society's trip to Ireland will start from London via Greenore. The Boyne Valley as far as Slane will be visited by conveyance from Drogheda. Returning to Greenore, the following will then be visited:—Carlingford, Greencastle, Kilkeel, The Silent Valley, Newcastle, Dundrum, Castlewellan, Donard Lodge, etc., Downpatrick, Saul Abbey, Shirell Wells, Ardglass, Killough, Tollymore Park, Rostrevor, and Warrenport. Anyone wishing to join the party can obtain fuller particulars from Mr. C. Churchill, 5, Annandale Road, East Greenwich, S.E.

THOSE who will be unable to be present at the Coronation Processions in London or the Great Naval Review at Spithead will have the opportunity of witnessing all these historical sights at the Polytechnic, Regent Street, W., almost immediately afterwards, as a complete series of animated pictures are to be taken by Mr. A. J. West, F.R.G.S., of "Our Navy," who has had special facilities granted him by the Admiralty, and has made arrangements for photographing all the principal events in London on the days of the great processions. One of the pictures which will be shown will be taken outside Westminster Abbey, within about 30ft. of the carriage from which his Majesty will alight uncrowned, and into which he will enter for the first time wearing the Crown of England. Another picture will record the various arrivals at the Abbey. It may also be interesting to note that only Mr. West's launch, with his staff of operators on board will be allowed to remain within the lines during the Royal Procession at the Naval Review. Mr. West himself, with another staff of operators, will be on board his Majesty's flagship "London"; so we may expect to see many items of important interest in these pictures, which thousands of people will be unable to see otherwise. Immediately the pictures are taken and developed, they will be shown at the Polytechnic, Regent Street, daily at three, on and after June 28th.

MESSRS. NEWTON AND CO., 3, Fleet Street, London, have prepared the following lantern slides of the King's Coronation:—1—His Majesty King Edward VII. in full Coronation Robes, from the painting by S. Begg. 2—Edward VII. and Alexandra Coronation. 3—The Military election of Alfred the Great, first King of all England. 4.—The prostration of Harold, son of Godwin. 5—The result of the recognition of William I., Christmas Day, 1066. 6—The Investiture of William II. with the Ring, Sunday, September 26th, 1087.—7—Her Majesty Queen Alexandra in full Coronation Robes, from the painting by S. Begg. 8—Coronation ceremonies of Henry I., Stephen, Henry II., and his heir apparent, Henry. 9—The Elevation of Edward the Elder at his Coronation at Kingston-on-Thames, Whitsunday, 901, drawn by R. Caton Woodville. 10—The Anointing of Edward the Martyr at his Coronation by St. Dunstan at Kingston-on-Thames, 975, drawn by R. Caton Woodville. 11—The Champion at the Coronation Banquet of Henry V., Passion Sunday, April 19th, 1413, drawn by Allan Stewart. 12—Richard I. delivering the Crown to the Archbishop before the Act of Crowning, Sunday, September 3rd, 1189, drawn by R. Caton Woodville. 13—The History of the Regalia, drawn by G. Amato. 14—The Taking of the Oath by Edward the Confessor. 15—The Crowning of Edward I. 16—The Second Oblation by Edward II. 17—The Oration of Hubert Walter, Archbishop of Canterbury, at the Coronation of John, Ascension Day, May 27th, 1199. The Litany at the Coronation of Henry III., at Gloucester Cathedral, St. Simon and St. Jude, October 28th, 1216, drawn by R. Caton Woodville. 18—The first recorded Court of Claims: John of Gaunt hearing the Petitions before the Coronation of Richard II., 1377, drawn by T. Walter Wilson, R.I. 19—Court of Claims, 1902. Arms of the Chief Claimants. 20—The Recess after the Coronation of Richard II. Vigil of St. Kenelm, July 16th, 1377. Drawn by A. Forestier. 21—The Banquet in Westminster Hall at the Coronation of Henry IV., drawn by T. Walter Wilson, R.I. 22—Various Services at the Coronation Banquet. 23—The Investiture of Edward III. with the Palium. 24—The Exhortation addressed to Edward IV. The Presenting of the Spurs and Sword at the Coronation of Henry VI. on St. Leonard's Day, November 6th, 1429, drawn by S. Begg. 26—The only Uncrowned King of England, Edward V., accompanied by his Uncle, Richard Crookback, received outside London by the Lord Mayor, May 4th, 1483, drawn by Rr. Caton Woodville. 27—The Coronation Ceremony of 1902: The Position of King Edward VII. at the Taking of the Oath. From the painting by S. Begg. 28—The Procession from the Abbey to the Hall at the Coronation of Richard III. and Anne of Warwick, drawn by Allan Stewart. 29—The Recognition at the Coronation of Henry VII., Sunday, October 30th, 1485, drawn by Allan Stewart. 30—The Distribution of the Regalia at the Coronation of Henry VIII. and Catharine of Arragon, drawn by T. Walter Wilson, R.I. 31—The Coronation of Edward VI., Shrove Sunday, February 20th, 1547. 32—The Sermon preached by the Bishop of Chichester at the Coronation of Mary I., Sunday, October 1st, 1553, drawn by A. Forestier. 33—The Presentation of the Gloves by the Lord of the Manor of Worksop at the Coronation of Elizabeth, drawn by A. Forestier. 34—The Homage, the Largesse, and the General Pardon at the Coronation of James I. and Anne of Denmark, drawn by R. Caton Woodville. 35—His Majesty King Edward VII. as Colonel-in-Chief of the 10th Hussars. From the painting by H. W. Koekkoek. 35—The Anointing of Charles I. by George Abbot, Archbishop of Canterbury, at Westminster Abbey, on Candlemas Day, 1626, drawn by A. Forestier. 37—The Presentation of the Bible at the Inauguration of Oliver Cromwell as Lord Protector, June 26th, 1657, drawn by R. Caton Woodville. 38—The Informal Coronation of Henry VII. by Lord Stanley on the Battlefield of Bosworth, August 22nd, 1485. 39—The only Uncrowned Queen Regnant of England: Lady Jane Grey Signing her Accession Proclamation, July 10th, 1553. 40—The Last Procession from the Tower: Charles II. and his Retinue on Tower Hill, April 22nd, 1661. 41—The Scene of the Coronation, Westminster Abbey. 42—The Inthronisation of the Queen Consort at the Coronation of James II. and Mary of Modena, on St. George's Day, April 23rd, 1685. 43—The Crowning of the Queen Consort at the Coronation of James II. and Mary of Modena. 44—The Oblation of the Sword by William III. and Mary II., April 11th, 1689, drawn by T. Walter Wilson, R.I. 45—The First Oblation at the Coronation of Anne, St. George's Day, April 23rd, 1702, drawn by A. Forestier. 46—Genealogical Table of the Kings and Queens of England. 47—The Inthronisation at the Coronation of George I., October 20th, 1714, drawn by S. Begg. 48—His Royal Highness the Prince of Wales. From the painting by S. Begg. 49—The Investiture with the Imperial Mantle at the Coronation of George II., October 11th, 1727, drawn by Allan Stewart. 50—The Creation of Knights of the Bath before the Coronation Ceremony, drawn by A. Forestier. 51—The Coronation Oath. The First Parliament of King Edward VII. The Lords who received 52—The Coronation Oath. The First Parliament of King Edward VII. The Commons who received His Majesty's Preliminary Declaration. Drawn by T. Walter Wilson, R.J. 53—The Procession from Westminster Hall at the Coronation of George III. and Queen Charlotte, September 22nd, 1761, drawn by T. Walter Wilson, R.I. 54—Her Royal Highness the Princess of Wales. From the painting by S. Begg. 55—The Fealty made by the Lords Spiritual at the Coronation of George IV., July 19th, 1821, drawn by G. Amato. 56—The Offering of the Bread and Wine at the Coronation of William IV. and Queen Adelaide, drawn by S. Begg. "The Church of the Coronation: Westminster Abbey":—57—The Jerusalem Chamber. From the painting of A. Hugh Fisher. 58—The Coronation Chairs. From the painting of A. Hugh Fisher. 59—The Entrance to the Choir through which the Sovereign passes to his Coronation. From the painting of A. Hugh Fisher. 60—Historical Incidents at Coronations of English Sovereigns, drawn by A. Forestier. 61—H.R.H. Prince Edward of Wales Saluting the Colours. From the painting by Allan Stewart. 62—The Holy Sacrament Administered to Victoria at her Coronation, the Eve of St. Peter, June 28th, 1838. 63—The Benediction Pronounced by Archbishop Howley at the Coronation of Victoria. From the painting by Sir George Hayter. 64—The British Dominions Beyond the Seas at the date of the Coronation. 65—The first proclamation of the Indian Imperial Title of the British Crown at Delhi, New Year's Day, 1877. Drawn by G. Amato. "King Edward's Acts Relative and Preliminary to the Coronation":—66—The First Preliminary to the Coronation Oath: His Majesty signing the Declaration for the Security of the Church of Scotland, January 23rd, 1901. 67—The Proclamation of the Date of the Coronation by the Common Crier of London, at the Royal Exchange, December 12th, 1901. 68—A Sitting of the Court of Claims at Westminster. 69—The Second Preliminary to the Coronation Oath: King Edward Signing the Declaration under the Test Act at his First Meeting with his Parliament, February 14th, 1901. 70—The Imperial Bodyguard: Types of the Soldiers of the Empire. From the painting by G. Amato. 71—The Coronation Ceremony of 1902: The position of King Edward VII. during the Act of Crowning, drawn by S. Begg. 72—The Coronation Ceremony of 1902: The Position of Alexandra, Queen Consort, at her Inthronisation, drawn by S. Begg. "Four Famous Coronation Legends," drawn by G. Amato:—73—The Legend of the Ring of Edward the Confessor. 74—The Legend of the Coronation Oil and the Ampulla. 75—The Legend of the Coronation Stone. 76—The Legend of Westminster Abbey.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

ON STAND DEVELOPERS.

To the Editors.

Gentlemen,—It probably falls to the lot of every photographer at some time or other to have to dilute the remains of some developing solution in order to make it "spin out." The dilution of the solution, besides protracting the process of development, has very little effect upon the action of the developer, and stand development has in consequence little to be said against it, and a great deal in its favour. For example, suppose we require to develop six quarter-plates. If the developer be diluted to six times its normal bulk the cost remains the same. If six vertical cells be employed—cheap glass cells such as are employed for Smee or square Bunsen batteries, or for

accumulators—the plates may be placed one in each cell and covered with solution. The development may then be watched with comparative ease, no removal from the dish being necessary for an examination of the plates. In film work it is generally desirable to substitute circular cells, such as gas jars, for the square ones.

Glycin is the compound most frequeuntly recommended for stand development, though many of the other agents answer equally well.

Liesegang's* formula is as follows:—

Boiled water	1,500 c.cm
Glycin	3 gms
Sod. sulphite	3 ,,
Sod. carbonate	45 ,,

For amidol the following is given by Dillaye:—

Amidol	3 gms.
Sod. sulphite	30 ,,
Boiled water	3,000 c.cm

Fourtier, in recommending a hydroquinone formula, gives:—

Water	1 litre
Sod. sulphite	75 gms.
Hydroquinone	15 ,,
Borax	5 ,,
Sod. carbonate	75 ,,
Pot. carbonate	25 ,,
Pot. ferricyanide	10 ,,

A good formula for a glycin developer is due to Hauff†, who employs the following:—

Hot distilled water	400 c.cm.
Sod. sulphite	5 gms.
Crystallised washing soda	45 ,,
Glycin	5 ,,

For use this concentrated solution is mixed with 2,100 c.cm of water.

Sshnauss advises the use of a pyrogallol and acetone solution,‡ stating that the acetone has no detrimental effect upon the gelatin, and gives as a satisfactory formula:—

Sod. sulphite	10 gms
Acetone	10 c.cm.
Pyrogallol	1 gm.
Water	800-1,000 c.cm.

The author states that with the above formula he gets no frilling of the film even in the height of summer.

Pyrocatechin and potassium hydroxide has also been advanced.§

It is interesting to compare the efficacy of various agents in stand development, and the following table serves to illustrate their relation:—

Amidol	1				
Glycin		2			
Hydroquinone			15		
Pyrocatechin				7	
Pyrogallol					15
Sod. carbonate		7	100		1.5
Sod. hydroxide				7	
Sod. sulphite	10	2	75	30	4.25
Pot. bromide					.3

The above are all formulæ offered by well-known men, and at any rate show a great discrepancy in the working powers of developing agents when subjected to slow action. Each is to be made up to one litre with water, the numbers representing grams.—I am, yours, etc.,

T. Thorne Baker, F.C.S.

IRREGULAR TONES.

To the Editors.

Gentlemen,—A professional photographer in a small way was complaining to me the other day that he could not get satisfactory prints; the faults of toning had spoilt several batches of prints, and although he had been working gelatino chloride paper for years the results were most disappointing. I recommended him to give up his separate baths, and try for a time a plan of combined toning and fixing for his large batches, as time was an object, and as the irregularity of the tones was his great trouble. There has at times been great outcry over the combined bath for many reasons, and theoretically we know it is sinful; certainly one finds it hard to say where gold ends and sulphur toning begins; certainly the question of permanency also enters the calculation, but even that need not be a great bugbear if hypo is plentiful enough, and washing likewise. In using separate baths we know that very often prints refuse to tone at all unless gold is plentiful, but the process is valueless if the toning is uneven and irregular.

Now, in the combined process I wish to speak of, one can be absolutely certain of avoiding this trouble.

One of my friend's troubles was the distinct and separate colours so noticeable in vignettes, but this may be especially so with an improperly used sulphocyanide bath.

When the old acetate of soda and gold bath was much practised some years ago professionals made much outcry about the wretched results often got, the mealy prints, blisters, etc., but when this bath was understood and mastered these troubles disappeared fast enough. If a sulphocyanide toning bath is to be used one cannot be too careful, or the troubles of my professional friend are sure to crop up. Boiling water should be poured on the sulphocyanide and the chloride of gold, and the solution be allowed to stand till next day; it is better still to dissolve the sulphocyanide in the boiling water and then add the gold solution. Made in this way the bath will always work well, and may be used over and over again, adding only the strong solution of gold and one-fourth the amount of sulphocyanide.

The prints toned in this way require really well washing, changing frequently, for the nitrate requires more soaking to get it out of the gelatine than out of the old albumen, and unless got rid of may cause further toning, giving reds and purples.

It cannot be a good thing to harden the film with alum before toning, and this should never be done if it can be helped, for many reasons. After toning, however, it is often not only advisable, but positively essential. If this is done it need hardly be said that further thorough washing must be given before fixing in the hyposulphite bath. This is more necessary than might be thought in these days of hypo-alum, etc., if the reason of this paper be borne in mind. I am speaking specifically of the avoidance of irregular toning, and this washing out of alum previous to fixing, if insufficient, may cause troubles just as we think we have escaped them. The hypo in these cases may with advantage contain a little carbonate of soda—pure carbonate.

In this way we shall succeed in getting prints without disagreeable double tones and irregular patches of colour.

Silver prints need to be very perfect to be artistic, and nothing looks worse than the wretched washed-out, irregular, patchy-looking things.—I am yours, etc.,

Frederick Graves.

PICTORIAL POSTCARDS AND THE POST OFFICE.

To the Editors.

Gentlemen,—In reply to "Pictorial," I might say that I have discovered this drawback in pictorial postcards, and I am sure many other photographers have also. I feel sure that there is a great deal of business in this, as I am often asked for them, but have never executed any order, as I was told by my dealer that I must not stick anything in the shape of a photograph on a postcard.

Now I think this is a pity for the public to be tied down to the collotype cards in this way. A person in search of these can go from one end of a town to the other and find about a dozen reproduced from one man's negatives in every stationer's shop. Surely something can be done to enable the lover of good pictures to purchase and send to his or her friends without this extra postage?—I am, yours, etc.,

Paste On.

PHOTOGRAPHY AT THE CORONATION.

To the Editors.

Gentlemen,—There is no question that photography will be more in evidence on the two Coronation days than on any two days in the previous history of photography, and it is sincerely to be hoped that the weather, and the light, will be propitious for the occasion. There is one difficulty that it may just be well to call to the attention of those who intend to secure photographs of the pageant, and that is the flags. Those at a distance are not likely to cause much trouble, but it is different with those that are close at hand. They block the field of view, and they are continually moving. In nearly every photograph we have seen of grand pageants, those of the two Jubilees for example, the picture has been greatly marred by waving flags in close proximity to the camera. It will, therefore, be well for the worker to select a spot where he will not be troubled with large, near flags, if such a spot can be found? In the case of photographing from windows the flags at the adjacent houses, though they may be small, will usually prove an annoyance unless they can be dodged or kept under control when the exposure is made. This a polite request from the neighbouring sightseers will often secure for a few seconds. I throw out these hints as they may be of service to some who have had no experience of photographing scenes, such as those of the Coronation days, and may not realise how their pictures may prove almost spoilt by causes not anticipated. In the case of cinematographs, fluttering flags, unless they are very near, will cause no trouble. On the contrary, they will add life to the scene. Mementoes of many of

*"Phot Almanach," 1900.
†Vogel's "Photographie," 1900.
‡Eder's "Jahrbuch," 1901.
§"Phot Centralblatt," 1900, p. 35.

the illuminations will be possible with a hand camera furnished with a rapid lens and quick plates, as the incandescent lamps are mostly so thickly studded round the building that the light emitted from them will be sufficient to illuminate the general contour of the building itself. Where this work is attempted the plates should be carefully backed, so as to avoid halation.—I am, yours, etc.,

AN OLD HAND.

June 20, 1902.

PROPOSED IMPORTANT AMENDMENT IN PATENT LAW.

To the Editors.

Gentlemen,—English patentees have always been at a disadvantage as regards patents they may take for their inventions abroad, but there now seems to be a probability of that being somewhat remedied. It is stated in the Parliamentary Notes of the "Standard" one day last week, that the President of the Board of Trade has drafted a new clause in the Patent Law Amendment Bill, with a view to meeting the objections made by a deputation that waited on him recently from Manchester and other parts. One of the contentions of the deputation was that foreigners taking out patents in this country should be compelled to work them here, as the non-existence of any provision to this effect places the British inventor at a serious disadvantage as compared with competitors abroad. Now, as the existing law stands, a foreigner can take out a patent in England, and so secure a monopoly for the invention, although he has no intention of working it here, or granting licences for its being worked. But if an Englishman takes a patent abroad—say in France or Germany—he is bound to work the invention there within a certain period, or the patent lapses. It will here be seen that at the present time the British inventor is heavily handicapped as compared with the foreigner. The English coal tar colour industry has been almost lost to this country in this way. Germany, for instance, makes a discovery and patents it here, and then blocks the way—manufactures the colour in Germany, and sends it to England. If this country makes the discovery and patents it in Germany he must manufacture the colour there, as well as here, or he loses his monopoly in that country. It is the same, of course, with photographic apparatus—lenses and the like. If the proposed new clause becomes law this state of things will be remedied, and English inventors, and foreign ones, put on a similar footing.—Yours obediently,

PATENT RIGHTS.

June 18, 1902.

TELEPHOTO STEREOSCOPY.

To the Editors.

Gentlemen,—It may interest those who study this branch to know what I did a year or two back. It is nothing wonderful, and I claim no credit, but there are probably very few such views in existence.

Standing on a vantage-point at about 9,000 feet elevation in the Himalayan chain, a magnificent horizon of eternal snows extended round nearly half the circle. I determined to have a 7½ x 5 stereograph. Day by day for weeks did I climb to the selected positions, but the atmospheric conditions at that time of year were always unfavourable. Nevertheless, I got a result, not good enough for exhibition, but fairly startling as stereoscopy. Using a focus about equal to 56 inches, a great mountain of about 20,000 feet, which I had well scrutinised as single with the latest and most powerful binoculars on the market, was revealed to consist of two mountains. A careful triangulation showed that the nearer one was nearly fifty miles off, and the further one nearly sixty. Their heights were (from memory) about 20 and 21,000 feet. How I bewailed the flatness of the negatives. Had they been brilliant, I should have constructed a special mirror or prism stereoscope, sent it to an exhibition, and demanded a medal.

F. GLEADOW, F.R.M.S.,
Indian Foreign Service.

Karachi, Sind

CORONATION PHOTOGRAPHS.

To the Editors.

Gentlemen,—Mr. J. Bentall Endean, in a letter to the "Times," asks "if it be possible for large photographs to be taken by State servants of the actual ceremonies in the Abbey."

Will you permit me, as the only photographer admitted to the Abbey at the late Queen's Jubilee, 1887, to state that owing to the "dim religious" light being so non-actinic, the period of exposure is one of many minutes, thus rendering life photography impossible, and I fear a flash light would not be permitted. ARCHER CLARKE.

Old Vicarage, New Kent Road, S.E.

HOW TO BUY A BUSINESS AND HOW TO START ONE.

To the Editors.

Gentlemen,—You often have in your journal questions on building studios, and generally from young fellows who wish to start on the road of making fortunes before they really understand what they are landing themselves in. The general assistant who knows a good business is being done by his employer, and the amateur who has his camera and takes a few friends in the back yard, are both tempted to build a studio and branch out as first-class photographers, and, often as not, call themselves artists, but it never strikes them that the successful photographer has many a sleepless night before he has been able to build up the business which has turned out perhaps all right, and enabled him to retire. Please do not laugh at the "retire," because it is done by those who stuck to it and much money made, but "General Assistant," who has thought his employer could not do without him, branches out, as I said before, with slight knowledge of the way to manage a business, although he knows how to do good work. He is tempted to charge high prices, and finds after a time customers come very slow, but why? He knows his work is pleasing everyone—in fact, they say so, and Mr. and Mrs., also Miss, So-and-so all recommend him, and naturally all will be photographed, but he finds those promises are so far from being realised that he begins to think he is charging too much for his work, so he cuts down his prices. Result, he loses the customers he had got, and has to make a new start, and everyone calls him a third-rate man, and twelve months is usually enough for him as a photographer, and he is advertising for a place and quite able to manage a branch, etc. I have had as many as 30 replies to an advertisement in your journal, and at least half of those men have actually boasted that they have been in business for themselves, and expect someone else to employ them as managers. He might have done very well had he started with enough cash to wait for business. One starting a business on his own wants at least enough after starting to carry him over two years. He then can be independent, and get his price, and be thought more of in the end. Now, for the purchase of a business. Most young fellows think they are going to get a good sound business in working order, and a good income, without paying much for it. There is in the market to-day a number of businesses, but how many are genuine concerns, and taking the amount of cash they say they are, and if they are, what are they selling for? I recollect some two years back I was looking for a good business for a customer, and I called on a number. Two of those who were giving up photography have applied to me for places since, and both willing to work for 25s. per week, and yet, according to their own statement, their income was from their own business about £4 per week; but who did they take in? Perhaps a man who had saved up the £260 in one case and £200 in the other—perhaps had nothing further to fall back on when they found too late they had no redress, the man having nothing, and besides gone. Never buy an old-established business which is declining, and the proprietor just wants to save himself from the dogs. I mean the one that has been run out. Never buy a business that has changed hands within twelve months, unless the business has been under management and the proprietor has another business, and unable to give it all his attention, and then the question arises, what has he paid his assistants in the business, and how many has he kept, if he has kept, good assistants, and paid a good wage, and they have been some time in his employ, and do not mind whether they stop under the new proprietor or not, well and good; but if they want to stop and have been paid but little, you can rest assured there is but little business. But never buy a business when the operator or the receptionist has been for a number of years in the same business,, when they are known as Mr. or Miss So-and-so, everyone will want to see those people. Better by half have a business where even the proprietor is not known to the customers too well. Then there is the business, the so-called high class. When they have issued to all the principal tradesmen, etc., in the town, a free sitting given, so many cabinets, etc., and you think they have really a good connection, do you know those negatives all count, and so do the orders, which are supposed to have been given, and as you go to look round, that is Mr. So-and-so, and go all through the lot, you, of course, think what a splendid connection they have; but little do you think those people have been taken free. Then there is the very nice photographs of children, and ladies in evening dress, taken for specimens, but booked up as orders. Without a doubt the most genuine business to buy is the one which shows the usual every day sitter. He caters for the public who spend the money, and as evidence gets them The man who is always showing specimens of fancy work is the man who runs after business, and the one who shows every day work is the one who does the business. Don't think because a man is in a side street he has no business to sell. I have known some of the most prosperous businesses carried on where there is not a shop in sight, and have worked in businesses where they have been situated in the very busiest street, and they have done simply nothing. If you want a good business, don't go in a street where all the traffic and bustle is, or you will be disappointed. You will get plenty of lookers, but not many customers.—Yours, etc.,

ONE WHO HAS BEEN THROUGH THE MILL.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY, 24, *Wellington-street, Strand, London, W.C." Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

PHOTOGRAPHS REGISTERED :—

F. Ward, M.D., 22, Museum Street, Ipswich. *Photograph of adult trout.*

W. Aimer, 80, High Street, Perth. *Four photographs of Rev. R. S. Barclay.*

FORMULA WANTED.—E. C. BICHERTON writes: "Could you kindly inform me what is the correct formula for carbon paper to produce green tints?"—In reply: Green tints may be obtained in carbon tissue by employing, as pigment, raw sienna and indigo or other blue, blending them to the tint desired.

BOOK WANTED.—H. J. B. writes: "Can you advise me in the next or following issue's Answers to Correspondents the name of publisher and title of a book on the method of finishing enlargements in pastels?"—In reply: There is no book devoted to finishing photographs in pastels. Johnson's work on the "Art of Retouching, Finishing, and Colouring," published at 2s., will help you.

AURINE.—S. MORRIS writes: "In your 'British Journal Photographic Almanac' for 1899, page 939, there is an article, 'The Removal of Rust.' One of the ingredients is called 'aurine.' Is there such a substance as this? If not, can you please tell me where I could obtain the stuff ready-mixed?"—In reply: Yes, there is aurine. It is one of the coal-tar colours, and may be had at such houses as Hopkin and Williams, Cross Street, Hatton Garden; Townson and Mercer, Bishopsgate Street, and the like.

STAINED PRINTS.—C. CONWAY.—(1) The "curious stains with the red edges" are caused by the prints being allowed to lie in contact with each other while in the fixing solution, so that it has not had free action. The remedy, in the future, is obvious. There is no way of removing the stains now. (2) The best mountant for carbon enlargements on thick paper is starch paste, thickly made and applied with a soft sponge, the paste being well rubbed into the paper.

FORMULA WANTED.—G. M. H. A. writes: "I shall be obliged if you will be so kind as to give me formula for making photographic medallions, either in bromide or other paper, same as those of the King and Queen of England now on the market and for sale."—In reply: The prints, by any process, are soaked in alcohol and then rolled in contact with a sheet of thin celluloid under a heated cylinder of considerable weight. They are then trimmed and stamped up with the backing plates in a "button press." All the requisite appliances are supplied by the Photo-Jewellery Company, of New York.

GOLD RESIDUES.—C. AND CO. write: "We use only albumen paper, and tone either with the acetate or the lime bath. We have been in the habit of precipitating the gold from the exhausted baths with a solution of protosulphate of iron; but we are not satisfied with the quantity we recover. Can you tell us a better way?"—In reply: We cannot, for the iron will throw down all the gold the solutions contain, whether little or much. If the baths are exhausted there will be little or no gold in them, and therefore but little to recover.

LEASE OF A STUDIO.—J. T. R. writes: "A month or two since, I took another studio from a man, on a lease for twelve months, on a weekly rental, the rent to be paid every four weeks, in advance. The lease was signed by us both, but it was not stamped. (1) Will you please tell me if the lease is binding, or is it no good without being stamped? (2) If it is binding, will the lease expire at the end of the twelve months, or will a notice be required?"—In reply: (1) If the agreement is unstamped it is of no value. It can, however, be stamped at any time, on the payment of, we think, £10, in addition to the stamp. (2) As the agreement is for a year, it expires at the end of that time, so no notice is necessary.

GUM AS A MOUNTANT.—T. CARR writes: "Is there any objection to the use of gum arabic as a mountant for photographs if it is freshly made, or with an antiseptic in it, and which would be the best one to use as such?"—In reply: Gum as a mountant has often been condemned as causing fading, and, we think, without sufficient reason, supposing the gum is good and it is used before any decomposition sets in. We have some prints that were mounted with gum nearly forty years old, and they show no deterioration. Carbolic acid or oil of cloves may be used as an antiseptic. The latter would be the preferable, on account of the smell in the pictures after they are finished.

REMOVING OIL SPOTS FROM ENLARGEMENT.—W. C. says: "An assistant has unfortunately got two or three spots of olive oil on an expensively-finished enlargement. Can you please say if there is any way of getting them out so that they will not show?"—In reply: Take some refined benzol, and put a drop or so on the grease spots, and, after resting for a minute or so, blot off with clean blotting paper. Then apply fresh benzol and again blot off, repeating the operation, and each time with fresh blotting paper, till all the grease is extracted. If the work is carefully done, no trace will be left, or only such as can be easily touched out. If the oil has gone through the mount, it should be treated on the back with the benzol as well as on the front.

PHOTOGRAPHY BY INCANDESCENT GASLIGHT, ETC.—E. W. B. writes: I am trying to adopt some means for photographing at night. Can you tell me if the incandescent gas would be strong enough, and how many burners it would require to get a good negative in from five to ten seconds' exposure, or do you think the hashlight apparatus most reliable? I should much prefer a constant light to a flash, if such can be got by the incandescent gas light."—In reply: Incandescent gas light may be employed. The number of burners depends upon the distance they are from the sitter and the area it is desired to illuminate. Try with a dozen to begin with. Good portraits may also be obtained by flashlight, but the smoke should be conducted out of the building. With the Platinotype Company's lamp there is no smoke.

STUDIO BUILDING.—"SITU" writes: "I should be extremely obliged if you would advise me as to what you consider the best form of studio to construct under the following circumstances:—It is to be built over other rooms, and the space available is 26ft. length, E. to W., and 14ft. width, N. to S. On the N. side the light is good and uninterrupted, except for 5ft. from the floor, along the entire length, where a brick wall must remain. The S. is quite open and uninterrupted. The following has been suggested. . . . Would an outside screen be necessary on S. side, and how can the plan be improved under conditions given?"—In reply: Under the circumstances, the design shown in the sketch cannot well be improved upon. As the 5ft. wall cannot be altered, we should advise you, if it is possible, to have the floor of the studio raised, say, 1ft., and the roof also 1ft. higher; that will be practically reducing the wall to 4ft. The same end, to an extent, will be attained by having a raised platform for the sitters. An outside screen on the S. side, as shown in the sketch, will be a convenience.

THE following advertisement appeared in a recent issue of the "Yorkshire Evening Post":—"To Amateur Photographers.—For three months from date, a highly-finished platinotype photograph and negative may be obtained for a small fee from Hoskins, photographer, 12, Park Lane, Leeds."

*** NOTICE TO THE TRADE, WHOLESALE AGENTS AND BOOKSELLERS.—*A Contents Bill is issued with each number of the* JOURNAL, *and copies may be had on application to the Publishers.*

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*** *The Editor can only be seen by appointment.*

*** *We do not undertake to answer letters by post.*

EX CATHEDRA.

The Reactions in the Making of Combined Toning and Fixing Bath.

A paper on this subject by Messrs. Lumière and Seyewetz appears in the Bulletin of the French Chemical Society. The bath recommended consists of the well-known mixture of hypo, alum, lead acetate, and chloride of gold. These investigators found the result to be a rather intricate mixture, containing, *inter alia*, sulphate of aluminium, acid sulphite of soda, pentathionate of soda, and sulphuretted hydrogen. They consider the action of the lead to be the acceleration of the replacement of the silver by gold. The chief value of the alum, besides its tanning action, being the production of pentathionate of soda, which is shown to give a more active toning bath. It is a question whether we have not here a case of, at any rate, partial toning by sulphur, for they found that a mixture of pentathionate of lead with hypo, and without any gold, produced as fine tones as when gold was present. It has long been known that the addition of a few drops of strong acid to a small quantity of hypo solution conferred upon it the properties of a combined toning and fixing bath. Here again no doubt, the toning property is conferred by the pentathionate produced, but, as in the former bath described, it is sulphur toning, and as such to be deprecated.

A Dangerous Trip by Dr. Miethe.

We gather from the "Photographisches Wochenblatt," that Dr. Miethe had a very exciting and dangerous voyage in a balloon recently. The ascent was made at Tegel about three o'clock in the afternoon, and the balloon landed at half-past six between Nieder-Finow and Liepe. Those who witnessed the ascent saw the balloon first pass through a mist and then suddenly into a thunder-cloud. Dr. Miethe was in the company of Lieutenant Hildebrandt. After attaining an altitude of 500 metres, the balloon was suddenly driven to a height of 2,000 metres, and then, as suddenly, fell half that distance. This was repeated six or eight times. Meanwhile the storm was proceeding, but although the travellers did not see the lightning they were deafened with the thunder and pelted with rain, hail, and sleet. In their rapid leaps and plunges the car was frequently on a level with the balloon and the tow-rope above their heads. The violent rocking of the car also added to the danger. Watches were not thought of, but according to the barograph this frightful experience must have lasted half an hour, when, through loss of gas by pressure, the balloon fell from a height of 2,200 metres upon a dense wood of beeches, but for which the travellers would probably have lost their lives. One of them descended by the rope and obtained help from the villagers at Liepe.

* * *

Burners for Acetylene Gas.

As is well known, one very irritating peculiarity of the use of acetylene gas is the quickness with which the burners clog up. Many cures have been suggested, much having been expected at one time from the admixture of carbonic acid gas with the acetylene, though we now hear little of it. Quite recently M. Fernand Gand contributed a paper on the question to the Paris Academy of Sciences. This clogging of the burners is caused by an incrustation of carbon due to the decomposition of polymerides of the gas. M. Gand points out that as this polymerisation only takes place when the acetylene is raised to a temperature above the boiling point of water it follows that it is the heating of the acetylene by the metallic burner before it leaves the orifice that can be the only cause of the polymerisation, and that if this could be avoided the decomposition and consequent deposition of carbon would be avoided. He states that an ordinary Manchester acetylene burner, if it be supplied with pure acetylene at sufficient pressure to give a full flame, will only exhibit a slight carbonaceous coating after from twelve to thirteen hours' use, and that even a hundred hours' use does not destroy the efficiency of the burner. But let the gas be turned down, with the consequent heating of the gas in the burner owing to the slow rate of issue, permitting longer contact with the metal of

the burner, and the polymerisation takes place, and a rapid deposit of carbon, rendering the burner useless, ensues.

* * *

The Instruction of Photographic Apprentices. At the first dinner of the Professional Photographers' Association the question of the training of competent photographic assistants was discussed and the opinion expressed that at some future date the Association might be able to found its own school. An excellent example of practical work in this direction is afforded by the action of the Copyright Protection Association of German Photographers in connection with the Munich Photographic Association. The Munich Technical School for Photographers was approached and asked to arrange for evening classes for apprentices. A scheme of instruction was drawn up, and on the 12th November last the school was opened. The period of instruction runs concurrently with that of apprenticeship, which is fixed at three years. At the starting of the school the classes have of necessity been amalgamated, but with the growth of the number of pupils the organisation will be completed. As it is compulsory in Germany that apprentices should attend evening classes for the completion of their education, the course of instruction must be viewed by that light, otherwise it will be misapprehended by English readers. Four masters undertake the curriculum, and the school hours are from two to five o'clock on Mondays, one to four o'clock on Wednesdays, and one to five o'clock (for drawing) on Fridays. At present there are 30 pupils ranging from 13 to 16 years of age. Of these 18 are resident in Munich, 10 are from other parts of Bavaria, one from another German State, and one from abroad. Their parents comprise 13 of the industrial, four of the commercial, and seven of the official classes, whilst the parents of two are independent. With quaint exactitude it is recorded that four were born out of wedlock.

* * *

Photographic Training. The instruction given at the evening school we have just described is apportioned in the following manner for each week:—Religious instruction, arithmetic, and book-keeping, business procedure, the duties of citizenship and daily life, each one hour. The physics and chemistry of photography, two hours. Drawing, four hours. Some idea of the scope of these subjects may be gathered from the following particulars. Arithmetic and book-keeping is taught not only for business purposes, but for the regulation of the household and the cultivation of economic habits. It ranges from the purchase of material, the calculation of charges, duties, discounts, foreign exchanges, interest, wages, insurance, to the various details of book-keeping and domestic accounts. Business procedure embraces training in correct speaking and writing, from the family letter to the various kinds of business of official correspondence. It also includes instruction in the relationship of debtor and creditor and the various documents which usually pass for such purposes. The lessons in citizenship and the arts of daily life refer to the preservation of health, the laws of master and servant, the organisation of the community and the State, the history of the graphic arts and photography. Physics and chemistry of photography deal with the materials used, the principles of the various processes, elementary optics, and the use of various kinds of lenses. Drawing is directed chiefly to the delineation of figure in line and by shading, to lighting the model, retouching, etc.

Although we do not offer this as an outline to be copied in a school for English photographers, yet it may be of use in drawing attention to the necessity for a system of thorough instruction suited to the needs of the professional in this country. It must not be forgotten that training in business habits is as necessary as the art side of his calling.

* * *

Absolute Alcohol. The employment of alcohol entirely free from water is indicated in many photographic processes, collodion for example being the more advantageous the less the amount of water the solvents hold. Such alcohol has always been made, mixing the spirit with a dehydrating material—carbonate of potash being a favourite material—and distilling the alcohol from it. The question as to the best substance to employ for the purpose has been investigated by many experimenters, and especially by Mendeléef and Squibb. The former chemist found that the only substance to be used satisfactorily is freshly-burnt lime, and that even with it special precautions have to be taken. The subject has been taken up by Dr. Sydney Young, who recently read a paper on the subject before the Chemical Society, and indicated an exceedingly novel method. He founds his process on the fact that when two liquids of different chemical type are distilled together a definite mixture of minimum boiling point in many cases distils over first, the last portion of the distillate consisting of that component which was originally present in excess. This happens with mixtures of alcohol and benzine and alcohol with water, while benzol and water are practically non-miscible, and distil over at a temperature lower than the boiling point of either liquid separately. He therefore expected a mixture of the above would boil constantly at a still lower temperature, and that the water would come over first, and pure alcohol last. His anticipations were realised. He found it well to collect the distillate in four fractions, the first coming over at a temperature of from about 64 deg. to 67 deg., and being a mixture of the three constituents. The next, 67 deg. to 73 deg., consisting chiefly of alcohol and benzol. The third, at 73 deg. to 78 deg., small in amount, and containing more alcohol. There is then left the fourth fraction, which may be simply run off from the still without being distilled, and consisting of alcohol with only a trace of benzol. This was mixed with n-Rexane, and re-distilled, the result being an alcohol quite free from water, and having a specific gravity of 0.80627.

* * *

Goethe and Colour Photography. A very interesting passage in Goethe's Farbenlehre is quoted in "Photographische Kunst," and by a very far-fetched chain of inferences the writer seeks to establish some connection between Goethe's writings and the development of colour photography. We think the attempt an unsuccessful one, but as the passage from Goethe is one of interest to photographers, we draw the attention of our readers to it. Goethe wrote:—"The action of coloured light upon acidification and neutralisation may easily be seen by coating a strip of paper with moist, pure white horn silver, and exposing it to light until it turns somewhat grey. Cut the strip into three pieces. Preserve one piece in a book for comparison, and expose the second under yellowish-red glass, and the third under bluish-red glass. The latter will darken and exhibit a loss of acidity, whilst the former, exposed under the yellowish-red glass, will become paler, and therefore approximate to its primary condition of more perfect acidity. This can be verified by comparison with the piece kept as sample. An ingenious arrangement has been made for experiments with the spectrum in this direction. The results correspond with what we have stated, and we will at some future time give particulars from the work of an accurate observer, who

has carefully experimented with the process." According to "Photographische Kunst," the "accurate observer" was Seebeck, who gave much attention to the chemical action of light of various colours. Seebeck's experiments did not lead to any results other than those described by Goethe. Nevertheless, Seebeck is a figure of importance in the history of the development of photography in natural colours, through the theoretical researches of O. Wiener and Zenker, who followed him. These led to the discovery of colour photography by the process of interference, known as the Lippmann process, and the bleaching process, recently published by Neuhauss.

* * *

German Collotype Printers. The formation of associations has a great fascination for Germans, and it would not be a great exaggeration to affirm that if two Germans met in the street and found they had certain objects in common, they would immediately found a society, appoint a president and officers and formulate a programme. The first Congress of German Collotype Printers was recently held in Berlin. It was composed of fifteen delegates, from nine districts, representing 37 towns, to which the committee had sent invitations. Collotype in Germany was said to be in a flourishing condition, giving employment to 700 hands. Wages range from 25 to 45 shillings per week, and the hours from eight to nine and a-half per day. Wages are paid for holidays, and overtime is remunerated with 25 per cent. advance upon the usual rates. The regulation of the number of apprentices and the influence of "technical institutes" received considerable attention. The system adopted by certain firms of engaging more apprentices than workmen to reduce the cost of labour was severely criticised. The "technical institutes," which take pupils and promise to teach them the whole art of collotype for £5, or more, in a month, without, however, giving any insight into practical work, were denounced as doing serious injury to the trade. Resolutions were adopted:—

1. To collect statistics as to apprentices, and to publish them.

2. To limit the number of apprentices to one for every five workmen in large establishments, and to one in small establishments employing less than five hands.

3. Every apprentice to be taught two branches of work.

4. Workmen from other trades to be paid the minimum wage of the locality.

5. The "technical institutes" and their offshoots to be opposed by all means, and their pupils only to be paid the minimum rate of wages in the locality.

Other resolutions concerning the rates of wages, the hours of labour, holidays, terms of notice, apprenticeship, etc., were also adopted.

* * *

Street Snap-shotting. Although, to everybody's sorrow, there was no Coronation last week, we may feel certain that thousands of plates were exposed upon the decorations and the many scenes of varied interest in the London streets. Everyone who owned a camera, from the modest "Brownie" upwards, had taken good care to charge his magazine, or dark slides, and to have plenty of ammunition in reserve. And when a camera is thus charged it has to be used, for however well the plates will keep in their original packages, they arouse distrust when they have for some time been removed from that safe enclosure. The weather during the week was all that could be desired for quick photography, for the sun was hardly once obscured by a cloud. Many cameras were in evidence, and they were of all sorts and sizes. We saw one huge cinematograph which was being worked from a covered cart, and several ordinary cameras of very large size. It was amusing to see one of these reared up in front of the Canadian arch in Whitehall, the police having been good enough to stop the traffic for a few moments while the lens was uncovered. In less than no time the arch was filled with a crowd of pedestrians, who were anxious to be included in the picture. But what was more interesting to us was the crowd of camera-bearers who sprang from nowhere, and took advantage of the temporary lull in the traffic to photograph the arch. And, truth to tell, this Canadian trophy was one of the few things worth photographing as a memento of the decoration of the London streets. It would perhaps be worth while to preserve some pictures of other forms of metropolitan decoration, as examples of what to avoid on future occasions of popular rejoicing. The way in which the beautiful old Abbey itself was disfigured and hemmed in by tiers of seats was simply deplorable, and was in itself a proof that our municipal authorities have much to learn with regard to the first principles of decorative art. We most regretfully endorse what Mr. Austin, of the "Illustrated London News," writes in "Our Note-Book" upon this subject: "The great solemnity of the Coronation is forgotten in its trivial and superficial aspects, in the hammering and knocking, and in the fearsome notions of decoration that possess the heads of many highly respectable ratepayers."

* * *

The Coronation Disappointment. It would be impossible to give a fair estimate of the money loss to the community by the stoppage of the Coronation ceremony and its attendant processions and festivities. It is stated that the railway companies alone will suffer to the extent of nearly a million sterling, but they can afford to lose better than can humbler folk. Photographers suffer with the rest, for we may feel sure that a number of the guests invited to the Abbey would have wished to be pictured in their finery, so that the photographs might be handed down as memorials of the great historic event in which they had figured as spectators. Possibly the photographers who have been hit the hardest by the suspension of the pageant are the cinematograph people, some of whom had made the most elaborate preparations to produce "living pictures" of every detail of the processions. One firm, we understand, had secured fifteen different positions on the route. Another had made special arrangements for quick production by importing a staff of skilled operators from Paris. Another had stolen a march upon his competitors by building up an imitation Westminster Abbey in France, and peopling it with actors and actresses from the gay capital to represent the King and Queen and the flower of the English aristocracy. All these players were carefully drilled to go through the Coronation ceremony, with a "property" regalia, and the result was said to be so successful that it was intended to show the picture at many of the metropolitan music-halls on the evening of the great day. Doubtless many good folk would have believed that the film represented the actual ceremony which had taken place a few hours earlier in the grand old Abbey at Westminster, for the man in the street does not trouble himself about photographic impossibilities. But the majority of Britishers would be apt to look askance at such a travesty, and, we fancy, would feel inclined to rebel against it. Another thing promised us by a still bolder advertiser,

who had evidently forgotten an old maxim with regard to the premature enumeration of unhatched chickens, was a film of the Coronation processions in natural colours. The same thing was promised, we remember on the occasion of the Jubilee procession, five years back, but the achievement never came off. Students of photography know well enough that whatever the future may bring forth, the production of a picture in colours, taken in the small fraction of a second necessary in cinematographic work is, at present, an impossibility. But the modern advertiser relies upon romance rather than upon reality. He knows that if he can only produce from his fertile brain the anticipation of some outrageous unfeasibility, the very boldness of the conception will attract the newspaper paragraphists, always on the look out for something startling, and he will get wide advertisement in the metropolitan and provincial Press without paying one farthing for it. For those who work their business on a more legitimate basis we feel a far greater sympathy in their terrible disappointment of last week. In common with the rest of us, they must comfort themselves with the hope that the Coronation is only postponed for a few weeks or months.

* * *

Another Red Cure.

A few weeks ago we commented in these columns upon Dr. Finsen's red-room cure for small-pox, and adverted to the very encouraging results which he had obtained by adopting that treatment. We are now told, on the authority of one of the evening papers, that what we may call "the red cure" is also successful in combating another malady, which, if not so serious in its nature as small-pox, is certainly quite as distressing to the unfortunate patient while it lasts. We refer to that *bête noire*, known as *mal de mer* by polite people, and as sea-sickness by the vulgar. The cure is said to be of German origin, and is brought about by wearing bright red spectacles and imbibing at the same time doses of calomel. In the absence of spectacles, a red room, or a dark room lighted by a red lamp, or one of those portable tents with a red window, used by some photographers for changing their plates, will, of course, do as well. "Have you such a thing as a dungeon on board?" asks the brave admiral of the Captain of H.M.S. Pinafore. The more likely question now to be asked is, Have you a red room on the ship, for the accommodation of those who would "seek the seclusion which the cabin grants?" Even that question will not be needed if the steamer authorities take time by the forelock, and provide all the portholes with panes of ruby glass. But before they go to this expense it will be well to inquire if this alleged cure has any foundation in fact, or whether it is a mere newspaper canard. It is quite possible that the calomel prescribed may have the effect of warding off sickness, without the intervention of any red glass at all, but wise persons would perhaps prefer a little temporary derangement of their digestive apparatus to dosing themselves with mercury. However that may be, we have a decided suspicion that this red cure for sea-sickness is hardly to be relied upon, and our chief reason for this attitude is the explanation given of the way in which the light acts. "It is deduced," says the paragraph we refer to, "from Epstein's investigations on the influence of colour on the blood vessels of the brain. Sea-sickness is due to lack of blood in the brain, *while red sends blood to the brain with a rush.*" The italics are ours, for we wish to emphasize a statement which everyone with a practical acquaintance with photography will at once see cannot be correct. Many of our readers spend several hours each day in ruby light, and if such light had the effect of sending their blood to the brain with a rush, we fear that before now they must have succumbed to apoplexy. The hundreds of workers in dry-plate factories whose time under red light is still more extended, would long ago have found their occupation impossible were this blood-rush theory tenable.

ANOTHER NOTE ON THE INSTABILITY OF SILVER PRINTS

The poet Keats' lines:—

> "A thing of beauty is a joy for ever;
> Its loveliness increases; it will never
> Pass into nothingness; but will keep."—

certainly do not apply, at least in their entirety, to the majority of silver prints as now produced. Things of beauty they may be, but as to whether they will prove to be joys for ever is more than doubtful, as witness the large numbers of faded, and fading, pictures produced only during the last decade—indeed, we might well say within the last four or five years. We have on many previous occasions—and only quite recently—dealt with the subject, and we shall here deal with it from a somewhat different point of view. There are, without question, many photographers, both professional and amateur, who pay but little, or no, attention to the stability of their work, notwithstanding that increased chemical knowledge on the subject should certainly conduce to greater stability in photographs, *i.e.*, silver prints. It would not be a rash speculation to say that 95 per cent. of the silver prints now being made by amateurs will be in a sorry plight four or five years hence. In the term amateurs, it must not be understood that we include those who possess a knowledge of the theory of the subject, and fulfil the conditions conducive to stability, but to those who are entirely ignorant of them, and work only to the "directions for use" issued with the different brands of paper they employ; and it may be added that in many instances these are not followed in their entirety.

It is mainly because we have noticed that there is an increasing tendency of late years in the instructions sent out with some of the papers now on the market to not sufficiently emphasise, to novices, the necessary conditions that are essential to securing the greatest permanence their papers are capable of yielding, that we once more recur to the subject. It is now many years since we first called attention to the fact that the perfect and complete fixation of silver prints was really of greater importance than the washing of them afterwards, although that is still a matter not to be neglected. It was then, and has several times since been, pointed out that unless the whole of the hypo salts of silver were converted into the soluble condition no reasonable amount of washing, however carefully done, would eliminate them. Also, that it is the presence of a trace of their sparingly soluble salts in the prints that works the mischief; for it was long since demonstrated that a mere trace of hyposulphite of soda, *pure and simple*, does no practical harm, even after the lapse of many years.

During the past few years there has been, in the instructions for use of many of the papers on the market, a growing tendency to reduce the strength of the fixing bath, and, at the same time, to curtail the time of the immersion in it. In the days when albumen paper was the only one employed for general work the strength of the fixing bath used to be from four to five ounces of

hypo to the pint of water, and the time of immersion from fifteen to twenty minutes. Under these conditions, when they were fulfilled, there was no question that the complex hypo-silver compounds were brought into the most soluble possible form. Now, in some of the makers' instructions, the proportion of hypo-sulphite of soda is given as two ounces to the pint of water, and the time of immersion as ten minutes—some even less. We are, of course, quite aware that the present gelatino-chloride papers do not contain quite so much chloride of silver as did the older albumen papers, but there is a wide difference between four ounces of hypo to the pint of water and two ounces to the pint of water. Also, there is a great difference in practice between fifteen minutes or more in the stronger and ten minutes in the weaker solution, and it is a question as to whether the somewhat complex salts are brought into the same soluble condition in the latter case as they are in the former; they certainly are not unless a good quantity of the solution is used and the prints are kept separated and continually in motion while they are in it.

Not only is the strength of the fixing bath so much reduced, and the time allowed in it shortened, but the time of washing is also greatly curtailed. In some of the instructions now before us, we are told to wash in running water for half an hour; in most, however, an hour is the time stated. Now, there is no doubt about it that the shorter the time of washing that a picture receives, *provided that all the salts are got rid of*, the better it is for its quality, and, indeed, for its stability. The Messrs. Lumière have conclusively proved that the hypo may be more completely eliminated with a very small quantity of water, rightly applied, and in a very short time, than it can be with many hours' soaking in running water, even with the best appliances. But what the Messrs. Lumière have pointed out is only applicable when the method they described is followed in its entirety.

Washing in running water means, with many, merely putting the prints into a flat dish and letting the tap run, or dribble, on them for the prescribed time, when they are considered to be properly washed, as per instructions, while, as a matter of fact, the bottom ones may be but little, if any, better for the treatment. Here is an instance. Calling on an amateur friend the other day, we noticed a couple of dozen, or more, prints washing in the way just alluded to. The greater portion of them were lying flat on the bottom of the vessel, in contact, and a few floating about. On our making a remark, our friend told us that he was following the makers of the paper's instructions of washing in running water for an hour, but he had done more than that, as he had given them a couple of changes of water before he had set the tap running. Our friend will possibly some day wonder why his prints, in a few years, have undergone a marked change.

Many amateurs and—we regret to say it—professionals, depend upon their printers—too often inexperienced girls and lads—who rely almost entirely on the meagre instructions issued with the different papers they use without possession of the knowledge that the makers who issue them assume they possess. We say meagre, for it is not to be supposed that the makers can be expected to issue with each packet of papers a treatise on photography and its theory. Even if they did, it is somewhat doubtful if it would prove of much value to those whose main object appears to be merely to produce a thing of beauty for the time being.

JOTTINGS.

The shower of Coronation honours passed clean over the photographic world. The olders readers of the JOURNAL may, however, be interested in knowing that some of Sir Conan Doyle's earlier writings appeared in these pages. I have a vivid recollection of a well-turned article of his, emitled, "Easter Monday with a Camera," which appeared in 1884. It was apropos of a visit to Portsmouth, and was not the only contribution from the doctor's pen that appeared in the "B.J." about the time when that fine historical novel, "The White Company," was laying the foundation of his subsequent success. It would be out of place here to criticise some of these Coronation honours, of course, but in all seriousness I cannot help thinking that the specific bestowal of a knighthood upon some person prominently associated with photography would appear just as rational as its assignment in other directions. Photography makes His Majesty the King known to millions of his subjects all the world over, who have never had an opportunity of seeing him in person, and its contributions to human progress and enlightenment are vast and lasting. The official head of photography in this country, for the time being, is the President of the Royal Photographic Society, and if it should ever come to pass that the holder of that position received a knighthood, the compliment to photography would assuredly have a salutary effect upon the public mind, which refuses to concede even the shadow of dignity to an important branch of the national industry. Perhaps next year, when the R.P.S. celebrates its jubilee, a knighthood may reach the occupant of the Presidential chair. *Chi sa?* I knew a photographer who more than once confided to me something stronger than a hope that he would be knighted. Indeed, on the publication of an honours list a few years ago he made no attempt to conceal his disappointment that his name was not included. I have my eye on another "knight of the camera" who is plainly marked out to be the possessor of the coveted prefix, sooner or later.

To Mr. Howard Farmer is due the happy reminder that Cambridge was the scene of the labours of Professor James Clerk Maxwell, with whom the theory of three colour photography virtually originated; and it is in accordance with the fitness of things that this fact should be recognised in the paper on the subject which Mr. Farmer proposes to read to the members of the Convention next week. Three colour printing is making great strides towards perfection—there lies before me as I write a reproduction of one of Mr. Frank Brangwin's water-colour drawings, which is remarkably fine, whilst some of the specimens that I possess exhibit such fidelity to the originals that at a distance they are indistinguishable from genuine water-colours—so that special *éclat* will attach itself to the Convention in that this year it holds its meeting at what may be considered the birthplace of trichromatics. A little more than an hour's run from London, the Coronation Convention should attract many Metropolitan photographers. The full programme has already been published in these pages. Surely nothing could be more delightful than a photographic gathering in a venerable university town, bathed in the glamour of ages of learning, with visits to Ely, Bury, and other places rich in archæological, architectural, and historical interest. One thing that always distinguishes a Convention meeting is the spirit of good fellowish and camaraderie that unfailingly prevails there. Setting aside the pleasures of the gathering, photographers have the opportunity of learning from one another by the informal exchange of information; friendships are made and cemented; and for at least one week in the fifty-two that community of interest exists without which general intellectual and material

advance is impossible. As one who owes a great deal to the Convention, I cordially wish the seventeenth meeting every success, and strongly advise all readers of these lines who can spare the time for a pleasant and profitable outing with the camera to join their brethren at Cambridge next week.

For some months I have kept by me two specimen prints, the work of the well-known photographer, Mr. J. W. Beaufort, of the Grand Studio, Colmore Row, Birmingham. They are mounted side by side for comparison. One is a matt bromide (or platinum) print from a studio portrait negative, the subject being the head and shoulders of a lady. The other is a warm, sepia-like print from the same negative, but instead of the background being plain as in the first instance, it has a canvas-like effect, indicating considerable hand-work. The face and neck have been retouched in the ordinary way, and the light drapery on the shoulders has been softened off. The total effect is that of a studio negative having a cloudy background applied to it by means of a brush. Mr. Beaufort calls this combination work "autogravette." It is effective and skilfully done, and such work may be popular amongst sitters; but in a perfectly friendly way, I put it to Mr. Beaufort that palpable mixtures of photography with something else that is not photography at all stand little chance of securing the permanent approval of educated people. The dignified portraiture of Craig Annan, William Gill, H. Walter Barnett, William Crooke, and other leaders, relies for success upon direct and simple photographic treatment, unallied with hand-work; and it is in that direction I would venture to suggest to Mr. Beaufort that he should turn. It is doubtful, indeed, if the amazingly clever combination "Lytrit" portraits of Mr. Strauss would command success in first-rate British studios, seeing how rapidly the better class of illustrated papers are to-day educating men and women, particularly the latter, into accepting work that bears the minimum amount of retouching on the negative.

For one day only I was recently invested with the ironic titles of "official photographer" and "photographer royal." The occasion was a launch party from Windsor to Clieveden, and to me was assigned the delightful task of taking post-luncheon groups with a 15 by 12 camera I had never seen before; fitted with a lens of which I knew nothing, and with dark slides carrying plates whose rapidity and brand were totally unknown to anybody in the large company. Nevertheless, some printable negatives resulted. As a student of "low life deeps," to quote from James Greenwood, that diligent recorder of the humblest phases of the struggle for existence, I was interested at the efforts of a peripatetic photographer to make a few shillings out of the numerous launch parties that patronise old Father Thames on a fine Saturday. This gentleman, provided with a whole plate camera, had stationed himself at one of the locks, and as the launches were closed in he rushed frantically up and down the banks, volubly offering to take photographs of the various parties, and submit the results on approval! All he wanted were names and addresses; he did not even ask for money down. I should imagine he was new to the business, as he booked absolutely no orders, and was heartlessly jeered at for his *gaucherie*. Perhaps one of the most lucrative branches of itinerantism is the house to house system. In a country village a week or two back I quietly watched two young fellows at work for about half-an-hour. The "tout" was jaunty, *debonnair*, and well dressed; the photographer presentable and a master of his trade. A dozen photographs of shop fronts with tradesmen or their wives standing in the doorways were taken in the time I have named; and later in the day I came across the men still at work. The pair went about the business with remarkable coolness and celerity, and must have pocketed pounds that day. This sort of thing goes on all over the country, and there must be hundreds, if not thousands, of such men earning comfortable livings in this manner, of whom the "photographic world," as it is termed, never hears.

Apropos of the sixth annual Convention of the Photographers' Association of New England, the full prospectus of which was printed in last week's JOURNAL, Mr. Hearn, the President, sends me the following note:—"I have sent you under separate cover a number of copies of my English circular of the European edition. In doing this, I have felt that you possibly would find it convenient to have them for the purpose of ready assistance in soliciting pictures for our Convention, in anticipation of which kindness on your part I have forestalled your willingness to assist us. I have written to Messrs. Craig Annan and Harold Baker personal letters, and these are all at the present time that I have written to in England, for work. If you will kindly mail the circulars I send, you would do so with better judgment than I possibly could display. The time is progressing, and I am very anxious to have some personal work, even if but a trifle, done by someone whose standing would be such as to make it probable that the results would be successful. I do not want to impress you with the fact that I want a big lot of pictures, for such would take too much time; for me to ask anyone to do for strangers, or even a brother association. A few pictures from several wood workmen would be all that I would ask for. Trusting that you will excuse my persistent application to you, and with expressions of my personal high esteem, believe me, etc." The circulars to which Mr. Hearn refers have been distributed to the best of my judgment, and I trust that those gentlemen to whom I sent them may find it convenient to loan him some of their work. What he wants in particular are good examples of British professional portraiture. The exhibition does not open till August 20th, so that there is plenty of time for the preparation and transit of the photographs.

Will Mr. C. H. Crosby, of New York, please accept my thanks for a set of three photographs illustrative of a clam-bake? I am already indebted to him for the formula, and I am not without hopes that I may one day taste the mixture itself on its native heath. I hope I shall be more successful with American clam-bake than I have been with Scotch haggis, between which and myself repeated effort has failed to establish a lasting attachment. One's tastes are sometimes refractory pupils. At a dinner party the other night I met a charming lady, whose only aversions were tomatoes and tripe; why the latter she did not know, as she had never tasted it. To Mr. Crosby—who, I perceive by the last number of "Camera Notes," has been elected to the Presidency of the New York Camera Club—I also tender my congratulations. Contrary to what was thought, the beautiful publication named is to be continued, under an editorial successor to Mr. Stieglitz. It is to be hoped that the fine illustrations of American photography will not be stopped; but nobody will be one penny the worse if some of the high falutin' letterpress is rigorously blue-pencilled. The childish screams for "recognition," in which some American amateurs never tire of indulging, keeps back the very thing they desire by exciting ridicule and alienating the respect and appreciation which their silent work would assuredly bring in the long run. Mr. Stieglitz, Mr. Keiley, and their sympathisers appear to have seceded from their less excitable *confrères* of pictorial

photography in New York. The cause of quarrel is not plain, but the thing bears the aspect of a petty squabble of a personal nature. I hope I am wrong. To an outsider the rows of photographers must appear ludicrous: the questions at issue are, as a rule, so trivial that it must pass the comprehension of a plain person why bad blood should be made over them. Yet in all the world's history it appears to have been true that "great events from little causes spring."

The hand camera finds one of its most fascinating, and not the least difficult, of its uses on a golf course, as a recorder of the peculiar or characteristic attitudes of the different players. But it requires very great rapidity indeed of film, lens, and shutter, to sharply snap the club in its swing, for that implement travels through the air with no inconsiderable speed. My thanks are due to the three friends who have been so good as to send me photographic mementoes of a famous foursome in which I lately bore a humble part. One of them has the inscription "The shot that won the medal," and is interesting, as showing the position of the player at the end of a capital drive. I have the melancholy pleasure of comtemplating myself in difficulties, due to the undesirable presence of unnecessary sand; other incidents were a reception by a crowd of caddies which Messrs. Herd, Vardon, Braid, and Taylor might have envied; and a particularly graceful presentation ceremony. The whole series forms a charming and instructive collection, illustrating the characteristic incidents of a fascinating game. Most golf photographs that I have seen show tame persons at the tees or on the putting greens; those of which I am writing trace the actual progress of a game right through, and are valuable as records, aside of their sentimental interest. Photographs of cricket, football, and other outdoor sports are seldom satisfactory, as they invariably include a wide field of uninteresting view, and the actual contestants are shown exceedingly small, owing to the great distance between subject and camera. In golf, however, you may be within a few feet of your man at the moment of striking, and catch his every attitude and gesture most realistically, inasmuch as his body is not moving at a particularly rapid rate, and thus offers an easy subject for instantaneous work. The camera forms an excellent adjunct to a golfer's outfit. To be complete, it should also include a phonograph, which occasionally would secure some most emphatic and illuminating records of sound waves. COSMOS.

AT the recent soirée of the Royal Society the beautiful model of the Antarctic exploring ship, the Discovery, exhibited jointly by the Royal Society and the Royal Geographical Society, naturally attracted considerable attention. The specimens of volcanic dust from the West Indies, exhibited by Mr. Henry Crookes, and especially the micro-photographs and the microscopic slides of the same, excited some interest. The exhibits by Dr. F. W. Gamble and Mr. Frederick Keeble, illustrating the colour changes of crustacea, especially in response to light, and under the influence of background, were of much interest. Another specially noteworthy exhibit was Dr. Travers's elaborate apparatus for liquefying hydrogen. Mr. E. J. Bles's living tadpoles of the Cape Clawed Frog well repaid study, as their remarkable transparency showed much of their internal economy. Mr. W. Gowland's Japanese pictures of Buddhist divinities and saints by old masters were curious examples of the art of Japan, and Mr. Edward Whymper's beautiful photographs from the Rocky Mountains of Canada, where he spent the greater part of last year, were remarkably striking. He had also some rather pretty specimens of jewellery, made from Rocky Mountains sodalite, which is allied to the lapis-lazuli. Professor Garwood's examples of telephotography in the Alps and Himalayas showed some excellent results of this very useful process. Nothing could be more striking and ingenious than Professor Ramsay's attempt to reproduce the Aurora Borealis by taking advantage of the krypton element in the atmosphere. For most of those present naturally the great attraction of the evening was the electric-lantern exhibition in the meeting-room. Professor Flinders Petrie showed some striking slides illustrative of the early civilisation of Egypt. Mr. J. Y. Buchanan exhibited a series of slides illustrating the performance of M. Santos Dumont's dirigible balloon and the accident to it in February last. Professor E. B. Poulton illustrated by means of very successful three-colour slides some of his recent work upon protective resemblance and mimicry in insects.—"The Times."

THE HOW AND THE WHY OF THE PORRO PRISM FIELD-GLASS.

[Presented at the New York meeting (December, 1901) of the American Society of Mechanical Engineers, and forming part of Vol. XXIII. of the Transactions.]

SIX years ago the writer brought home from Germany a strange new kind of field-glass, called the Zeiss prism binocular, one of the first made, and among the earliest imported into this country. It looked like an eccentric and somewhat unlovely opera-glass, and persons casually handling it gasped to hear that it cost forty dollars. In the meantime, however, the public has grown used to seeing prism binoculars, and har dened, in a way, to their price, realising that they are instruments of precision, to which all other kinds of field-glasses bear about the same relation as that of a cheap watch to

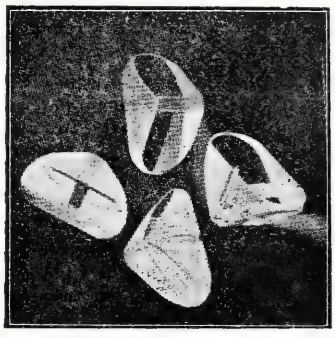


FIG. 1—PORRO PRISMS.

a fine chronometer. Each has its place in the world; the costlier is to be accounted a luxury. But what the public has not yet come to wholly understand is the reason why the prism binocular gives its marvellous results. Since these insure its permanency and development beyond all peradventure, a simple analysis of the principles involved becomes an essential part of the average man's education, and is surely not to be overlooked by the engineers forming this Society, some of whom, doubtless, own and use the instrument without fully understanding the how and the why of it.

The combination of prisms called by his name was invented about fifty years ago by the French engineer and optician, Porro, to whom a patent was granted by Napoleon III. The principle of Porro's invention is illustrated by Fig. 2, where two prisms, each having one 90 degree angle and two 45 degree angles, are shown in their relative positions. A pencil of light or the image of an object passing through them is inverted.

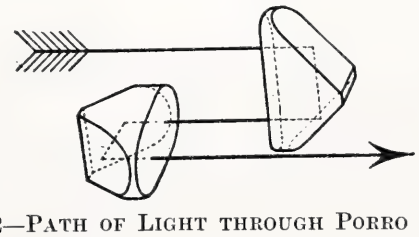


FIG. 2—PATH OF LIGHT THROUGH PORRO PRISMS.

To follow the development of terrestrial telescopes and clearly make comparisons, we must illustrate by diagrams the principles governing the three common types of refracting telescopes together with the Porro prism telescope.

Fig. 3 shows a sectional view of the instrument known as the Galilean telescope, which is the same thing as our common field or opera glass.

In this telescope the rays of light collected by the object-glass are allowed to pass through a system of double concave lenses *before* reaching the focus, with the result that the converging pencils of light gathered from the various parts

of the field are made divergent as they emerge from the concave eye-lens ready to enter the eye. As this d

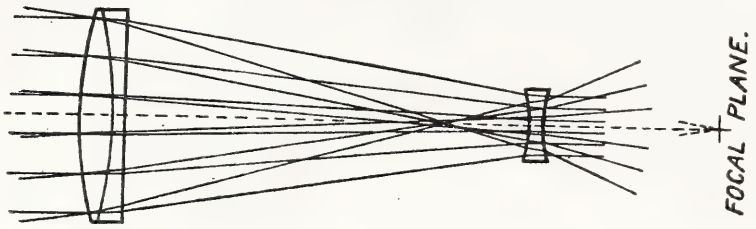


FIG. 3—GALILEAN TELESCOPE (OPERA-GLASS).

cone of pencils of light is necessarily many times larger than the pupil of the eye, but a small part of the field gathered by the objective can be utilised; hence the very small field of view in all telescopes of this type. This limitation necessitates very low magnifying powers, the highest we find being but six diameters, while the usual power for Galilean field-glasses is but four or five diameters, and for opera-glasses but two or three diameters, which latter is generally considered sufficient for ordinary theatre use.

Fig. 4 illustrates the arrangement of lenses and the path of light-rays in the type of terrestrial telescope commonly known as the "spy-glass."

The rays of light gathered by the object-glass reach their focus at the "focal plane," and back of this is the system of lenses forming the erecting eye-piece, from the eye-lens

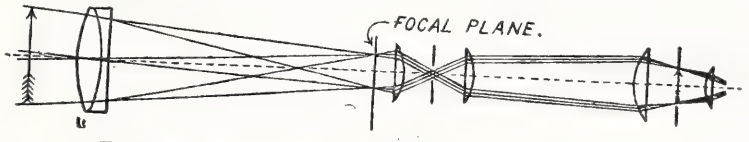


FIG. 4—TERRESTRIAL TELESCOPE (SPY GLASS).

of which the pencil of light passes to the eye. In this type, also, the field of view is necessarily so reduced as to make the use of the instrument very unsatisfactory. It must be quite long, too, and therefore very hard to hold steadily.

Our next illustration is the astronomical telescope shown in Fig. 5.

This is the most simple and most perfect of all. As in the other types, the object-glass gathers the light and sends it down towards the focus at the "focal plane," where it is taken by the simple astronomical eye-piece. Thence it emerges in a pencil of light smaller than the pupil of the eye, which, by using the same magnifying power as in the other types mentioned, is enabled to observe a field of view three times the diameter (nine times the area) shown in either of the instruments illustrated in Figs. 3 and 4. But in this instance the object is seen inverted. All astronomical telescopes show the object thus; which is all right for the stars, but will never do for terrestrial observation.

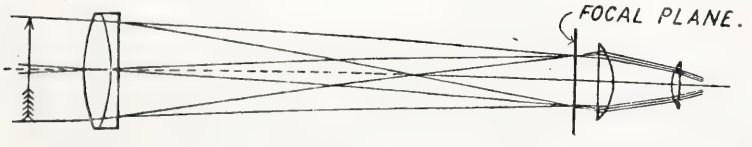


FIG. 5—ASTRONOMICAL TELESCOPE.

Now, if we could erect the image of the object shown in the astronomical telescope, we should have the finest terrestrial telescope possible. This is just what is done by introducing the Porro prisms. The object is now shown with all the clearness, definition, and large field of the astronomical telescope, and in an erect position; and so the pretty problem is solved.

But there are several questions to be asked by the thoughtful man who handles one of these field-glasses. We may as well anticipate them and answer them in turn.

First: Just how do the prisms do their part?

The prisms serve a two-fold purpose, the first and most important being, as has been said, the erection of the object observed, and the second, the shortening of the telescope by twice turning the ray of light upon itself, so that the total length adjusted for use, whether for 6, 8, or 10 power, is but four inches, and the total weight, in binocular form, but thirteen ounces; so small and light, indeed, that it can easily be carried in the pocket.

Each triple barrel of the prism field-glass contains two double reflecting prisms, as shown in the diagram, Fig. 6.

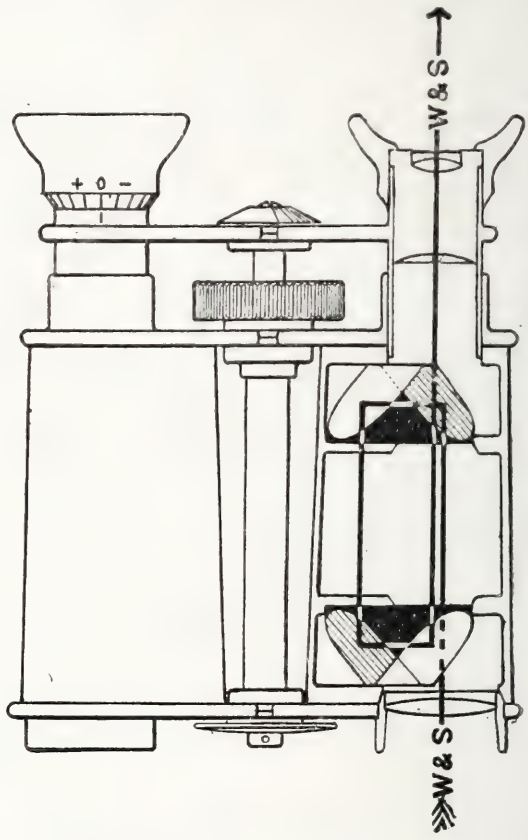


FIG. 6—WARNER & SWASEY UNIVERSAL PRISM FIELD-GLASS (SECTIONAL VIEW).

The rays of light passing through the object-glass enter the first prism in such a way as to be twice totally reflected, each time at an angle of 90 degrees, thus emerging parallel to the entering ray, but in the opposite direction. It is then caught by the second prism, and is similarly reflected and sent on its course toward the eye-piece, in its original direction without change, except in one very important particular, viz., the image of the object observed, which without the intervention of the prisms would be upside down, is now erect, and is ready to be magnified by the simple astronomical eye-piece, just as the stars and planets are magnified in the largest telescopes.

Second: How can the field be so surprisingly large here, or why is the field shown by the old-time glasses so small? Let us try and get a correct comparison of the two types of telescope.

When observing with the Galilean telescope (opera-glass type), the axes of the pencils of light flowing from the several parts of the field gathered by the objective are divergent as they

emerge from the concave eye-lens; and as they cover an area many times the size of the pupil of the eye, most of the light is lost; the field utilised is very small, and can be moved over an extended area by moving the eye about the eye-lens of the instrument, as when looking through a paper cone from the *larger* end.

The Porro prism field-glass is constructed on exactly the opposite principle. The axes of the pencils of light coming from the several parts of the field are concentrated by the convex lenses of the eye-piece, and emerge from the eye-lens in a pencil of light small enough to all enter the pupil of the eye, in the same natural manner as we observe with the unaided eye in looking through a paper cone from the *smaller* end, without strain or weariness to the eye, thus giving a large and uninterrupted field of view, three times the diameter (nine times the area) possible in the old style instrument of the same power.

In the development of the prism binocular it has been found that the magnifying powers which may be most advantageously used range from 6 to 10 diameters. It is true that no one power is best for all purposes. A good average, however, is reached in the 6 and the 8 powers, which are those in most popular use. The uninitiated often make the mistake of thinking that the highest powers are most desirable, which is far from the fact. Any increase in power must be met by a decrease in field of view, by a diminution of light, and also by an increase in the effect of unsteadiness of the instrument while observing. The Porro prism glasses are so short that they can be better held than any other kind of terrestrial telescope, and therefore there is no practical difficulty in holding an 8-power with sufficient steadiness to make terrestrial observation successful. Any higher power than this is apt to cause annoyance from the reasons mentioned, while the 6-power (which is as high as any of the old-style Galilean field-glasses) is eminently satisfactory for natural history and general landscape observations, and the fact that its field is three times as large as is possible in the Galilean telescope of the same power is enormously in its favour.

A few minutes' practice will enable one to quickly determine the power of any opera or field glass.

Place the left eye-piece to the right eye, closing the left eye meanwhile, and carefully focus on a near object, preferably a window across the street. With this object clearly in view, open the left eye, when two images of the window will be evident—one magnified by the instrument and the other as seen by the unaided left eye. An instant's comparison will show how many times longer and wider is the image shown by the telescope than the one viewed by the unaided eye. This ratio represents the power of the field-glass in diameters.

The magnifying power of the two field-glasses can readily be compared by observing an object with both at the same time, using one eye for each of the glasses tested.

The many special advantages possessed by the Porro prism field-glass early attracted the attention of Government officials throughout the world, and after searching investigation and severe tests these instruments have been very generally adopted for Government use. During the last year Germany ordered over six thousand of them, while England has sent as many or more to South Africa; and in the various departments of our own Government they have become very popular and are rapidly taking the place of all other field-glasses. The fact that they give greater power and field, with better definition, and at the same time are but a fraction of the size of the old Galilean type, is a sufficient explanation of their popularity for Army and Navy use.

In view of the great advantages possessed by these instruments over all other terrestrial telescopes, why, you will ask, did the invention wait a half-century before practical use was made of it? There are at least two adequate reasons:

First: The best optical glass manufactured at that time absorbed so much light as to render impracticable the successful use of Porro prisms made of it.

Second: Opticians have only within recent years known how to make absolutely flat surfaces, without which the object seen through the Porro prism telescope is distorted.

Both difficulties have been brilliantly conquered. The borosilicate glass made by Mantois of Paris and Schott of Jena, and which is exclusively used for these prisms, is so nearly perfect that but 4 per cent. of light passing through it is lost by absorption. Moreover, optically flat surfaces are now made correct within a limit of less than one-tenth of a wave-length of light (meaning in linear measure, less than 1-500,000 of an inch), and it is a proper source of pride to us all that our honoured fellow-member of this Society, Mr. John A. Brashear, is the founder and head of the works which lead the world in this class of production. The spectroscope prisms made in his laboratory are in use in the leading observatories of the world, and have never been equalled, while the Porro prisms, which he manufactures by the thousand, are the most perfect ever made.

The credit for first applying the principle practically in bringing out a successful Porro prism field-glass belongs to Dr. Abbe, of Jena, the able leader and manager of the famous Zeiss works, which have done so much in perfecting optical instruments. This was in 1895.

WORCESTER REED WARNER.

AN OLD STORY WITH A REINFORCED MORAL.

IT is well over a quarter-of-a-century since I first wrote about residues in these pages. I am about to thresh the subject out once more, being induced thereto by several conversations with practical men I have had of late. The burden of their remarks has been: "I do not think I shall bother after residues any more; now I have given up albumenised paper, there is nothing to be got for the trouble of getting out of print washings," and so on. And there is at the bottom of the matter a certain amount of truth; but it is one of those half-truths which we are apophthegmatically told is "worse than a lie." It is not for me to become an apologist for albumenised prints, though I am far from having entirely given up its use; but there is truth in the statement that the washing waters from modern sensitised papers—gelatine and collodion—contain a far smaller proportion of silver than would be obtained from an equal quantity of albumenised paper washings. But, carefully carried out, there is quite enough recoverable to make it worth while taking steps to collect it; besides, it does seem such unscientific work to throw silver even in small amount down the sink. So far as to print washings; but when we come to discuss hypo the matter assumes quite another aspect; other, that is, than that presented by print washings, for the saving of hypo residues is to be regarded now in the same light as it was twenty years ago. Indeed, seeing the comparative failure of the print washings source, extra attention ought to be given to the hypo question. I have at various times made many inquiries among professional friends as to whether they saved their used hypo or not, yet the reply has very many times more frequently been "no" than "yes," So much has been said both by myself and others on this point that it might seem useless to say more, but I cannot help sermonising on the text while there are so many fixing baths to be saved. And more than once have I received extraordinary rebuffs. Once, when

I was doing my best to induce a photographer to adopt the plan, I was met with the astonishing reply: "Oh, yes; I see your little game. You want to put some business in the way of a friend who sells the chemical to throw the hypo down." I assure my readers that I did not invent this story; the above reply was literally, and in real earnest, made to me. Still, I have gone on trying to "do good by stealth." I have never yet been made to "blush to find it fame" by finding so many studios with hypo collectors attached. This is how the matter works out now. Recently I took the trouble to have all the residues from the print washings and the precipitate from the hypo separately collected and sent to the refiners, with instructions to assay and reduce each lot separately. It was only a small collection; but it answered as well as a large one for the purpose in view. Formerly there used to be no great difference between the values of the two lots—chlorides and sulphides—when separately valued, so that to save trouble we eventually got in the way of sending the whole collection as one package; but when this recent batch was sent, there was about five pounds worth hypo product to one of print washing. See what that means. Anyone getting a five pound note for the chloride obtained from his print-washing waters would have obtained twenty-five pounds from his hypo! Surely such facts should appeal to the most indifferent; yet I was credibly informed not very long ago by one of the largest publishing photographers in London that in none of his branches was the hypo saved; it was thrown down the sink when done with—probably some hundreds of pounds worth per annum! This to me would have seemed incredible at one time; but it was simply an exalted demonstration of a fact which had become well known to me.

Yet I should like once more to be allowed to describe the very simple method that I and others adopt. We simply throw the silver down from the hypo in a similar manner to that adopted with print washings, the one difference being that for salt we substitute "liver of sulphur," a polysulphide of potassium. It has, of course, the one objection of giving off a highly offensive odour when its solution is poured from vessel to vessel. There is, however, this saving point about the offensiveness of the operation. The solution of sulphide very quickly decomposes when exposed to the air, giving rise in a very short time to a skin or scum that prevents further annoyance, so long as it is not disturbed. Further the sulphuretted hydrogen given off into the air does not contaminate it for an indefinite time. It gradually decomposes and becomes undiscoverable by the sense of smell. The recovery of silver is not confined to the print-fixing hypo; that which has been used for negative fixing should be thrown into the same vat. Lately I collected the hypo from a branch studio from time to time into a gallon wide-mouthed glass bottle, throwing the silver down each time the bottle was full. After a few gross of negatives had passed through, I sent the result to the refiner, who extracted seven and sixpence worth of silver from the sulphides thrown down. This would represent such an imaginary amount of trouble to the average operator that he would not care to undertake it; yet, as a matter of fact, the trouble involved or time wasted was virtually nil.

One other consideration to again bring forward. The print-fixing bath, besides silver, always contains a certain amount of gold derived from the waste gold toning solutions, that should always be thrown in, and from the toned prints themselves. This gold accompanies the silver when the latter is precipitated, and my own experience has been that often the silver obtained from hypo contains so much gold that the refiners allow from fifty per cent. more for such silver than for that from chlorides.

A practical note may here be made. It is thought by some that the residues should be collected, reduced to metal, and re-dissolved to form nitrate of silver by the photographer himself. This is quite a mistake. The cost of materials, crucibles, firing, and risk of loss through accident will, as a rule, average more than the amount saved by doing the reducing at home. I have for over forty years dealt with one firm for residue work, and I recently asked them to let me know the principle on which they based their charges for reducing. They replied: "Our charge for reducing residues is always based upon the burnt weight, and is one shilling per pound." From this it is obvious that true economy will, as often pointed out in this journal, consist in keeping all residues, paper clippings, filter papers, etc., as clean and free from foreign matter as possible; otherwise a charge of a shilling a pound of burnt rubbish will have to be taken off the gross cash result of residue saving.

I do not think I need write more. I would reinforce my old story by adding the moral: If you are determined to throw some silver down the sink, throw the print washings down, and save the hypo residues!

G. Watmough Webster, F.C.S., F.R.P.S.

ON THINGS IN GENERAL.

I was greatly interested in Mr. P. Everitt's account of a mildew experience. I presume that the fungoid growth he spoke of (at the L.P.P.A.) was a case of mildew, as his description tallied with its appearance. This most annoying defect is strangely erratic in its attacks. I have seen one out of a number of pictures hanging on the same wall, and apparently under identical conditions, violently attacked, while all its fellows were intact. I have had many hundreds of cases brought under my notice—both photographs, water-colour paintings, engravings, and, strange to say, miniatures on ivory. Whether it has been a coincidence or not, it is impossible to say; but the cases brought to me seem to have come in cycles; one year there would be quite a large number, the next year perhaps a single one or two. This is probably the effect of special atmospheric conditions, as mildew is largely dependent for its attacks on the presence of moisture and absence of ventilation. The best cure for further growths is exposure to air and sun. Its growth is by spores, which are shed like seeds, and if a suitable nidus, such as damp paper, is ready, new plants will arrive, shed their fruit, and so on. If unchecked, the fungus will quickly send its roots, as they might be popularly termed, right through a thick piece of paper. A photograph, for instance, framed without pasting the glass in and the back unprotected by proper slips, is almost certain to be damaged if hung in a room in which a fire is not usually burning in cold weather. The action is somewhat thus. A cold day is followed by what is known as a warm damp one. The air is surcharged with moisture, and permeates into the frame between glass and picture; this being still cold causes a precipitation of moisture, which it enters much more readily than it leaves, and thus the exact conditions of moisture and lack of ventilation obtain, and the fungus develops and ruins the picture if not checked in time.

I should be glad if the Editors would tell me what Mr. Luke Fildes, for instance, ought to charge me for permission to copy one of his oil paintings, as I do a little painting myself. (It may be stated that there could not be much more than a quarter-of-a-pound of paint used upon one.) It would all be clear profit, for he would already have been paid for the picture. I am asking this question after reading, first, the inquiry of "C. H. C.," who asks what a photographer "ought to charge"

for a negative for him to practise with; and secondly, Mr. Walter Barnett's clever handling of Mr. Bibby's cool offer of half-a-guinea for permission to reproduce photographs selected by him—it would, he submits, be "clear gain." It is high time a very strong crusade was started against one side only of this question, the half-guinea fee. That is the minimum sum receivable under Copyright Union conditions; but by the large majority of photographers who have little experience of copyrights the half-guinea appears to be looked upon as the standard sum to be asked. Playing upon this ignorance, there is a great tendency on the part of publishers generally, not to speak of some illustrated journals, to assume that half-a-guinea is the sole recognised fee, whatever the subject. It may do for a subject of slight and passing interest; but where the photograph is one of considerable interest, and such as must almost of necessity appear, if possible a fee of many half-guineas should be asked, and would be paid. I do hope photographers asked for or possessing photographs of such interest will bear these remarks in mind, and not permit themselves to be bluffed by a publisher's circular or letter, several of which I have seen, which state that 5s. or 10s. is the "usual fee they have paid." Verbum sap.

FREE LANCE.

THE PLATINOTYPE PROCESS.

I.—THE CHEMICALS AND PAPERS.

IN 1894 Von Hübl published the most complete work on the platinotype process, and a second edition has just been issued,* which contains a notable addition in the shape of the author's researches on sepia printing, and a digest of the same may be of interest.

In the introduction the author divides the process into three kinds:—(1) That in which paper coated with ferric oxalate is exposed to light and then developed with a solution of a platinum salt and potassium oxalate; (2) here the platinum salt is added to the ferric oxalate and the paper sensitised with the mixture and the print developed, after exposure with solution of potassium oxalate; (3) the developer is mixed with the sensitiser, and it is only necessary to immerse the print in water after exposure in order to have a perfect result.

With regard to the first process, Hübl states that it is but rarely used, but that it deserves the fullest consideration, as it exceeds the two other processes in beauty of the results, and in the safety and ease of manipulation. The second process includes both the hot and cold bath processes, the former requiring a shorter exposure, and giving softer results than the latter, whilst the third is the print-out process.

Ferric oxalate is the principal light-sensitive salt, and this is used in the form of a 20 per cent. solution with 1 or 2 per cent. of oxalic, and this is called the "normal iron solution."

The usual method of preparing ferric oxalate is by precipitating ferric hydrate from ferric chloride by means of caustic or carbonate of soda, and digestion of the ferric hydrate with oxalic acid. This method necessitates, however, a quantitative analysis of the resultant solution, in order to ascertain the percentage of ferric oxalate. In order to avoid this, Weissenberger (Photo. Corresp. 1889, pp. 420, 609) suggested the use of ammonia iron alum dissolved in hot water, and precipitation with carbonate of soda and Hübl still further improved this method of using ammonia and doing away with filtration.

Ammonia iron alum, $Fe_2K_2(SO_4)_4$, $24H_2O$, is a commercial salt, and is a constant composition, and contains 11.62 per cent. of metallic iron. It must be kept in closed bottles or it effloresces and the percentage of iron increases.

Ferric oxalate contains 29.78 per cent. of metallic iron, and there is therefore in 100cc. of a 20 per cent. solution 5.96 or, in round figures, 6g. of metallic iron, and the equivalent quantity of ammonia iron alum is 51.63g., and to allow for a small loss 52g. should be used.

To prepare this salt, Hübl recommends a tall cylindrical measure of about 7cm. diameter and 25cm. in height. This should be marked, by a strip of paper outside, at the level of 85ccm. In this measure 52 grammes of powdered ammonia iron alum should be placed, and 20ccm. of liq. ammoniæ fort. 880 and 20ccm. of water poured on to it, and the mixture well stirred for several minutes. If there is no smell of ammonia, a few drops more of ammonia should now be added, and the mixture again well stirred. The measure should be now filled up with water, the precipitate well stirred or shaken up, and then left to settle. When it has settled down the water should be decanted or siphoned off, and the operation repeated till there is no longer any smell of ammonia and it does not turn litmus-paper blue.

It is important that the total bulk of the mixture should not exceed the level of the 85ccm. mark. When it has reached this level 21.5 grammes of pure oxalic acid should be added and the mixture well stirred, and, if necessary, left to itself for a little time. A perfectly clear solution will be obtained, which will measure 95ccm. This must be made up to 100ccm. It is essential that the addition of the oxalic acid should be made by yellow light, and the resultant solution, which is a 20 per cent. solution of ferric oxalate, must not be exposed to daylight. The solution should be greenish-yellow when examined by daylight, and, on the addition of ferridcyanide of potash, should turn dark green, but give no blue precipitate.

Another salt which is useful is oxalate of lead, which may be obtained commercially, but can also be prepared by dissolving 20g. of acetate of lead in 100ccm. of water, heating gently and adding 4g. of oxalic acid, collecting, washing, and drying the precipitate. One gramme of the lead oxalate should be added to every 100ccm. of the iron solution, and the resultant mixture well shaken, filtered, and labelled "Lead-Iron Solution."

Sodium ferric-oxalate, $Fe_2(C_2O_4)_6Na_6 + 11H_2O$, it is advisable to buy. It should be in clear, green crystals, though if any adherent yellow powder is present it is not of much moment. Fifty grammes of this salt should be dissolved in 100ccm. of water and the solution filtered and be kept in the dark, and labelled "Soda-Iron Solution."

Two platinum salts are required, both of which can be obtained commercially and which are not worth the trouble of preparing.

Potassium chloroplatinite, K_2PtCl_4, occurs in red crystals, which are readily soluble in water, and a stock solution of 1 to 6 of distilled water should be prepared, and kept in the dark.

Sodium platinic chloride, $Na_2PtCl_6 + 6H_2O$, occurs in yellow prisms, and when heated to 100deg. C. loses its water of crystallisation and becomes a yellow powder, one part of which dissolved in ten parts of distilled water forms the stock solution. In order to avoid the trouble of heating, practically one-fourth more of the hydrated salt may be used instead, that is to say, 12.5 parts instead of 10 parts.

Hübl points out that the chemical reactions in platinotype printing have been represented by Berkeley as follows:—
During exposure:

$$(Fe_2(C_2O_4)_3 = 2FeC_2O_4 + 2CO_2$$

and during development:

$$(6FeC_2O_4 + 3K_2PtCl_4 = 2Fe_2(3_2O_4) + Fe_2Cl_6 + 6KCl + 3Pt.$$

But, from arguments which we need hardly recapitulate, he comes to the conclusion that formic acid is formed, and that

* "Der Platindruck." Arthur Freiherrn von Hübl. Halle a/S: William Knapp.

this plays a considerable part in the reduction of the platinum salts, especially during development.

Considerable importance is laid by Hübl on the raw paper used, and he points out that its surface has considerable influence on the results, as the image is not embedded in any colloidal vehicle. The colour of the paper is seldom pure white, being generally blue or yellow. The former gives bright, clear, high lights, whilst the latter gives softer effects. For small prints with smooth surface the blue-tinted papers are better, whilst for large prints the yellow tint is to be preferred. So that the prints should not turn yellow aferwards, pure linen papers should be used. The sizing of the paper is of importance, too, and those papers sized with resin are the best. All papers are improved by a sizing preliminary to sensitising. Gelatine, arrowroot, carragheen, tragacanth, Agar-Agar, etc., may be used. Gum arabic and dextrine cannot be used, because they are soluble in water and would dissolve in the developer.

Gelatine has the disadvantage of causing numerous bubbles whilst sensitising, and also it tenaciously retains traces of platinum salts, so that the prints on paper thus sized have a tendency to yellow in time. It further gives a slightly-glazed surface.

Arrowroot, carragheen, and tragacanth are very satisfactory, and always give matt surfaces. Agar-Agar combines the good qualities of arrowroot and gelatine. To prepare the preliminary coating with these substances, ten parts of each should be used to every 500 or 1,000 parts of water. They should be allowed to swell for an hour, and be then dissolved. To the gelatine solution five parts of powdered alum should be added, and the mixture must be used warm. Arrowroot must be mixed with cold water and added to boiling water and stirred till a clear solution is obtained. For Agar-Agar five parts should be soaked for an hour in 500 parts of cold water, boiled for five minutes, and then filtered through fine muslin, and then allowed to cool, and the jelly thus obtained pressed two or three times through coarse linen, and the resultant finely-divided mass distributed over the paper with a brush.

The following are the papers specially recommended:—Smooth Rives and Steinbach paper, No. 27 of the Neusiedler Actiengesellschaft für Papierfabrikation in Vienna, the roll papers of Schleicher and Schull of Düren.

The English drawing-papers by Whatman and Harding have a very good grain, but are, unfortunately, animal (gelatine) sized, and this must be removed. To effect this the paper should be placed in a dish of hot water to which some sulphuric acid has been added, and after about an hour the water must be poured away and the paper washed with repeated changes of water, to which, finally, some ammonia should be added. It must then be pressed between blotting paper to dry and subsequently sized with a 1 per cent. solution of Agar-Agar, applied hot and liberally with a brush, and then dried, again treated with the solution, dried, and then with a 2 per cent. solution of arrowroot.

E. J. Wall.

Plymouth Photographic Society opened its summer session under most auspicious circumstances on Saturday, June 21st, when a large party, at the invitation of the vice-presidents, Mr. Frederick Johnson and Mr. W. H. Mayne, visited Ivybridge, a very charming country town about a dozen miles from Plymouth. The weather was the first touch of summer that had come upon the country after the long, dreary, wintry season that had prevailed. The party walked through Stowford Woods and aver the grounds of Lukeslands, ablaze with rhododendrons in bloom, gathering at the London Hotel for tea, the guests of the gentlemen named. A very pleasant season was spent, followed subsequently with some instrumental and vocal music. Thanks were tendered to the vice-presidents, and some interesting remarks were made by several speakers. The charm of the scene, the length of the walk, and the splendid weather did not encourage much photography, the social and sociable element prevailing. The party returned to Plymouth by the last train, much pleased with the outing.

Exhibition.

THE DERBY EXHIBITION.

Even at this recent date it seems difficult to determine which Corporation has the honour of being the first to welcome photography by officially recognising it as one of the graphic processes entitled to an exhibition in its local Art Gallery. As far as we are able to ascertain, Derby takes the first place with an exhibition held in 1885, and triennially since.

Derby and Photography are inseparably connected with the names of the late Richard Keene and his pupil, now Sir William Abney. It is fitting that the exhibition opened on the 18th inst. should find Sir William Abney the patron, and Mr. C. Barrow Keene, the late Mr. Richard Keene's son, the president of the Society. The Corporation has placed its admirably lighted and easily accessible picture gallery at the disposal of photographers, and the exhibits have been well hung by Mr. Crowther, the curator of the Art Gallery. Mr. C. Barrow Keene, the aforesaid president of the Society, Mr. W. Bendle Moore, vice president, and Mr. F. G. Smith, the honorary secretary.

The larger portion of the exhibition is devoted to an invitation section, and from the fine work here shown, some of it well known at the "great" exhibitions, useful lessons as to subject and treatment may be learnt.

Mr. Wm. Crooke has strength and directness of purpose in No. 162, "Baillie Cameron," and the grouping and posing of the three figures in "The Children's Hour," No. 229, are worthy of the more deliberate art of the painter, notwithstanding a little insistence of dress. There is massive strength in Charles Reid's No. 157, "Grim and Solitary," and a very pleasing composition in Alfred Werner's, No. 309, "Evicted," in which the sky is too light for a quite harmonious result. The three portraits by Fred Hollyer are worthy of him, the most popular, indeed, it was sold at once, being No. 316, "Holman Hunt and Ruskin at Coniston." A "Portrait Study," No. 308, by W. W. Winter, who, by the way, has recently had the honour of photographing the King, is entirely satisfactory, save the intrusion into the background of a little slice of a studio landscape. Dr. C. F. Grindrod's romantic "Woodcutters," No. 319, is attractive, yet pitched in too loud a key. We turn with pleasure to N. S. Kay's, No. 276, "The Spinet," a dainty thing, in which one might only ask for a little more separation of the figures. But one work is shown by C. Barrow Keene, "An Old Stairway," which has already received distinction here and abroad. Except for heavy shadows, John Westworth's, No. 201, "Awaking Day," is a delightful sweep of landscape, and there is heaviness too, but of the right kind, in J. M. C. Grove's, No. 206, "Evening at Wapping." Mrs. Archie Commeline's gum portrait, No. 209, "Portrait of Mrs. G.," would have been good had not most of the half-tones slipped off in the process. It would seem impossible that No. 220, "Daydreams," and No. 218, "Shadows of Departing Day," should both be by Miss Bessie Stanford, but the catalogue assures us of the fact. The former is a very pleasant dream and the latter a rude awakening. "The River Bank," by W. Rawlings, loses none of its attractiveness by acquaintance, and we anticipate a similar verdict of the future for C. F. L. Barnwell's graceful No. 185, "A Longton Lass." John Moffat's "Scene from a Greek Play," is successfully ambitious and rich. A new work which will doubtless be heard of again is No. 299, "Expectant," by J. Page Croft. Alexander Keighley contributes seven frames, notably No. 207, "Evening Light," redolent of an artist's introspection, but in out-of-door flower scenes he appears to be in danger, in making the flowers tell by tone and grouping, of losing naturalness. Strong portraits come from the studio of the late J. Caswell Smith and Miss Lizzie Caswell Smith, and a very charming one by Mrs. Gertrude Wallis, No. 256, must not be overlooked Messrs. Bemrose and Sons show six large frames of reproductions produced by from one to six printings; No. 337, Collotype, one printing; No 335, a two-tint process; and No. 333, granotype process, four to five printings, are as good as anything of their kind. Space will not permit of a detailed reference to the excellent work, most of it very well known, by David Blount, W. J. Byrne, A. Horsley Hinton, R. B. Lodge, E. T. Holding, F. A. Bolton, F. H. Evans, J. Kearney, junr., Miss Janet Reid, J. H. Coath, R. W. Robinson, J. M. Whitehead, and many others. A striking likeness, on a very large scale, of the Marquis of Salisbury, by Lambert Weston and Son, has the post of honour in the gallery.

In the local class silver and bronze medals were offered by the Corporation for competition, and the judging was kindly undertaken by Mr. William Crooke, of Edinburgh. Harold Burkinshaw takes the premier award with No. 56, "A Silenced Highway," in which the delicate gradations of sunlit snow are rendered with ability and reticence.

Similar high praise may deservedly be given to the other seven works contributed by this member, and we specially draw attention to his Nos. 53, 60, 62, and 148. A silver medal was offered by Sir William Abney for the best set of Derbyshire views, and this has been awarded to J. C. Lee for four prints of pictorial quality. No. 73, "By the Highway," is almost quite meritorious, and is closely followed by No. 80, "Evening," the remaining two being No. 77, "In a Derbyshire Village," and No. 83, a moorland scene. There is some heaviness in each of the prints, but there is artistic aim as well. Bronze medals were awarded to S. Finney, S. F. Wood, F. G. Smith, and H. G. W. Dawson, but the names are not given here in any order of merit. No. 15, "In the Park," by S. Finney, shows the intention of the author to make a picture which should appeal on grounds other than those of subject; No. 21, by S. F. Wood, "Corner of Entrance Hall, Haddon," is as good a rendering of a familiar subject as anyone can hope to get; No. 81, "Sunset," by F. G. Smith, is of the *Salon* school and of very high promise indeed, a promise made certain by like ability shown in his Nos. 74, 76, and 79; H. G. W. Dawson's medalled print, No. 129, "In Kedleston Church," shows a tomb illuminated by two rays of light and therein is its poetry.

Coming to the general body of exhibits, C. E. Etches has an impressive work in No. 34, "In a Derbyshire Dale," and judging by the six prints shown of his, and the six by Douglas Deeley, there is no doubt that these workers are destined to come to the front. Mr. Deeley's No. 37, "Handegg Falls," has immense, yet pleasing, contrasts, and breadth of treatment is shown in No. 31, "Summer in the Woods." The six large prints of Egyptian subjects by J. A. Clayton go to prove that one may go further and fare pictorially worse. A. Victor Haslam's, No. 54, "The Housewife," is true, a statement one can hardly make in reference to F. C. Smithard's "Triforium, Gloucester," No. 27, for, surely, architecture is never so uncertain in outline. No tricks are shown by Charles Bourdin, and his "In the Alps," No. 44, must be accounted in tone, rendering, and atmosphere, and also in composition, an eminent success. On quite different lines, but meriting the same verdict, is No. 85, "On the Seine, Paris," by W. Forsyth. Howard Barrett shows twelve hunting scenes, and there are grace and movement in No. 89 and grouping as good as could be hoped for. J. B. Copeland, in No. 100, "Dovedale," has a view which goes far to redeem that dale of its unphotographic reputation. Special mention must be made of Mrs. F. H. Gandy's No. 110, "Tulips," which is graceful and reticent, and of C. H. Eaton's open-air feeling in No. 134, "Haddon Hall from the River." Mrs. Highton's "Granny" will appeal to many, and so will George Walker's usual faultless work. Dr. Collier Green has two fine views, but both his and Mrs. Gandy's exhibit were not for competition. Miss Evelyn Boden's four portraits in the invitation section show her customary effective, and frequently quiet, treatment, and we particularly like No. 239, "Mine Eyes Beheld the Blessed Pity Spring," and No. 305, "R. H. Tenant, Esq."

There is much good work which considerations of space compel us to leave unnoticed, and we recommend such of our readers who can to visit the exhibition, which will be open until the 18th July.

KODAK (LIMITED) v. CLARK (SURVEYOR OF TAXES).

[Reprinted from "The Times."]

THIS was a case stated by the Income-tax Commissioners for the division of Finsbury for the opinion of the Court. The facts, which were very fully set out in the case, were shortly as follows:—

In 1880 the business of George Eastman, of Rochester, U.S.A., was established to manufacture photographic materials. That business was taken over by the Eastman Dry Plate and Film Company, of Rochester, which company in 1889 entered into an agreement to sell its business in the United Kingdom and in all other parts of the world, except North and South America, to the Eastman Photographic Materials Company, Limited, of London, a company registered under the Companies Acts 1862-1886, with a nominal capital of £150,000. That business was carried on wholly independently of the business of the American Company, the Eastman Dry Plate and Film Company. In 1890 the Eastman Dry Plate and Film Company of Rochester transferred its business to a company called the Eastman Company, formed according to the laws of the State of New York. In 1891 a company called the New Process Film Company was formed according to the laws of the State of New York. Those two companies amalgamated in 1892, and became the Eastman Kodak Company of Rochester. The Eastman Company and Eastman Kodak Company were distinct from the Eastman Photographic Materials Company, but the last-mentioned company purchased a considerable part of the goods which it dealt in from the Eastman Company. On September 30th, 1898, an agreement was entered into between the Eastman Photographic Materials Company of London and George Eastman of New York for the sale to him of the property and undertaking of the company for the sum of £344,000. On November 15th, 1898, Kodak (Limited) was registered. Its prospectus, which formed part of the case, stated that the company was formed for the purpose of acquiring the business and property of the Eastman Photographic Materials Company (Limited) of London, including the shares of the German Eastman Kodak and the French Eastman Kodak, and not less than 95 per cent. of the shares of the American Eastman Kodak Company, thereby bringing under a single control all the Eastman Kodak companies covering the whole world. It then enumerated the places where the business was carried on—namely, London, Paris, Berlin, and Rochester, U.S.A. It further stated that the French, German, and American companies were to be worked as subsidiary companies. The directors included, among others, George Eastman, who was also to be managing director, and George Dickman, managing director of Eastman Photographic Materials Company (Limited), who was also to be joint managing director of Kodak (Limited). The memorandum of association stated that the objects of the company (*inter alia*) were to acquire and carry on the business of the Eastman Photographic Materials Company, and to acquire and hold not less than 85 per cent. of the paid-up issued share capital of the Eastman Kodak Company of New York; to carry on the business of dealers in photographic materials in England, the United States of America, and other countries; and to superintend and manage the business of any company of which the company held shares, debentures, or other interests. The dividends were to be paid in London, but the directors had power to direct that dividends or interest payable to any shareholders whose names were entered in the local register of any foreign country or colony, or were known to be resident in any foreign country or colony, as far as possible should be paid out of the income from the possessions or property of the company in such country or colony direct by the local agents of the company. Ninety-eight per cent. of the shares of Eastman Kodak Company were transferred to and acquired by Kodak (Limited). There were 30 additional shareholders holding 818 shares of $100 each of the Eastman Kodak (Limited), who were independent of Kodak (Limited), and whose shares were not acquired by Kodak (Limited). Some of those shares were held by the seven directors of the American Company as qualifying shares. By the law of the State of New York Kodak (Limited) could not exercise any further control over Eastman Kodak Company than by a vote as its shareholder at general meetings of the Eastman Kodak Company. The case further stated that Kodak (Limited) in fact did not interfere in or control the management of Eastman Kodak Company; and that it had dealt with Eastman Kodak Company as an ordinary customer for goods purchased by it, and that the goods were invoiced as was usual in the case of distinct traders, and the moneys due from Kodak (Limited) to Eastman Kodak Company were paid by bank drafts. The bankers of Kodak (Limited) in America received from Eastman Kodak Company any dividends due to Kodak (Limited) and retained such dividends in America, which were applied in payment of the dividends to the American shareholders in Kodak (Limited). The report of the directors of Kodak (Limited), of March, 1900, issued to the shareholders showed the amount standing to the credit of the profit and loss account of the combined companies to be £345,778 9s. 6d. Kodak (Limited) were assessed in respect of the whole of the profits made by the combined companies under Schedule D of 16 and 17 Vict., c. 34, sec. 100, Schedule D, case 1 of 5 and 6 Vict., c. 35. Kodak (Limited) appealed against that assessment, contending that the business carried on by the Eastman Kodak Company was carried on in America and not in the United Kingdom, and that, therefore, no assessment could be made under the Income Tax Acts in respect of its profits upon Kodak (Limited), as they were not profits of Kodak (Limited); that the only interest Kodak (Limited) had in Eastman Kodak Company was as a shareholder; that the dividends to which Kodak (Limited) were entitled in respect of the said shares in the Eastman Kodak Company were taxable only under case 4 or 5 of section 100, Schedule D of the Income Tax Act, 1842, and not otherwise; that the dividends upon the shares of Kodak (Limited) in Eastman Kodak Company were taxable only to the extent to which they were actually received in the United Kingdom, and that no part of such dividend had been received in the United Kingdom; that the Eastman Kodak (Limited) and Kodak (Limited) were distinct and separate entities. Kodak (Limited) admitted their liability to be assessed for the year 1899-1900 in respect of the profits of the business carried on by Kodak (Limited) as the successors to Eastman Photographic Materials Company (Limited), including therein the profits made by means of the French and German companies. The appellants relied upon the following cases:—"Colquhoun v. Brooks" (14 App. Cas., 493), "San Paulo (Brazilian) Railway Company v. Carter" (1896, A.C., 31; 3 T.C., 407), "The Bartholomay Brewing Company v. Wyatt" (1893, 2 Q.B., 499), "Norwich Union v. Magee" (44 W.R., 384; 3 T.C., 457), "Ryhope Coal Company v. Foyer" (7 Q.B.D., 485; 1 T.C., 343), "Apthorpe v. the Peter Schoenhofen Brewing Company" (80 L.T., 395; 4 T.C., 41). It was contended for the Crown that the company, having its registered office in England, where the directors' meetings were held, accounts published, and

dividends declared, and where a considerable portion of the business was carried on, Kodak (Limited) was liable to assessment upon its total profits, including those of the American company; that Kodak (Limited) had the actual control of the business in America, which it was carrying on. Reliance was placed upon the terms of the prospectus, the memorandum and articles of association, and also upon the following cases:—"Frank Jones Brewing Company v. Apthorpe" (15 "The Times" Law Reports, 113; 4 T.C., 6), "United States Brewing Company v. Apthorpe" (4 T.C., 17), "St. Louis Breweries (Limited) v. Apthorpe" (47 W.R., 334; 4 T.C., 111). The Commissioners held that:—(1) The American company was carried on by, and was the business of, the appellants, and that the profits and business were technically the profits and business of Kodak (Limited); (2) that, if the business at Rochester and the profits made thereat are technically the business and profits of the American company, the American company for all purposes were the agents of the appellant company; (3) that the appellants were successors to both the prior English and American companies; (4) that Kodak (Limited) was liable for its profits made in America under Schedule D, case 1.

Mr. Danckwerts, K.C., and Mr. Kerly appeared for the appellants; the Attorney-General, the Solicitor-General, and Mr. Rowlatt for the Crown.

Mr. Justice Phillimore, in giving judgment, said it was an important case and the facts were numerous and conflicting, but he had had such assistance given him by learned counsel that he was able to give judgment at once. As to the findings, the Commissioners had found that the English company controlled the American company; if so, it seemed to him that the proper thing to do was to apply the principle of the San Paulo Railway case and say that the American company was carrying on business in England and was to be taxed in England, and say it was substantially the business of an English company. His Lordship read from the judgment of Lord Herschell in "Colquhoun v. Brooks" (*supra*), and, continuing, said that following upon that case came the San Paulo Railway case, in which it was pointed out how "Colquhoun v. Brooks" differed as to the facts. The San Paulo Railway was held to be carrying on business partially in England, and was liable to be taxed. That case was followed by the "Bartholomay Brewing Company v. Wyatt" (*supra*). He did not think that the decision in that case was sufficiently understood. The second point, which his brother Wright had taken, was well worthy of attention. "I think that, in point of law, whatever control is exercised by the English company is exercised by it as the holder of practically all the shares in the American company; and if that is so the English company cannot be properly said to carry on the business of the American company at all. The business of the company is not carried on by its shareholders, but by the company through its directors." That passage showed that one should not make a jump from control to carrying on business. The company might control another, but it did not necessarily follow that the business carried on by that company was carried on by the controlling company. Then came a group of cases which required a little consideration. When looked at not one of them covered this case. In "Frank Jones Brewing Company v. Apthorpe" there was one company in England. The Court had to ask itself whether it came within the decision of the San Paulo Railway case, and the Court came to the conclusion that it did. In the "United States Brewing Company v. Apthorpe," the facts were the same as in the Frank Jones case, except that the United States Brewing Company carried on business in several States, in some of which an alien could not hold land. The decision turned upon the particular facts of that case which did not touch this case. In the "Louis Breweries Companies v. Apthorpe" case there were two reasons why that did not cover this case—(1) The facts stated by the Commissioners put the parties out of Court. They found facts and did not ask themselves whether there was good evidence to support them. (2) There were, as in this, two companies, and a great number of shares belonged to the members of the controlling company. The directors of the St. Louis Brewing association held one share each in their own right. The Court held that the mere existence of a board of directors of the American company did not prevent it from being considered an English company, and therefore it was liable to taxation. His Lordship read from the judgment of Lord Justice Romer in the case of "Peter Schoenhofen Brewing Company v. Apthorpe," that the Court in that case, upon the facts, had very little difficulty in deciding that the company must be taxed. The English company bought the assets, goodwill, and everything of the American company. In the present case Kodak (Limited) held 98 per cent. of the shares of the Eastman Kodak Company. The Eastman Kodak Company did not carry on business for the English company. The American company were manufacturers, and the English company were buyers. If the companies were identical it would not matter at what price the goods were invoiced, but it mattered very much to the holders of the 2 per cent. of the shares of the American company. He held that there was no evidence upon which the Commissioners could hold that the American company was carried on or controlled by the English company. The one question was whose business was it, and the other was, who controlled that business? If it was the business of some one else it did not matter that the English company controlled it. He gave judgment for the appellants, and directed that there was no evidence upon which the commissioners could have come to the conclusions as stated in the case. There remained a serious question—whether 98 per cent. of the profits of the Eastman Kodak Company ought not to be returned—that question had not been argued before him—or whether the Crown could not compel Kodak (Limited) to make the Eastman Kodak Company return their profits. Those were matters upon which he was not asked to give a decision.

Patent News.

THE following abridged description is specially drawn for the BRITISH JOURNAL OF PHOTOGRAPHY by Messrs. Hughes and Young, patent agents, 55 and 56, Chancery Lane, London, W.C., who will give advice and assistance free to our readers on all patent matters:—

PATENT APPLICATIONS.—No. 13,061.—Paul Rudolph, Jena, Germany. "Improvements in objectives for photographic and like purposes."

No. 13,069.—Alfred Quarterman, 170, Kennington Road, London. "Enlarging, diminishing, and distorting mirror photograph glasses."

No. 13,189.—Joseph Lambert, Lord Street, Liverpool. "Improvements in and connected with portable dark chambers for photographic purposes."

No. 13,216.—Arthur Englefield, Lincoln's Inn Fields. "Improvements in the treatment or preparation of photographic pictures, prints, and the like to facilitate the painting or colouring thereof."

No. 13,261.—Thomas Walton, 297, High Street West, Sunderland. "Tripod head for pocket cameras."

No. 13,335.—Edward James Castle, 8, King's Bench Walk, Temple. "Improvements in cameras for photographic purposes."

No. 13,351.—Otto Fulton and William Mountsteven Gillard, Chancery Lane. "Improvements relating to photography."

No. 13,465.—Joseph Boylan, 57, Park Road, Bradford. "Improvements in camera dark slides."

No. 13,468.—William Norman Lascelles Davidson, Chancery Lane. "An improved reflecting lens attachment for photographing and exhibiting still or animated objects in natural colours."

No. 13,554.—George Mitchell, 530, Fulham Road. "Improvements in and relating to rollable photographic films."

PATENTS ILLUSTRATED.—No. 3,873.—Photography.—Patentee: J. J. Acworth, Imperial Dry Plate Co., Cricklewood. Exposures, determining.

Relates to a slide-rule for calculating photographic exposures. The numbers representing the speed numbers and the stops are on slides on the rule, the scales for the actinometer time and the time of exposure being on the fixed part of the rule; or this arangement may be reversed. To calculate an exposure, the speed of plate scale is set opposite the actinometer time scale, and the time of exposure is read off on the scale opposite the number representing the value of the stop on the scale.

No. 4,000.—Photography.—Patentee: J. Hubert, 138, High Road, Chiswick. Lamps, actinic; lighting arrangements.

Relates to arrangements for igniting a number of flash lights simultaneously and preventing the escape of smoke. The flash powders are placed on pans supported by glass discs closing the mouths of inverted bell glasses. These bell glases are suspended at different places in the room, and furnished with reflectors so as to give a good light on the subject being photographed. The powders are simultaneously lighted by electricity from the generator, which is connected to a push. The igniting devices in the powders are connected by branch wires to the main conductor, which is connected to the push. Wires lead from the push to the camera, to release the shutter.

No. 4,032.—Photo-mechanical printing.—Patentee: P. Henking, Naufbeuren, Bavaria.

Relates to the production of a durable photo-mechanical printing surface. A dull ground-glass plate is coated with bichromatised gelatine containing finely-powdered stone. After this has been printed upon from a photographic plate and developed by washing, the surface is moistened with a mixture of glycerine and the strongest liquid ammonia.

LONDON and Provincial Photographic Association.—On Thursday, July 3rd, the annual meeting will be held, and election of officers for the ensuing year. On the succeeding Thursdays through July and August the meetings will be open to any member or visitor who has any matter of photographic interest to bring forward. Visitors (especially from the Colonies and abroad) are always welcome at the White Swan Hotel, Tudor Street, Fleet Street.

New Apparatus, &c.

Schering's Pyrogallic Acid Crystals.

We have received from Messrs. A. and M. Zimmermann, 9 and 10, St. Mary-at-Hill, E.C., the London agents of Chemische Fabrik auf Actien (vorm S. Schering), Berlin, a sample 1-oz. bottle of their Pyrogallic Acid. The feature of this article is that it is manufactured in the form of fine crystals, the result being that the full 1oz. is contained in a small bottle of a capacity of 1½ fluid ozs.

The crystals, though not dissolving so instantaneously as the old form of pyro, nevertheless readily form a complete solution with the help of the stirring-rod. We have tried this preparation, and, in our hands, it was quite up to the high standard of the older pattern. The name of the manufacturers is sufficient guarantee for the purity of the article, and we should imagine it will soon become appreciated by those photographers who still consider that pyro has no rival as a developer for plates or films.

The Disc Actinometer. Sold by the Autotype Company, 74, New Oxford Street, London, W.

Retailing at the small price of one shilling, this little instrument reduces the actinomery of carbon printing to its simplest possible form. The



directions engraved on the block indicate the manner of its use. The casing is of light material, and one circular piece of paper will obviously answer for many exposures, as the lid revolves. As claimed for it, the disc actinometer is both hardy and efficient.

The Pocket Ray Camera.

The Pocket Ray Camera, which is sold by the Rochester Optical and Camera Company, of 112-113, Fore Street, London, E.C., is, as its name implies, characterised by portability. The ¼-plate, when closed up, measures only 5in. by 4in. by 2in. and weighs a couple of pounds or so—hence it may be carried without inconvenience in the jacket pocket. When fully opened out, it extends to about 7½in., and the bellows is of the conical form. It has a finder moving on a hinge, thus admitting of being used both ways of the plate; a doublet lens; a Unicum shutter, and a focussing-scale. The body is of mahogany, leather covered, and there is a focussing screen. The principal feature of the instrument is that it takes metal slides, carrying either a single plate or a cut film; and as the slide is considerably under ¼in. thick, we arrive at the very acme of compactness in this regard. Half-a-dozen slides would hardly take up as much room as a well-filled cigar-case. The Pocket Ray, which has two bushes for stand-work, allows of time, instantaneous, and bulb exposures being given, and is as well-finished and pretty a little machine as we have recently had through our hands.

Messrs. Rae Bros., photographic dealers and opticians, 134, St. Vincent Street, Glasgow, write: "16th June, 1902. Important! Having purchased the entire stock of Messrs. Geo. Mason and Co., late of Buchanan Street, at exceptionally low prices, comprising:—For the amateur: Hand cameras, field cameras, stereo cameras, backgrounds, lenses, stands, mounts, albums, printing frames, and photographic sundries. For the professional photographer: Studio cameras, lenses, studio stands, backgrounds, head rests, and a large assortment of mounts—all sizes. For the lanternist: Bi-unial lanterns, full-size kinematographs, lecturers' lanterns in japanned tin, Russian iron, and mahogany, fitted with oil, gas, and electric arc lamps—we intend offering the whole stock at 50 to 75 per cent. below the usual prices for cash to clear. The goods will be on show at 21, Dundas Lane, off Buchanan Street, until July 9th."

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

July.	Name of Society.	Subject.
5.....	Ashton-under-Lyne	Ramble Chester and Eaton Hall.
5.....	Camera Club.....	Ramble—Filliegh and West Buckland.
7.....	Southampton Camera Club.....	Print Competition—*Animals.*
9.....	Southampton Camera Club ..	Ramble—New Forest.
9.....	North Middlesex Photographic	*Home Portraiture.* Mr. A. H. Lisett.

ROYAL PHOTOGRAPHIC SOCIETY.

June 24th.—Technical meeting, Mr. Furley Lewis in the chair.

Graduated Light Filters.

Mr. E. Sanger Shepherd prefaced a description of a graduated light filter that he has devised by a few words relating to the necessity which led to its production. In taking a landscape photograph it is well known that the proportion of light reaching the sensitive plate from the sky exceeds by very many times that which proceeds from the shadows of the subject. On the other hand, the scale of the photographic plate is by comparison extremely limited, and utterly incapable of reproducing the enormous contrasts of Nature. It often happened that a cloudy sky was quite visible in a negative, but yet be proof against printing on to paper. The earliest attempt to meet the difficulty was to coat the negative with a stained varnish and remove the portions where the density was already sufficient or in excess of requirements. This method was, however, unsatisfactory, and not invariably successful. Then came forms of lens shutters with flaps and openings arranged to give longer exposure to the foreground than to the sky of a picture. The results were uncertain, however. The light filter which Mr. Shepherd now brought forward as a substitute for these various devices was graduated from end to end They are graduated upon a "curve" worked out to suit the average landscape. The sector plays an important part in deciding upon the "curve" which governs the degree of graduation in the filter. Mr. Shepherd showed diagramatically how the thing was worked out, and said that a very marked improvement followed the use of the filter. The graduated filter could also be made to fill the place of the ordinary orthochromatic filter. The Gilvus and Absolutus filters were not superseded, as the screen was only a compromise, and especially suitable for landscape work.

Mr. T. E. Freshwater showed some photo-micrographs of

Volcanic Dust

emitted by Mont Pelée, La Souffrière, and other mountains in eruption. The photographs were taken to ascertain the composition of the dust. Some of the specimens contained a lot of magnetic iron, quartz crystals, "brown glass," hornblend, mica, etc. The dust was of varying degrees of coarseness, according to its origin. Slides were shown on the screen, and the characteristics of the elements composing the dust were pointed out.

Votes of thanks to Mr. Shepherd and Mr. Freshwater were passed with acclamation.

PHOTOGRAPHIC CLUB.

June 18th.—Mr. G. E. Brown, F.I.C., in the chair.

Mr. T. Wallis, of Wallis Bros., Kettering, gave an interesting description of the firm's specialities, roller-blind shutters and focal-plane cameras. Two types of shutter were shown, the standard pattern giving time and instantaneous exposures ranging from any length to 1-130 sec. in the smaller sizes, and the compound shutter, with two apertures, a wide one, giving time and instantaneous exposures to 1-90 sec., and a narrow one, 1-100 to 1-300 sec. By an exceeding ingenious arrangement the narrow aperture is wound inside one of the rollers when not required. The focal-plane camera, with a shutter on the same principle, giving exposures of time and ⅛ to 1-75 sec., with wide slit, and 1-100 to 1-800, with narrow slit, in three sizes, ¼, 5in. x 4in., and ½-plate, and two patterns, No. 1, with Beck R.R., and No. 2, with Beck-Steinheil orthostigmat and rising front and very light American pattern plateholders, was also shown and explained. Incidentally, the advantages of the firm's X ways maps over the ordinary one in wet and windy weather were emphasised. A hearty vote of thanks to Mr. Wallis was passed at the conclusion.

PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

A meeting of the Hull and District Branch of the P.P.A. was held on the 9th ult

The Honorary Secretary reported that up to that date he had received replies from sixteen of the local members signifying their adherence to the minimum scale of charges suggested by the association at the meeting of April 9th. He said this clearly proved that the branch was earnest

in its desire to loyally co-operate in the effort now being made to improve the business position of those members who, from various causes, had found themselves forced into an unprofitable and difficult war of charges.

The correspondence, as published by THE BRITISH JOURNAL OF PHOTOGRAPHY, between Mr. Walter Barnett and the proprietors of "Bibby's Quarterly" was laid before the members, and it was resolved that the branch do record its high appreciation of Mr. Barnett's spirited defence of professional interests, and do tender him its thanks. Many suggestions were put forward as to the probable motive underlying the "Quarterly's" desire for anonymity on the part of its photographic contributors, and especially as, according to criticisms published within its own pages, the illustrations were the best part of the production.

It was agreed that it would be difficult to adequately watch the insertion of photographer's work without the aid of the Press-cutting associations, and that, therefore—apart from the unfairness of the proposed excision—it was a matter of business necessity that photographers should not relinquish their right to the acknowledgment of name under the reproductions.

SOUTHAMPTON CAMERA CLUB.

THE members of the above Club had a ramble on the 21st ult., in North Stoneham Park, where, by kind permission of Willis Fleming, Esq., they were not slow to reap a good harvest of Nature's pictures, for which not a few opportunities presented themselves. On the 23rd ult. the Club held a meeting at the Philharmonic Hall, under the presidency of Mr. G. Vivian, when a debate was indulged in as to the relative merit and usefulness of the various photographic printing papers. The chairman defended P.O.P., Mr. Cosser made out an excellent case for platinum, whilst Mr. Trigg championed bromides. Each defended his choice with considerable ability and credit, and a lengthy, interesting, and instructive discussion followed, in which several members joined. Ultimately P.O.P. was declared by a majority of those present to be the most useful and practical paper for general purposes, without disparaging either of the others, which were considered to have their distinctive virtues, especially platinum, which met with well-deserved approval.

New Books.

A FINE Stage Photograph.—Messrs. Window and Grove, 63a, Baker Street, London, W., have kindly sent us a most interesting memento of the play, "Paola and Francesca," now being performed at the St. James's Theatre, London, S.W. There are twelve figures in the group, which recalls the happy effect of fresco-photography exhibited some years ago at the Photographic Salon by Mr. Henry van der Weyde. Stage photographs not infrequently suffer from manifest artificiality of posing and lighting—qualities (or defects) inseparable from the conditions under which the work must be done—but Mr. Grove, the producer of the beautiful piece of photography before us, has, in surmounting these obstacles, achieved a very striking success in naturalness of effect. The grouping is easy and unconstrained, and the two central figures in the play acquire essential, but not over-accentuated, prominence by the careful manner in which the other ten persons in the picture are subordinated to them. But each figure is in itself a study in the expression of attitude, and would alone make a most telling photograph. The lighting of the group is soft and tender, and there is an absolute absence of harshness of effect. The photograph is well printed in sepia platinum. As a study in grouping and lighting, as a memento of a notable play, and above all as an effective and refined piece of decorative photographic work, Mr. Grove's "Paola and Francesca" deserves the highest praise. It is seldom nowadays, with the spread of pictorial knowledge and ability, that to eyes like our own individual photographs appeal for more than passing recognition. Mr. Grove's "Paola and Francesca" is an exception. It bears scrutiny again and again, and can be "lived with."

"Photographisches Compendium." By Dr. Eugen Englisch. Published by Ferdinand Enke, Stuttgart.

This handbook to photography, written by Dr. Englisch, who was editor of the Archiv für Wissenschaftliche Photographie, is intended for the use of the amateur who wishes to take up photography for scientific purposes. The style of the work is concise and explicit, and the aim has been to give a scientific explanation of the apparatus and the various processes. Starting with the properties of light and their effect upon sensitive substances, the author proceeds to give an outline of geometrical optics as applied to photography. Lenses, cameras, plates, developers, etc., are explained and described. The principal processes of negative making and the various printing processes are described. Chapters are also devoted to telephotography, stereoscopy, enlargement, projection, microphotography, copying, and colour photography. The purpose of the author has been to give the reader a comprehensive view of the whole field of photographic work, and it is surprising how much has been compressed into this small volume of less than 300 pages.

"The Year Book of Photography, and Amateurs' Guide, 1902." Edited by P. R. Salmon, F.R.P.S. 600 pp.; price, 1s. London: Published at 9, Cecil Court, Charing Cross Road, W.C.

"Stereoscopic Photography" is the subject of the principal article in this annual, and the editor is to be congratulated upon a serviceable compilation that should induce modern amateur photographers to interest themselves in stereography. There are many illustrations, and the practical information is conveyed in such simple terms that even a beginner should be able to grasp the author's teaching. Mr. Salmon covers nearly the whole available ground. In his fourth chapter, however, he allows himself to fall into the erroneous assumption that his methods of working were criticised by "a humorous and an anonymous writer" in these pages. This is not the case. The other contents of the annual are varied and useful. Mr. J. T Ashby writes poetically of Bettws, and supplies many commonplace views. "Dry Collodion and Its Uses" is the subject of Mr. J. F. Hornsey's article. Forty pages are occupied by the Gazetteer, and there are sections devoted to "Winter Work," "Tables and Formulæ" (compiled by Mr. Wall); "Novelties of the Year," etc. The "Year Book" is in its forty-third year, and the present issue, if somewhat weak on the pictorial side, is a really useful "guide" to the very large class to which it appeals.

MR. W. COBB, of the Empire Photographic Dry Plate Company, Rochester House, Granville Street, Wood Green, N., informs us that he has had the honour of submitting to the Queen a short Coronation poem in anticipation of the now postponed great event, which her Majesty graciously accepted. The poem was printed in ordinary type, and surrounded with a border of natural flowers, lilies, roses, and lilies of the valley, and then photographed as a natural colour photograph 8 by 6 transparency. Mr. Cobb adds:—"Unfortunately, I have met with an accident with one of the negatives, and have therefore to make a duplicate picture, which I will ask you to honour me by accepting a copy. I enclose herewith a rough print from one of the negatives; this will give a little idea what the picture is like." The sentiment of Mr. Cobb's lines is that of devotion to the Throne; and we are glad to perceive that the author's old-time gift of verse still flourishes. Surrounded by flowers, the ode makes a pretty offering, and we note that the Queen thanked Mr. Cobb for his "unique specimen of photography."

The Royal Regalia.

King Edward's Crown, Orb, Sceptre, Ring, and Anointing Spoon are shown in an admirable 12 by 10 photograph kindly sent us for acceptance by Mr. R. Lang Sims, of 437, Brixton Road, London, S.W. The negative was specially taken by Mr. Lang Sims, on the 20th ult. It is old history now that these Royal symbols were not called into use on the day appointed and so long looked for; but the photograph of them does not, perhaps, lose in interest on that account. The Coronation of the King is only postponed, and many of our readers will, no doubt, wish to possess a print, from an original negative, of these historic symbols of British Sovereignty.

Commercial & Legal Intelligence

AUTOMATIC Views, Ltd.—In the Chancery Division of the High Court, before Mr. Justice Farwell, a petition was heard from W. and J. George, Ltd., and others, for whom Mr. Ashton Cross appeared, asking for a compulsory winding-up order. The Company was registered in May, 1901, but the petitioners had not been able to find out how much share capital had been issued. There was a balance of £150 in the managing director's hands, and the Company possessed a valuable contract with the London and South-Western Railway for putting machines on their stations. Mr. Martelli appeared for the Company, and his Lordship made a compulsory winding-up order.

AT Devonshire Assizes, at Exeter, on Monday, before Mr. Justice Bigham, the action was tried of E. J. Murray v. F. Kitto, the question in dispute being as to alleged fraudulent misrepresentation in the sale of a business. Mr. J. A. Foote, K.C., and Mr. Ward Coldridge were for the plaintiff gave £600 for stock, goodwill, and fixtures. It was alleged defendant. The plaintiff was formerly a grocer and an amateur photographer, of Bath. The defendant has for eighteen years carried on the business of a photographer at Torquay. He offered his business for sale through a London paper. The parties corresponded, and eventually the plaintiff gave £600 for stock, goodwill, and fixtures. It was alleged that the defendant misrepresented that his takings were £700 a year, that he had taken as much as £1,000 a year, and that his profits were £400 per annum. The plaintiff did not take in his first twelve months £100, and he suggested that the defendant had "cooked" his books. His lordship summed up strongly in favour of the defendant, and said he did not believe he intended to cheat. He gave the plaintiff a rough estimate of his business, but it had fallen off since, owing to the plaintiff not being so expert in his methods as the defendant. Without leaving the box, the jury found for the defendant Kitto, with costs.

The case of Kodak, Ltd., v. the London Stereoscopic Company, came before Mr. Farwell, it being a motion by the plaintiffs, who are bringing a dozen different actions against various persons, for an interim injunction to restrain the sale of films identified as the plaintiffs' goods. The defence was that the names under which the films are sold merely indicate the sizes, and do not necessarily imply that they are the plaintiffs' goods. Messrs. Houghton are one set of defendants and the London Stereoscopic Company another set. The suggestion having been made that this action should be transferred for hearing by the same judge as was hearing the other actions (Mr. Justice Buckley), his Lordship, when the matter was mentioned to him last week, directed it to stand over and he would see what could be done. Mr. Fletcher Moulton, K.C. (with whom was Mr. D. M. Kerly) for the plaintiffs, now said that the parties were agreed that there was a question to be tried, and he had agreed with his friend, Mr. Upjohn, K.C., that he would deliver statement of claim that day, statement of defence to be given by the end of the following week. He asked now that his Lordship might give them a date for trial before the Long Vacation. His Lordship expressed the difficulty he had in doing that, seeing that Mr. Upjohn had asked him already to try 159 actions arising out of the formation of the Panuco Copper Company. He would, however, bear the application in mind, and he directed counsel to mention the matter to him again as soon as they were ready.

A Sad Case of Suicide.—Mr. Walter Schroder, Deputy-Coroner for Central London, held an inquest at the Islington Coroner's Court concerning the death of Herbert Thomas Archer Pridham, aged 34 years, a photographer, lately residing at 214, Seven Sisters Road, Finsbury Park, who committed suicide by poisoning himself. Mrs. Alice Pridham, the widow, stated that deceased, who was in business as a photographer, had enjoyed fairly good health. On Saturday last she went into the country on a visit to some friends, leaving deceased at home. He was then depressed, having been worried about his business, which was not paying. On Friday she received a telegram, and on returning home found that he was dead. He had never threatened his life. They had notice to quit the premises on Tuesday next, and this troubled him, because he could not pay the rent. Besides, he had borrowed money for the purpose of starting the business. He was a most sensitive man, and easily upset. John Gourley Stacy, of 214, Seven Sisters Road, a commission agent, stated that he knew that deceased had been worried about his not being able to pay the rent of the studio owing to business being bad. On Monday he saw him, when he was very down-hearted, and he complained that the weather was so much against him, and also that the landlord had told him he must leave the premises. On Wednesday he heard deceased walking about his room and talking to himself, and witness, becoming nervous, left the house. On going back at two o'clock on Friday morning he saw a piece of paper upon which was written:—"You will find my body upstairs." He called a neighbour and the police, and on going into deceased's room found him lying on the bed dead. Inspector William Smith of the O Division stated that he was called to the house, and found the deceased dead on the bed. He was fully dressed. There was a tumbler on the dressing table. Police-Sergeant Alfred Glover, 304 O, gave confirmatory evidence, adding that he found on the clothing six pawn tickets. Dr. Michael Joseph Bulger, divisional police surgeon of the Y Division, stated that he found the deceased had been dead for 24 hours. He was lying in a peaceful manner in the bed, his arms being folded across his chest. Witness had since made a post-mortem examination of the body of the deceased, and found in the stomach some brown fluid smelling strongly of cyanide of potassium. Death was clearly due to poisoning by cyanide of potassium. The widow (recalled) stated that deceased had of late years been giving way to drink owing to his worry. The jury returned a verdict—"That the deceased committed suicide whilst of unsound mind."

"Improving" an A.R.A.'s Picture—Polak v. Bailey (Smith third party).—Recently, before Mr. Justice Darling, an action was brought by Mr. E. Polak against Mr. William Bailey to recover the amount of a bill which had been given by the defendant for a picture by Mr. Wyllie, A.R.A. The defendant alleged that he was entitled to recover the amount from Mr. Sidney Smith, picture dealer, Waterloo Road, to whom the picture had been entrusted for sale. Mr. C. L. Attenborough appeared for the plaintiff, while Mr Hugh Fraser represented the defendant. The third party appeared in person. Mr. Sidney Smith, the third party, stated that he drew the bill in question, which was accepted by Mr. Bailey as the result of an agreement. The agreement stated that the bill was given in respect of the sale by the plaintiff of a painting by W. L. Wyllie, A.R.A., and that the painting was to be worked on by Mr. C. Smith If the painting was sold for more than the amount of the bill the difference was to be divided between him and Mr. Bailey. In the event of the painting not being sold, witness agreed to meet the bill at maturity. Mr. C. Smith, who was to work on the picture, was a relative of his, and an artist. The painting, which was purchased at Christie's in December last by Mr. Polak, was handed to him on sale or return. Mr. Justice Darling: What was this painting? Witness: It was a sketch.—When was it painted? I should say about twenty years ago, at least.—What was your relative to do to it? The agreement was that I was to get him to touch up the picture. When purchased there was a flash of lightning in the sky, which interfered with the sale of the picture. I took it to Mr. Wyllie to finish it, and he said it would take him as long to finish it as it would to paint another picture. I therefore got an artist to paint over the lightning.—Was it your relative who did that? Yes.—What else was to be done? It was to be further worked on, but my relative refused to do it.—Were you going to put something in instead of the lightning—a rainbow, for instance? (Laughter.) No. There was a dark star and a flash of lightning which have been covered by a few strokes of the brush. (Laughter.)—What was your relative to do—put in some ships? A few touches by an artist would do what is necessary.—Was your relative to put his name on it? No; it still bears Mr. Wyllie's name.—Then he was not to sign it as Wyllie, Smith, and Co.? (Laughter.) No.—If your relative had worked on it, it would still have been a picture by Mr. Wyllie, A.R.A.? If he had put further boats or figures in it would have been the work of two men. But my relative would not do it.—Why? Because he does not consider himself justified in doing it.—It may seem very idle curiosity, but is there much of this thing done? Very little, I believe.—Mr. Attenborough: It is not every picture that has lightning in it. (Laughter.)—Mr. Justice Darling: But people who can paint out lightning and put in ships can do other things.—Witness: Whatever was done to this picture I intended to send it round to Mr. Wyllie and show him.—Mr. Justice Darling: Did Mr. Polak know of this agreement between you and Mr. Bailey? Witness: No; there has been no attempt to sell the picture as a finished work by Mr. Wyllie. That artist would charge me 150gs. for a finished work of that size. With a little "turps" I can in five minutes take the paint off the lightning. (Laughter.)—Then if anyone cares to have this sketch by Mr. Wyllie he can have it with or without lightning? (Laughter.) There must be judgment for the plaintiff for the amount of the bill (£25), with costs on the High Court scale, against the defendant, and judgment for the defendant against Mr. Smith, the third party. There will be no costs as between Mr. Bailey and Mr. Smith, as the transaction between them was not one to commend itself to me. I do not like people who enter into partnership to paint out lightning in other people's pictures.—Mr. Smith said the matter could be easily cleared up with Mr. Wyllie.—Mr. Justice Darling: Yes, you can easily put the lightning back.—The "Morning Post."

News and Notes.

Photographic Convention of the United Kingdom: Cambridge Meeting.—Mr. Howard Farmer has promised to contribute a paper entitled "Clerk Maxwell's Gift to Photography," and is hoping to be able to illustrate it with a reproduction of the well-known portrait of Professor Clerk Maxwell, which hangs in Trinity Hall, Cambridge.

Selection of Subject.—The walls of two photographic exhibitions are covered annually with examples of well-produced photographs, but among these it is rare to find anything that shows substantial artistic training. This is to be deplored, since fleeting forms of beauty can be seized by the camera in a way denied to the painter—bewildered by rapidly changing expression. And more, for Nature not infrequently casts a picture, totally harmonious, faultlessly composed, and which is sometimes as pleasing in monochrome reproduction as in the doubtful hues imposed by some artists.—"Knowledge."

The Kodak Company is now holding an exhibition at its branch depot, Strand, W.C., which, although it does not appeal so directly to users of Kodak cameras and photographers generally as other exhibitions held in the same place, is, nevertheless, interesting and appropriate to the present time, when Royal personages are so much centres of attraction. The exhibition consists of enlarged photographs of the reigning European sovereigns, and other members of the Royal houses, but there is also a capital series of enlarged Kodak pictures of the recent Coronation ceremonies of the young King of Spain, and an equally interesting collection of photographs taken during the Prince of Wales's Colonial tour

Loan Exhibition of Engraving and Etching.—The following are the regulations for the Exhibition of Engraving and Etching, which the Board of Education have decided, at the suggestion of the council of the Society of Arts, to hold, during the early part of next year, in the Victoria and Albert Museum, South Kensington:—(1) The exhibition will consist of examples, both old and modern, of copper and steel engraving—line, mezzotint, and stipple (plain and coloured); aquatint; and etching (2) The exhibition will be confined to works specially invited (3) All exhibits contributed unframed will be framed by the authorities. (4) The exhibition will be opened at the early part of the year 1903, and will remain open about three months. All works should be sent in not later than November 15th, 1902. (5) Every care will be taken of all works sent for exhibition, but the authorities of the museum will not be responsible for any loss or damage. (6) All works to be sent to the Storekeeper, Board of Education, South Kensington, S.W., and all communications to be addressed to the Secretary, Exhibition of Engraving and Etching, Board of Education, South Kensington, S.W.—"Journal of the Society of Arts."

Messrs. Doubleday, Page, and Co., publishers, 34, Union Square, New York, write:—"'The Moon.'—We have in contemplation the issuance of a work of unusual interest to all astronomical workers and students—'The Moon,' by Professor William H. Pickering, of Harvard College Observatory. It will give a clear account of the planet's origin, and will sum up all the existing knowledge regarding it. The book will treat briefly of lunar superstitions, myths, and fancies, and give a short history of lunar research up to the present time. Perhaps its most notable feature will be a complete lunar photographic atlas, showing the whole moon at five different ages—in short, five complete atlases of

the moon in one. The atlas will consist of about 100 plates, and is the only complete photographic atlas of the moon in existence. The changes in the appearance of the surface with the age of the moon are very striking—so much so that in some cases the region is hardly recognisable. With the atlas will be published a photographic map and key-map to the moon, the latter giving the names of all the formations, and the former their exact shapes, latitudes, and longitudes. These last have been determined now for the first time by photographic processes for the whole moon, and the results are accordingly far more accurate than anything heretofore published."

THE Dangers of Telephotography.—The following amusing reference to the peculiar powers of telephotography appears in a recent issue of the "Australian Photographic Review":—"Most of our readers may know that there is such a thing as telephoto-photography, and they may be aware of the fact that by simply attaching what seems to be another lens to the camera, the photographer is now enabled to bring distant objects within range of the glass. Just as we can see through the telescope distant objects brought apparently within our reach, so the camera, with this additional lens, can see and reproduce objects that were hardly visible to the unaided sight. However, the general public evidently know nothing of this new method of making pictures. A very amusing incident, showing the dangers of telescopic photography, came under our notice last week. A picnic party on the Blue Mountains, out for a day's pleasure, after a time missed two of their number, who had wandered 'a wee' on their own account, to have a little time of their own. The cameraist was led to believe he saw the lovers comfortably seated on a jutting rock, at some distance. After adjusting his telephoto lens, to his delight he focussed the wanderers, and secured a tell-tale picture, which would at any time prove a most damaging line of evidence in a subsequent breach of promise case. Picnic parties should beware of telephoto lenses."

ASTRONOMY Without a Telescope.—Mr. E. Walter Maunder writes in "Knowledge" of the interest awakened by the discovery of new stars: "The appearance of a 'new star' has, in all ages, been felt to be an impressive occurrence. The constellation groupings are so permanent in their character that to see of a sudden some old familiar pattern amongst the stars changed in its features by the sudden appearance of a new member—a star like the other stars and not a planet, for its place undergoes no change—is so at variance with our ordinary experience that it is no wonder that our forefathers regarded such an event as partaking of the supernatural. In the times before the telescope—indeed, we might go further, and say in the times before the spectroscope—such an event brought no information with it. It was impressive, it excited curiosity, but it conveyed scarcely any lesson. The spectroscopic examination of 'new stars,' on the other hand, has been extraordinarily fruitful, though we are very far as yet from being able to fathom the exact meaning of the facts which we have observed. One thing is clear, namely, that bodies appearing so suddenly as 'new stars' have always done, and fading away again so quickly, must differ entirely from the great host of permanent stars. And yet we cannot but feel that the changes through which a 'new star' may pass in a few weeks, and the order in which those changes succeed each other, may throw much light upon the changes which have marked in the past, or will mark in the future, the life-history of the more stable members of the heavenly host. It is this thought which makes the watch for 'new stars' of such importance. They offer to us a key, which, however imperfect, is the only one which we can hope to find to unlock the secrets of stellar evolution. And that the 'new star' may give us the fullest information within its power it is essential that it be subjected to the scrutiny of the spectroscope whilst its light is still on the increase. The importance, therefore, of a stringent watch on the heavens does not lie at all in the *éclat* which will justly attach to the observer who is fortunate enough to be the first to detect a stellar outburst, but in the supreme importance that not one of the few short hours during which the star's light is on the upgrade may be unnecessarily wasted. The most famous of all 'new stars' is, of course, the one which appeared in the constellation Cassiopeia in November, 1572, and which is always associated with the name of Tycho Brahe, since, though he was not actually the first to discover it, he has left us the fullest and most systematic observations of it. It was lost to sight in March, 1574, after having been visible for seventeen months. Thirty years later another 'new star' appeared, only less famous than the Nova of Cassiopeia. This one was also observed for seventeen months, and is always associated with the name of Kepler, though its actual discoverer was not Kepler himself, but one of his pupils, John Bronowski. Its position was in the right foot of Ophiuchus."

THE Imperial Coronation Bazaar.—"What will you do if it rain?" Such is the remark people generally make on hearing that the Imperial Coronation Bazaar, to be opened by the Queen, on July 10th, is to be held in the Royal Botanical Gardens. The answer is that the first aim of the design has been to avoid all risk of weather, either from rain or extreme heat. This has been obtained by erecting along the whole length of the broad walk a series of white Venetian masts, and fixing to them on either side of the walk, at a height of 25ft., a lean-to awning covering in 25ft. of the grass. The stalls are erected under this at its lowest point, which is naturally the side farthest away from the broad walk; it will thus be seen that in front of the whole of the stalls there is a covered walk, whilst the broad walk being kept uncovered ensures the bazaar being free from the excessive closeness of a marquee. The truly awful erection of broomsticks covered with so-called "art muslin" that one frequently sees erected for bazaar-stalls has induced me to design the stalls in a simple manner with square green latticework, each stallholder covering her trelliswork with a different flowering creeper, the result being that the bazaar will more resemble an old English trellis-garden than a bazaar. The stereotyped gilt spear-heads and bannerets that are commonly associated with the tops of Venetian masts have been abolished, and a novel form of capping and banneret substituted. Attached to each mast will be a large, flat, iron hoop, ornamented with a copper heart; and evergreen wreathing, illuminated by many thousands of electric lights, will be festooned from mast to mast and from mast to stall. The amount of wreathing to be used would extend to four times the length of Canterbury Cathedral. The extraordinary interest shown in the bazaar and the promise of Queen Alexandra gracing it by her presence make the responsibility of providing sufficient space very great, in order to avoid the unseemly crush that is invariably associated with our big bazaars. It will, however, be seen that this danger has been avoided when it is stated that the bazaar buildings cover an area of nearly 150,000 square feet—a space, it is believed, more than twice the size occupied by any bazaar held in this or any other country, and nearly three times the area of S. Peter's, Rome. The great forecourt, which is situated in the centre of the bazaar, and in which will be found the bandstand, the American Court, and the Court of the Five Arches, is in itself larger than the arena of Olympia, and nearly half as large again as the Albert Hall, taking the area on the box-level. An idea of the quantity of canvas which will be used may be gathered by the fact that no less than 107,480 square feet of it will be in use, which is enough to cover the area of S. Paul's Cathedral eleven-and-a-half times. The amount of lathing required for the trelliswork is also very large, and it would, if placed on end, reach a height of thirty-seven times that of S. Paul's Cathedral. On either side of the entrance to the bazaar will be found the administrative buildings, built after the style of old cottages, and consisting of police, fire, ambulance, parcel and post offices, bank, press bureau, cloak-rooms, and the private offices. Friends of the Hospital for Sick Children and supporters of the bazaar will doubtless be glad to hear that, notwithstanding the vastness of the work, its cost will be much less than the amount frequently spent on the stalls and decorations of bazaars of considerably smaller dimensions.

CONWAY Castle in Danger.—Mr. C. H. Bothamley addressed the following letter to "The Times" of June 28th:—"I beg to be allowed to call attention to a danger which at present threatens one of the most interesting parts of the ancient castle at Conway, hitherto one of the most valuable of medieval relics, partly by reason of its intrinsic interest, and partly because it has in the past escaped the devastation of the restorer and rebuilder. Unfortunately, unless active steps are taken in its interests, it will no longer enjoy this good fortune. The Town Council of Conway, with, it is stated, the approval of a public meeting, has decided to celebrate the Coronation of his Majesty the King by 'restoring' what is called the Queen's, or Eleanor's, tower in the castle. This is the north-east tower, which contains on one floor the well-known oratory with its attached side-chambers, and, on the floor above, the great fireplace and window recess of an apartment of unusual magnificence for its date and position. In general character and arrangements this tower is in fact unique amongst the many remains of medieval military architecture in this country. A public appeal has been made for subscriptions with a view to raise the sum of £500, which it is estimated the proposed restoration will cost; and it is obvious that with such a sum a great amount of mischief may be done. In support of this appeal it is urged that the tower is of national interest, and that it has fallen into a very ruinous condition. The first statement is certainly true, but provides the strongest argument in favour of keeping the tower as nearly as possible in its original condition; the second statement is also true, if it means that the ornamental detail of the oratory has practically all perished, but is open to great doubt if it is intended to refer to the fabric of the tower. Probably some pointing and, perhaps, some grouting would be advantageous; but both internally and externally the tower itself seems to be quite sound, some repairs that were necessary in the interior having recently been well carried out by Mr. De la Motte, the borough engineer and surveyor. I submit that anything beyond the work necessary to ensure stability would be sheer vandalism, and would destroy for ever the great interest which now attaches to this tower. I was unable to ascertain in Conway exactly what it is proposed to do, and I gathered that no definite scheme had been framed a few weeks ago; but it will illustrate the kind of thing that may happen if I say that one of the proposals that have been discussed was to put into the tower a floor and a roof, so as to provide a shelter room for trippers! Fortunately, this proposal met with much opposition. It is still true that 'the castle and town of Conway form together the most complete and best-preserved example of medieval and military architecture in Britain': but it will not be denied that the castle owes very much of its attraction and interest to the fact that, so far, it has not been disfigured by unnecessary rebuilding, nor by the erection of accommodation for trippers, which make such eyesores at other places of the same kind. It is with a desire to prevent any such misfortune that I venture to call attention to what it is proposed to do, and to express a hope that not only may the appeal for subscriptions for this purpose meet with no response, but that sufficient influence may be brought to bear on those concerned to lead to the abandonment of the proposal and the adoption or some other method of celebrating the chief event of the year. To do irreparable injury to the grandest monument of Edward I. would surely be a most unfortunate way of attempting to do honour to Edward VII."

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

ORGANIC DEVELOPERS.

To the Editors.

Gentlemen,—If you care to put your correspondent, Charles Macgregor, in communication with me, I think I can help him in his work. I scarcely wonder that the para-amidophenol was impure if he evaporated a solution in water to small bulk. A simpler course would have been to extract the free base with ether. Organic developers, however, are by no means easy things to prepare, even after a good deal of practice in organic preparations, owing to the extreme ease with which they are oxidised.—I am, yours, etc.,

C. E. Kenneth Mees.

Rylands, Caterham, Surrey, June 21, 1902.

THE SUN AND MOON NEAR THE HORIZON.

To the Editors.

Gentlemen,—If Mr. Kollmorgen's theory were sound, it is evident that two round discs of the same size would exhibit an apparent difference when placed one high up on the wall and one at the eye level, which latter position is equivalent to the position of sun or moon at the horizon. If your correspondent will try this experiment, he will at once see that no such difference of size is apparent.

Unquestionably the illusion is due to the error of judgment in comparing the sun or moon with terrestrial objects at a distance. The reason why the phenomenon is not so apparent if we look at sun or moon when high in the heavens, through trees or across roofs, is obviously because the trees and roofs are not, under such circumstances, at any great distance. It is only when terrestrial objects, reduced in size by their distance, are seen in apparent proximity to sun or moon, that its disc of unvarying size appears large, habit leading us instinctive'y to expect that, like the distant trees, etc., it too should appear smaller on the horizon.

Charles E. Benham.

Colchester, June 23, 1902.

"CAMERA NOTES."

To the Editors.

Gentlemen,—By order of the Board of Trustees, I am directed to notify the subscribers and advertisers that "Camera Notes" will be published quarterly, as heretofore, and at the same price, $3.00, per annum, or $1.00 per number. The magazine will be edited and managed by Mr. J. C. Abel, who succeeds Mr. Stieglitz. The form of "Camera Notes" and its previous high standard will be fully maintained.

H. B. Hart,
Secretary.

Camera Club, Three West Twenty-ninth Street,
New York, June 5, 1902.

REMOVING RUST FROM STEEL.

To the Editors.

Gentlemen,—With reference to the query of S. Morris, in your issue last received, I would point out that nothing is easier than to remove rust from steel, if the article is of simple construction, or can be taken to pieces.

It is only necessary to have a saucepan of boiling water and to throw the pieces of the article in: the rust will detach itself, as also will thick oil, and can be easily removed, if slightly attached when the pieces are cool. They should be removed from the water while boiling, and will dry themselves (if slightly wiped) without further trouble.

The principle involved is that the rust and steel expand at very different rates, and the sudden rise of temperature facilitates separation. Of course, polish can only be restored by a process such as originally produced it, but I have found this plan succeed perfectly with gunlocks, etc., though it is many years since I had occasion to employ it.—I am, yours faithfully, J. F. T.

June 27th, 1902.

PORTRAITURE BY INCANDESCENT LIGHT.

To the Editors.

Gentlemen,—I see "E. W. B." inquires in the "Answers to Correspondents" column, for a method of taking portraits at night by incandescent light. If that gentleman cares to communicate with me I should be pleased to forward him a description of a simple arrangement designed by myself and worked very successfuly during the past winter months. The accompanying rough specimen of an ordinary cabinet vignette head was taken with it, and received the same exposure as all—viz., 10 seconds.—I am, dear Sirs, yours faithfully,

Fred Stanley.

Helios Studio, Cotton Road, Nuneaton.
June 27th, 1902.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY, 24, *Wellington-street, Strand, London, W.C.*" *Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

PHOTOGRAPH REGISTERED:—

H. C. Visick, 77, Whiteladies' Road, Clifton. *Photograph of H. R. H. Duke of Connaught with Others and Motor-Car.*

TRICOLOUR PHOTOGRAPHY (E. J. Golding).—The criticism referred to a specimen print published in a catalogue, and labelled as we described. We obviously cannot give the producer's name. He might object, and would possibly try and spell "label" with an "i."

BOOKS WANTED.—G. O'CONNOR writes: "Please recommend me some books on negative retouching, and give publisher's name. I do not see any books on this subject advertised."—In reply: "The Art of Retouching," by Robt. Johnson, published by Marion and Co., Soho Square.

PYRO STAINS.—"FINGER" writes: "Please tell me the simplest and best way to remove pyro stains from the hands."—In reply: Pyro stains, if they are deep, are not easy of removal. Rub them well with chloride of lime moistened with water; rinse the hands, and apply a little very dilute hydrochloric acid.

BACKING.—G. R. writes: "Will you favour me with a good recipe for backing plates, either fluid or paste?"—In reply: The following is an excellent backing:—Gum solution (office gum will do), 1 part; caramel, 1 part; burnt sienna (ground in water), 2 parts; mix, and add methylated spirit, 2 parts. "Solaraxe" is also an excellent backing. It is sold by Messrs. Fuerst Bros., Philpot Lane, E.C.

PHOTOGRAPHING MACHINERY.—"ISO" writes: "As I have some machinery to photograph which is painted emerald green, and wish it to print much lighter—over-corrected, if possible—if you would give me a hint or two I should feel obliged."—In reply: You should have no difficulty in the work if you employ isochromatic plates. If you wish the machinery to be very much lighter, we should recommend you to have it flaked in a light grey colour, and then clean off the flatting with turpentine after you have secured the negative.

PHOTOGRAPHY IN SOUTH AFRICA.—R. W. LEONARD, of Foxton, Gloucester Road, Cheltenham, writes: "Would it be against your principle to furnish me with the address of 'R. W. B.,' who in the Journal asks for information regarding an opening in South Africa for photographers? My only object in asking this favour is that I am very anxious to go out there as operator or general assistant, and thought, perhaps, there would be an opening with him."—In reply: Perhaps "R. W. B." will communicate direct with Mr. Leonard.

INSOLUBILISING GELATINO CHLORIDE.—J. B. writes: "Please do me the favour of telling me, through the medium of your paper, the following:—How to make gelatine paper quite insoluble after being toned in a combined bath containing sufficient alum and washed with ice-cold water, and yet as soon as the fingers touch the surface

the gelatine dissolves. Any suggestion would oblige."—In reply: The paper you are using must be prepared with an exceptionally soluble kind of gelatine, if it remains so soft after being toned in a bath containing alum. We would suggest that you immerse the prints in a solution of alum, and then thoroughly wash them before toning.

VARIOUS QUERIES.—S. F. writes: "Having several times received valuable information from your paper, I should be pleased if you would give me a little assistance on the following questions:—(1) Where can I find out the exact colours of the King's and Queen's crowns, also jewels and orders of same? (2) Is 'Sola' an American printing paper? How is it made, and can it be procured in England?"—In reply: (1) We are sorry we cannot tell. We have an idea, however, that we have recently seen in something a full description of the crowns. Perhaps some reader may assist our correspondent. (2) We do not know the paper, or, at least, under that name; hence we can give no idea as to how it is made.

STUDIO BUILDING.—"SOLAR" writes: "(1) I have seen what I consider an excellent site for the erection of studio, but shall be compelled to adopt a south light. Should I find this very difficult to handle? (2) If not, would the fluted or ribbed glass be a satisfactory medium for stopping the glare of the sun? Or the suggestion of a better substitute would be valued."—In reply: (1) You will find a south light a little difficult to work at first, or till you get used to it. With a south light you will be able to obtain effects that it would be difficult to obtain in any other. The late Mr. Valentine Blanchard and the late Mr. Adam Salaman gave preference to a south light. (2) We should prefer to have the studio glazed with ground glass.

CINEMATOGRAPHY.—"ANIMATION" writes: "I am enclosing you a print from a cinematograph film taken with a Wray lens working at f/5-6. As this is fully exposed, but does not seem quite sharp, would it be permissible to use the other stop which the lens is provided with—f/11? Do you think, this time of the year, that the film would be fully exposed if this stop was used? This is my first experience in taking these animated photos, and I am taking a procession here on Coronation Day, and want the same to be a success."—In reply: So far as we can judge from the prints, the lens is not properly focussed. They would, doubtless, have been much sharper had they been in focus. As regards the f/11 stop and sufficient exposure, that will, of course, depend upon the rapidity of the films used and the rate at which the apparatus is worked. Why not make an experimental trial?

PRINTING DIFFICULTIES.—"NEMO" writes: "Could you kindly advise me about the following difficulties? (1) We are using C.C. paper, and at times experience great trouble in getting them to tone evenly. They not only take a very long time to tone, but the prints look poor and lifeless, and this with the bath that is always used, and which at other times gives such beautiful prints. Could you suggest a method which would guarantee uniform results? (2) Could you suggest the cause of rusty stains which appear on some of our P.O.P. prints? (3) What is the cause of platinotype paper being grainy, and marks resembling white splashes? Could this be avoided, notwithstanding the weather?"—In reply: (1) We can only suggest that the same conditions be fulfilled at all times, as when the satisfactory tones are obtained then uniform results will be secured. It is impossible for us to indicate, without seeing the manipulation carried out, where the fault lies. (2) Not beyond saying that they are due to faulty manipulation. (3) This query is really answered by the reply to No. 2. Probably the trouble is due to scum or the developing bath.

BLUE PRINTING.—F. E. C. writes: "(1) I am engaged in an engineer's works as blue printer, etc., and have frequently to do large prints of black lines on white ground, and have great trouble in getting same, owing to not being able to examine them during the printing, my frame being simply two sheets of plate glass, one on the other; and I frequently find, when using extra thick paper, the lines are broken and not sharp. (2) I have also a Hall's patent electric lamp, but find it, too, useless, as it is impossible to open it for inspection during exposure; and, having to move the light up and down, I get very unsatisfactory prints, the light not covering uniformly. Can you kindly explain how I can remedy this, my trouble and annoyance, and oblige?"—In reply: (1) We should say that the paper is not pressed evenly in contact while printing. Place a piece of thick, soft felt at the back of the paper. If you cannot sufficiently judge the exposure from the margins of the paper, we should advise you to use an actinometer, such as is employed in carbon printing, though this is not found necessary by experienced workers. (2) If the lamp is rightly used, the illumination will be even. See that it traverses the full length of the cylinder.

HOURS OF LABOUR.—"CORONATION DIFFICULTY" writes: "A certain photographic publishing firm in the W. district of London, whose hours of business are from 8 till 7—except Wednesday, when we leave at 6 o'clock, and Saturday 1 o'clock—in the first instance decided to let us have Friday and Thursday afternoon, but said that we were to work until 8 o'clock every night till Thursday, namely, one hour Monday, Tuesday one hour, and Wednesday two hours extra, making four hours extra, so that in reality we should be only getting Friday and one hour extra, and some of us were satisfied fairly well; but some objected to working until 8 o'clock every night, so the manager has cancelled what he first said, and is not giving us a holiday at all. Now, in the first place (1) Did the King proclaim a two days' holiday? (2) Can it be enforced, or does it rest with the employer whether he feels disposed to give a holiday or not? (3) Can he alter or enforce extra hours above the usual time? or (4) can the employee lawfully refuse to work the extra hours unless he likes? (5) Can the firm stop our pay if we stop away during those two or one of those two days?"—In reply: (1) The King proclaimed two days' holidays for banks. (2) With the employer as to whether he pays or not. (3) In factories the hours are limited from 8 till 8 o'clock every day but Saturday. (4) He can leave if the hours do not suit him, of course. (5) The employer can, as a matter of course, stop wages if the employee stops away. You do not seem to realise that employers can fix their hours of work as they like, so that they do not infringe the Factory Acts.

STUDIO BUILDING.—"SEMPER FIDELIS" writes: "I am about to build a new studio, and I should be much obliged if you will give me advice under the following circumstances:—The space at my command is as follows:—25ft. long east to west, and 10ft. 9in. north to south. The west end is the end of a house. I intend running up a 4½in. brick wall the full length, viz., 25ft.. on the south side, and I want to know what height I must build up. The form of studio will be of the lean-to design. I also want to know what height I must build my front or north framework to take the roof, which I want at the proper angle, viz., 62deg. 30m. On the north side the light is uninterrupted but for a wall which stands 9ft. high. I enclose sketch of ground-plan with position of the 9ft. wall and house. What will be the width of the top lights required, and height and width of the north front light, and would painting the 9ft. wall (at present standing on the north side) a good white act as a reflector? I shall be glad of any criticism on the above, as I have been a reader of your valuable paper for a long time."—In reply: If the 9ft.-high wall on the north side is as near to the proposed studio as is indicated in the sketch, you will have practically no side light at all. Painting the wall white will scarcely help matters. You will practically have only a top light. We are, of course, assuming that the wall is as shown in the sketch. If we are right in our surmise, we should prefer to have a south light, if that is unobstructed. We should suggest that you reconsider the matter, and get Bolas' book on studio building, published by Marion and Co.

*** NOTICE TO THE TRADE, WHOLESALE AGENTS AND BOOKSELLERS.—*A Contents Bill is issued with each number of the* JOURNAL, *and copies may be had on application to the Publishers.*

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*** *The Editor can only be seen by appointment.*

*** *We do not undertake to answer letters by post.*

EX CATHEDRA.

The Law of Copyright. The French Courts have recently had to adjudicate in a case of photographic copyright, which may not be without interest to some English photographers. Mlle. Marie Linnartz, who is known professionally as Mlle. Sidney, has sued a photographic firm for unauthorised publication of post-cards bearing her portrait in the style of "poses plastiques," much to her annoyance, as well as her detriment as an artist. The defence set up was that Mlle. Linnartz had toured through France and various foreign countries as a trapeze performer and quick-change artist. She had been photographed in Berlin, and as post-cards are not recognised as works of art, and therefore not protected by German law, it was contended that they might be sold in France without permission of the sitter. We are glad to see that the French Courts have decided in favour of Mlle. Linnartz. The negatives and photographic stones are to be given up, and the defendants are also condemned in costs and f.100 damages. But for the fact that the defendants had exerted themselves to withdraw the post-cards from circulation as soon as objection was made, the damages would have been assessed at a much higher amount.

* * *

On Flicker. As we need scarcely observe, one of the great drawbacks to many cinematographic displays is the irritating flicker of the image, or succession of images, on the screen. In a general way, the cause of this is known; but Mr. T. C. Porter, M.A., in a paper communicated to the Royal Society by Lord Rayleigh, and entitled "Contribution to the Study of Flicker," has treated the subject of flicker—not necessarily cinematographic flicker—from a scientific standpoint, and has evolved a formula indicating the amount of flicker according to the intervals of the illumination and the rapidity of succession of certain experimental dark and light objects. The method adopted was to cause the rotation of a black disc with a white sector, and to count the number of rotations per second requisite in order that the sensation of flicker may just vanish. It was also shown that the number of rotations was unaffected by the wave frequency of the colour employed when the disc was placed in the different colours of the same spectrum, the intensity of the light being the sole acting factor. The concluding portion of Mr. Porter's contribution showed the relative intensity of the various portions of the same spectrum, as shown by the results we have mentioned, and—within the limits of experimental error—it showed that the curve of intensity coincident with the curve of expressing the same fact given by Vierordt, and obtained by him, Sir W. Abney, and others, is an entirely different method.

* * *

The German Patent Office. Some very interesting statistics are given in the "Central Zeitung für Optik und Mechanik" concerning the work of the German Patent Office last year. The scrutiny to which patent specifications are subject in Germany is probably the most searching of any, but notwithstanding this fact, which must add considerably to the expenses of the office, a nett profit of about £150,000 was made. The total receipts amounted to £278,000, and the expenses to £128,000. Of the patentees 4,212 were German, of which 1,198 were resident in Berlin, 739 in Saxony, 578 in Bavaria, 192 in Hamburg, 185 in Wurtemberg, 177 in Baden, 131 in Hessen, 98 in Brunswick, and 85 in Alsace and Lorraine. It is remarkable that the percentage of successful applicants was larger among those of foreign nationality, and this is attributed to previous examination of the specifications by other patent offices. Thus the United States is credited with 63 per cent., England 55 per cent., Switzerland 54 per cent., Sweden and Norway 53 per cent., France 51 per cent., and Austria-Hungary 46 per cent. Opposition was offered against 1,711 applications, but was only successful against 27 per cent., and only in less than half of these cases was the patent refused. At the end of the year there were still 22,880 specifications under consideration, so that the German Patent Office is nearly a year behind its work. A German patent gives 15 years' protection, but there were only 1,090 patents in their last year of life, and not one of these related to hydraulics or rope-making. We may add

that very considerable hardship is sometimes the result of the slowness of the German Patent Office in granting patents.

* * *

Copal. This resin forms the great "stand-by" of the coach-builder, varnish made from it being the basis of that beautiful glass-like and apparently everlasting coating that makes a well-finished carriage so attractive. It is often suggested that such a varnish ought to be suitable for photographic purposes, but it should be known that the gloss is produced not by the mere act of laying on a coat of varnish, but by putting coating upon coating and rubbing down and smoothing each coat before its successor is laid on. Then, again, these varnishes contain oil as well as copal, and the solvent is turpentine, and not alcohol. If a pure alcoholic solution of copal, as has been suggested, were tried for varnishing negatives, we opine that, though it might be an excellent damp resistant, it would be too soft in hot weather. The best copal will actually melt at a temperature little above that of boiling water. Then, again, this resin is not a simple one ; it is a mixture of several, each of which has its own melting point, some lower than boiling water. If, however, it be desired to experiment with copal, it may be mentioned that if powdered and exposed to air it appears to absorb oxygen and become more soluble in alcohol. This resin varies to a great extent in quality. Of two samples recently analysed by MM. Jschirch and Koch, as narrated in the Archives of Pharmacy, Paris, one was comparatively soft, easily soluble in alcohol, and melted at 115 deg. C. ; the other was only partially soluble in alcohol, was comparatively hard, and melted at 120 deg. In many other respects the samples varied greatly, so that definite statements as to the qualities of copal are not possible. So far as our own experiments go, we have not found any resin to equal shellac as a basis for photographic varnishes.

* * *

Reflection of a Rainbow. The old question, whether a rainbow can be reflected in a sheet of water or not, has been raised in a scientific contemporary, and at first sight would seem to be one that could be easily settled by a photographic test, but that the true inwardness of the argument would not be reached by such a test might be argued. After Tyndall's wonderful lectures on light were first given in America they were published in book form in this country, and an incautiously-worded paragraph of his gave rise to no little discussion at the time—about thirty years ago. Omitting the argument upon which he founded his conclusions, we find him writing: "Hence, though the cloud on which the bow is painted may be reflected from the water, we can have no reflection of the bow itself." Nothing would seem to be plainer than this, yet eventually Tyndall had to qualify so strong a statement. It was conclusively proved that when a rainbow spanned a sheet of water there could also be perceived in the water another bow, and the ordinary usage of the language would permit that appearance to be termed a reflection. Tyndall's explanation was that a different bow is seen from every varying point of view, and that, therefore, though a bow is seen in the water, it is the reflection of rays of light quite different from those entering the observer's eye. Still, it must be remembered that the bow seen in the water is caused by reflection, and to that extent the popular idea is correct, and Tyndall wrong. In the discussion now going on, a writer explains that he has seen reflections in the water of what sailors call "wind-dogs"—pieces of rainbow, as it were—though the partial bow in the sky was invisible. A camera could show a photograph of a rainbow in sky and water at the same time, and thus give proof of the actual fact wanted to be known, apart from any word-fencing, or failing a rainbow and a sheet of water, a mirror could be laid on the ground when a rainbow was seen, and a photograph taken of bow and bow in mirrors at the same time.

* * *

Solar Eclipse Photographs. The Astronomer Royal has supplemented the official visitation of the Observatory at Greenwich with a series of social "at homes," and the first of these took place on Tuesday last week, when, in spite of the untoward state of the weather, numbers of visitors found their way to the historic building in Greenwich Park. The photographs exhibited aroused much interest, and especially was this the case with regard to a series representing the last three solar eclipses of the sun—namely, those of 1898, 1900, and 1901. It was clearly demonstrated that these photographs, as might have been expected, are far in advance of the most careful work of the most conscientious draughtsman, and it would seem that their comparison may afford new data for future research as to the physical condition of the solar envelope at maximum and minimum sun-spot periods. In the photograph of the 1898 eclipse, when sun-spots were prevalent, there are observed conspicuous rays in the corona, many of them being at considerable angles to the sun's equator. But three years later, when we arrive at a minimum sun-spot period, these outer rays give place to two great equatorial extensions which give little evidence of disturbance, while the polar regions of the sun are crowned with plumes so like the magnetic curves one can obtain by scattering steel filings upon a card-covered magnet, that some astronomers assign to these appearances a magnetic origin. In addition to the solar photographs, there were shown some splendid pictures of the great nebula in Orion, and a picture of the Pleiades, in which the nebulous matter attached to each of the principal stars are shown in wondrous detail. It is interesting to note that the operators at the Greenwich Observatory do not confine their attention to photographing objects separated from this earth by millions of miles of space. They formed among themselves, two years ago, a camera club, and the results of their labours, in the form of photographs of mundane things, formed an attractive feature of the exhibits shown to their guests last week.

* * *

Test for Wood Fibre in Paper. For many purposes the use of paper in the manufacture of which wood-fibre is employed is quite permissible, while for other purposes its employment is contra-indicated in a most pronounced manner, and photography, we need scarcely point out, is a conspicuous example of the latter class. Those who have given little attention to this matter may think that an unnecessary amount of prominence has in time past been given to the subject, while those who have observed what wood-fibre paper is capable of cannot speak too strongly against it. We have before us as we write a piece of paper on which has been painted, in artistic lettering, a photographer's announcement, the same having been placed in a large plate-glass window. When this bill was being made the draughtsman, wishing for as large a piece of paper as possible, obtained a few plain sheets from a local newspaper with a reputation for the excellence of the paper its news was printed on. It was a beautiful, pure white when the lettering was first put on. After a few weeks' exposure to the sun it had turned a dark buff colour—the effect of light only, not atmospheric dirt. Anyone can imagine what the result would have been if such a paper had been made as a basis for a photograph, and it

says much for the care exercised by the manufacturers of various kinds of photographic paper that we so rarely see anything in the nature of darkening of the whites through the action of light. Still these effects have happened, especially in the case of carbon work. A process, therefore, by which either photographer or manufacturer could readily test any particular sample of paper as to the presence or absence of wood-pulp in its texture would naturally be useful. Such a process has been published by Herr Albert Kaiser in a German technical paper. Equal volumes are taken of amyl alcohol (free from furfuraldehyde) and sulphuric acid, and the mixture is heated to 90 deg. C. (194 deg. Fahr.) until a little gas is given off. The product, which is reddish-green in colour, is allowed to cool, and then forms the testing material. If pure filter paper be moistened with the liquid it will become red or violet in colour. If, however, the paper under examination should turn green, and afterwards blue, the presence of wood-pulp may be predicated. The result becomes sooner visible if the paper is gently warmed in a current of air.

* * *

A Lens Competition. It is not often we find opticians enter the field against each other, yet this has recently been the case in France, where a competition has been held for lenses of long focus suitable for military balloon service. The report of Major Houdaille upon the subject, published in the "Bulletin de la Société Française," does not give the points which were considered of greatest importance, nor the method of testing, but it would seem that defining power at long distances for a small area was the principal consideration. Eight lenses were sent in, and five exposures were made with each at speeds varying between 1-200th and 1-10th of a second. The forty negatives were separately examined by each of the five members forming the jury, and the award was made upon the result of the 200 observations. A gold medal was awarded to M. Hermagis for a rectilinear lens of 1 metre focus with an aperture of *f*.9. M. Krauss received a silver medal for a Zeiss planar of 60c.m. focus with an aperture of *f*.8. Messrs. Voigtländer and Son were awarded a bronze medal for a lens of 60c.m. focus with an aperture of *f*.9. Some very interesting peculiarities were noted as the result of the competition:—

1. The defining power of the lens, or the distance at which an instrument will render the unity of measurement, varies considerably from one instrument to another.

2. In lenses of short focus the average power is proportioned to the focus of the lens, but when this exceeds 60c.m., the power increases much more slowly.

3. Lenses of the same focus and same aperture differ considerably in their power of defining very small objects in a feeble light.

When we consider the difference between various types of objectives, as exemplified by the number of lenses and the reflecting surfaces they contain, it is not surprising that there should be some difference in their performance. But probably another important factor is the homogeneity of the glass, which diminishes with the size of the lens. If central definition be only considered, then it is not surprising that the old rectilinear, with its thinner lenses, should show to advantage. But if extent of field be an essential then the result would doubtless be different.

* * *

Radiations or Emanations. A few weeks ago Mr. J. Dormer suggested in these columns that the term "radiography" should be "restricted to the action of immaterial emanations such as those from uranium." The difficulty of knowing what is a material emanation and what is an innate property such as gravity is well shown in a most interesting investigation upon the radio-activity of thorium compounds by Professor Rutherford of McGill University, and Mr. Frederick Soddy, B.A. (Oxon), demonstrator in chemistry at the same. Part of their investigation referred to the chemical nature of the emanations from the thorium compounds. They had shown that when exposed to changes of temperature between 110deg. below zero and an incipient red heat, no permanent change in the value of the emanation took place; but if that heat be exceeded "de-emanation" sets in, though before that turning point of temperature is reached the emanating power gradually increases about three or four-fold. The emanating property is conveyed to air which has passed over thoric, and the endeavour was made to discover any chemical nature it possessed. Such air was passed through a tube of platinum black, exposed to the highest temperature obtainable by electricity. In every case the emanation was unaltered. The conclusion was arrived at that "the theory that the emanation may consist of the surrounding medium rendered radio-active is thus excluded, and the interpretation of the experiments must be that the emanation is in chemically-inert gas analogous in nature to the members of the argon class. . . . . It may be that one of the inert constituents of the atmosphere is rendered radio-active in the presence of thoria, and so constitutes the emanation. . . . . The other alternative is to look upon the emanation as consisting of a gas emitted by the thorium compound. . . . . In the present state of our knowledge, it would be premature to attempt to distinguish between these two alternatives." The conclusion of the paper states that radio-activity and emanating power appear to be manifested indiscriminately in all the products, without reference to their chemical nature. So far, the actual constituent of thorium has only been obtained in relatively minute quantity, and therefore does not answer to any definite analytical reactions.

* * *

A New Discovery. There are many ways of giving a high finish to a photographic enlargement which, without such hand work, would look flat and heavy. Some work upon the picture with pastels, some with water colour, others excel in producing most beautiful effects of modulated light and shade by means of the air-brush, while many prefer the more solid medium afforded by oil colours. To these last an invention, recently described by the Paris correspondent of the "Times" newspaper, will be of great interest, for it deals with a new method of applying oil colours to canvas. And although we are of opinion that painters will not readily relinquish the older methods in its favour, it is quite on the cards that it may prove suitable and convenient for photographic enlargement work. The correspondent in question tells how he visited the studio of Mons. J. J. Raffaelli, whom he describes as "one of the most celebrated of the genre painters among living French artists," in company with a large number of native and foreign painters who had been invited to witness a demonstration of this new method of applying oil pigments to canvas. After expatiating on the troubles of an artist, who under present conditions is bothered with various little inconveniences and complications which arise in the practice of oil-painting, especially when he is at work away from his own studio, M. Raffaelli referred to pastel work. Although pastels were free from the faults incidental to oil colours, the colour falls off and loses its tone. For many years he had been trying to combine the advantages of the pastel, its fine soft velvety colouring, with those of oil painting, to which time adds a new beauty, and at last he thought he had succeeded in doing so. He had so manipu-

lated the oil colours that instead of being presented in compressible tubes they took the form of small solid sticks like crayons, which could be rubbed direct upon canvas, wood, ivory, or paper. He then showed how the colour could be applied by reproducing the principal parts of a complex picture, and he declared that when the work was dry, which would be very soon, the reproduction would be unalterable, and free from "those impedimenta which embarrass the painter." As we have already indicated, we consider it very doubtful whether many painters will readily consent to relinquish their brushes for these sticks of colour. For the artist relies so much upon the handling of his brush to secure his effects that it is difficult to see how his work can be properly done if the chief tools are thrown aside in favour of such clumsy substitutes. With the photographic enlarger it is different. His business is to fill in an outline already traced for him by the action of light, and little more than the suggestion of colour is often sufficient. For this reason we shall be glad to hear more of these oil pastels.

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Bromide Paper Records. Bromide paper, besides being so largely used for general photographic purposes, is employed in astronomical and other observatories for making records. The paper for this purpose is cut into strips and wound on reels actuated by clockwork, a spot of light reaching the paper—which is, of course, contained in an otherwise light-proof box—through a small aperture. The seismograph, or earthquake recorder, designed by Professor Milne, furnishes its wonderful records by means of a roll of bromide paper, and as this instrument has been much in evidence lately, a short description of the way in which it acts may prove interesting to our readers. From a rigid upright, set upon a foundation of solid masonry, there swings a horizontal boom made of steel. This boom is 37 inches in length, and is about as thick as a penholder at its butt end, tapering to the thickness of an umbrella rib at the other. At this thin end of the boom is fixed a small plate of brass with a narrow slit parallel with the length of the beam. This moves above a fixed brass plate with a similar slit, but at right angles to the former one, this fixed slit being at the top of a box containing the clockwork-driven roll of bromide paper. A lamp and mirror combine to throw a beam of light through the tiny opening afforded by the crossing of the two slits. Now it is evident that, so long as the boom is stationary, the light spot on the travelling reel will describe an unbroken, straight line, but if from any cause the delicately-balanced boom, which is really a horizontal pendulum, be caused to vibrate, the line will be intersected by lateral excrescences. And this is what occurs when the vibration caused by a shock of earthquake shakes the apparatus. The seat of disturbance may be hundreds of miles away, but the motion travels in waves, just like the disturbance caused in a still pond by a stone thrown in its centre. Professor Milne's seismograph at the Isle of Wight has in this way registered earth disturbances which have taken place at the Antipodes. One of these instruments was lately mounted at Baltimore, and, strange to say, it gave evidence of its utility the very first day of its installation. The straight line was broken by lateral tangles, and as the strip of bromide paper upon which the record was made was marked with the hours and minutes, it was ascertained that these tangles indicated the terrible earthquake at Guatemala in which so much destruction was wrought, and so many lives lost. It is noteworthy that this instrument at Baltimore is situated within a short distance of a railway tunnel through which there are passing frequent trains, and that although the vibration caused by their passage is quite evident to anyone in the neighbourhood, such vibration is too quick for the instrument to register. The slower earthquake motion, finding its origin hundreds of miles away, although quite imperceptible to the senses, is infallibly recorded on the travelling strip of bromide paper.

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Pharmacists and Photography. Thousands of chemists and druggists throughout Britain have a photographic department, and as a feeder thereto many of them have installed a dark-room, where the ubiquitous amateur can change or develope his plates. The same system prevails in the United States, at least, so we judge from an article in one of the American technical journals which circulates among the drug stores there. It is to this article we call particular attention, for we deem it to be mischievous in the advice which it imparts; and, as it may possibly have been reprinted in some of our home journals, its baneful influence may be felt far beyond the usual limits of its circulation. The article suggests that its *clientele* should not only deal in photographic products, but should actually manufacture them. The pharmacist, "in his leisure moments," is recommended to make emulsion and coat gelatine plates, and to encourage him in doing so formulæ are given, together with general directions for carrying out the work. The making of a gelatine emulsion and the coating of plates is easy enough on paper; it is only when one begins to tackle the business in earnest that difficulties arise at every step. In a well-ordered factory, where everything goes like clockwork, special precautions are taken to obviate such difficulties, and failures are therefore few and far between. But they will occur sometimes through unforeseen circumstances. The amateur maker of plates, with his rough and ready appliances, and working, as he must do, in a room destitute of any means of regulating its temperature, or keeping out dust, is beset with pitfalls at every turn, and lucky is he if many a batch of emulsion does not go wrong and prove quite valueless except for the silver it contains. But let us suppose that the enterprising druggist has surmounted all difficulties, and has succeeded in manufacturing a few gross of plates. They may be of very good quality, but who will buy them? Certainly not the ordinary type of amateur photographer, who is usually wedded to one brand of plate, and will use no other if he can help it. We can imagine such an one calling at the plate-making chemist's for goods, and on being pressed to buy a packet or two of the proprietor's plates, taking up this attitude: "*Ilford* I know, *Cadett* I know, *Imperial* I know, but who are you?" The poor chemist would therefore find, after all his labour and trouble, that he could not get rid of his plates, and would curse the day when he learnt how to make them. It would not be an impossible task to show that if he actually commanded a ready sale for home-made plates the industry would not pay. The actual outlay in materials would not be much, but the labour and trouble involved in turning out small batches of plates in the absence of proper appliances is enormous. A familiar Latin proverb runs: "*Ne sutor ultra crepidam*," which may be roughly translated for our present purpose, "Let not the chemist and druggist reach beyond his bottles."

Messrs. Edmeads and Co., of 30, Burchell Road, Peckham, London, S.E., write:—"We should be much obliged if you could find space in your valuable Journal to inform your readers of the fact that we have been appointed the sole agents for the supply of a new brand of orthochromatic plates, manufactured by Messrs. Westendorp and Wehner, Cologne o/Rhine. We shall be most happy to answer any inquiries your readers may send us respecting above plates, which have received very good comments from one or two photographic papers in England and abroad."

THE LIMITATIONS OF PHOTOGRAPHY.

Very little consideration is needed to lead to appreciation of the fact that a better understanding of photographic limitations would prevent much failure and disappointment. We see so many struggling laboriously in pursuit of an ideal impossible and unattainable, so much effort mis-spent and wasted because wrongly directed, so large an amount of chagrin and weariness, and early abandonment of efforts that, bent more wisely, would have added to the sum total of successful achievement and human gratification, that the pity grows upon us that it should be so.

The examination of different phases of failure from this cause, and some attempt at a rational understanding of the bounds and limits of photographic work generally, cannot fail to possess a broad interest. Perhaps the first and most palpable aspect in which this question strikes the general observer is in those branches of camera work which infringe on the borders of the world of art. With so many instances of beautiful and feeling execution by men who have made their mark in the ranks of so-called pictorial workers, it would, of course, be mere idle heresy to deny that, in capable hands, the products of the camera may be as truly pictures, in the best sense of the word, as anything that the painter, sculptor, or engraver may produce. The question, however, arises, and has been discussed and settled in contrary senses, by different individuals, over and over again, how much is the success of such pictorial photographs directly due to the camera and its technical tools, and how much to the individuality of the worker, or a happy concurrence of chances? View it as we may, the conclusion can hardly be resisted that the photographer is to an enormous extent bound to defer to certain inevitable laws and fixed conditions of work, by adherence to which only can he rely on obtaining the results he desires. The scope for individual expression and creation is therefore obviously very small. The artist of the camera, unlike his brother of the brush, cannot choose his subjects without let or hindrance, cannot treat them except in certain aspects. This is, of course, the crux of the whole matter. All the claims of photography as a means of artistic expression revolve round that single pivot. The successful pictorial workers in photography are necessarily well aware of this fact, and it is by a wise avoidance of all those things which experience teaches them are beyond their legitimate pale, by a clever and expert choice of just those subjects, in the special guise which is acceptable to that combination of possibilities and mechanical exactions which may be said to constitute the invisible genius of photography, that they contrive happily to produce works of artistic merit and beauty. But against the one who succeeds must be balanced the many who waste an incalculable amount of priceless time in a vain endeavour to force the camera to produce what it never will, nor possibly can. As has been so often pointed out, although the photographer's lens and the human eye may be fairly compared as practically performing the same work, and casting upon their respective retinæ virtually identical images, yet it cannot be ignored by any process of reasoning that behind the eye alone lies that subtle and complex system of nerves and sympathetic cells which constitutes the sensitive, ever-changing brain. The retina of the eye sees the same image that is thrown upon the focussing screen, it is true, but every portion of it subject to involuntary messages from the centres of memory —suggestion and imagination. It is not only what the eye sees, but what the brain sees, thinks it sees, or remembers to have seen.

And so it comes to pass that until hardly-won experience has trained the photographer to move only in the legitimate paths that are open to him, and at the pace and in the manner fore-ordained by the inexorable optical, chemical, and mechanical laws that in reality command and mould his work, his time is spent in hopelessly endeavouring to reconcile these conflicting forces into conformity with his own intentions and aspirations. He sees some scene of sylvan beauty, full of the poetry of colour and atmosphere, and, to his mind, redolent with suggestion. Alas, in trying to transfer it to his plate, he somehow misses just those very points of merit that touched his fancy; the negative is commonplace, lifeless, even irritating. He has not yet learnt the lesson that to produce the pictorially-admirable landscape, by photographic means, quite different aspects and qualities must be sought for in the view that it is desired to exercise his craft upon. He has one idea of what is beautiful, and the camera has what is practically a diametrically opposite one. Or perhaps we find the taker of portraits, imagining vain things of what is in his mind's eye a telling pose, displayed to advantage in a light that might have moved Rembrandt himself to envy. Oh! the clumsiness of the result, as compared with his anticipations, and the utter weirdness and woodenness of the lighting! He has to be schooled by the best of all schoolmasters, failure, before he becomes submissive to the inevitable requirements of successful operating, which forbid him to light or pose his sitter as he himself would wish, and oblige him to humour the likes and dislikes of his lens and plates. As a wise general once remarked, when asked why he did not at once give battle to the enemy, "I do not wish to fight, but to win." Success is not to be achieved by blindly rushing against immovable obstacles, but by deliberate choice of opportunity, and movement along the line of least resistance. And perhaps this is peculiarly the case in photography, where the worker is probably much less concerned with what to do than what to avoid. It is, moreover, a craft which demands a large amount of compromise, the best results being seldom obtainable in what at first sight appears the most natural and direct way. In seeking to give due emphasis to one feature of his subject, the photographer is apt to find that he exaggerates at the same time something that he would fain have relegated to a minor position. He discovers the necessity of hitting the happy medium, the indispensableness of a give-and-take policy. It is an inability to comprehend the vital necessity of cultivating the art of compromise that is responsible for so much that is eccentric and bizarre in photographic work, to say nothing of the many unrecorded failures that have not even eccentricity to recommend them.

On the other hand, this very need of compromise constitutes in itself one of the gravest obstacles in the way of artistic and original work. It conduces so fatally to tameness and lack of virility that it might well be esteemed the deadliest foe that the photographer has to contend with. He must be ever on the watch that he does not sacrifice too much to the mechanical requirements of his art, that in grasping the shadow of technical excellence he does not really lose the substance thereof. It so often happens that a slight technical fault may be really an artistic gain. The merely mechanical photographer, who spends his time and thought balancing one factor against the other, shunning carefully any appearance of excess or undue favour to any one part of his work, is apt to end in the production of most insipid and lifeless results. Many of the present limitations of photography are not necessarily permanent. It is quite conceivable that the science of years to come may remove an appreciable proportion of them, although others, necessarily inherent in the very nature of the art, must always remain. Speaking in advance, it is, of course, quite impossible to hazard any forecast as to what direction

such improvements may take; nothing but time can show. Meanwhile, the best photographer, it goes without saying, is he who least allows himself to be hampered and embarrassed by what he nevertheless clearly realises are very real and tangible hindrances, that must and will be reckoned with, and who is ever on the look-out for means and methods for the reduction and overcoming of such obstacles, and the consequent enlargement of his outlook and possibilities, to say nothing of the advantage to his fellow-workers, a final point which the true lover of his craft would be the last to overlook.

THE CONVENTION.

Favoured by fine weather, the seventeenth meeting of the Photographic Convention of the United Kingdom opened at Cambridge on Monday last. In the earlier part of the day the photographic opportunities offered by the colleges and public buildings were freely availed of by the members; and visits were also paid to various other places of interest in the town, the authorities courteously granting every facility for the use of the camera.

In the evening the Mayor of Cambridge (Mr. G. Kett), accompanied by members of the Corporation and officials carrying the civic insignia, welcomed the members of the Convention at the Guildhall. Amongst those present were Sir R. S. Ball (President of the Convention), Sir William Herschel (retiring President), the Vice-Chancellor of the University, Mr. William Crooke, Mr. C. H. Bothamley, Mr. John Stuart (Glasgow), Dr. Mann, Mr. E. J. Humphery, Mr. A. L. Henderson, Mr. Thomas Bedding, Mr. H. Snowden Ward, Mr. F. H. Sanderson, Mr. P. R. Salmon, Mr. W. J. Croall, Mr. F. W. Hindley, Mr. S. H. Fry, Mr. T. K. Grant, Mr. R. R. Beard, Mr. H. C. Rapson, Mr. Harold Baker, Mr. Warwick Brookes, Mr. Thomas Birtles, Mr. F. A. Bridge, Mr. A. Seaman, Mr. S. B. Webber, Mr. C. P. Lucas, and many others, including a large number of ladies. The public meeting-room of the Guildhall was comfortably filled by the attendance, and an exhibition of photographs and apparatus was on view.

After the reception of the members by the Mayor and Corporation, a recital on the organ preceded the formal welcome of the Convention, which was voiced, in a few well-chosen words, by Mr. Kett.

Sir William Herschel (retiring President), before introducing his successor, Sir R. S. Ball, briefly traced the principal items of photographic progress during the past year, paying special attention to the work of Mr. E. Sanger Shepherd and Mr. Edgar Senior, the latter gentleman's Lippmann film work coming in for special recognition. Having been invested with the badge of office, Sir Robert Ball took the chair as President of the Photographic Convention of the United Kingdom for 1902-1903, amidst great applause.

The President's address assumed the form of a lecture, illustrated by lantern slides, of recent photo-astronomical work, particular reference being made to the labours of Professor Barnard and other American astronomers. The substance of Sir Robert's address will be published next week. Delivered in his well-known enthusiastic manner, it was listened to throughout with deep attention. At its conclusion, a vote of thanks, proposed by Mr. Bedding and seconded by Sir William Herschel, was tendered to Sir Robert Ball, who, in turn, invited the meeting to thank the Mayor and Corporation for the welcome accorded to the Convention. A brief acknowledgment by Mr. Kett led up to the final item of the programme, a display of lantern slides.

The week's proceedings have to a large extent been discounted by the publication, in the Journal, of the principal portions of the Handbook issued to members, and it therefore only remains to us to chronicle the successful opening of what, at the time of writing (Tuesday) promises to be a pleasant meeting of the Convention in the charming University town of Cambridge, and to informally record the thanks of the members to the local and University authorities for their kindly welcome and the many privileges extended to the visitors.

DISAPPOINTED PURCHASERS OF BUSINESSES.

A case was briefly reported in the "Commercial and Legal Intelligence" last week which should be read by all who, with but little practical knowledge, think of entering the ranks of professional photographers. There are many amateurs who know the cost of all the materials employed in the art, and the prices charged by high-class photographers for their work, and therefore assume that it is a very lucrative business. Hence they, with their limited knowledge, are anxious to enter it, thinking that, as they know how to develop a negative and print from it, they are duly qualified to work a studio. Our readers will remember the correspondence that appeared in our pages, a couple of months or so back, inaugurated by Mr. H. Walter Barnett, calling attention to an advertisement of the "Illinois College of Photography," where pupils were to be taught in from three to six months "to open a studio of your own, etc." This advertisement very naturally brought a smile to the faces of those who knew that the qualifications necessary to carry on a high-class studio are not to be acquired in a school or college with any amount of tuition; it is only to be obtained by actual experience and practice with ordinary everyday sitters in the studio. One of the principal things to be learnt, and that is only learnt by experience, is how to deal with the different *clientèle* that visit the studio for sittings, and to judge of their chief characteristics with a few minutes' conversation, and then portray them in their portraits. In the case cited above it appears that the defendant had for eighteen years carried on a tolerably lucrative business in Torquay, and then disposed of it to the plaintiff, who was formerly a grocer and amateur photographer. The takings, it was said, were some £700 per annum, but on the part of the plaintiff it was alleged that in the first twelve months he did not take £100, and it was suggested that the defendant had "cooked" his books, and therefore fraudulent misrepresentation was alleged. The learned judge, in summing up the evidence, took a practical view of the case, for he said that the business had fallen off since the sale, owing to the plaintiff not being so expert in his methods as the defendant. Without leaving the box, the jury found for the defendant, with costs. Now here is a case of a business which had been carried on successfully by its late owner for eighteen years being taken over by one of an entirely different trade and an amateur photographer, with, presumably, no extended practical experience in professional work in the studio. We have on several occasions, in articles and in answers to correspondents who have complained of alleged misrepresentation in the sale of businesses, pointed out that when a business has changed hands any falling-off in the alleged takings may be more due to the incomer not giving the same satisfaction to the customers as did his predecessor than to any fraudulent misrepresentation. The same thing often happens in the transfer of medical practices. Individuality has much to do in the case of medical practitioners as well as photographers, even when both may be equally as skilful as those who preceded them.

THE PUBLIC RECOGNITION OF ART PHOTOGRAPHY.

In our issue of the 13th ult., in bidding good-bye for the present to Mr. J. C. Strauss and his colleagues, we expressed the hope that their efforts to obtain a separate building for the display of "art photographs" at the forthcoming St. Louis International Exposition, might be crowned with the success they desire.

Mr. Strauss has since then kindly sent us the following circular cutting, which we print in full :—

Universal Exposition, St. Louis, U.S.A.

St. Louis, June 9th, 1902.

Mr. J. C. Strauss, City.

Dear Sir,—I have received the June number of "The International Studio," which you so kindly sent me, and have read with considerable interest the article on Photography at the St. Louis Exposition.

I now hand you an advance copy of Circular No. 5, relating to photography.

It seems to me that the whole question is now satisfactorily adjusted, and I trust you will be as diligent in your efforts on behalf of this department as you have heretofore in photography as a fine art.

Hoping that I may have the pleasure of seeing you in the near future, I beg to remain, yours very sincerely,

(Signed) J. A. Ockerson,
Chief Department Liberal Arts.

Universal Exposition, St. Louis, U.S.A.

St. Louis, U.S.A., June 9th, 1902.

Mr. Charles Holme, Editor "The International Studio,"

New York City.

Dear Sir,—I note, with much satisfaction, that you have given space to the question of photography at the Universal Exposition to be held in St. Louis in 1904. I beg your indulgence in offering the following explanation of the situation confronting me when I entered upon my duties as chief of this department.

The proposition made by the photographers, through Mr. Strauss, for a separate building had been rejected, and photography in general had been assigned to the Department of Liberal Arts by the officials of the Exposition. In my opinion, this was right and proper. The photographers, however, were not satisfied, and put forth claims for the work of the artist in photography, and demanded space in the Fine Arts Palace for what they termed artistic photography. They insisted on segregating a certain kind of photographic work, and holding it aloof from the class of work done in everyday photography.

A number of interviews were had with Mr. Strauss and others, with the hope that some satisfactory solution of the problem could be reached. On my part, the disposition to meet the wishes of photographers, as far as practicable, must have been apparent to all who participated in these conferences. That there is certain high-grade artistic work in photography was not for a moment questioned, but just how to provide for it, under the approved classification, was not so readily determined.

After much careful consideration by Prof. Halsey C. Ives, chief of the Art Department, and myself, an agreement was reached whereby such pictures as satisfactorily passed the scrutiny of the "National Jury of Selection" should be hung in the Art Palace.

The classification is shown in detail in Circular No. 5 of this department, enclosed herewith, and I hope that you may find space for it in your columns.

Mr. Strauss deserves much credit for his effort on behalf of photography, and in the future I trust that his influence will be directed toward the development of a grand display of photographic work from all parts of the world.

France has already signified her intention of sending a generous display of her choicest work.

Trusting that the above disposition of the matter may be satisfactory to the photographic fraternity, and that this department may be accorded their hearty support, in return for which I again pledge them all the assistance in my power, I beg to remain, yours very truly,

(Signed) J. A. Ockerson,
Chief Department of Liberal Arts.

Universal Exposition, St. Louis, U.S.A.
Department Liberal Arts.
Circular No. 5.—Photography.

Photography in general will find an attractive home in the Liberal Arts Palace amid congenial surroundings filled with the displays of the Graphic Arts, Music, the Drama, Civil Engineering, Architecture, etc.

Special provisions will be made for the display of selected high-grade examples of artistic photography. Admission to this class may be confined strictly to such art work in photography as may satisfactorily pass the critical inspection of the National Jury of Selection of the Department of Art.

Pictures from the United States exhibitors which are thus admitted shall be hung in the United States section of the Art Palace, to such extent as the room available will permit.

Pictures from foreign exhibitors will be admitted under similar rules, but must also, in all cases, conform to the rules of the respective foreign sections to which they belong, as to whether they can be hung in the foreign sections of art or not.

A suitable, attractive space will be specially prepared in the Liberal Arts Palace, where pictures selected in accordance with above rules may be properly displayed, in case they do not find suitable space in the Art Palace.

We publish the above, for though we had closed our comments on this matter, yet in justice to Mr. Strauss we feel that the success that has attended his great efforts should be made known to our readers, so that any photographers in this country who intend to exhibit at the Exposition may be made aware of the altered conditions attending the treatment of this section. Mr. Strauss points out that it would appear to be a good thing to start some movement on this side of the water, to the end that the same regulations that apply to American work be equally applicable to English exhibits. This, we think, is a matter for the Royal Photographic Society to take in hand and deal with. We would point out that the Exposition has been postponed to 1904, and that the complete circular, of which we give a portion above, can be had upon application to Col. John A. Ockerson, St. Louis, U.S.A., Department Liberal Arts, Exposition.

CELESTIAL PHOTOGRAPHY.

[Abstracted from an article in "Blackwood's Magazine" for July.]

When with great pains the star photograph has been secured, to what end will it lead? Not, as a rule, to the publication of a beautiful picture, crowded with stars gathered in streams and clusters, upon a background flecked with pale nebulosity. That is the kind of photograph which is used to illustrate the text-books, and a very beautiful thing it is. But its beauty is a snare. It looks so amazingly rich for the very simple reason that a great many square degrees of sky have been crowded into a very small picture. It is as though every town, village, and hamlet were dotted in on a map of Great Britain a few inches high. That would produce an exaggerated effect of over-population. And, be it noted, such a small-scale map would be of very little use if one wished to measure accurately the distance from village to village. The smallest distance to which one could measure on the map would correspond to a good many miles on the country roads. And so it is with those crowded star photographs which give so vivid

a picture of the richness of the sky; they show that the heavens are densely crowded with stars. But they altogether exaggerate the case; and it is almost a pity that they are so constantly reproduced, for no one could be surprised if it were believed that they are the typical star photographs, to obtain which the great photographic telescopes are erected.

Such is not the case. Almost the whole work of a great observatory consists in making accurate measurements of one sort or another, and they have been induced to set up large photographic telescopes because it is found that measurements of the places of the stars can be made with higher precision upon a suitable photograph than upon the stars themselves. But the photograph must be suitable; and that means that the images of the stars must be small and sharp, and the scale of the picture must be large. Now the scale of the picture depends directly upon the length of the telescope with which it is taken: to get a large-scale picture one must have a long telescope. A small angular distance in the sky will then correspond to a comparatively large distance upon the plate. That will not produce a gorgeous picture, for the stars will be widely scattered, and all effect of richness will be lost, unless indeed one is photographing one of the great star clusters. But a fifty-thousandth of an inch upon the photograph, which is about the limit of our powers of measurement, will correspond to perhaps a couple of hundredths of a second of arc, an angle as large as the angle between two lines drawn to opposite points on the edge of a penny set up nearly two hundred miles away.

It is clear that when we have a telescope which will produce photographs upon so large a scale, the distances upon the plate of star from star must be measurable with a high order of accuracy. But it was one of the scientific surprises of about fifteen years ago to find that the measurements which are made upon such a photograph are actually a great deal more accurate than those which could be made by direct measurement at a similar telescope, and that, in spite of the fact that a higher degree of magnification can be employed at the telescope than the photograph will profitably bear. The reason is very simple when it is pointed out. It is just this, that the image of a star in the telescope is very rarely absolutely steady. The light from the star, before it reaches the telescope, has to pass through a great depth of our atmosphere, which is, except in rarely favoured regions of the world, continually disturbed by currents of air hotter or colder than the rest. Rifle-shots are very familiar with the kind of effect which this produces. On a blazing hot day, when currents of air are rising from the heated ground, they see their target dancing before their eyes, growing taller and shorter, and breaking in pieces, with the bull's-eye now in one corner and now altogether gone. Something of the same thing happens to the star-image when the telescope is set up in any but a few tranquil places, and especially when it is in a country much broken up by mountain chains or arms of the sea. On all but two or three nights in the year the star-image will be seen dancing and quivering in the telescope, more or less as the air is much disturbed or uniform. And when the observer tries to set the spider-line of his measuring apparatus upon the image, he has to make some kind of estimate of its mean position and set upon that. It is really surprising how accurately this can be done after long experience; but the unsteadiness of the object is bound to set a limit to the accuracy which even the most practised observer can obtain. Now it might be thought that this constant vibration of the object would be more fatal to the photograph than to visual observation; but it is not so. For the motion is very quick: several times a second does the star make a small jump from its mean position and return to it, and on an average it jumps every way with equal frequency. The consequence is that the photographic plate, which keeps a record of every jump, produces in the end an image which is certainly larger than it ought to be, but which is, as a rule, enlarged equally in every direction, so that its centre remains still where the centre of the image should be. And when the plate is put under the microscope of the measuring machine, and the threads which are moved by the measuring screw set upon the photographed image, the enlargement of the image is small loss compared with the gain which results from the fact that the image is steady. That is whence the real gain in accuracy of observation is derived.

And the gain in convenience is enormous. Suppose that the work in hand is the survey of a rich and complex group of stars. The aim is to lay down the present positions of the stars in that group with all possible accuracy, in order that we may bequeath to future generations of astronomers a complete record of the configuration as it appears to-day. For the present configuration will not remain unchanged for ever. The stars are doubtless in motion with respect to one another, and our whole solar system is in motion through space, so that one day the group will be seen from a sensibly different point of view. Small changes will come to pass in the apparent arrangement of the group, and in the course of years they will develop, so that ultimately something may be discovered of the real structure of that distant region of the universe, and of the laws by which its motions are controlled. The duty of astronomers of to-day is to leave an indubitable record of what we see now: that will be the foundation on which our successors may be able to rear their theories, when the slow cosmical changes have had time to develop. Now, to make by direct visual observation such a survey of even a small group of stars is a most tedious and troublesome business. It involves many nights of work at the telescope, interrupted often by spells of bad weather, with the transparency and steadiness of the air continually varying, and, worst of all, with a ceaseless change in the conditions which control the many corrections that must be applied to the observations, to free them from determined sources of error—for no measure made at the telescope is fit to stand as it is made, as an expression of real truth. Night by night the parts of the telescope expand when it is warmer, and shrink when it is cold, introducing into the measures all manner of discrepancies; and there are defects of workmanship still remaining when the maker has done his best, whose effects must be determined and allowed for. The effect of the refraction of the air upon the measures is always altering; the effects of the aberration of light vary with the position of the earth in its orbit round the sun; and the complications which arise from the slow steady swing, and the little swings superposed upon it, of the axis of the earth itself, can scarcely be expressed in words. It requires no elaboration of the argument to make it clear that when a set of measures extends over many hours, or many nights, the calculation of all these things afresh for every single measure consumes a terrible amount of time, and is unspeakably dreary. And the trouble is all due to the fact that the measures made by eye observation at the telescope must be made one after the other. If they could all be made at once, there would be only one set of conditions, instead of many, for which the corrections must be calculated and applied. Photography has made this possible. The sensitive plate will record as easily ten thousand stars as ten; and when it is developed, there is the record of all the stars under exactly the same conditions. It may be put away until a season of cloudy weather stops work at the telescope; it may be measured gradually day by day, as the convenience of the observer, not of the clerk of the weather, may dictate. And when these troublesome corrections of which we have spoken come to be applied, there is only one set to

calculate instead of hundreds. One uniform scheme of corrections will apply to the whole of the measures which may be made, entirely because the observations, if we may apply such a term to the processes which go on among the sensitive silver particles embedded in the gelatine film, were made all at once, instead of in small successive groups.

One must not, however, allow enthusiasm for photography as a means to celestial measurement to thrust aside the claims it makes for recognition in many other *rôles*. As a mere observer the photographic plate possesses certain powers which the eye cannot hope to rival; but, on the other hand, it is in one quality at least conspicuously deficient, and it will be convenient to pause for a moment to draw a sharp line of demarcation between two main classes of descriptive observation, each of which is fruitful of discovery: the detection of minute detail in a bright object, and the detection of objects of the last degree of faintness. The power to excel in both these matters is not always found in the same eye. The man who is keen to pick up the first shred of misty light which betokens the approach of a new comet may be altogether wanting in that curious insight which seems to feel rather than see that a small point of light is not single but double, and that increased magnifying power and a steady night will show one more new double star. And the photographic plate is of all observers the most one-sided in this respect. While it can patiently store up the light from a very faint source until at last an image can be developed, its power of portraying every minute detail is almost contemptible, at present. We say "at present" advisedly, because the chief cause which makes the photograph to fail in this respect may any day be overcome by some chemist's discovery. The cause is this, that the sensitive film is very coarse-grained. The particles of silver salt in it are of sensible size, and the image will bear only a small magnification—some twenty diameters—before it begins to split up into individual grains, and then nothing is to be gained by going further. The half-tone process blocks which are used so much for illustration nowadays provide a similar case. Whoever has brought a glass to bear upon one of these, in the hope of seeing fine detail more precisely, will be at no loss to appreciate the meaning of this difficulty. At any time this difficulty of the coarse-grainedness of our plates may be surmounted; but there will always remain the blurring effect of the unsteadiness of the air, which, we have already seen, will enlarge the image of each point into a disc of some size. Even in the steadiest climates this must always stand in the way of photographing extremely fine detail. The plate is too faithful; it records everything that falls upon it, whether it is wanted or not. The trained eye can wait for steady moments, during which it will perceive clearly for an instant what is lost the next in a wave of unsteadiness; and so, by choosing its moments and waiting patiently, it can distinguish what will never be made distinct by the plate, which mixes good and bad together. There remains, then, one field in which the eye is still supreme, the examination of fine detail in the sky, whether in the systems of stars or the surface markings of planets and moons. And when we have mentioned this we have mentioned almost the only field of observation which will be left for those who are conservative enough to work still with the human rather than the photographic retina.

In its power of observing very faint sources of light the photographic plate is supreme. What the eye cannot see in a few seconds of intense gazing, it will never see at all. The light is not strong enough to stimulate the nerves of the retina and convey an appreciable impression to the brain; and no prolonged gazing will help, for whatever impression is produced dies away in a small part of a second, and can be succeeded only by others of the same intensity. With the photographic plate it is quite different. Every small pulse of light which falls on a grain of sensitive silver salt does a little towards breaking up the molecules of which it is made. Wave after wave adds its effect, until at last some of them are decomposed, and an image can be developed. To photograph a very faint source of light is thus, within certain limits, merely a question of continuing the exposure for a sufficient length of time, a matter of skill and patience only. How great is the superiority of the photographic over the eye and pencil method of delineating the forms of the nebulæ may be judged from the fact that, until photography was applied, we knew scarcely anything definite about the shape of most of them. Between the drawings of different observers there was a fine dissimilarity: the eye was baffled in the endeavour to follow the complex windings of wisps of light of the last degree of faintness, and no pencil could reproduce the infinitely delicate gradations with which they fade away into empty space. The great nebula in Andromeda is an object which offers to the eye at a telescope an appearance almost uninteresting. It is an oval patch of light which fades away imperceptibly to the edge of the field of view, and shows no structure whatever. By very attentive care the astronomer Bond detected some faint and apparently straight rifts in the outlying portions; but no definite structure could be satisfactorily made out until in 1885 Dr. Isaac Roberts obtained a photograph of the nebula, which was a revelation. Out of the shapeless mass of faint light and ill-seen channels was evolved a great bright nucleus set in a wonderful structure of rings, like a vast nebulous Saturn, irresistibly suggesting the formation on a tremendous scale of a system of bodies moving round a central sun, after the manner in which Laplace has in his nebular hypothesis pictured the growth of our own system of sun and planets.

This resolution of the Andromeda nebula into a structure so clearly generated by a whirling motion under the action of some such force as gravitation, and offering so tempting a case for the study of celestial dynamics upon a stupendous scale, lent a great impetus to the work of photographing the nebulæ. About 6,000 of them had been discovered before the days of photography, and very many years ago the famous telescope of the Earl of Rosse had shown that a few of them had a spiral structure. It was very hard to see—scarcely any telescope that was made for years afterwards would show it at all. It was still more difficult to explain, or even to conjecture, what force could twist a great mass of star-stuff—we have no better name for it—into the form of a spiral; and there was even some satisfaction in feeling that, after all, these cases were the exception, and not the rule, and that their explanation was not involved in whatever theories we might have to form about the nebulæ in general. Photography has completely upset so sanguine a view of the case. As nebula after nebula has yielded up the secret of its structure to the sensitive plate, more and more cases of the spiral form have been found, with the aggravated complication that the spiral is not single, but as a rule double, and is studded all along its length with bright knots that look suspiciously like ill-formed stars. And the culminating point has been reached quite lately in a remarkable statement modestly hidden away in the description of a new branch of work which has recently been taken up at the Lick Observatory—taken up four years ago by James Keeler, then newly appointed director, and interrupted in the saddest way soon afterwards by his untimely death. At Lick they have now the three-foot reflecting telescope, which was mounted by Dr. Common at Ealing more than twenty years ago, and which produced the remarkable early photographs of the Orion nebula which will always be associated with his name. When he set

about to build a larger instrument it passed into other hands, and was finally presented to the Lick Observatory, where under the brilliant Californian sky it has first been enabled to show its true worth. It was put to a re-observation by photography of all the nebulæ in Herschel's great catalogue, and when the plates were examined they were found covered with nebulæ previously unknown, and more than half of these were spirals. It is estimated that there are at the very least 120,000 new nebulæ within reach of this instrument, with so large a proportion of them of the class which were of old considered rare that we shall have to invert our notions of these bodies altogether, and for the future look upon a nebula which does not show a spiral structure as the exception rather than the rule. Compare this vast number with the 6,000 which were known after a century of diligent star-gazing, and we shall have some small idea of what photography can do for descriptive observation and discovery.

A PHOTOGRAPHIC AQUARIUM.

Comparatively little has been done at present towards obtaining a photographic record of the ways and manners of the countless creatures which live beneath the surface of the sea, the river, and the lake. Yet what a rich and practically inexhaustible field of work has the aqueous world to yield up to the really enthusiastic naturalist-photographer! Pictures of animal life on the seashore, with the exception of bird studies, are very rarely seen, though there are plenty of interesting subjects nearly always at hand along the seashore, and amongst the rocks, if the photographer will only use his eyes intelligently.

It is to the photographing of creatures which lead a purely aquatic existence, however, that I now wish to draw attention. It will be found to be a branch of photography at once most novel, exciting, interesting, and instructive. The photographer must, however, make up his mind that all failures are to be considered as object-lessons of what not to do next time. He must learn to manipulate his camera with swiftness and precision, and be able to decide at once the right moment for exposure; for truly in this work to hesitate is to lose for ever an opportunity that may never occur again. Patience and an unconquerable determination to obtain the desired picture are the two most important adjuncts to successful work.

The apparatus required is neither particularly elaborate nor costly, and let me here assure the uninitiated that a complete diver's outfit is not at all necessary for the work. It is of great importance to have a really good rapid lens, giving perfect definition to the very edge of the plate without too much stopping down. This will probably be the most expensive part of the outfit, but, provided he knows how to use it properly, the owner of the lens should never have cause to regret the price he has paid for it.

Unfortunately there are still a very large number of photographers who will not take the trouble to master even the barest rudimentary knowledge of optics, and consequently are hardly likely to get the best results from their lenses, except by an occasional fluke.

Next in importance to the lens comes the aquarium, or rather aquariums, for two or three will be wanted for storing the creatures, as well as the one specially designed for photographing them in. The ordinary large bell or propagating-glass will be found to answer admirably for storing moderate-sized fish, etc., for a few days. The glasses should be fastened securely to well-weighted wooden bases, so that there may be no fear of their being easily knocked over, and their contents spilled on to the floor. As the rounded sides of the propagating-glasses distort the objects, they are not much good as permanent aquaria for careful observation; and therefore the permanent aquarium should be square or oblong, properly slate bottomed, and with not more than three sides glazed. It is often an advantage to have only one side glazed, and the other three sides of well-tarred wood or slate. A very cheap and useful tank can be made by using stout half-inch wood for the back and sides, and one-inch wood for the bottom. The back and sides should dovetail together, and the bottom should be screwed on; the plate glass front can be let in by what carpenters call "rabbet and bead." Cover the whole of the interior, back, bottom, and sides with one-eighth of an inch thickness of pitch. Warm the glass to be used for the front, run the hot pitch into the "rabbet," and then insert the warm glass and carefully press it home. When the pitch has hardened, go over all the joints, sides, and corners, with a liberal coating of the following cement:—Litharge, one part; fine white sand, one part; resin, one-third part. Mix with sufficient boiled linseed oil to form a thick paste.

The tank in which the creatures are to be photographed requires to be well and carefully made, and I should advise that its construction is placed in the hands of a really competent carpenter or plumber, unless the would-be photographer of aquatic life has a good knowledge of carpentry. The size of this aquarium will be determined by the size of the particular creatures to which the photographer intends to devote most of his attention, and three of its sides must be made of glass, so as to admit as much light as possible. The two sides may be made of ordinary plate glass, but the front must be a piece of perfect "patent" glass, or very thin glass, absolutely free from scratches, air bells, or distortion. It is most important to have the best sheet of glass obtainable, as through it the lens and plate will receive the image of the object to be photographed; therefore no blemishes must be present.

It is advisable to have the tank fairly deep and oblong, though its width need not be very great, and can in the following manner be further diminished during the photographic operations. A stout false back exactly the same depth and length as the interior of the tank must be carefully made. As one side of this false back will form the background to the subject to be photographed, it is advisable to have three or four made, so that a suitable one can be selected. Some of these false backs should be painted light grey, white, and slate colour; each back to be a different colour, or, for economy's sake, each back can be painted a different colour on the opposite sides. On to one or two false backs, that have been painted a stone colour, pieces of rock should be fastened in as natural a manner as possible, to give the idea of a rock pool, little holes and niches being left into which water-weeds, seaweeds, etc., may be fastened when preparing to photograph an inhabitant of the river or the sea. These false backs are employed in the same manner as the piece of glass which forms the false back of the zoophyte trough in which microscopists place living colonies of hydrozoa and bryozoa for examination under the microscope; the object being to bring the specimen well forward, and as nearly as circumstances will permit into one plane of focus.

When the photographic aquarium is going to be used, it should be placed on a table, in such a position that its contents may be as brightly illumined as possible; a north aspect out-of-doors, or in a greenhouse or conservatory will be found best, as a strong flood of light will then pass down from the surface of the water. A suitable background is then selected and fixed in position by means of a couple of springs and wedges, so that, although the creature to be photographed has free space to rise to the surface, or seek the bottom of the water, and move up

and down the length of the tank, it will not be able to retire to the back of the tank, where it would be out of focus, directly the plate is in position and the shutter set. Care must be taken, however, that the false back is not brought too far forward, or in the case of a fish, for instance, there will be wild and frantic plungings, on account of the fish finding that it has not room to use the fins on the sides of its body. When the false back has been placed in position and the camera set up in front of the aquarium, the specimen to be photographed should be transferred from the stock tank; and while it is settling down somewhat in its new quarters, an area must be selected and focussed. Shutter set and plate in position, the photographer must stand or sit by the camera, pneumatic ball in hand, ready the instant the specimen comes within the known focus, to make the exposure. In cases where a particular pose is desired, the patience of the photographer will be often tried severely, the specimen passing again and again over the focussed area, but declining to show off that particular characteristic movement so much desired. In this work a twin lens or good reflex camera, like the "Miral," for instance, that enables one to focus sharply practically up to the moment of exposure, will be found a great boon; though it is wonderful what can be done with the ordinary stand camera and a good supply of patience. The aquarium photographer must "learn to labour and to wait."

Very striking and interesting photographs of the inhabitants of the aqueous world may be obtained at night, with the aid of a couple of good magnesium flash lamps. The specimen should be placed in the photographic tank during the daytime, so that it may grow accustomed to its surroundings, and settle itself comfortably for the night. The two magnesium lamps, preferably worked with magnesium powder blown through the spirit flame by pneumatic tubing, should be placed one on each side of, and close to, the aquarium. It is advantageous to enclose them in three-sided screens, the inner sides of which have been painted white, as by this means the light will not get distributed over the room, but will be concentrated and reflected directly into the tank from each side, so that fairly even illumination will be obtained. It will be found convenient if the two tubes of the magnesium lamps can be connected to one ball, or bellows, which can be pressed either by the foot or hand, so that the two discharges of powder are simultaneous. All the preparations should be made as quietly as possible, so that the specimen is in no way aroused or alarmed, otherwise the photograph will not be so successful. If possible, it is best to place the magnesium lamps and their screens in position during the daytime, so that there need be no fear of frightening the subject when it is at rest. With a little ordinary care, the spirit can be poured on the gauze of the lamps and ignited without in any way disturbing the inhabitant of the aquarium. The operation of discharging the magnesium powder and making the exposure should be carefully rehearsed, so that when the actual attempt is made, it may be carried out successfully. With patience, a series of photographs at once beautiful and interesting may be obtained.

F. Martin Duncan.

Professional Photographers' Association.—Mr. Edwin Leeker (manager Debenham and Gould), Glen View Studio, Bournemouth, was elected a member of the P.P.A. at the last meeting of the committee.

London and Provincial Photographic Association.—During July and August the Thursday evening meetings will be open to any member or visitor who has any matter of photographic interest to bring forward. Arrangements are also being made for a short series of lantern lectures, probably by Mr. R. J. Beckett and Mr. A. L. Henderson, during the above period, further illustrating their recent travels in the Iberian Peninsula. Visitors are always welcome.

PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

The second annual general meeting of the members of the above association met at the rooms of the Royal Photographic Society, 66, Russell Square, London, W.C., on Friday evening, July 4th, Mr. Thomas Bedding, F.R.P.S., president, in the chair.

After the reading of the minutes by the hon. secretary, Mr. Alfred Ellis, scrutineers were appointed to examine the ballot papers which were sent in, the choice falling upon Mr. J. Done and Mr. England.

The president then said that it would be necessary to make a slight departure from the order of the agenda paper as printed, and he would ask the members present to consider the proposed alterations in the rules. The first one dealt with the question of non-payment of subscriptions, and it was felt that some grace should be given to members, who through accident or inadvertence, had not paid their subscriptions in time. The alteration proposed was that a member joining after March 31 should not be called upon for a second payment until July 1st of the following year. The next proposed alteration referred to the date of the ordinary meetings, and it was now suggested that, instead of five first Fridays in certain months, they should have meetings in the second Fridays in February, May, and December. The next alteration affected Rule VII. It provided for the appointment of two auditors, and it postponed the annual general meeting from July to October in each year. Professional photographers are generally much busier in the former month, and it is to meet the general convenience of members that the alteration has been proposed. The revised Rule X proposes a plurality of vice-presidents instead of one as at present. Your committee suggests that a convenient number would be three. It is also suggested that the retiring president should become a vice-president, thus following the practice of the Photographic Convention of the United Kingdom. The idea is that a man, having passed the chair, would have acquired experience, which could not fail to be of service to the association. Such were the alterations in the rules suggested by the committee, who had devoted much time and thought to the work. He would suggest that if these alterations met with the approval of those gentlemen present, some one would be good enough to propose their adoption *en bloc*.

Mr. Frank Turner made the required proposition, which was seconded by Mr. Dalby, and carried unanimously.

The next business on the agenda was to receive the report of the committee, the statement of accounts, and to consider recommendation of the committee with regard to fire insurance. The president requested the secretary to read the report, which was as follows:—

Report of committee for the year ending June 30th, 1902:—

1. Your committee have to report that since the first general meeting of the association on Friday, July 3rd, 1901, the number of members has increased from 370 to 525.

2. Four general meetings of the members were held in the months of October, December, February, and April, and the committee and sub-committees have met on thirty-one occasions.

3. Your committee regret to have to record the death of one of their number, Mr. J. Caswall Smith.

4. The first annual dinner of the association was held at the Criterion Restaurant on Thursday, March 6th, and was a great success, the attendance exceeding a hundred, and being composed of photographers from all parts of the country.

5. Local branches of the association have been formed at Hull, Edinburgh, Aberdeen, Liverpool, and Folkestone (East Kent).

6. A handbook, containing the rules and list of members of the association, was issued in August last; subsequently in April this year Handbook No. 2 was circulated, containing information relating to dealers' discounts to members, bye laws, and various recommendations.

7. The correspondence during the first year of the association's existence has been very great, the hon. sec. having received and acknowledged about 1,100 communications on a variety of subjects of interest to members. The guidance of the committee has been sought in, amongst other matters (1), Professional charges; (2), The public exhibition of sitters' copyright photographs; (3), copyrights; (4), The disputed qualities of photographic mounts; (5), Studio building; (6), Photographing on the public highway, etc., etc.

8. Your committee are pleased to report that in several instances pressure was successfully exerted on the proprietors of newspapers, and trading firms to remove misleading statements as to the value of cheap enlargements offered to the public.

9. Considerable attention was paid to the question of manufacturers' terms to members of the association, and your committee is happy to announce that in several instances important concessions were obtained, the details of which are given in Handbook No. 2. The influence of the association has undoubtedly brought about a more equitable treatment of the professional photographer in the matter of discounts as against the outside retailer of photographic supplies, and your committee take pride in the knowledge that to the Professional Photographers' Association belongs the credit of achieving this important result. The committee confidently believe that as the association in-

creases in numbers the sphere of its influence will be correspondingly enlarged. In accordance with the instructions of the general meeting of members held on February 7th, your committee approached various insurance companies with the view of ascertaining the minimum rates charged to members of the Professional Photographers' Association. The general terms of the replies received was to the effect that while some of the offices were prepared to make abatements in certain classes, it was impossible to lay down a fixed tariff generally applicable to photographic establishments. The only tangible reduction offered was contained in a letter received from the Fine Art and General Insurance Company, Ltd., offering to accept the transfer of policies at the premiums now paid to the companies insuring members' studios, and for other property, allowing a discount of 20 per cent. therefrom, and to pay a commission of 5 per cent. to the association, who will act as agents. Extensive inquiries have been instituted with regard to the position of this office, and your committee, having regard to the terms offered, feel justified in recommending it to members as being a reliable and trustworthy company, to which fire insurance business may be given. Your honorary secretary is so far satisfied with the status of the office that he has transferred a policy of £12,000 to it. Members are particularly reminded that, in order to obtain the Fine Art Company's special terms, the insurances must be effected through the Professional Photographers' Association.

10. Your committee strongly advise members of the association, wherever practicable, to become dealers in photographic materials, in order to obviate the unfair competition to which they are subjected to at the hand of shopkeepers, who are not photographers, undertaking the production of portraits, enlargements, and which legitimately fall within the sphere of professional photographic work.

11. The members of the Hull branch of the association have agreed upon a minimum scale of charges for portrait and view work, and your committee commend their excellent example for general imitation wherever possible.

12. The hon treasurer's balance sheet is appended:—

THE PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.
Balance sheet, July 1st, 1901, to June 30th, 1902.
July 1st, 1901.

Dr.	£	s.	d.
To balance of cash in hand	71	18	9
To donation	2	2	0
To 168 subscriptions, 5s....	42	0	0
To sale of 94 dinner tickets	28	4	0
	144	4	9

July 1st, 1902.

To balance	43	13	5

THE PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.
Balance sheet, July 1st, 1901, to June 30th, 1902.
June, 1902.

Cr.	£	s.	d.
By printing and stationery	30	16	0
By postages	11	16	10
By salary of assistant secretary (49 weeks) ...	24	10	0
By reporting meetings	3	4	0
By Royal Photographic Society for meeting ...	0	10	6
By ditto	0	12	6
By Spiers and Ponds' dinner	29	1	6
	100	11	4
By balance at bank	43	13	5
	144	4	9

13. The committee, being frequently approached for advice and assistance in members' copyright difficulties, have under consideration the position of the association in the matter. In view of probable alterations of the existing Copyright Act, the committee strongly urge all photographers to join the association, in order to strengthen its bonds when the necessity for action arises. An agitation is already afoot aiming for the passing of a Fine Arts Copyright Bill, uniformly applicable to Great Britain and the Colonies, and it is urgently desirable that the interests of photographers should be considered in the proposed measure, and that the Professional Photographers' Association should be officially represented in all movements of this nature. It has been suggested that the association should establish a benevolent fund for the benefit of its members, and the matter has already been discussed, and your committee propose taking it into further consideration at the earliest possible date. The establishment of the association marks a new era in professional photography, and your committee earnestly appeals to all members to give it their whole and undivided support, and to induce their brethren in all parts of the United Kingdom to become members to the end that, in seeking to promote the objects of the association, the support of the entire profession may be available. With unanimity of support, not only should the status of professional photography be advanced, but the material prosperity of the craft itself be promoted.

The president then called upon two gentlemen, not being members of the committee, to move the adoption of the report, and to second it, respectively. Its adoption was moved by Mr. Parker, seconded by Mr. H. J. Godbold, and carried nem. con.

The president then invited the members present to make any remarks or suggestions, assuring them that the committee would be quite pleased to be either censured or castigated to any extent for any wrongdoing of which they might have been guilty. This drew a remark from Mr. Dalby, to the effect that the report was of such a gratifying character, that it was in itself a refutation of some unfair criticisms of the association.

The president remarked that, as all seemed in favour of the report, the state of affairs was eminently satisfactory. It had now been unanimously adopted and passed. He might observe that those gentlemen who have not yet sent in their ballot papers could do so up to nine o'clock that evening, and that while the scrutineers were proceeding with their duties, the secretary would read some letters which had been received on the business of the association.

The secretary then read a number of letters from different gentlemen, mostly country members of the association, regretting their inability to attend the meeting, and expressing their hearty sympathy with its work and aims. The longest letter was from Mr. T. C. Turner, who, in adverting to the work of the association, expressed the opinion that the various discussions which it had initiated, had been of the greatest value to the profession generally. He alluded more particularly to the questions of cutting prices, copyright, and a minimum scale of charges. He also dwelt upon the question of the "free enlargement" advertisements, and remarking that the public were always apt to think that they could get something for nothing—suggested that the association were doing a good work in undeceiving them. He condemned competition among photographers, and urged them to get better acquainted with one another through the means offered by the association. They would all do better by making an effort to attend the London meetings than by forming branches in country districts, where the membership would be too few to do much good. The letter concluded with a promise of personal help in organising meetings, etc.

The auditors, Messrs. Fry and Barraud, were re-elected for the ensuing year — proposed by Mr. Skillman, and seconded by Mr. Douglas.

Mr. W. G. Parker then proposed a vote of thanks, which was seconded by Mr. Dalby, to the officers of the society, for the excellent and thorough manner in which they had carried out their arduous duties. This was carried nem. con. The president, having called upon the hon. secretary to respond to this vote,

Mr. Alfred Ellis said: I was not prepared for this part of the performance, for there is no mention of it on the agenda paper. I have to thank you all for your kind expressions with regard to my own and my colleague's services, on behalf of the association. Well, gentlemen, we have worked hard, and I think I may say, without vanity, that we deserve well of the photographic profession in general. I must express a certain sense of disappointment at not finding a larger attendance here to-night. I asked several members to come, and they were very kind and sympathetic, saying, "All right, we know everything is safe in your hands; I will come, if I can," and so on. All made this kind of genial excuse. This is not quite the right kind of thing. There is a certain satisfaction in being blown up and bullied, and when you have made up your mind to face the music, you are disappointed when it does not come. For this reason I should have liked to have seen a better attendance. With regard to the report, I am sorry we could not secure a better discount from the plate and paper maker's association. Unfortunately, we number at present only about 500 members, and we, therefore, cannot truly plead that we represent the whole of the photographic profession. As our numbers increase we shall no doubt get better terms. With regard to the fire insurance matter, we opened up communications with a number of different insurance companies, but we could not get them to promise anything definite. Each case, we were told, must stand on its own merits. The Fine Art Insurance Company were the only ones who made a businesslike proposition, which was the offer to make a reduction of 20 per cent. on the premiums now being paid, beyond which they expressed their willingness to meet the members fairly with regard to any renewed proposals. Our annual dinner was a great success, and I hope that our next one will attract such a crowd of members, that we shall have to bespeak the large Victoria Hall at the Criterion Restaurant to accommodate the diners. I venture to say that the correspondence which has passed through my hands—eleven hundred odd letters—is indicative of the use of the association. It is of great advantage to members seeking information to use the facilities offered by such an association as this. They can get advice at little cost of either trouble or money. That is all I have to say, gentlemen, except to thank you most heartily for your kind expressions of approval of my conduct. (Applause.)

Mr. Huli then proposed, and Mr. Sims seconded, a vote of thanks

to the Royal Photographic Society for the loan of the room in which the meeting took place, and the president promised that this resolution should be conveyed to the parent society.

Nine o'clock having now arrived, the president called for voting papers to be handed in, and while this was being done, Mr. Bridge moved a hearty vote of thanks to the retiring president for the genial and skilful manner in which he had conducted the meetings of the association during his year of office. Upon calling for someone to second this vote, there was a most hearty cry of "We all second it."

The president said: It is a little out of order, gentlemen, for all of you to undertake a duty which is generally performed by one alone, but I am quite sensible of the kindly feeling which prompted a suggestion, which is so gratifying to me, your retiring president. Those among you who are endowed with good memories may call to mind that, just twelve months ago, I expressed the opinion that a professional photographer was the right man to occupy this chair. But it was ultimately decided that, in laying the foundations of such an association, an adhesive material was required. And so it came about that I was the mortar destined to hold the bricks together for a while. The foundation was well and truly laid, but the edifice was not complete, nor will it be complete for many years. I am proud, gentlemen, in vacating my position, to become one of your vice-presidents, and I assure you that, in that capacity, my interest in the affairs of the association will increase rather than diminish. We all look ahead, and we must all have ideals to look to, or we cannot succeed. My small efforts on your behalf would have been fruitless without the unselfish work and co-operation of my friend, Mr. Alfred Ellis. I cannot give you an adequate idea of the time, trouble, and expense he has devoted to the work of the association, and it is no exaggeration of terms to say that the whole profession owe him a deep debt of gratitude for what he has done. I thank you, gentlemen, on my own behalf, for the kind manner in which you have spoken of my humble services. Although I am retiring from the chair, my interests in the association will not diminish one jot. (Applause.)

After a short interval, during which the result of the ballot was ascertained by the scrutineers, the president intimated that over one hundred papers had been filled in—i.e., rather more than one-fifth of the members had taken sufficient interest in the association to fill up their papers. This did not seem much, but he assured them, from his knowledge of the inner working of other societies, that the proportion was quite a large one. He then read out the results of the ballot:—Mr. William Grove (president). Vice-presidents, H. Walter Barnett, W. Crooke, and Ernest C. Elliott.

London members of the committee: Messrs. Ellis, Bridge, Turner, Mackie, Jacolette, Hull, Dalby, Simmons, Sims, and Scamell.

Country members: Messrs. Werner, Webster, Morgan, Barry, Whitlock, Valentine, Gill, Moffat, Spink, and Chapman.

A vote of thanks to the scrutineers, proposed by the new president, and seconded by Mr. A. Ellis, which was carried unanimously, brought the proceedings to a close.

THE PHOTOGRAPHIC SALON.

The entry form and prospectus of the Photographic Salon (tenth year) at the Dudley Gallery, Egyptian Hall, Piccadilly, from September 19th to November 1st, 1902, is in circulation. The receiving day is Monday, September 8th, from 10 a.m. to 6 p.m., on which day all pictures for exhibition must be delivered at the Gallery, either personally or through an agent.

The aim of the committee is to exhibit only that class of work in pictorial photography in which there is distinct evidence of personal artistic feeling and execution. Careful consideration will be given to all pictures entered for exhibition, and a selection of works of pictorial merit made by the committee. Pictures which have already been publicly exhibited in London will not be accepted. Pictures sent for exhibition to any other exhibition open in London at the same period are liable also to be disqualified. No awards are offered, and no charge is made to exhibitors. Exhibitors will be entitled to a season ticket. Arrangements will be made for the sale of pictures, if desired, and a commission of 15 per cent. will be charged on sales effected.

In celebration of this, the tenth exhibition, each exhibitor will be presented with a commemorative metal placquette, designed by Charles Emanuel.

The following are the conditions of entry, etc.:—

1. Each picture must be separately framed, and each frame must bear on the back, name of exhibitor, number and title of picture, and price, if offered for sale, corresponding to the particulars on the entry form.

2. Pictures will be received at the Dudley Gallery only, on Monday, September 8th, from 10 a.m. to 6 p.m.

3. They must be delivered, carriage paid, accompanied by their entry form, and without packing or wrappers of any kind, either personally or through an agent.

4. Messrs. James Bourlet and Sons, 17 and 18, Nassau Street, Middlesex Hospital, London, W., will undertake to receive, deliver, and return exhibits on the following terms, viz.:—They will collect within a radius of four miles from their warehouse (or receive and unpack) and deliver at the Gallery; also, if rejected, and at the close of the exhibition, will remove from the Gallery and re-deliver in the aforesaid district (or repack) for the sum of 1s. 6d. each frame (irrespective of size). All frames remaining in their warehouse after the close of the exhibition, without instruction from the owners, will be charged at the rate of 3d. per week. Packages from the country and abroad must be delivered at Messrs. Bourlet and Sons, carriage and agents' fees paid, not later than Thursday, the 4th September, accompanied by their entry form, and should be labelled outside, "For the Photographic Salon."

5. Due notification will be sent of pictures which are not accepted. Messrs. Bourlet and Sons will remove to their warehouse those which have been brought to the Gallery by hand, and will, if requested, return the same to the owners, free of charge, within a radius of four miles from their warehouse.

6. At the close of the exhibition, all exhibits must be removed on Saturday, November 1st, between the hours of 8 p.m. and 10 p.m. If not so removed, they will be warehoused at Messrs. Bourlet and Sons, at the expense of the owners.

The committee particularly wish to assure intending exhibitors that every care will be taken of frames sent for exhibition, but they cannot accept responsibility for damage.

ROYAL CORNWALL POLYTECHNIC SOCIETY'S EXHIBITION.

The sixty-eighth exhibition of this society will open at Falmouth on Tuesday, August 26th, 1902. In view of 1902 being the Coronation year of His Majesty the King, their patron, and having as president an eminent exponent of electrical science, Sir Wm. Preece, K.C.B., F.R.S., the Royal Cornwall Polytechnic Society have decided to make electricity a special feature of their exhibition of 1902.

Medals and prizes in the following departments:—Mechanics (Board of Trade protection granted to all new and unpatented inventions).—Machinery and models; mechanical and other scientific inventions and improvements; naval architecture; scientific papers, etc. Fine Arts.—Works by professional artists and by amateurs. Ornamental Art.—Wood carving; pottery; printing; bookbinding; leather work; lace making; and art needlework. Photography.—Photographs by professionals and by amateurs; photographic apparatus. Natural History.—Essays; local observations; collections of specimens; monographs, etc. "Lander" Prizes.—Maps and essays on the West Indies. Shorthand and typewriting. Cornwall County Council.—Prizes to students in the classes under the Technical Instruction Committee of the Cornwall County Council:—Applied design; modelling; painting; drawing; wood carving; repoussé, etc; net making and repairing; sail repairing; rope splicing; ginging of hooks; improvements to fishing gear.

This exhibition has been established nearly seventy years, and affords the best opportunity of making known the merits of inventions, etc., throughout the West of England. It will be held in a spacious hall and adjoining rooms, and will continue open for one week. No charge will be made for space. Advertisments are invited for the exhibition catalogue; for terms, see Prize List. List of prizes, and all further information may be obtained from the secretary, Edward Kitto, The Observatory, Falmouth.

Regulations.

1. All exhibits must be forwarded so as to reach the Polytechnic Hall, Falmouth, not later than Tuesday, August 19th, after which no article will be eligible for competition, and no space can be guaranteed.

2. All pictures and photographs must be framed; and if left at one of the following places of the society's authorised agents on or before Tuesday, August 12th, will be conveyed from these depôts to and from the exhibition, free of charge:—Messrs. Worth and Co., Cathedral Yard, Exeter; Messrs. Harris and Sons, 70, George Street, Plymouth; Mr. James Lanham, High Street, St. Ives, Cornwall. The above agents will not receive any article unless delivered to them free of conveyance and other charges.

3. The carriage on all other articles must be paid by the exhibitor.

4. All cases and packages sent to the exhibition must be addressed: "The Royal Cornwall Polytechnic Society, Falmouth," and must bear the name and address of the owner; the covers to be fastened with screws. The exhibitor must write at the back of each picture his name and address, its title, whether it is an original or a copy, the name of the artist, and whether he is a professional or an amateur. The works of professional artists may be sold from the gallery, through

Mr. E. Kitto, the secretary of the society, and a commission of 5 per cent. will be charged thereon

5. Exhibitors must enter all articles intended for exhibition on forms provided for that purpose by the society, or of any of the above-named agents.

6. This entry form must in all cases be returned to the secretary, on or before August 9th.

7. The society will not be answerable for loss of, or damage to, any article sent to the exhibition, but every care will be used to prevent injury while in the society's possession.

8. After admission, no article may be removed until the close of the exhibition.

9. Discretionary power is vested in the officers of the society as to exhibiting any article sent.

10. Board of Trade protection is granted to all new and unpatented inventions.

The judging in all departments of the exhibition (except shorthand and typewriting) will take place on Monday, August 25th.

Exhibitors of inventions are invited to attend on August 25th (judging day) to personally explain the merits claimed for their exhibits.

The Art Union of Cornwall (under the sanction of the Board of Trade) selects its prizes from the works exhibited by professional artists. The drawing for prizes will take place at the Polytechnic Hall during the exhibition—viz., on Friday, August 29th, 1902. Information respecting the Art Union may be obtained from the honorary secretary, W. W. J. Sharpe, Falmouth. Information respecting the photographic department may be obtained from Mr. W Brooks, Laurel Villa, Wray Park, Reigate (member of the General Committee).

New Apparatus, &c.

The Focussing Cooke Lens.—Manufactured and sold by Taylor, Taylor, and Hobson, Stoughton Street Works, Leicester.

Messrs. Taylor, Taylor, and Hobson have recently introduced a new type of mount for their well-known Cooke lenses, and have submitted a specimen to us for inspection. In outward appearance these lenses do not differ materially from the usual characteristics of Cooke lenses, excepting that a new alloy of aluminium has been substituted for brass and that the hood of the lens is provided with a scale indicating the anterior focus when the various divisions are brought opposite the indicator by rotation. The workmanship of the new mount is excellent. The novelty of this mode of focussing, if such it may be called, consists in the variability of the separation of the front lenses. By slightly increasing the air-space between them, an appreciable shortening of the focus of the system is effected, and as this is done by screw adjustment it is easy to fix the focus for distances between very near objects and infinity. We have, in fact, a scale provided for objects at 3, 4, 6, and 10 yards and infinite distance from the camera. It is well known that modern anastigmats are extremely sensitive and that their performance is materially affected by their adjustment. The question may therefore be asked, does the performance of the Cooke lens suffer when the present system of focussing is used? A trial of the lens has satisfied us that Messrs. Taylor, Taylor, and Hobson are right in using the new system for hand-camera lenses. We notice a very slight difference in the quality of the image at the corners of the plate when the lens is used for very close objects; but, on the other hand, the greater accuracy in focussing by means of the enlarged scale on the lens-hood, as compared with that which would be provided upon a hand camera, is an advantage of far greater importance. The lens system, moreover, still remains at its best when the scale is returned to its normal position. We notice with feelings of reverent regard for the memory of an old friend, the former editor of this paper, that Messrs. Taylor, Taylor, and Hobson have quoted as a prophecy the following extract from the late J. Traill Taylor's book on the Optics of Photography:—"Perhaps the most useful lens of all, should it ever reach the stage of being manufactured, will be one in which, by the rotation of a collar, the focus of the lens, complete in itself, is susceptible of being altered to a considerable extent."

This is another testimony to the late J. Traill Taylor's foresight in practical optics. Although the new focussing device of Messrs. Taylor, Taylor, and Hobson does not provide that considerable latitude in the equivalent focus of the lens which our late editor desired, yet it must be looked upon as a step in that direction, and we believe users of the hand camera will find it a distinct advantage. Messrs. Taylor, Taylor, and Hobson have also sent us photographs of a test chart for astigmatism, taken with one of these lenses. Results are shown for each of the distances engraved on the lens, and the photographs are remarkably good over an angle of 50deg.

"The Optical Magic Lantern Journal."—The proprietors of this journal ("The Magic Lantern Journal" Company, Ltd.), have appointed W. Alfred H. Saunders, of Birmingham, editor and secretary. The publishing and editorial offices have been removed to Princes Chambers, 6, Corporation Street, Birmingham, whence the usual special autumn number will be published on October 1st next.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

July.	Name of Society.	Subject.
12.....	Brentford Photographic	Zoological Gardens.
12.....	West London Photographic ...	Oxshott.
16.....	North Middlesex Photographic	*The Platinotype Process.* J. W. Marchant, F.R.P.S.
16.....	Borough Polytechnic.....	Monthly Outings Competition.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

July 3rd.—Annual meeting, Mr. T. E. Freshwater in the chair.

The annual report and balance-sheet, showing that a very satisfactory year's work had been accomplished, and that the financial position of the Association was good, was read by the hon. sec. and adopted.

The election of officers and committee resulted as follows:—Trustees: Messrs. A. Haddon and T. E. Freshwater. Committee: Messrs. R. Beckett, R. P. Drage, T. K. Grant, J. W. Hodges, R. J. Kindon, W. J. Marshall, H. C. Rapson, and J. S. Teape. Curator: Mr. S. Heskins. Recorder: Mr. E. Featherstone. Librarian: Mr. E. T. Wright. Hon. Sec. and Treasurer: Mr. W. D. Welford. Delegates to the Affiliation: Mr. A. Mackie and H. C. Rapson.

Mr. A. L. Henderson passed round a print from the negative made by Dr. Grün at a recent meeting. The exposure was ten seconds in the usual lighting (about seven gas-burners) of the room. A short discussion ensued, and it was considered certain that before very long improvements in the construction of the lens would render it of still more value. With all its faults, it yet allowed its owner to do work that would be impossible with other instruments. As regards the print, all of those present were recognisable except where some strong halation occurred, but it was thought that much of this might be removed and the figures rendered plainly visible.

Some discussion followed on the question of removing a film from a glass plate without hydrofluoric acid. Hydrochloric acid and alcohol were named as efficacious, and other more or less well-known methods were repeated.

During the months of July and August the meetings, as is always the case, will be informal.

Commercial & Legal Intelligence

The Secretary of Messrs. Langfier, Ltd., writes:—"I have pleasure in informing you that my Company has just declared a balance dividend at the rate of 17½ per cent. per annum for the year ended June 2nd last."

One of the features of the Cambridge Convention is Messrs. Marion's show-room at the Lion Hotel. It is in charge of Mr. J. M. Dickinson, the able and courteous representative of the Company. The stock shown is very large and varied, and both amateur and professional photographers are catered for.

Mr. J. Lizars writes:—"I shall be pleased if you will intimate that I have now removed my Aberdeen warehouse from 28, Bridge Street, to 171, Union Street. I have been compelled to do this owing to the growing demand for the goods of my manufacture, which has necessitated larger premises."

The work of the war correspondents being happily over, "Commercial Intelligence" has despatched to South Africa a special correspondent to report upon the commercial conditions there from the British traders' point of view. The representative sent is an expert who is familiar with the trade and industry of the old and new worlds. He is not sent to "write up" South Africa, but to tell the plain truth about it. His mission will last several months, and his reports, which will appear exclusively in "Commercial Intelligence," will deal with every branch of export trade, and be of interest alike to those who already have trade relations with the Cape and to those who are thinking of entering the South African market for the first time.

The Official Receiver for the Brentford District has issued particulars of the failure of Andrew George Adamson, residing in apartments at 22, Willcott Road, Acton, and lately residing at 69, Amhurst Park, N., and lately carrying on business at 22, Christopher Street, Finsbury Square, E.C. From these particulars it appears that the debtor has filed a statement of affairs showing gross liabilities amounting to £4,906 2s. 2d., of which £3,086 2s. 2d. is expected to rank against the estate for dividend. The assets are estimated to produce £5 only, that being the estimated value of his furniture. The deficiency consequently amounts to £3,081 2s. 2d. The report and observations of the Official Receiver are as follows:—"The bankrupt states that in June, 1895, with a cash capital of about £300, he commenced to trade at 18, Eldon Street, E.C., as an electrical engineer; that he carried on a similar business at 22, Christopher Street, Finsbury Square, E.C.; that in 1899, at Dashwood House, New Broad Street, E.C., he was carrying on business in partnership with another, under the style of Adamson Brothers, as electrical engineers; that in November, 1901, the partnership was dissolved, and that for some

months past he has been in the employ of a firm of metal spinners in London, from whom he receives a salary of 30s. per week and commission." The Official Receiver understands that the debts owing by the above firm were taken over by the bankrupt, and that some of them are still outstanding. Several creditors, at the date of the receiving order, had taken proceedings to recover their debts. The bulk of the bankrupt's furniture was disposed of in May of last year for £44 7s. 6d. The bankrupt attributes his position "to inability to obtain the purchase price of my business of an electrical engineer, formerly carried on at 18, Eldon Street, E.C., and sold in 1896," and to pressure by creditors. As regards the unsecured debts, a sum of £1,051 is shown to be owing to cash creditors, £500 to a firm of patent agents for "professional remuneration and disbursements," and £400 to the firm by whom the bankrupt is employed, for "work done and advances." The security held by the creditor stated to be "partly secured" consists of a charge upon three British patents for improvements in electric and gas lamps for photographic purposes. The "contingent liabilities" refer to the bankrupt's liability as (1) surety for the repayment of an overdraft, and (2) as acceptor of an accommodation bill. No satisfactory account has been furnished to explain the "deficiency" of £3,081. The bankrupt has been requested to file a cash account for a period extending over the last two years.—"Express" (Acton).

THE Patent Law Amendment Bill.—Last week, in the House of Commons, Mr. Gerald Balfour, in moving the second reading of this Bill, announced that he had done his best to meet some of the objections urged to the Bill by a deputation representing chambers of commerce, and said he intended to introduce amendments into the Bill in the Committee stage, which he thought would prove satisfactory to the community generally, and might be accepted as a reasonable solution of what was undoubtedly a somewhat difficult problem. He would explain shortly the main respects in which the amended Clause 2, which he would have to move in Committee, differed from the provisions of the Bill in the form in which it was introduced. The first dealt with the phrase "reasonable requirements of the public." The patentee might be required, as the Bill originally stood, to grant licences when the reasonable requirements of the public with reference to his invention had not been satisfied by reason of the neglect or refusal of the patentee to work the patent or grant licences on reasonable terms. It had been represented to him that the phrase "reasonable requirements" was not sufficiently explicit, and in particular that it did not specifically include the reasonable requirements of the producing portion of the public as opposed to that of the consumers. As he proposed to amend the clause, if any existing industry or the establishment of any new industry was prejudiced by the failure of the patentee to work his patent, or to grant licences, the reasonable requirements of the public should not be held by the Court to have been satisfied. The next point dealt with extreme cases. He proposed to retain the principle of granting compulsory licences as the basis of the amended clause, but to give the Court in certain extreme instances the power to revoke the patent. The Court would be empowered to revoke the patent if they were of opinion that the reasonable requirements of the public were not satisfied by the grant of licences. But this was subject to a proviso that no order should be made before the expiration of three years or if the patentee gave satisfactory reasons for his default. This was a reasonable compromise between extreme views; it would not work harshly upon the poor patentee, while it would render difficult or impossible a patent's being taken out to prevent production in this country. In accordance with the recommendation of the committee, the High Court was substituted for the Board of Trade as the tribunal to decide whether a compulsory licence should be granted. It was, no doubt, a serious matter to entrust to an executive department of the Government the decision of a case in which enormous pecuniary interests might be involved; but an objection to the substitution of the High Court was the length to which proceedings might be carried by appeals. He proposed, therefore, that the tribunal should be the Judicial Committee of the Privy Council with no appeal. This committee had a right, which, however, had never been exercised, to determine the duration of a patent in the public interest, and this constituted a precedent for making the Committee of the Privy Council the tribunal for dealing with this matter. The last point on which he proposed to amend the clause was in reference to cases where there was prima facie evidence that a patent was being used only to prevent manufacture in this country. In such a case he proposed that the onus of proving that public interests had been reasonably met should be with the patentee. These were the principal amendments he proposed to introduce in the Committee stage, and he hoped that the House would give the Bill a second reading in order that it might be referred to the Standing Committee on Trade, feeling sure that it would emerge in a form that would give general satisfaction to the commercial community.

CONGRESS and the Universal Exposition at St. Louis.—The United States Congress has amended the law which provided for the opening of the Universal Exposition at St. Louis, May 1st, 1903, by deferring it for one year. This has been done for many reasons, the principal being that, since its inception, the scope of the Exposition has enlarged. To show the extent of the buildings, it may be pointed out that four of those already in course of construction take in a sweep of more than one mile. The fifteen palaces, designed for the industries and the arts collectively, will hold the new century's first exhibit of the world's resources and output, and will at the same time present a birdseye view of the growth and progress of all peoples and all countries. Up to the middle of June the money available for the St. Louis Universal Exposition, including State and National appropriations, amounted to $20,000,000, or something over £4,000,000. As already stated, the date fixed for the opening of the Exposition was May, 1903. For several reasons this has now been deferred to May, 1904. Generally, all the world over, exhibitors ask for time, upon the plea that they are not able, on such short notice, to design and prepare the special exhibits necessary. If the thing is to be well done, they need a year to plan and to put their ideas into form and another to carry them out; that is to say, if they are to carry out the purposes of the management, and to include among their exhibits the latest models, processes, and discoveries. The intention to do this is shown by the schedules to be very strong. The postponement until 1904 has also been made, the resident representative of the Exposition in London informs us, in order that, while the buildings were planned to be complete at the time originally fixed, and the progress already made assured success, they may now receive, not only the much-desired attention in the matter of construction, but that their decoration and beautifying may be carried out somewhat more leisurely and satisfactorily. The same conditions also apply to the ornamentation of the grounds; they will be planted, and the year's additional growth will give them a finish as well as a completeness otherwise impossible. While the postponement was under discussion, assurances were received from nearly all the leading foreign countries and from many of the States of the American Union that the postponement would be welcomed by them in an official capacity, by the business men and manufacturers who generally exhibit, and also by those elements among the people who will furnish visitors. More time was also needed for making and perfecting arrangements for the congresses and meetings, now such important features of all universal exhibitions.

ELECTRICAL and Other Patents.—If we assume that the number of patents taken out in connection with an industry is a measure of its activity, some useful information on this question will be found in the recently issued report of the Comptroller-General of Patents. The number of patents sealed in each of the 146 classes into which inventions are divided by the Patent Office is given in tabular form for each year from 1885 to 1900. Comparing the number of patents in 1900 with those in 1899, says the "Electrical Review," of London, we find that in the class of dynamo-electric generators and motors there was an increase of 7 per cent.; in electricity, conducting, etc., an increase of 17 per cent.; in electricity, measuring, an increase of 10 per cent.; in electricity, regulating, an increase of 5 per cent.; in electric lamps, etc., an increase of 5 per cent.; in electric telegraphs, etc., an increase of 1 per cent.; in electrolysis, an increase of 11 per cent.; in galvanic batteries there is a decrease of 8 per cent. It is evident from these figures that all the principal branches of the electrical industries, except galvanic batteries, are in a progressive condition. Electric traction does not form a separate class, so that an exact statement of the progress of invention in this department cannot be arrived at from the table, but the Comptroller states in his report that the attention of inventors has been specially directed to this subject both in 1900 and 1901, the protection of the public from accidents due to broken wires being a favourite subject. The rise of the motor-car industry has led to a great increase of patents in connection with this industry, while the enthusiasts who, three or four years ago, overwhelmed the Patent Office with cycle inventions have evidently subsided—the patents in this class in 1900 are only 36 per cent. of the number sealed in 1897. The figures given in the report with regard to oppositions to the granting of patents are of special interest in connection with the proposal which is now before Parliament for an official examination as to novelty. Between 1894 and 1901 about 1 in every 200 applications was opposed before sealing. This opposition can only be made by a party interested in an earlier patent for the same invention, or by a party from whom the invention has been obtained by fraud. The public, who have most interest in the suppression of bogus patents, have no *locus standi* in the Comptroller's Court. Sir Edward Fry's Committee found that more than 40 per cent. of the patents granted were wanting in novelty, and at present the sole available process of preventing the sealing of a bogus patent results only in the suppression of less than ½ per cent. Evidently, it should be open to any member of the public to oppose the sealing of a patent, or else the Patent Office itself should protect the public from being blackmailed by the bogus patentee. The surplus of receipts above payments in 1901 was over £107,000, a sum which should either be spent for the benefit of inventors, or remitted from the fees. There is no justification for a special tax on invention.

THE Bausch and Lomb Optical Company, Rochester, N.Y., announce a photographic competition open to amateur and professional photographers, residents of foreign countries, as well as the United States, the object being to bring together as large and representative a collection of photographs as possible, in order that the present development of the photographic art and the progress in lens and shutter construction which has been made during the past quarter century may be made evident. In order to enhance the interest of photographic work, the awards have been divided into a number of classes, such as landscape, portrait, genre, instantaneous, architectural, interior, etc. Several special awards for telephoto and other work have been provided, also a special award for users of the Bausch and Lomb rectilinear lenses on various makes of hand cameras, kodaks, etc.

PRACTICAL Application of Scientific Education in Germany.—It is the common belief that the commercial rise of Germany has been largely due to the results of the Franco-Prussian war, which put money into its coffers and stimulated the energies of the people. Doubtless much of Germany's phenomenal success of the last quarter of the past century was due to this event; but in order to gauge accurately the nation's capacities and aims, it is necessary to look farther back than 1870-71. It is perhaps unnecessary to say that the whole standard of education in Germany is higher than in either the United States or England, and technical education had its beginning in Germany long before the Franco-Prussian war. Sixty years ago (writes "The Scientific American") Liebig had fifty students working in his factory, and all of the German Universities have had their own chemical laboratories since 1827. To-day, there are in German factories 4,500 thoroughly trained chemists, besides more than 5,000 assistants, whose brains are constantly at work upon the problems of improving processes, and lessening the cost of production. The sugar

industry illustrates the practical application which the Germans make of their educational system. In 1840 154,000 tons of beetroot were crushed, from which 8,000 tons of raw sugar were produced, showing about 5½ per cent. of raw sugar extracted from the root. Twenty years later 1,500,000 tons were treated which produced 128,000 tons of sugar, or about 8 per cent. Last year about 12,000,000 tons were crushed, which produced 1,500,000 tons of raw sugar, raising the percentage to 13. This advance is due entirely to scientific treatment. The production of dry colours, chemicals and dyes in Germany shows a corresponding increase in product and in dividend-paying capacity. Comparing the statistics of the dyeing industry of the year 1874 with those of 1893, it is found that notwithstanding prices in 1898 were considerably lower than in 1874, the net income in 1874 was 24,000,000 marks (about 6,000,000dols.) and in 1898 was 120,000,000 marks (about 30,000,000dols.). The great increase of earning capacity is due largely to the constant labour of trained men, who by application of their technical knowledge have so cheapened production that they have succeeded in getting this trade away from the English, who formerly controlled it. Another illustration is found in the manufacture of artificial indigo, a chemical process for marking which was discovered in Germany about thirty-five years ago. It was started with less than forty workmen, all told. It now employs over six thousand men, and has a staff of one hundred and forty-eight scientific chemists. By placing this substitute upon the market at a very low price the Germans have nearly ruined the natural-indigo industry of India. The Germans have also discovered a method for obtaining ground slag from steel processes, which is used as a fertiliser; and England, although she produces as much steel as Germany, has become a good customer for this article. A century ago the English and French makers of scientific instruments were far in advance of the Germans. During the last twenty years all this has changed. The value of the exports from Germany of scientific instruments for the year 1893 was about 1,250,000dols.—three times what it was in 1888—and the work gave employment to 14,000 people. The conclusions to be arrived at from the foregoing are not so much academic as economic and practical. In Germany, a young man is called upon to decide, early in his career, whether he will take a classical or a scientific course. If he decides to take the latter he goes into the "Real Schule," or lower scientific school, to be elevated thence to the "Real Gymnasium," or scientific high school, and thence to the "Polytechnicum," or institute of technology, which is separate from the Universities. In this course he learns no Greek and only a moderate amount of Latin; but he has the sciences, engineering, mathematics, modern languages, history and a mixture of practical and theoretical training in various technical branches, with frequent excursions for the purpose of inspection of work in factories and public enterprises. The faculties of these institutions keep in touch with the manufactories, and when capable young men graduate they easily find situations. This is also true of the technical high schools, of which there are twenty-four, which likewise have courses in engineering, architecture, drainage, irrigation, modelling, drawing, chemistry, modern languages, history, etc.

News and Notes.

Royal Institution.—A general monthly meeting of the members of the Royal Institution was held on Monday afternoon (the 7th instant), the Duke of Northumberland, President, in the chair. Mrs. Bailey, Miss L. M. Burnett, Right Hon. Sir Ernest Cassel, K.C.M.G., Lady Kelvin, Miss F. A. Musgrave, Mrs. E. Otter, and Mr. E. Schweich were elected members.

Stuart Robson, fifty, a photographer, was brought up at the Middlesex Sessions, on Saturday, to receive sentence for obtaining from various tradesmen in the northern suburbs a total sum of £71 3s. 9d. He obtained the money by falsely representing that certain inventions of his were proving great successes and "going ahead like fire." One invention was a combination of a camera and a cycle, by means of which, it was said, a man riding along could take a continuous photograph. The prisoner was remanded for a long statement he had prepared to be inquired into.

The photographic fiend, it appears, has made a new departure. In his own language, it may be said that he has undergone a fresh "development." He has invented what he calls a water lens, "which works at phenomenally large apertures, and consequently is available for extremely rapid exposures, bringing within the pale of practical work subjects which might not previously be undertaken with any hope of success." I am told that with the assistance of the new discovery it has already been found possible to take several large groups of pantomime performers at their work on the stage, and that before long it will enable every playgoer to become his or her own photographer. The opera-glass is to disappear, and the Kodak is to take its place. Fancy that! Think how the interests of the stage will be advanced when those who sit in front are busily employed taking each other or taking the performers behind the footlights.—"Carados" in "The Referee."

The amateur photographer has been in great force during the past fortnight. The song of the streets has been "The March of the Camera Men." The lady amateur has also been much in evidence, and has specially favoured our Indian and foreign visitors. I myself yielded in a weak moment to the fascination of the thing, and became the proud possessor of a Kodak, which has monopolised much of my spare time. In the course of a week I snapshotted a Maharajah, a Burmese envoy in a pink petticoat, the sentry on duty at Dorchester House, the occupants of the new ape-house at the Zoo, the balloon ascent at the Crystal Palace, Sir Thomas Dewar, M.P., in his motor-car, a Fiji policeman asking a London policeman the time, the entrance to Westminster Abbey, Lord Hawke carrying his bat out, the Canadian arch, and Billy Greet listening to a new "Caruso" record on the gramophone and wagging his tail at the top notes. Mr. Alfred Ellis kindly offered to develop the photos for me, and has done so and sent them home. That was some three days ago. At the moment of writing, I am still examining them with a large magnifying-glass in order to make out which photograph is which. The only one I am really certain about is the Fiji policeman, whom I took in Piccadilly. His head is apparently about ten feet above the Albemarle Hotel, and I know him by his hair. As a photographer I have evidently something to learn.—"Dagonet" in "The Referee."

Newgate.—In years past many prisoners in Newgate Gaol, under sentence of death, have been respited. Some year or two back the prison itself was condemned, and is to be pulled down. We now learn that it has just received a respite for a few months. Why we call attention to the matter is that some photographers who have not already done so may still, for a few months more, have the chance of securing a photographic memento of the building as it has existed for several generations. It is true that it is not by any means a picturesque structure; indeed, it is just the reverse. Its interest centres in its being the building that has confined, and from which was executed, and lie buried within some its precincts, some of the greatest criminals that have ever lived—and that alone. Such of our readers who desire to secure photographs of this—we may say gruesome—structure will do well to embrace the opportunity while the light is good, and before the demolition of the building is commenced. Too often is the opportunity, through procrastination, put off until it is too late to secure views of disappearing London. Some we know now regret that they did not secure views of that ancient street so well known to "bookworms"—Holywell Street—before it was demolished to make way for the Strand improvement. It is for this reason that we call attention to the fact that the old Newgate prison is soon to disappear.

Royal Observatory, Greenwich.—The first of the social "At Homes" which the Astronomer Royal has instituted to supplement the official visitation took place last week. Notwithstanding the showery weather, a large number of guests availed themselves of his hospitality and inspected the instruments and photographs. The series of solar eclipse photographs excited special interest. The last three total eclipses of the sun (those of 1898, 1900, 1901) have all been successfully observed by members of the staff; and the results of the three eclipses, taken with similar instruments and under similar conditions, afford clear evidence of the gradual change in the type of the corona at different phases of the sun-spot cycle. The corona of 1898 showed great activity in many directions, there being several conspicuous rays at considerable angles to the solar equator, but by 1901 the aspect had changed to the characteristic type of sun-spot minimum, namely, two great equatorial extensions, of a regular simple structure, with little evidence of disturbing forces, while the poles of the sun are unoccupied, except by the Polar plumes," a series of narrow rays curving away from the sun's axis on either side, which so strongly recall the magnetic curves made by iron filings on paper when a magnet is held beneath, that a magnetic origin is ascribed to them by some astronomers. Some beautiful photographic results have been obtained with the 26in. equatorial presented by Sir Henry Thompson and the 30in. reflector presented by Dr. A. Common. In particular, the great nebula in Orion is portrayed with a marvellous amount of detail, great streams and whirls of nebulous matter radiating in all directions and connecting the two well-known nebulæ, which to the eye appear absolutely separate. A photograph of the Pleiades also showed great wealth of detail, each of the principal stars having its own nebula appendage, many of them of the most complicated and fantastic forms. These photographs were exhibited at the Paris Exhibition last year, and a diploma of merit was awarded to them. The photographers of the staff have not confined their efforts to celestial subjects. A camera club was inaugurated two years ago, and a large number of studies and enlargements were on view in the library.—"The Times."

Instructions in the Use of Papers.—Anent our article last week, "Another Note on the Instability of Silver Prints," a correspondent writes commending the article, and at the same time takes us somewhat to task for not more emphatically condemning the instructions issued with some of the papers now on the market, and upon which so many amateurs rely—namely, weak fixing baths and short washing, and combined baths and the like. Our correspondent says, in effect, that some makers seem to vie with some others in making, according to their instructions, their papers simpler for the inexperienced amateur to work than others. A, for example, recommends a combined bath that contains lead, alum, etc., in which the print is toned and fixed at the same time, simply because it involves less trouble in the manipulation. B, he says, while recommending separate toning and fixing, says wash in running water for an hour. C again says wash for half an hour, and so on. All this, the writer says, is done to make the paper appear, to the novice, more simple to work than those of others, quite regardless of the probability of the stability of the pictures. Our correspondent charges the makers of the papers with bringing photography into disrepute by the instructions they issue. We cannot hold with him entirely on that point. As the makers, as we said in the article, assume that the users have some knowledge of photography, though, unfortunately, many have not, but that is not the fault of the manufacturers. The writer condemns the combined bath very emphatically—we have never commended it; but there seems no reason why it should not yield fair stability if the prints are really toned by gold, which, by the way, is not always the case. As regards the washing, that can be as effectually done in half an hour, if the fixing has been properly done, as it can be with several hours in running water, provided it be done in the right way. This, of course, involves a little extra trouble on the worker. But surely the amateur,

however novice he may be, will not mind this if he values the permanence of his work, provided he knows how to obtain it, but that is manifestly not the province of the manufacturers to teach in the brief instructions for its use that are issued with the papers.

A New Discovery in Oil Painting.—The Paris correspondent of "The Times" writes:—"I went this afternoon to the spacious studio in the Rue de Courcelles, where M. J. J. Raffaelli, one of the most celebrated of the *genre* painters among living French artists, had invited a numerous company, consisting principally of the most competent French and foreign painters who are at present in Paris. The object of this gathering was to hear from M. Raffaelli the description of a curious discovery which he has made concerning oil painting, and which appeared to excite the enthusiasm of the whole company.— M. Raffaelli, combining practical demonstration with theory, began by expounding the general principles of his discovery:—'I have always been struck, and almost irritated,' he said, 'at the inconveniences and complications which arise in the practice of oil painting. As long as an artist paints in his studio these inconveniences are not so numerous. The painter has his brushes, his oil colours, his palettes, his eraser, and all the utensils necessary for his work. When the prepared colours begin to run on account of the oil with which they are mixed, the palette can be wiped, the brushes and accessories cleaned, and according as the painter is accustomed to do this himself or to employ a pupil or servant there is more or less waste of time, but this is all. When, however, you plant a landscape or make a portrait at the sitter's house or in the open air all these troublesome details break the unity of your thought, so that you have to reconstitute your original conception, and the interruption generally becomes perceptible in the finished work. The pastel has not this inconvenience, but it has a much greater one—the colour falls off and loses its tone. Even if you put a glass over it, it rarely, after a time, retains its orginal beauty and lustre. For many years I have been trying to combine the advantages of the pastel, its fine soft velvet colouring, with those of oil painting, to which time adds a new beauty. I fancy I have succeeded, and I have, therefore, invited you to see a demonstration. I have contrived to put oil colours in small solid sticks like crayons, which I rub against the canvas, wood, ivory, or paper. I have procured, as you see, one of the most complex pictures in colour and design. I shall reproduce the principal parts of it before you, and you will be able to judge of the perfection with which this is done. As soon as it is quite dry, which will be very soon, my picture will be unalterable without any of those impedimenta which embarrass the painter.' M. Raffaelli accordingly reproduced under our eyes a portion of the model, which it was impossible to distinguish from the original. The enthusiasm was very great, and M. Bernard, a great colourist, on looking round the pictures in the studio, exclaimed:—'It is wonderful; it is a revolution in oil painting.'"

During the debate on the Commonwealth tariff, one of the speakers justified his vote for a high duty on the camera and its requisites by remarking that they were "luxuries, pure and simple." Even at the risk of being considered rude, we have allowed ourselves to take a mental snapshot of the worthy orator who voiced the profound argument; and notwithstanding the 500 miles of atmosphere between our lens and its objective, the negative discloses a clear outline of such an eminently bucolic brain as alone could give room to this ridiculous opinion. It would be a wast of time for us to attempt to point out anything different to this gentleman, as no doubt he would fail to appreciate any achievement of the camera which did not include his own aldermanic proportions, and the machine which depicted these might well be called a luxury —and taxed out of existence. However, when we see that it is possible for such wilful ignorance to be displayed in high places, it is well for us to note the daily increase of our obligations to photography. At every step forward which man takes, the camera lends him aid. Intellect is enabled to meet intellect, though they be thousands of miles apart. The natural means of communication of ideas, particularly those of the painter, the sculptor, the engraver, the artist, would be almost parochial in their reach did not this little vision-recorder "camera" make their presentments available the wide world over; and the conventional means of communication, such as printing, writing, dramatising, are also becoming more deeply indebted to it every day. To the scientist with his "facts" the camera has become the most indispensable of all his adjuncts; and who shall say how high its value when considered in its relations to the defining of shapes and bodies terrestial or celestial? Truly there is no field of change in which it is not employed, and its agency, be it remembered, is always for the betterment of the human race. And yet our Senator would prefer the camera as a luxury, and tax it to extremes. The gentleman in question would, as we gather, separate the amateur from his share in the triumphant march which photography is making, but we would inform him that the larger proportion of new successes is due to the happy-go-lucky amateur, who experiments out of pleasure and passes it on to science. The student can now go to the public library and photograph the page he wishes to learn. A certain star in the constellation Pleiades, which has always been considered a "plain" star, has been proved by photography to be nebulous. Lengthy business letters are now photographed in America and transmitted abroad in that form. The camera has proved a lightning flash to be not only a single-forked streak, but a dozen or more, branching in all directions. The engineer may now detect flaws which the eye of man cannot perceive. By means of a flashlight apparatus, change in the foundations of a breakwater 50ft. below the surface may be depicted. Modern map-makers reproduce their plans by photography, some of the plates at the Ordnance headquarters, Southampton, weigh over 30lb. By the aid of tiny photographic apparatus the doctor can find out what is going on in the globe of the eye. Merchants supply photographs of articles inquired about by their distant customers. This and much more being common knowledge of the masses has regretfully escaped a learned representative of the people, who are called upon to suffer through his ignorance.—"The Australian Photographic Journal."

Phrenology and Photography.—Few businesses, or professions, as one may term it, have made such rapid advances during recent years as that of photography. As an art-science in matters of investigation and record its services in the path of progress have become indispensable. Not alone in portrait-taking, but regarding it as one of the most useful of investigating apparatuses, the camera is now employed in recording and conducting researches in a vast variety of ways by astronomers, meteorologists, surgeons, physicians, geologists, artists, chemists, botanists, physicists, and anthropologists; in the bureau of the statesman, the counting-house of the merchant, the offices of the lawyer, draughtsman, clerk, the workshop of the engineer, etc. Photographic facsimiles of authentic documents are held in courts of law to be as good, almost, as the documents themselves; thus, for the purposes of lawyers, statesmen, diplomatists, etc., the art is invaluable. There are advantages and disadvantages connected with this profession as with nearly all others. In the first place, it is admitted to be crowded; chiefly, perhaps, because of the many amateurs who dabble in the art. It will be seen, however, from what has already been stated, that there is plenty of opportunity for developing and extending its uses; yet only those who are adapted to enhance its value and perfection in the best productions of photographic art may expect to succeed in and adorn the profession. Photography is recognised as an artistic-scientific profession, and to succeed in it the individual must possess artistic-scientific as well as business abilities. He must have considerable knowledge of chemistry, and be fairly versed in the technicalities of art. There are firms in London and provincial towns which take pupils and apprentices at a premium varying from £25 to £100 according to the firm's recognised standing. The engagement is generally for four years, and a small weekly wage is usually given. When competent to take a position as chief assistant or operator, a salary of two or three guineas or more per week may be earned, though 35s. to two guineas per week is more nearly the ordinary wages paid. But the aim of the aspiring people is generally to go into business on his own account. It is an advantage, then, to join the Professional Photographers' Association, of which Mr. Alfred Ellis, 51, Baker Street, London, W., is the hon. secretary. Though founded only as recently as last year, this Association has a membership which includes the names of some of the best photographers in Great Britain, and it is doing much to enhance the interests and raise the status of professional photographers. Some years ago the Royal Photographic Society was established, but previous to this the photographer had practically no status, excepting the position which each made for himself by good work done. From £50 to £100, at least, is required to commence business, even in a small way. The young pupil would do well to augment his knowledge of art and science by attending the art and science schools or classes which are established in most large towns. Many young ladies are employed as mounters, retouchers of negatives, reception-room attendants, and book-keepers, and in other light work well-suited to persons having artistic tastes, at a salary ranging from a few shillings to two guineas per week, according to their skill and proficiency. The various chemicals used, and the necessary operations conducted in the dark-room —though not so injurious since the partial, if not general, abandonment of the wet collodion process, when photographers, closely confined, unavoidably inhaled much of the fumes of ether and alcohol—are still a source of detriment to the health, because of the scarcity of light and air, unless the dark-room is constructed on the latest improved plans. If much occupied in the dark-room, a brisk walk should always be taken after business hours. Phrenologically, the photographer should possess large perceptives, form, size, individuality, colour, and order, also comparison, constructiveness, imitation, and ideality, so that he may have a natural taste for art; large human nature and causality, to give him an interest in studying physiognomical differences, and the characters and appearances of others, so as to assist him in "posing" to the best advantage. These combinations will also give him an analytical and scientific bent. He should have well-developed executive organs, firmness, and fair acquisitiveness, conjoined to well-developed perceptives to give him energy, perseverance, and business tact, and sufficient agreeableness and concentrativeness to make him suave, patient, and persuasive. He should possess a healthy and somewhat wiry constitution, together with a fair development of the mental temperament, so as to enhance the activity of the whole of these specific mental qualities.—J. Millott Severn, F.B.P.S., in "The Popular Phrenologist."

Photography in France.—The writer has recently been looking through some notes of a holiday spent last summer in France, in the hope that some of his experiences may be of use to those readers of "Scraps"—and they must be numerous—who contemplate visiting the classic land of Gaul during the coming summer season. He was accompanied by a friend, also a knight of the camera, and they divided their time between Paris and Normandy. Both were whole-plate workers, but to economise weight they shared one camera between them, each, of course, bringing his own dark-slides. Each endeavoured to make his own collection of photographs completely representative, and independent of the other, but care was taken never to make absolute duplicates of a particular view. The plan was found to be very satisfactory as regards results. There was none of that feeling of half-ownership which comes when two workers have everything absolutely in common. Each could honestly say of any photograph in his own collection, "I took that: that was my idea"; and each could rely on borrowing any negative from the other to add to and complete the souvenirs of his holiday. Besides the whole-plate, a quarter-plate magazine hand-camera was carried for light work, both in the hand and on the stand, and it was found most useful for street scenes and architectural details. Films—Ilford films—were used throughout the tour, and it was their lightness which made a walking tour with the whole-plate camera possible. Six dozen whole-plate films were found an imperceptible addition to the baggage, whereas everybody knows that six dozen whole-plates would require a porter to trundle them behind one in a barrow. There is a certain word which strikes terror into the heart

of every photographer who thinks of working on the Continent, and that word is "Customs." It has made many a timid worker wistfully put away his apparatus again, feeling that it is not for him to brave the fiery ordeal of the frontier, and that he dare not risk his precious instruments in the reckless hands of the Customs officials. But here let it be stated, for the encouragement of the nervous, that whatever may have been the case a decade or so ago, when photography was far less popular than at present, photographers nowadays rarely have any difficulty with the Customs, and the horrible yarns one hears of quantities of precious films being ruthlessly ripped open and fogged are mostly apocryphal, and such an outrage is never likely to take place at Dieppe, Boulogne, Calais, or any port where photographic tourists are frequently met with. If one is going to Paris it is by far the best plan to postpone buying one's plates or films till one gets there, and then to call on the Paris agent of the Ilford Company—M. Carette, in the Rue Laffitte, about ten minutes' walk from the Gare St. Lazare. It would not, of course, be wise to rely on getting the larger sizes of films or plates without previously communicating either with him or with the Ilford Company. Besides being up to date in his stock, M. Carette is courtesy itself, and always willing to impart some of his extensive knowledge of photography in the French capital to his English customers. He has also a very well-appointed dark-room on the premises, and the writer was particularly impressed by the cordiality with which he invited his companion and himself—perfect strangers—to come and use it "as often as they liked" while they were in Paris. There seem to be few restrictions on photography in public places—as regards exteriors, at any rate. The writer used his camera pretty frequently in the gardens and parks without ever being interfered with; indeed, whenever a gendarme appeared on the scene, and the photographer's heart sank into his boots at the dread sight, instead of an arrest and deportation to some modern equivalent of the Bastille, all that resulted was a polite inquiry as to the success of the picture, with, perhaps, some good advice as to the best point of view. It was not uncommon to meet a gendarme who was himself a photographer, and with one guardian of the peace the writer and his friend had quite a long "confab" about lenses. As an example of the freedom with which photography may be indulged in out of doors in Paris, it may be stated that no permission is needed to photograph in the grounds of the Palace of Versailles, with all its architectural and horticultural treasures. Plates in great number may be expended at this delightful place. It would, of course, be absolutely impossible to give even the faintest idea of what to photograph in Paris. There are so many subjects, each appealing with varied force to different tastes, and the "opportunities" in light and shade are so numerous, compared with a dingy, smoke-beclouded city like London, that whole books might be filled with suggestions for photographic triumphs. The tourist naturally feels bound to attempt some of the stock architectural sights. It would not be human nature if he did not, but it seems rather a pity for a photographer with a limited number of plates at his disposal to waste any on subjects of which photographs may be purchased anywhere for a few pence. The plan adopted by the writer, and one which is widely practised among amateur photographers abroad, was to lay in a large stock of the admirable pictorial postcards, bearing tastefully selected local views, which may be obtained in every French town or village of any note. They are splendidly got up, the blocks being in many cases nearly perfect, and they far surpass anything of the kind which has ever been put on the market in England. The price is the modest sum of one penny. Having by this means acquired a large collection of photographic views, one feels freer to follow one's own personal inclinations as regards photographing, and the specialist can allow himself free play without being reproached on his return home for not bringing back any "real views" of the country. It must be borne in mind that when on tour the English photographer's stock of plates is limited to those he carries with him, it being next to impossible to get plates in English sizes when away from the large towns. The light in the North of France is little, if any, more actinic than that in England, and the exposures required will be found to be as a rule about the same. In Paris the light is deceptive, being decidedly less brilliant than it appears to be. This is no doubt due to a slight yellowing of the light caused by the smoke in the air; and that there is some amount of smoke in the air of Paris no one who has surveyed the city from the heights of Montmartre will venture to deny. Hand-camerists at work in the Paris streets and on the Boulevards are specially liable to set their shutters at too high a speed, only to find later on, after development, that a series of splendid pictures is seriously marred by detailless shadows. On the Boulevards, too, considerable allowance has to be made in summer for the dark green of the foliage and the heavy shadows which it casts. Carriage of Apparatus.—The whole-plate camera and slides, and also the films, which take next to no space, were carried in a stiff cloth case, which was strapped on the shoulders knapsack fashion. This was how it was carried when "on the tramp," but when prowling round a town or village in search of the "photographable" a single strap was passed round it and the case slung over one shoulder like a satchel. One of the two carried this, while the other bore the tripod, the hand-camera, and one or two necessaries, though the latter were rigidly restricted, as the photographers were never away from headquarters either at Rouen or Paris for more than a week at a time. Storage of Exposures.—As films were invariably used, this was a comparatively simple matter, the plan being to pack the exposed films in dozens and to restore them to their original wrappings, care having been taken to preserve the various pieces of brown and oiled paper. Each film was, of course, numbered before putting it in the dark slide—just a small figure on one corner in pencil—and against a corresponding number in the notebook was written the subject and full particulars of the exposure for guidance when developing. Changing.—In most towns a dark-room can be found—in France known as a "cabinet noir"—it is in the country that difficulty arises. The best plan is to change one's exposures at the hotel, just before going to bed, having blocked up the window with a counterpane or a blanket or two. A portable ruby-lamp may be carried, but with a little practice it will be found quite simple to do everything by feeling.—"Ipswichian," in "Photographic Scraps."

Patent News.

The following abridged description is specially drawn for the British Journal of Photography by Messrs. Hughes and Young, patent agents, 55 and 56, Chancery Lane, London, W.C., who will give advice and assistance free to our readers on all patent matters:—

Patent Applications.—No. 13,605.—Christian Gustav Warnecke and William Henry Heath, 101, Northampton Buildings, Clerkenwell. "Improvements in and relating to photographic cameras and roll-holders."

No. 13,653.—James Henry Smith, 322, High Holborn. "Improvements in camera stands."

No. 13,708.—James Edward Smith, 5, Euston Road, King's Cross. "Improvements in photographic apparatus."

No. 13,848.—Charles Edwin Pollard, 9, Regent Street. "A new or improved panoramic camera."

Patent Illustrated.—No. 4,388.—Photography. Patentee: J. Courtier, 9, Avenue de l'Observatoire, Paris.

Lamps, actinic.—Relates to a method of producing flash lights for ordinary photography, or a succession of flashlights for kinematographic photography, by volatilising metal wires by the electric current. A number of different arrangements are described. In one arrangement the wire is fed forward by two rollers till it comes in contact with two plates forming the terminals of an electric circuit. At the instant of double contact the wire is volatilised, and gives the flashlight.

No. 4,407.—Photography. Patentee: W. O. Stanley, Hawthorn Bank, Altrincham.

Cameras; stands.—Relates chiefly to a lazy-tongs mechanism applied to an adjustable camera-stand, and also to a copying-camera. In the copying camera the easel is connected to the back of the supporting frame by a lazy-tongs. The lazy-tongs is extended or contracted by a screwed rod connecting opposite corners of an end cell.

No. 4,787.—Photography. Patentee: H. J. Haddan, 18, Buckingham Street, Strand.

Cameras; dark slides; roller slides.—Relates to a camera which may be used either with films or plates. An aperture is cut in the back of the casing of the roller slide, and into this the plate-holder is inserted. The front of the camera is connected to the back by jointed links so designed that, when the camera is fully drawn out the film is in focus. To bring the plate into focus, the hinged link is turned up from the position, so as to arrest the links before they are fully extended.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

THE ALDIS LENS.

To the Editors.

Gentlemen,—With reference to our advertisement in your Coronation issue, offering to supply one of our No. 2 S. II Aldis lenses in Unicum shutter, complete for 27s. 6d., we think that possibly some of your readers might prefer to have the shorter focus lens—i.e., No. 1, S. II. 5in. f.l. in place of the No. 2 5¾in. f.l. We should be very pleased to make this exchange if they will write us on the subject, and it will also materially hasten the rate at which we shall be able to send the lenses out. We should also be obliged if they will quote the number which they will find on the receipt for their remittance.—Thanking you in anticipation, yours faithfully, Aldis Bros.

13, Old Grange Road, Sparkhill, Birmingham.
July 2, 1902.

DECORATIVE PORTRAITS.

To the Editors.

Gentlemen,—If you think this letter too much of an advertisement of my own goods, please do not insert it. If, however, you agree with me that it might do a good turn to some of our smaller professionals, I trust you will find room for it.

There is a feeling abroad that any decoration, such as a frame or a floral design, round a portrait, is somewhat *infra. dig.* for a profes-

sional, and should be left to amateurs. I do not agree with this at all, except, perhaps, with those who do a very high-class business. On the contrary, I believe these trifles might be the means of increasing business, and then *infra. dig.* can go to Bath.

I am not afraid to test the matter, and therefore I offer to lend to two photographers, in different parts of the country, about twenty or thirty suitable designs for use with their own negatives, by simple double printing. The only condition is that a proper display of the prints must be made in a shop window accessible to the passer-by. Later on no doubt the photographers will, for the benefit of their brethren, relate their experiences in your columns, and without connecting me with it at all. The result may somewhat be governed by local circumstances, but we must chance that, and see what results.—Faithfully yours, WALTER D. WELFORD, F.R.P.S.

Warwick Lodge, 166, Romford Road, London, E.

"THE TYMA."

To the Editors.

Gentlemen,—In consequence of the success of the demonstrations of the "Tyma" trough for the development in daylight of rollable films at the above address, we have made arrangements for similar demonstrations at the times and places stated below. We shall be obliged if you will call your readers' attention to this.—Yours truly,

G. HOUGHTON AND SON

88 and 89, High Holborn, and Dean Street, London, W.C.

July 4th, 1902.

Messrs. Spiers and Pond, Queen Victoria Street, every Monday at 4.30; Messrs. Hobbies, 166, Aldersgate Street, every Tuesday, at 1.30; Messrs. Stanley, London Bridge Approach, every Thursday, at 1.30 to 3 30.

THE ILLINOIS COLLEGE OF PHOTOGRAPHY.

To the Editors.

Gentlemen,—We are in receipt of the May 9th issue of the BRITISH JOURNAL OF PHOTOGRAPHY, with a two-column comment on the Illinois College of Photography.

In response to same, will say we were solicited by the "Munsey Magazine" people to increase our space from one inch to quarter page, and their "expert" ad. writer would write up the copy and have the electro made and inserted. It never has suited us, and should not have been published. If you care to notice the July issue you will see we are running a quarter page electro like enclosed copy.

We say in our catalogue that photography is a life study, which it is. We mail you a copy of our catalogue, which we hope you will receive in good order. We are doing all we can to raise the standard of photography, as hundreds of our students all over the world can testify, and next year shall start a two years' course in the college.

A student will learn more in our institution in one month than he will in an ordinary studio in six months.

Trusting this will give you a better idea of our intention, we are, yours fraternally, L. H. BISSELL, President.

Illinois College of Photography, Effingham, Ill.

June 26th, 1902.

[The following is a copy of the modified advertisement referred to.—EDS. B.J.P.]

THE SUN NEVER SETS
On I.C.P. Students. They attend from all over the Globe.
LEARN PHOTOGRAPHY.
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I.C.P.
The original and only exclusive College of Photography in the World. We want you to write to-day for our catalogue showing engravings of our equipment, and containing full information, terms, and cost. It will interest you.
ILLINOIS COLLEGE OF PHOTOGRAPHY,
Wabash Avenue, Effingham, Ill.
Good Positions Secured for Graduates.

"THE KING'S HIGHWAY."

To the Editors.

Gentlemen,—I beg leave to ask your opinion on the following matter:—

Last Saturday afternoon a friend and I, with our cameras (½-plate stand), were rambling in the country along the high road, when we saw in front of us a new electric light and power station, together with dwellinghouse and grounds laid out, belonging to the local authority.

Thinking it worth a plate, we levelled our cameras at it from the centre of the road, when out rushed the official inhabiting the house, yelling, "Off you go!" "Go out of this!" "Be off with you" as if we were tramps or burglars. We ventured to remind him that we were not trespassers, and had a right to take any view from a public road that we thought fit, particularly a public building. He retorted that he knew the law better than we, and if he did not be off it would be so much the worse for us. I may be mistaken in my views of right and wrong, so before calling again to take the house where this cultured imitator of old Bumble resides, may I solicit your view as to the legality of my aspirations?—Yours truly,

July 7th, 1902. M. A. P. S.

[You are perfectly within your right in photographing from any part of the King's highway, providing you do not transgress against the police regulations.—EDS B J.P.]

NATURAL COLOUR CINEMATOGRAPHS.

To the Editors.

Gentlemen,—I wish to be allowed to contradict a serious misstatement that appeared in your issue of last week under the heading "Ex Cathedra" concerning cinematographic pictures in natural colours. It is seldom safe to characterise a thing as impossible in these go-ahead days, neither is it safe to stigmatise an advertisement an "outrageous infeasibility" without first ascertaining the facts. Tri-colour records (and the only reference to this in the daily Press distinctly says that the pictures are taken through three-colour screens) can be taken in the short exposure necessary for a cinematograph film, and had the Coronation taken place, a true colour record of it would have been obtained. I do not doubt but that the BRITISH JOURNAL OF PHOTOGRAPHY is as ready to withdraw unjust criticism as it is to protect the public against unscrupulous advertisers.—I am yours faithfully,

8, Queen's Road, Hounslow, EDWARD R. TURNER.

July 7th, 1902.

[Mr. Turner has been good enough to show us a specimen of natural colour cinematography obtained by the trichromatic process.—EDS. B.J.P.]

COPYING.

To the Editors.

Gentlemen,—It seems hardly necessary to give details in a practical and scientific journal like this on the subject of copying print, pictures, line drawings, etc.; yet there may be some young photographers who may be called upon suddenly to produce a copy of an illustration that has appeared in the Press, either for judicial purposes or even for the simple one of lantern slide making; indeed everyone may at some time wish to try his hand at copying.

We may wish to photograph some picture that has made its appearance in a daily paper, and a hint or two upon the best and simplest mode of procedure may come in useful. The object to be copied should be fixed securely and flatly upon a vertical stand, or against the wall, in a good, even light, that gives equal and even illumination. In the case of some subjects the reflection of light given off from shiny or bright surfaces, even from the printing ink, forms a troublesome complication, but by remembering the rules of light reflection, and that the angle of reflection equals the angle of incidence, we may avoid the trouble.

Sometimes we find that an illustration is printed on such extremely thin and almost transparent paper that the printing on the other side shows through; this may be overcome by using as a backing a dead, smooth, black substance, such as black velvet; the lines and marks will then cease to trouble us. In developing negatives of line drawings hydroquinone should always be used. The contrast obtained and the hard, biting, clean black and white image it is possible to get with certain hydroquinone developers favours us in this class of work, and most hard and unsuitable as such a developer would be for pictorial work, it suits our purpose admirably in copying black and white. It is a point of importance not to give too much exposure. Rather under than over exposure should be aimed at.

It is well to use a large stop, provided extreme definition be not required, and a slow plate; in fact, a photo-mechanical plate should be employed. What we require in our resulting negative is clean black and white, that is to say, clear glass lines on a black background. If further density be required after development it is best to trust to intensification rather than overdo the developing. In the case of copying etchings and engravings a difficulty is often experienced on account of the stains and spots that appear on the prints so frequently.

These may be overcome in various ways. Firstly, the engraving may be treated with a solution of chloride of lime, or chloride of lime and weak hydrochloric acid. This will generally remove the stains. On the other hand, and especially if we do not wish to interfere with the print, the engraving may be photographed through pale yellow glass, either by covering it with a sheet of the glass, or by means of a yellow screen inside the lens, and a yellow sensitive plate used. Of course the exposure will have to be much prolonged in such a case. Another plan is to photograph the print by yellowish light, as by letting the light which passes to it come through a yellow medium. For printing probably few processes offer so many advantages as bromide, both in point of saving of time and character of results.—I am yours truly, FREDERICK GRAVES.

July 7th, 1902.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY, 24, *Wellington-street, Strand, London, W.C.*" *Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

PHOTOGRAPH REGISTERED :—

E. Walton, 30, North Street, Horsham. *Photograph of A. Shrubb.*

NOIRGAMEO.—Better communicate with the local superintendent of police.

DOUGLAS CARNEGIE.—We have no such photographs available. Your best plan, perhaps, will be to visit the library of the Royal Photographic Society, 66, Russell Square, W.C., and consult some of the illustrated volumes. No doubt the right of reproduction could be easily arranged for.

PHOTO MEDALLIONS.—In reply to a correspondent writing from Japan, we gave, a fortnight ago, the address of the Photo-Jewellery Company of New York, as supplying the presses and appliances for the production of these pictures. The Crayon Art Company, of Brecknock Road, N.W., write reminding us that they also supply what is necessary.

ADDRESS WANTED.—J. MALLIA asks: "Can you please give us addresses of frame-makers to the trade in Portsmouth and Plymouth or thereabout?"—In reply: We regret we are not acquainted with any frame-makers to the trade in either of the towns named. Messrs. Epstein and Co., Broad Street, Bristol, are the nearest makers we know to Plymouth.

RETOUCHING.—R. L. P. says: "Could you kindly inform me of your opinion of my retouching?"—In reply: The retouching shows a certain amount of promise, but it is far from perfect. The strong freckles you have made print lighter than the surrounding parts, and the eye on the shadow side should have been made brighter, and the same with the shadow on the mouth.

AN UNSATISFACTORY TRANSACTION.—"BROMIDE" writes: "Having sent a negative and cash for an enlargement to a firm advertising same, three months ago, and not being able to obtain same, or even any answer to my correspondence, what are the best steps to take?"—In reply: Sue the parties in the County Court for the money paid, and for damages for the retention of the negative. We wish you had given us the name of the people.

STAINED PLATES AND PRINTS.—G. AUSTIN asks: "Could you please let me know the cause of plates going yellow, and also a remedy for greenness in bromides?"—In reply: There are so many causes that will conduce to these troubles. Without seeing examples, we cannot indicate which. All we can say is that they proceed from faulty manipulation, possibly from imperfect fixation in the case of plates, and the use of too large a proportion of bromide in the case of the paper.

BOTTLES WANTED.—"CYMRO" says: "Please can you let me have the address of firms that sell bottles. I have written to several firms, but I have not had a satisfactory answer. I want the bottles to make up developers, and toning baths, and retouching medium, etc. I shall want a quantity of them."—In reply: Any bottle merchant will supply what you require if you send him samples of the patterns you want. The manufacturers will also make them to your pattern, but you will, of course, have to order several gross of each kind at a time.

COPYING OLD MANUSCRIPT.—"AMSET" says: "I want to photograph some pieces of a manuscript written on papyrus. The writing is quite black, but the papyrus has turned a yellow-brown. Should I get a better result if I put a pale blue glass in front of the lens? And further, if I do use such a glass screen, would there be any further advantage gained by using an isochromatic plate?"—In reply: We should advise the use of an isochromatic plate sensitive to the yellow rays. Without seeing the manuscripts, we could not say whether any advantage would accrue from the use of a colour screen. Why not try a plate with and without one?

A CAPITALIST WANTED.—T. L. C. says: "A gentleman who is in the photographic line advised me to write to you for advice, and I should be very much obliged if you will give me some. I am a riding master of over twenty years' experience, and published a book some twelve years since. What I wish to do is to give a lecture on riding, training, and on horse phrenology, with animated pictures with light, also some on cinematograph; but I have the knowledge without the means. I feel sure a great deal of money could be made if anyone would join me with capital."—In reply: Our correspondent had better advertise for a capitalist.

CARBON PRINTS FROM OPAL.—"CARBON" says: "Can you give me any information regarding the albumen formula for coating opal for double transfer carbon work? I have seen some prints with a beautiful matt surface, and was told the coating was albumen, and have since experimented with it, but without success. I cannot get prints to leave opal, though same has been well rubbed with French chalk, previous to coating with albumen. If you could give me any information I shall be glad."—In reply: In all probability the glass has been coated with collodion, not albumen. Try with ordinary enamel collodion, thinned by the addition of about one third of its bulk of a mixture of ether and alcohol.

CHARGES FOR VIEWS.—D. DODDS says: "I have just recently started here, and have got an order in hand for a printer. I had to go out of town to take twelve views and supply a finished print off each (unmounted) to make process blocks from. As this is my first business dealing with the printing trade, I will take it as a favour if you will give me a little practical guidance as to (about) the amount generally charged for this class of work. I don't want to either over or under charge."—In reply: Every photographer has his own tariff for this class of work. Some charge more than others for what they do. The fees largely depend upon the size of pictures taken, and this you do not give; so we can give no idea what your charges should be.

COST OF STUDIO.—W. B. writes: "Would you kindly answer the following question re cost of building studio? You have often suggested the perusal of 'The Photographic Studio' by Thomas Bolas, but it nowhere indicates the cost of the studio therein described. What would be the cost (within, say, £30) of studio described by Mr. Bolas? You may be pleased to know that I have carried out your suggestion of cutting out and sticking in a book some of the queries appearing in the 'B.J.' I have looked through some scores of back numbers?"—In reply: We can give no idea whatever, as so much depends upon local conditions. Labour and material are dearer in some towns than in others. Your best plan will be to get estimates from two or three of the local builders in your town. We hope you will find the cuttings useful in the future.

LENS QUERIES.—R. MCCONCHIE writes: "Will you be good enough to answer following:—(1) What focal length of lens is generally employed for the production of 2in. heads? (2) Is there any relationship between focal length of lens and size of image, or focal length and distance from object, which governs results; that is to say, within which distance-distortion would become evident? (3) I have a portrait lens of focal length 13in., but my heads are not pleasing. Should not this be of sufficient focal length? (4) For copying (I don't mean for reproduction, but ordinary work), is a photo-mechanical plate superior to an ordinary?"—In reply: (1) A lens of about 12in. or 14in. focus. (2) Certainly there is. There will be no palpable distortion in a 2in. head taken with a lens of the above focus. (3) We should say so. (4) Not much, though it is not advisable to use extra rapid plates in copying.

*** SPECIAL NOTICE.—*The Cambridge Convention: Portrait of the President and Group of the Members.—With the* BRITISH JOURNAL OF PHOTOGRAPHY *of July 18th there will be presented a Special Portrait of* SIR ROBERT S. BALL, *President of the Photographic Convention of the United Kingdom, Cambridge, 1902, and a half-tone reproduction of the Group of Members. The publishers ask us to state that this number of the Journal will offer a favourable opportunity for the insertion of specia advertisements. The usual scale rates will be charged, and order and copy should reach them not later than Monday morning (July 14th).*

The British Journal of Photography.

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THE BRITISH

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*** *The Editor can only be seen by appointment.*
*** *We do not undertake to answer letters by post.*

EX CATHEDRA.

Red sensitive plates. A correspondent, who has been experimenting with Burbank's formula, writes to draw our attention to the high sensitiveness for red, which is thus obtained. With the same normal exposure, as for blue, plates thus prepared are sensitive right up to and a little beyond the A line. The following is the formula for preparing the plates:—Heat 1 gramme of cyanine with 30 gramme of chloral hydrate and 120 c.c. of distilled water for 30 to 40 minutes in a water bath. The solution should be well shaken. Add 30 c.c. of strongest ammonia, when chloroform will be given off, and the cyanine precipitated is soluble form on the sides of the beaker. Let settle and decant the surplus liquid. Dissolve the cyanine in about 100 c.c. of methyl alcohol, and add to it a solution of 8 grammes of quinine sulphate dissolved by heat in 60 c.c. of methyl alcohol. Make up the quantity to 250 c.c. with methyl alcohol.

For the sensitising bath take—

Distilled water	160 c.c.
Cyanine solution	1 c.c.
Ammonia (strongest)	1 c.c.
Solution of silver nitrate (1 in 40)	5 drops

To be well shaken before use.

Soak the plates in the bath for four or five minutes, rinse under the tap, and dry in a box containing a dish of concentrated sulphuric acid. The stock solution of cyanine must be made and kept in the dark room, and should be protected as much as possible from the dark-room light.

Petzval's Birthday. It seems almost unaccountable how the facts of everyday life should be obscured by conflicting statements, forgetfulness, or other causes. The date of the late Professor Petzval's birth appears to be a case in point, judging by a paragraph from the pen of Dr. Eder, published in the "Photographische Correspondenz." In reply to an article by E. Suess in the "Almanach Wien, Kais, Akad. d. Wiss, 1892," referring to the conflicting opinions which existed as to the date, Dr. Eder stated that Petzval had dictated it to him as the 6th January 1807, and that it was written down in Petzval's presence. This date is also given in Dr. Eder's "Handbuch der Photographie," but it has been questioned by many persons, because Petzval's two brothers were also born on the 6th January in different years. It seemed therefore highly improbable that the three sons should have been born on the same day of the same month, and that this day should also be known in Germany as the day of the three Magi. However, such was actually the case, for Dr. Ermenyi, who has recently published a biography of Petzval in the "Photographisches Centralblatt," has searched the register, which confirms it. It is also found to be a fact that the three brothers were frequently called the three Magi by friends who knew them intimately. We might also instance the birthday of the late J. Traill Taylor. Not until late in life did he ascertain his age, and then only by a reference to it in an old letter.

* * *

German trade and Tariff manipulation. In our issue of the 24th January we drew attention to some particulars furnished by Fritz Hansen of the value of German exports in photographic materials. A new publication, the "Photo-Böise," reproduces these statistics in an article by the same writer, and but for the side light it throws on German ideas of the manner in which foreign trade may be promoted we should pass it by. The writer reviews the situation of the various German photographic industries, and seems to consider that the future of some of them largely depends upon the action of the Government. The Customs duties upon imports should be regulated to support the manufacturer, and in making commercial treaties with foreign countries favourable terms should be secured for the entry of German goods at lower duties. Germany, however, is tending in a Protectionist direction itself, and other countries with Protective tariffs are not so altruistic that they will turn the left cheek after being smitten on the right, especially if the hand be covered with an iron gauntlet. It is the aim of the German photographic industry to dominate the markets of the world, in which effort, we are told, it should receive the support of the Government to accomplish this happy state of things. But when we examine the figures more closely, we find our

friends have little upon which to congratulate themselves. Manufacturers complain that Germany is being flooded with cheap American cameras. The dry-plate industry is largely dependent upon England for its supply of glass, and the increase of the duty of this important item in the manufacture threatens the export trade with extinction. The photographic paper industry is at the mercy of the General Paper Company. Surely the millenium is still located somewhere in the Greek Calends!

* * *

Worel's Experiments in colour Photography.

The discovery of Professor Lippmann a few years ago, by which process several workers have produced some beautiful photographs in natural colours, has attracted the attention of a number of persons to kindred fields of photographic investigation. The results hitherto obtained have not been very satisfactory from a practical or commercial point of view, yet each step, whether in the direction of failure or success, brings information worthy of being recorded for the guidance of other investigators. This month, in the "Photographische Correspondenz," we have a short account by Karl Worel of a process upon which he has been working for over three years. In some respects it closely resembles that of Dr. Neuhauss, to which we drew attention a few months ago, but there are marked points of difference. As in Dr. Neuhauss's process, that of Herr Worel depends upon the bleaching of certain dyes by the action of light, and the investigations were undertaken for the purpose of solving the following three problems:—

1. Is it possible to isolate the colours red, yellow, green, and blue by the bleaching action of light, when paper is prepared with a mixture of the three primary colours?

2. Can the tendency of individual dyes to bleach, by the action of light, be so enhanced, that the isolation of the colours may take place in a few hours, and can this tendency be controlled, without detriment to the prints to the extent that the dyes may be restored to their original low state of sensitiveness?

3. Is it possible by suitable means to diminish, or completely destroy the sensitiveness of the dyes in their original state?

* * *

Karl Worel's Process.

The process is based upon the experiments which were made in elucidation of the three propositions given in the preceding paragraph. It was found:—

1st. That certain red, yellow, and blue dyes, when spread upon paper, reproduced the colour of the incident light, if the mixture was suitably proportioned to the sensitiveness of the different dyes, and the exposure sufficiently prolonged.

2nd. That the group of ethereal oils comprises certain kinds, which enhance the sensitiveness of organic dye stuffs to the action of light. The evaporation of these oils when exposed to heat and their solubility in certain fluids, which do not dissolve the dye stuffs, afford the means by which the dyes may be reduced from the supersensitive to the normal state. About one hundred different kinds of ethereal oils, obtainable in commerce, were tried, and it was found that oil of anise was the most powerful sensitiser. It was proved by analysis that of the various substances found in ordinary commercial oil of anise, the powerful sensitising property may be attributed to anethol.

3rd. That solutions of salts of copper fix these dyes, if not completely, yet to an extent sufficient for practical purposes. (Herr Worel did not succeed in completely fixing the prints upon paper.)

In general terms the process may be described as follows:—Writing paper, free from wood pulp, is drawn through a bath composed of alcoholic solutions of primrose, Victoria blue, a few drops of cyanine, curcumin, anramine, and a certain amount of anethol. The composition of the bath is tested with a negative formed of red, yellow, green, and blue strips of glass, by exposure to sunlight. If correctly adjusted, the four colours should be well rendered. The temperature of the bath should be 20 deg. C., and the paper should be dried at the same temperature. Print through a stained glass picture or a coloured positive. The bath rapidly deteriorates, and it is necessary to make the prints immediately the paper is ready. As a rule great transparency of the original, weak colour baths, excess of anethol and strong light give quick prints, whilst strong originals, strong colour baths, small amount of anethol, and weak light give slow prints. Weak colour baths and excess of anethol also give weak prints, whilst strong colour baths and less anethol give strong prints and greater permanence. After printing, transfer the picture to a bath of pure benzine, in which leave it protected from light for an hour, and dry at 30 deg. C. The anethol must be completely removed in this bath, otherwise the pictures will fade. Repeat the bath if the print retains any scent of anethol. Fix in a saturated solution of sulphate of copper for two or three hours, then wash and dry the print.

* * *

Foreign made Cameras.

It may, we think, be truly said that nothing has been so much photographed, in a given time, as the Canadian arch now standing in Whitehall. We were passing it a day or two after it was finished, and were much interested in the number of exposures that were being made upon it, alike by hand and stand cameras. At one time we counted over a dozen in sight, from the modest little four-and-sixpenny Nipper to those of the more costly kind. During the ten minutes or so we were watching quite a hundred, or probably more, plates or films were exposed; for some of the people were exposing plate after plate, regardless of their cost. But what impressed us most was that, with one or two exceptions, we recognised that all these cameras were of foreign make—French, American, or German—and it struck us at the time there must be a great lack of British enterprise for that to be the case. Surely British inventive genius is equal to that of every other country, and the workmanship at least as good, if not superior. It is said that wages are higher here than in other countries, but this certainly does not apply to America—there they are higher than here. The real reason is that in the manufacture of these cameras the greater portion of the work is done almost automatically by machinery. It is true that the necessary plant is somewhat costly to instal, but if it pays other countries to instal it, one would have thought that it would pay Britishers equally as well to go to the cost. Evidently, however, they do not seem to think so, or possibly have not the business enterprise to do it. But the fact remains that thousands of foreign-made cameras are imported into this country weekly which, quite as well, might have been made at home. Most of the English-made cameras are made by hand, which, of course, makes them more costly, but are they any more suitable for immediate requirements for all that, and will the general public nowadays pay a much higher price for what is claimed to be a more desirable thing? "Hand-made" is a general cry from our cigarettes upwards, but what matters it to the

purchaser whether the things he purchases are hand or machine made, so long as they answer his requirements?

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Forcible Language. Photographers generally, and especially those who have experienced the refining influence of a West-End studio and reception-room, have suave manners, and seldom resort to what are known to our American cousins as "swear" words. We knew one, indeed, who acknowledged that he could never mention the substance called "dammar" without some hesitation, and the suspicion of a blush. We are glad to think that the profession generally adopts the high tone of the crew of H.M.S. "Pinafore," who never used a big, big "D." But we must own that episodes sometimes occur in the vocation of a photographer, as in other businesses, when an expression of more than usual energy may be called for. And although purists may consider that under no sort of circumstances is such an expletive justifiable, others will admit that its use is a help in time of trouble. To those, however, who would prefer not to use naughty words even under the gravest provocation, there is a resource open which we can strongly recommend. A book has lately been produced by Herr Schuch, which contains a huge compilation of insulting expressions, and the name of the volume will at once recommend it; it is known as the Schimpfwoerter lexicon. The bad words are sorted under five different categories, so as to be suitable to the different kinds of persons to be insulted. But the main point is that anyone possessing himself of this erudite volume need not foul his tongue with any explectives at all. Should he have a dispute with a neighbour which calls for extra adjectives, he would merely say, "You're a 1,478 S.L." His antagonist will then refer to the expression thus numbered in "Schimpfwoerter," and would take to himself, with the best grace he could, the compliment conveyed. In this way the man who respects himself will be able to relieve his feelings, and at the same time avoid any risk of prosecution for slander. Herr Schuch has performed a distinct service to mankind in producing this addition to the common vocabulary, and we trust that someone will perform a like service for this country. If such a work were officially recognised, and its employment among the wayfarers of our streets rigorously enforced, the atmosphere would be far purer and clearer than it is at present.

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Duplicates. It has long been the laudable custom among the custodians of national museums to send copies of their more important exhibits to similar institutions in other countries, and, in many cases, the copies, for purposes of study, are quite as good as the originals. Celebrated statues are reproduced in plaster, ivories in a composition very like the real article, while all kinds of treasures in metal are most beautifully copied by means of the electrotype process. Possibly when the tricolour method of photography has reached a more forward stage we shall have similar realistic reproductions of the various illuminated manuscripts which are worth far more than their weight in gold. We are glad to learn that the authorities of the Bodlean library at Oxford are now causing some of their priceless treasures to be reproduced by photography, and are prepared to issue these copies to other libraries and to private buyers. We gather that the collotype process is the one which has been employed for this work, but doubtless the powers that be will have taken expert advice as to the best method to adopt for different reproductions. They have expressed the hope that these copies will be widely applied for among bibliographers, for they do not entertain the hope that the general public demand will repay the cost of production. Certain memorials of Shelley, reproduced in this way, are now obtainable, and will doubtless be valued by his many admirers, especially as the cost is so very moderate. Among these we note a miniature of the poet, when a boy, from a copy by Reginald Easton; a portrait of him, reduced from a crayon drawing; and another portrait, each of which can be obtained for eighteenpence. Another interesting relic is Shelley's "Sophocles," which he had in his possession when he was drowned, the edges of which are supposed to show the mark of his thumb incrusted with brine. Price, 1s. For the same price can be had a picture of the poet's watch and seals, and a picture of the guitar given to him by Mrs. Jane Williams. Such pictures are not only of interest themselves, but they would form a most valuable clue in case the originals were lost or stolen. Such happenings are not impossible. We may instance the theft of the Nelson relics from Greenwich hospital and the more recent violation of one of the well-guarded cases of valuables at the Victoria and Albert Museum, South Kensington.

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The Discoverer of Coal Gas. It is difficult to realise that less than a century ago London was lighted by the dimmest of oil lamps, whose radiance was so feeble that the footmen who attended upon carriage folk carried in their hands flaming torches so that Jehu could see which way to drive. Attached to the iron work of certain doorways in Bloomsbury and Mayfair may still be seen the extinguishers used for putting out these links—in a double sense, links of the past. Then came the discovery of gas, and for nearly a hundred years gas has been our sheet anchor so far as artificial lighting is concerned. And now, when gas is being supplanted to an enormous extent by electricity, the question comes up, who was the discoverer of coal gas? South country men will promptly answer this query by telling you that the useful gas was discovered by one Murdoch, a Cornishman, and will perhaps inform you that at his native town of Redruth there may be seen on the house where he lived a tablet to the effect that he discovered coal gas in 1792. Frenchmen attribute the discovery of gas to one of their own countrymen. But it would seem that the honour really rests upon a Hollander, of the name of Minckelers, who was born at Limburg, and at the early age of 23 was appointed professor of Natural Philosophy at Louvain, Belgium. It appears that in the year 1783 this young professor was busily experimenting with a view to find a gas of the approximate lightness of hydrogen which should be suitable for inflating balloons at a more economical rate. That very year the first gas balloon ever made had ascended from Paris under the guidance of MM. Robert and Charles, and everyone was full of the marvels likely to be achieved by this new method of exploring the atmosphere. Heating coal dust in a retort extemporised from a gun barrel, Minckelers had the satisfaction of seeing the smoky gas pour forth, and was able to inflame it. After that experiment he established an installation, which we may regard as the first gas works ever constructed, for the purpose of lighting his lecture-room at Louvain, and it was so illuminated for some years. A movement is now on foot to erect at Limburg a monument, by public subscription, in honour of Professor Minckelers, of whom his countrymen are rightly very proud. If it be the fact that Minckelers published at Louvain in 1784 a pamphlet describing the production of carburetted hydrogen from the decomposition of coal, his claim to be its discoverer would seem to be established. But it is obvious that it is one of those discoveries which were bound to come sooner or later, and more than probable that Murdoch made it independently, and without any knowledge of Minckeler's existence. On this account it would be well to allow the tablet on the modest house at Redruth to remain as it is, for, as far as Britain is concerned, he is the discoverer of coal gas.

THE SELECTION OF LENSES FOR STUDIO WORK.

Whether from an increase in the number of recruits to the already crowded ranks of professional photographers, or from an aggregate of causes unknown, we have had, for some time past, as our correspondence columns show, an unusual number of queries relating to the focus of lenses to be used for certain classes of work in studios of specified dimensions. The general trend of these inquiries has been in the direction of the employment of one lens to do a variety of work—a lens, for example, to take cartes, cabinets, and large heads, or, possibly, to cover also a large plate. Now, as the focus of a lens is not like an accordion, capable of being expanded or contracted at will, it follows that its adaptability is rigidly fixed, and subject to exact mathematical limitations. How this works out in practice we will briefly indicate, premising at the same time that a one-lens man would be ruthlessly handicapped in the race for business success.

It ought not to be necessary, though facts show that it often is so, to point out that in regard to the sizes of figures or heads taken under fixed conditions the focus of a lens only is the governing factor, the question whether it is a portrait lens, an anastigmat, a rectilinear, a wide angle or a narrow angle, not governing in any sense the size of the picture taken from a given standpoint, this, by the way, whether portraiture or landscape be the work in hand.

The selection of a type of lens has, however, to be made, and the universal consensus of opinion points to a "portrait," *i.e.*, a Petzval type of lens for studio work, though it is the dearest kind of instrument. The reason for this is obvious. Although a modern anastigmat or a rectilinear is suitable for most purposes, occasions arise when the utmost rapidity of action is a paramount consideration. This is only attainable with a portrait lens. Further, a portrait lens is capable within its own limited field of view of an amount of critical sharpness of definition that is unequalled. Where more modern lenses approach them in rapidity the price approaches at the same rate, and may, indeed, pass that of a portrait lens. We are assuming all through that one lens only or at most a limited number is desired. If no such governing factor interferes, then it may be pointed out that, with a given focus, excessive rapidity not being absolutely necessary, an astigmat of one form or another will be more advantageous for taking groups, especially when the length of studio is restricted. A portrait lens has a very small area of sharp definition, working at full aperture, say *f*3 or *f*3.5, sharpness must not be expected much outside a circle of a diameter equal to a third of the focus. Stopping down will increase the dimensions of this circle bounding the area of sharp definition, but with any diaphragm likely to be used in a studio a portrait lens will have very poor covering power compared with the other slower lenses. We should put from one-half to two-thirds of the focus as the utmost maximum of the diameter of the circle in which good definition can be looked for when employing any lens founded on Petzval curves, for the fact remains that, to this day, the quickest lenses in common use, the so-called "portrait lenses," are but slight modifications of those whose construction was devised by Petzval more than half a century ago, and the introduction of which rendered photographic portraiture a practical possibility. Within their own limited area, when well constructed, their fredom from spherical aberration is so great as to give a critical definition with a large aperture that no other lens can reach. But, as we say, this area is extremely limited, and the moment it is overpassed spherical aberration increases so rapidly that it can only be got rid of by the use of small diaphragms, thus reducing the use of the lens in practice to the level of those of a cheaper type. It may be objected that we are laying unnecessary stress upon definition, seeing that the tendency of modern work of an artistic type is in the very opposite direction. There would be some ground for advancing such an objection, but then it must be borne in mind that we are writing more especially for the photographer whose expenditure in lenses has to be reduced to the lowest limits, and who wants to have as many possibilities as possible under his control. He knows that the general public still hankers after sharpness, and will have it. And, again, the work he will have to do will probably be most varied in character, and he knows that if he desires to tone down an obtrusive degree of sharpness it is very easily done, apart even from that valuable means of introducing a graduated amount of spherical aberration over the whole arc of the picture obtainable by the construction introduced by Dallmeyer the elder many years ago. He knows, too, he may have to do enlarged work—perhaps a life-size head from a full-length "carte"—and if he have not critically sharp definition in his original negative his enlargement will be useless. Our remarks are less applicable to the still small number of professionals whose work is specialised, for in photography, as in physic, the specialist is a growing factor. We were conversing with a well-known professional portrait photographer the other day, and he informed us that he had abandoned all out-door work; he would not take a group; he confined himself entirely to single figures and few of those full-length, and he was able to command prices that were almost fabulous. Such a one need look neither at the price of a lens nor the number required for the variety in even his limited scope. We write for the benefit of the larger majority, and in a succeeding article we purpose giving such working details as will enable anyone to gauge his possibilities and accommodate them to his pecuniary restrictions to the best advantage.

THE NEBULAR THEORY.

[Abstract of Presidential Address to the Photographic Convention of the United Kingdom.]

In these days there is no necessity to vindicate the immense importance of photography. Of its innumerable applications I have in the great majority of cases no authority to speak; I shall confine what I have to say to the uses of photography to astronomy, and I shall endeavour to illustrate my subject with the help of the wonderful photographs that have recently been obtained, especially at the Lick and Yerks Observatories. I stand here to-night with a grave task before me. I am called upon to expound, so far as my powers will permit, an exceptionally great subject. How puny do all other things appear in comparison with the great nebular theory. Our personal affairs, the affairs of past, present, and future shrink to insignificance in comparison with what is revealed in that mighty chapter from the book of Nature which we hope to open. The grand transformations through which the solar system has passed, and is even now at this very moment passing, cannot be seen by us poor creatures of a day; they might perhaps be surveyed by beings whose pulses counted centuries instead of seconds, by beings whose minutes were longer than the duration of dynasties, by beings to whom an hour was far longer than all human history. The sun appears constant in size and constant in lustre during the brief interval in which man is permitted to strut his little hour, but the sun has not always been the same; it did not always shine as it does now, nor will it continue for ever to shine as it does at present. Our great luminary is smaller at the end of each year than it was at the beginning; the same is true through indefinitely great

periods of time. In a retrospect we see the sun ever larger and larger; there was a time, uncounted millions of years ago, when the sun had ten times the diameter that it now possesses; there was a time when the materials which now form the sun were expanded into a volume of diameter greater than the diameter of our earth's orbit at the present moment. But even when the sun was millions of times as big as it is now it was not heavier; there could not have been appreciably more material in it, but that material was enormously rarefied. Thus our reasoning makes us think of an epoch when the sun was very different indeed from the globe which we know so well. It had then no earth to cherish with warmth and gladden with light. Our globe was in those days truly "without form and void." At the time when the sun was swollen out into this great ball of glowing gas, the materials of the earth were in a condition utterly different from their present state. The earth was then part of the great nebula itself, from which the sun and all the solar system has been formed. Laplace bade us imagine a great primæval nebula or fire-mist. He reminded us how this must be incessantly radiating its heat and gradually contracting. Laplace demonstrated that it was infinitely probable such a nebula would have some movement of rotation; he pointed out the remarkable dynamical law by which the contracting object would gradually accelerate its rotation, and he showed how the inner parts would thus revolve more quickly than the outer parts. Laplace bade us see how the denser parts of the nebula at the centre gradually drew themselves together, so as to form a sun. He showed in like manner how the outer parts of the nebula gradually cohered together to form the planets. By strictly dynamical reasoning, Laplace thus pointed out how from an extensive diffused nebula a solar system, with sun and planets all complete, could be duly evolved in the lapse of ages. Laplace bade us see how the subsidiary systems of satellites appropriate to each planet came into being; he made it plain that these satellites would revolve around their primaries, just as the primaries revolve around the sun; he bade us follow in imagination the progress of the whole system, from the widely-diffused nebulosity—a mere stain of milky light in the sky on the one hand, to an organised system of revolving worlds on the other. If Laplace lived now there are many objects in the heavens to which he could point in triumphant vindication of his theory. The age of photography has dawned, and the photographic plates have not only illustrated in the most marvellous manner the spiral nebulæ discovered by Lord Rosse, but they have succeeded in disclosing many other spiral nebulæ. The photographs have even revealed on the plate beautiful spiral nebulæ invisible to any human eye, no matter what may be the telescope to which it is applied. How strikingly the spiral nebulæ elucidate Laplace's theory. We see in the Great Spiral how the central part is condensed, doubtless in consequence of the fact that the nebulous matter is drawing itself together. We see how the future sun may gradually become evolved, we see how planets also originally "without form and void" gradually come into shape, drawing as they do so their material from the same primæval fire-mist. We have in the photograph of the Great Spiral a marvellous illustration of those principles of celestial evolution which Laplace laid down for the formation of the solar system. I can imagine the astonishment and delight with which Kant or Laplace would look on a photograph of the Great Spiral. If we tried to imagine the best picture of the great primæval fire-mist which has evolved into the solar system, I feel confident we could not obtain anything so effective as the photograph of the Great Spiral. There is also another most remarkable discovery of modern times which has added much weight to the arguments in favour of the nebular theory. If the sun and the earth—to confine our attention solely to those two bodies—had originated from the primæval nebula, they would bear with them as a mark of their common origin a striking identity in material and composition. We do not, of course, mean that the nebula was homogeneous all through. Nature does not like homogeneity. The nebula was evidently irregular, vague in form, dense in some places, greatly rarified in others. We by no means asert that if we compared a sample of the nebula in one place with a sample of the same nebula taken a hundred or a thousand million miles away from it, that the two samples would show identity of chemical composition. We need not be surprised at this, remembering that two samples of rock from the same quarry would not be identical. But we may feel confident that the elements present in the nebula will be more or less widely dispersed through it, so that if two globes are formed by concentration in different parts of the nebula, we might reasonably expect that though these two globes would not be actually identical, yet that the elementary bodies which entered into their composition would be in substantial agreement. If one element, say iron, was abundant in one body, we should reasonably expect that the same element would not be absent from the other. Laplace had no means of testing this surmise, but our modern methods enable us to investigate the chemistry of the sun, and have shown that the elements of which the sun is composed are practically the same elements as those of which our earth is built. Is not this a weighty piece of testimony in favour of Laplace's theory? Laplace knew not of these photographic and spectroscopic revelations; he mainly based his belief in the nebular theory on a remarkable deduction from the theory of probabilities. If the evidence thus derived seemed satisfactory to Laplace one hundred years ago, this same line of evidence, strengthened as it has been by recent discoveries, is enormously more weighty now. Laplace was able to count up about thirty instances in which movements of revolution and movements of rotation in the solar system had a common direction. The mathematical mind of Laplace drew a remarkable inference from this unanimity. Here, he said, are thirty different movements, each of them might have been either from right to left or from left to right, but as a matter of fact they are all unanimous. Laplace showed that there were a thosand millions to one in favour of this unanimity being the result of some common cause, and the nebular theory offered such a cause. For as the great nebular was rotating it carried round with it, of course, the masses of nebulæ which were ultimately to form the planets. As each of the planets broke away from the central mass it was found to be revolving, just as the moon revolves round the earth once in each revolution, then as the mass contracted further, its motion accelerated, and the planet came to turn more quickly on its axis, though still at all times constantly revolving in the same direction. In this way the unanimity of the movements was a natural consequence of the nebular theory, and no other method has ever been suggested by which so remarkable a concord could have arisen. Laplace deemed that the thirty common movements were sufficient to establish his argument. But the modern discoveries have enormously strengthened the original argument; there are now 500 objects which revolve around the sun, and they all turn in the same direction. The numerical expression for the probability of the truth of the nebular theory has to be correspondingly amended. The argument has been strengthened countless billions of times. In a notable lecture which Huxley gave in the year 1880 on the coming of age of Darwin's famous book, "The Origin of Species," he mentioned some great discoveries in geology and biology which had taken place since the publication of the immortal work. He then announced that these fresh discoveries brought such wonderful corrobora-

tion and illustration of the truth of Darwin's theory that if the famous doctrine of natural selection had not been formed to account for the facts of Nature as they were known to Darwin when he wrote his book, the theory of Natural Selection would have had to be formed to explain the facts which had been brought to light in the twenty-one years which succeeded. May I venture to make a similar claim on behalf of the great nebular theory? If that theory had not been invented to account for the phenomena which were known to Laplace, it would have had to be invented for the purpose of explaining the additional discoveries which have been made in the century which has since run its course.

SIR R. S. BALL.

CLERK MAXWELL'S GIFTS TO PHOTOGRAPHY: OR, THE RED, GREEN, AND BLUE.

[A Communication to the Cambridge Meeting of the Photographic Convention of the United Kingdom.]

WITHIN a year of the discovery of photography, in 1839, men's thoughts turned to the possibility of fixing the colours of the camera image. Robert Hunt had already obtained some* experimental results with a certain sensitised paper, showing that, on exposure to diffused daylight, under red, yellow, and green glasses, it became red under the red glass, yellow shade under the yellow glass, and green under the green glass. He also wrote as follows:—"Colour alone is wanting, and there are sufficient reasons for believing that in the progress of research we shall, before long, arrive at processes by which the delightful pictures of the camera obscura shall be rendered permanent in all the beauty of those glowing tints which give to the fields of creation their exquisite charm and enchanting character." These remarks and experiments of Mr. Hunt are valuable as affording an example of the attitude of many early enthusiasts, both as regards the possibility of reproducing colours, and of the manner in which it would be accomplished. That is to say, it was fondly hoped, during those sanguine days which immediately followed the first achievements in monotone, that a substance or preparation would be found, which, on exposure in the camera, would permanently assume, or could by subsequent treatment be made to assume, the natural colours of the object.

Years, however, passed without any real progress being made. In 1850 or thereabouts, Clerk Maxwell, an undergraduate at Trinity College, Cambridge, was studying the subject of Colour. By 1855, and when but twenty-four years of age, he had conceived a complete system of recording colours by means of photography, as well as a method of reproducing them. This was published in a paper communicated to the Royal Society of Edinburgh, 1855 (vol. XXI.), entitled "Experiments on Colour": "Let it be required to ascertain the colours of a landscape by means of impressions taken on a preparation equally sensitive to rays of every colour. Let a plate of red glass be placed before the camera, and an impression taken. The positive of this will be transparent wherever the red light has been abundant in the landscape, and opaque where it has been wanting. Let it now be put in a magic lantern along with the red glass, and a red picture will be thrown on the screen. Let this operation be repeated with a green and a violet glass, and by means of three magic lanterns let the three images be superimposed on the screen. The colour on any point on the screen will then depend on that of the corresponding point of the landscape, and by properly adjusting the intensities of the lights, etc., a complete copy of the landscape, as far as visible colour is concerned, will be thrown on the screen. The only apparent difference will be that the copy will be more subdued, or less pure in tint, than the original." Here we have the first conception—clear, definite, and incisive—of the method of recording colours to which we now look with confident hope to solve the problem of colour photography; and in mentally looking back to this time, we can realise the immense step forward which it chronicles.

Sixteen years had passed and had been spent by those who investigated the subject, in the quest for a substance which would arrange itself, by the action of light, into permanent compounds reflecting the multitudinous hues of Nature, or in trying anything and everything which appeared in the least hopeful; like mariners setting sail to discover a port without charts or compass, and without even knowing its whereabouts, they were without a clue or a guide to help them. Clerk Maxwell, at one stroke, located the port and gave the true course.

Sixteen years had passed and the sensitive plate was universally regarded solely as a chemical means of recording gradations of light and shade. Forty-seven years have since passed, and, speaking broadly, negatives are still regarded much in the same way. Clerk Maxwell in one short sentence gave us the more truthful statement, that our negatives are records of colour. It is true that people knew their sensitive plates were only sensitive to the violet rays—but this is a very different thing to the full recognition that negatives form a true record of that colour, and can be used to reproduce it in its proper gradations as existing in the original. Clerk Maxwell further told us that by three such records—the others being red and green—all the colours of Nature can be registered for future production at will.

It will serve to emphasise Clerk Maxwell's teaching to note here the opinion which his associates had of him at this time; and, on this point, no better testimony could be offered than by quoting* from the Rev. Dr. Butler, the present Master of Trinity College:—"When I came up to Trinity † twenty-eight years ago, James Clerk Maxwell was just beginning his second year. His position among us—I speak in the presence of many who remember that time—was unique. He was the one acknowledged man of genius among the undergraduates. We understood, even then, that, though barely of age, he was, in his own line of inquiry, not a beginner, but a master."

Clerk Maxwell, among other studies, continued his researches on colour, and the Transactions of the Royal Society for 1860 contain his paper on "The Theory of Compound Colours." ‡In awarding to him the Rumford Medal, Major-General Sabine, the then Vice-President of the Royal Society, said:—"The researches for which the Rumford Medal is awarded lead to the remarkable result that to a very near degree of approximation all the colours of the spectrum, and, therefore, all colours in Nature, which are only mixtures of these, can be perfectly imitated by mixtures of three actually attainable colours, which are the red, green, and blue, belonging respectively to three parts of the spectrum." This paper contains Maxwell's celebrated curves and diagram, which show (1st) the particular red, green, and blue referred to by Major-General Sabine, and (2nd) the proportion in which, when mixed, they imitate all the colours of the spectrum, and, in Maxwell's own words, "since all natural colours are compounded of the colours of the spectrum, they may be compounded of these three primary colours."

No reference to photography is made in this paper, but the following year, in a lecture at the Royal Institution, he made his second reference to the art, and again repeats (with a

* "Researches on Light." (Longmans.)

* Life and Letters of James Clerk Maxwell, by Professor Lewis Campbell and Dr. Garnett.

† This was written in 1879.

‡ Clerk Maxwell and Modern Physics, by Professor Glazebrook.

demonstration this time) his system of 1855, but substituting for his coloured glasses three solutions of ferric sulphocyanide, cupric chloride, and ammoniated copper respectively, and here recognising what is now so well established, that coloured glasses are indefinite and unsatisfactory. He also does not this time say that the reproductions are less pure than the original, but, on the contrary, in referring to his demonstration, says:—"Given a suitable sensitiveness to the red and green, the reproduction would have been a truly coloured representation of the ribbons." This lecture is now well known, and, therefore, need not be reproduced here. On page 568 is given a photograph of the spectrum through the three solutions.

As in 1855, so in 1861, notwithstanding the reputation of its author, and that he now held without dispute the premier position as an authority on colour, no special notice seems to have been taken of his system of recording and reproducing colours by means of photography. While the whole intellectual world could appreciate and applaud his purely scientific researches, the technique of the art of photography was not sufficiently advanced for its workers to practically utilise his teaching or to appreciate it at its true value; it should not be forgotten also that the scientific faculty of the times, having exhausted itself in the search for a chromophorous substance which would solve the problem, no longer retained the sanguine hopes so eloquently expressed by Mr. Hunt at an earlier period, and had, indeed, given way to scepticism.

Louis Decos du Hauron subsequently re-discovered Maxwell's system of recording colours, and pointed out, amongst many other applications, that by the use of transparent pigments whose colour is * complementary to that which the negatives record, the system can be applied to the production of colour prints. At this time the Franco-German War began, and Louis Ducos du Hauron, though a born investigator, nobly left his experiments and went to fight in his country's battles. By 1879, however, he and some of his pupils, notably Artigue, of Bordeaux, and Albert, of Munich, had produced excellent specimens.

Years continued to pass, and while Maxwell's teaching concerning photography was forgotten, his researches on colour and his colour curves were published in other countries and copied into text-books, until one fine day a strange thing happened. It occurred to someone that as Maxwell had shown that he could reproduce the spectrum and all colours by mixing three spectrum colours in the proportions represented by his curves, the curves, therefore, formed the real missing link in colour photography, and that the proper thing to do was to adjust sensitive plates so that they would be affected by the various rays, in accordance with the curves. This plausible theory, backed up by specimens erroneously exhibited as evidence of its magic efficacy, spread like an epidemic, and again the more valuable truths contained in Maxwell's own teaching have remained unseen and unrecognised.

Up to the present time no one has ever shown that the colour curves can be employed without the introduction of †fundamental defects. It will be found that its exponents invariably state their case by starting with the spectrum as a test subject, and any system which will not reproduce it correctly is immediately condemned. They conclude that because a system which accurately reproduces the spectrum will also reproduce all colours—that the reverse of this is true; that is to say, that if the spectrum cannot be reproduced, neither can other colours. But such is not the case. Let it be supposed that the spectrum which has been recorded on plates adjusted to the Maxwell curves be reproduced with the three narrow bands of rays which constitute his spectrum primaries; this new spectrum, correct in all its hues and intensities, can now be photographed without reference to the Maxwell curves, for it can be recorded by plates on which the same three narrow bands of coloured plates are exclusively allowed to act; and we have here an example in which the analysis and synthesis colours are identical.

This may be given in the form of a definite principle, as follows:—Any colours which are formed by the admixture of distinct groups of rays can be reproduced by plates on which the same groups of rays only are allowed to act; or briefly, in such cases colours will correctly reproduce their own kind.

Day by day, and year by year, it is more thoroughly brought home to us that the colours we have to reproduce in the subjects we mostly wish to photograph are the most opposite to those of the spectrum; that, instead of being homogeneous, they approach white in complexity, and are, indeed, largely diluted with white; and that the vast majority of these natural colours may be considered as compounded of three groups of rays, red, green, and blue, which together comprise the whole of the rays contained in white light, as represented by Maxwell's three solutions (see photograph on last page), and in accordance with the foregoing principle are correctly recorded when the same groups of rays are used for the analysis.

On being put to the practical test, the result is a complete confirmation of Maxwell's teaching; it is found that his own system reproduces natural colours (not the spectrum) with wonderful accuracy, and the colour curve record is found by comparison hopelessly defective.

Suppose the camera obscura being unknown, a great man tells us he has discovered that by the use of a tiny aperture in one side of a dark chamber a complete image of all visible objects in front of it, whether within a few inches or very far away, is obtained. This is analogous to Maxwell's colour curves and spectrum primaries.

Let the same great man, realising that the images obtained in this manner are too faint to be of practical service, also tell us that, by the use of a lens devised by him, we can use a large aperture and still obtain at the one focus sharp images of all the subjects we usually want, although we cannot with it obtain the image of an object within a few inches.

This is analogous to Maxwell's division of white light into three parts, combined with the rule—the same rays for analysis as for additive synthesis, a teaching and a rule, which, by their exquisite translation of what appears to be infinite complexity, into a perfect simplicity, constitute, perhaps, the greatest gift among the many great gifts which he gave to photography.

Appendix.—Defects of the Colour Curve as Applied to Colour Photography.

When using the Maxwell spectrum primaries R′G′B′ (see diagram), every authority, without exception, I believe, accepts as correct his curves for the reproduction of both spectrum and natural colours; but there are many things which, while readily obtainable in the laboratory for scientific experiment, are useless for the ordinary purposes of life. That Maxwell's spectrum primaries are examples of this, and are quite impracticable for use as reproduction colours in tri-colour photography, and that Maxwell himself never hinted at such application, are also, I believe, universally accepted. It therefore becomes essential to study the subject with the view of getting something practical, and a very natural first step would be to employ as reproduction colours dyes or transparent glasses which transmit narrow bands of colour approximating those

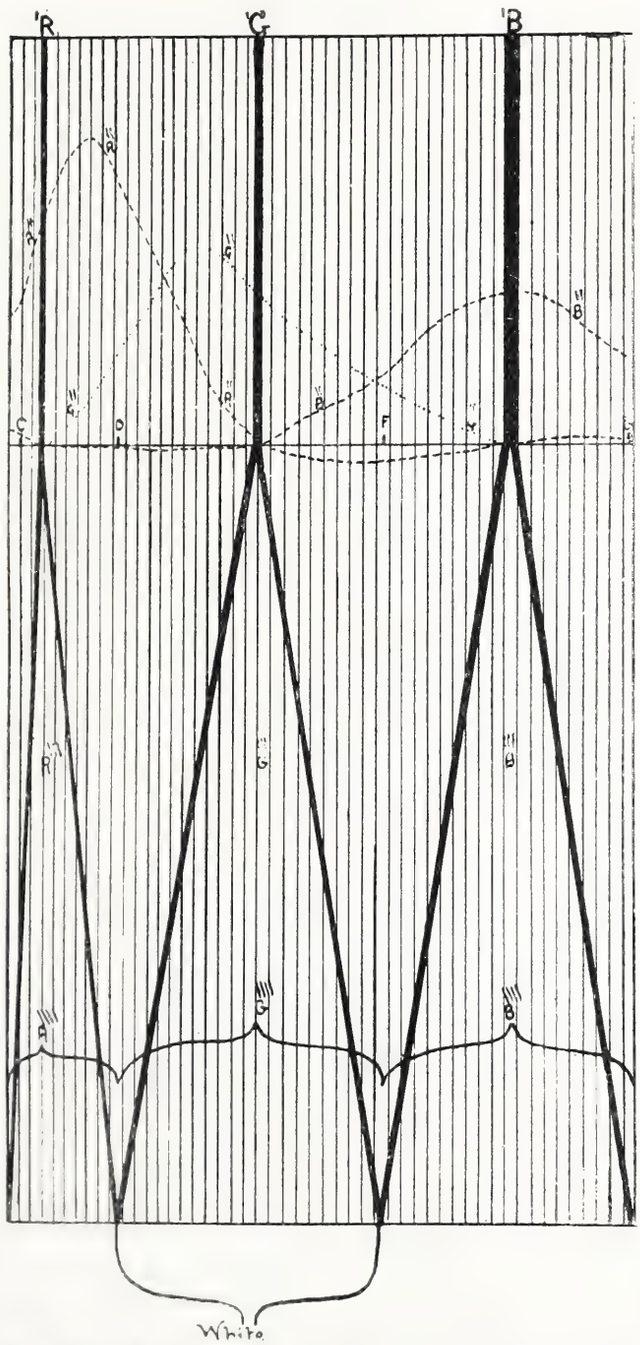
* "Complementary" is used here to mean the remainder of the rays which make up white light.

† Described in a short appendix to this paper.

of Maxwell's spectrum primaries in purity and are the same in hue. Directly this is done, there is introduced into the new primaries a quantity of one or of both the other original primaries, dependent on the width of the bands of spectrum rays employed.

Let us suppose a set of dyes is used whose absorptions are identical with those marked $R'''G'''B'''$ in the diagram. Taking the green as an example, it is obvious that the green at G'''

DIAGRAM.



NOTE.—The lines diverging from the spectrum primaries R' G' B' until they enclose together the whole of the spectrum R'''' G'''' B'''' represent a series of Reds, Greens, and Blues respectively, having increasing complexity of ray composition.

cannot possibly reproduce those above it—that is, those purer than itself—neither can it by keeping to the Maxwell curves reproduce correctly, either itself or those below it, for if the curves are correct for reproductions by means of the pure primary G', they cannot also be correct for the impure primary G'''. Therefore, whether purer, or the same, or less pure, they will all inevitably be incorrect from the introduction of an excess of the other colours.

Again, in the case of the red and blue primaries, the same truth indicates that every colour into which red and blue enter is falsified by the addition of an excess of green. These errors can, as has been suggested by Dr. R. S. Clay,* by a modification of the Maxwell curves, be adjusted so that the hue of the original is not changed by the use of the impure primary, but is simply diluted with white—the curves being modified that the added excess of one primary is balanced by an equal excess of the other.

VISIBLE SPECTRUM.



Spectrum record on Lumière Panchromatic Plate with solutions of Ferric Sulphocyanide, Cupric Chloride and Ammoniated Copper respectively (Maxwell's filters), showing the subdivision of the Spectrum into three parts. The strength and sections of the solutions employed are given in the PHOTOGRAPHIC JOURNAL, June, 1901.

In practice it is found that even the most ardent advocates of the colour curve system employ as reproduction primaries colours represented by $R''''G''''B''''$—in other words, without acknowledging the fact, they have adopted Maxwell's own synthetical primaries, but fail to perceive that they are advocating for use with them a defective colour record.

At first sight it does not appear very serious that colours should be diluted with white, but a little closer examination shows that the colours of nearly all the subjects we wish to photograph—i.e., landscapes, architecture, portraits, etc.—are already excessively diluted with white, and this creates in fact the greatest practical difficulty we have in reproducing these subjects in colours.

On applying the same reasoning to the far more important colour prints, in place of the dilution with white there will be degradation† with black; and a very few days in a workshop

* Proceedings of the Royal Society, June, 1901.

† This is quite independent of the degradation due to the well-known defects in commercial pigments.

will show that the use of the Maxwell or similar curves as a basis for the production of tri-colour prints gives a fatal degradation to the colours.

E. Howard Farmer.

A METHOD OF MEASURING OBJECTS IN THE MICROSCOPE.

[A Paper read before the Section of Photography and Microscopy of the Franklin Institute May 1, 1901, and reprinted from the Institute Journal.

In Carpenter-Dallinger on the Microscope (seventh edition, p. 226), the following is given as the "simplest" method of measuring objects in the microscope: "Project the magnified image of the object by any of the methods described under 'camera lucida and drawing.' If we carefully trace an outline of the image, and then, without disturbing any of the arrangements, remove the object from the stage and replace it with a 'stage micrometer,' which is simply a thin slip of glass ruled to any desired scale, such as tenths, hundredths, thousandths of an inch and upwards. Trace now the projected image of this upon the same paper, and the means are at once before us of making a comparison between the object and a known scale, both being magnified to the same extent. . . . In favour of the above method . . . it will be noted (1) that no extra apparatus is required, (2) that it is

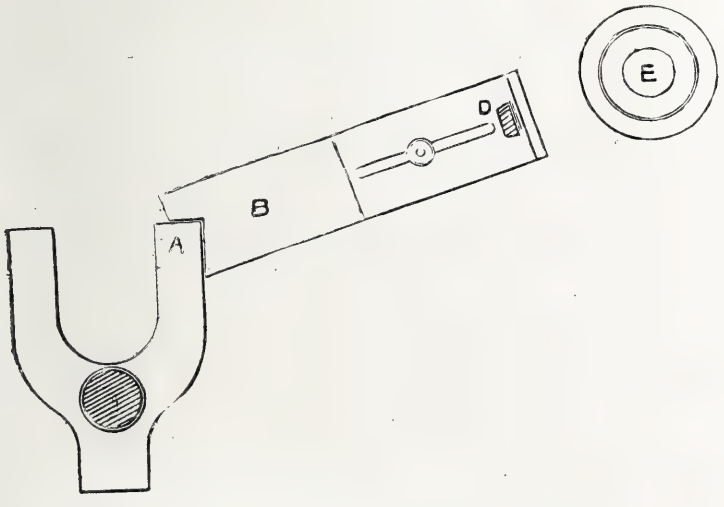


Fig. 1.

extremely simple, and (3) that it is accurate." A quite expensive accessory, the screw micrometer eyepiece, is then referred to as the most efficient piece of apparatus for this purpose, and the use of a simple form of eyepiece micrometer, which is the most usual practice, is described as being somewhat less accurate than either of the above methods. Even the use of an eyepiece micrometer involves a separate determination of its values for every objective, and for some particular tube-length for each objective, and with that particular eyepiece which contains the scale. Anyone who employs a considerable variety of objectives will require a rather formidable reference table, must work with the tube-length indicated in the table, and must use a particular eyepiece, in order to get a measurement.

It goes without saying, that a method which would give a direct reading, which would not be affected by change of objective, eyepiece, or tube-length, would be more convenient and generally more desirable than the methods above described.

Such a method which I have realised consists in projecting the image of an illuminated scale in the plane of the object by means of the sub-stage condenser. An efficient apparatus can be made for a few cents, and after it has once been adjusted by the aid of a stage micrometer, it can be brought into service at a moment's notice whenever wanted.

This apparatus is best made with a fixed adjustment for a particular microscope stand, and for illumination from a particular direction. I shall therefore describe the device which I am using with a Bausch and Lomb "BB" stand and a Welsbach light. Other forms of stand and other sources of illumination can readily be provided for.

In the diagram, Fig. 1, A is the base of the microscope, B a block of wood seven inches long (notched to fit against the microscope base and project in a particular direction, as shown), C is a rider with set-screw and a post and spring-clamp D, to hold a jeweller's saw having sixty-four teeth to the inch. E is the Welsbach light, diffused by a ground-glass chimney and shielded from the eyes by a hood open only on the side towards the microscope. The source of light being on a level with the microscope, the jeweller's saw is supported in a vertical plane, directly between the light and the microscope mirror, and in this position its image can be focussed in the field of the microscope by racking back the condenser just a trifle. The image of the saw-teeth constitutes the measuring scale, which can be given any desired value, within limits, by adjusting its distance from the microscope mirror and comparing the focussed image with the scale on a stage micrometer.

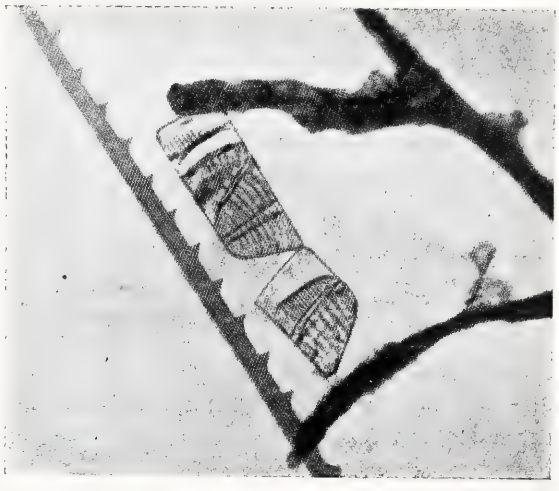


Fig. 2.

My adjustment makes each tooth equal to one-fiftieth of a millimeter on the stage micrometer.

Of course, an engraved scale, on glass or celluloid, can be substituted for the jeweller's saw, and the apparatus may be otherwise elaborated, as by making the scale revolvable and otherwise adjustable as to position and angle, but these are refinements which I do not at present require.

When the scale is not wanted the block is pushed aside, and can be brought back into position in an instant. It is evident that in order to ensure strict accuracy the scale itself must be accurately divided, and must occupy a position at right angles to a line drawn from the centre of the source of light to the centre of the mirror; the distance must be constant, the surfaces of the mirror must be plane, and the condenser must be capable of projecting a sufficiently sharp and undistorted image. For such measurements as would be required with low and medium-power objectives, I have found an ordinary Abbe condenser efficient by closing up its iris to sharpen the image. An achromatic Abbe condenser used in the same way will define well enough to provide a readable 1-100th millimeter scale. With a better corrected achromatic condenser I have

obtained a satisfactory 1-200th millimeter scale, and it seems probable that one of the newer types of aplanatic, achromatic,

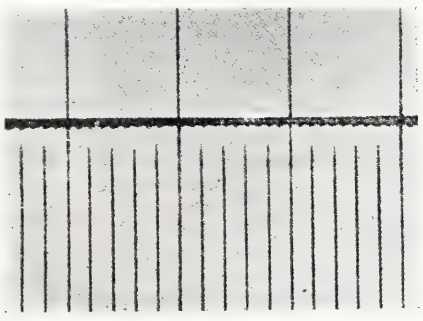


FIG. 3.

or apochromatic condensers, now regarded by some authorities as almost indispensable for really critical work with the microscope, would define a scale to measure with sufficient accuracy to 1-1000th millimeter. The expensive and comparatively troublesome Filar micrometer will make still smaller and more accurate measurements, which, however, are very seldom required, and are not provided for in the equipment of the great majority of microscopists.

Fig. 2 is a photograph of an image of both object and scale as seen in the field of the microscope, but with a coarser scale than I have described. Fig. 3 is a photograph of a 1-100th millimeter projected scale in the field with a 1-100th millimeter stage micrometer.

FREDERIC E. IVES.

PLATINOTYPE PROCESS.

(Continued from page 532.)

II.—THE COLD BATH PROCESS.

THE necessary solutions for this process have already been described with one exception, and that is the oxalic-gelatine solution; this is prepared by soaking 2 grammes of gelatine in 20ccm. of water, adding ½ gramme of oxalic acid and heating. After this treatment the gelatine solution remains fluid, but the solution will not keep more than a few days. Hübl recommends three stock solutions:—

I.

Chloroplatinite solution	3 ccm.
Lead-iron solution	4.5 ccm.

II.

Chloroplatinite solution	3 ccm.
Lead-iron solution	4.5 ccm.
Oxalic gelatine solution	1 ccm.

III.

Chloroplatinite solution	3 ccm.
Lead-iron solution	3 ccm.
Soda-iron solution	2 ccm.

For smooth papers from 2 to 3 ccm. of water should be added, and for rough from 3 to 8 ccm. These quantities are enough for a sheep 50 by 75 cm.

All these formulæ give rather soft prints; if, therefore, prints with greater contrasts are required, from 5 to 10 drops of the 10 per cent. solution of sodium platinic chloride should be added. Solution No. I. will keep for a month in the dark, and gives with arrowroot sized and Rives paper brownish black tones, on drawing and water-colour papers pure black tones, and on Rives paper with gelatine sizing blue-black prints. By coating Rives paper with arrowroot and using solution No. II. blue-black prints are obtained. For very hard negatives solution No. III. should be used.

The particular method of sensitising and drying will be described later on.

THE HOT BATH PROCESS.

For brownish black tones on arrowroot paper and pure black prints on drawing paper, which has been freed from animal size and re-sized with Agar-Agar, as already described, the following solution should be used:—

Chloroplatinite solution	4 ccm.
Iron solution	5 ccm.

For smooth papers add from 2 to 3 ccm. of water; for rough papers from 3 to 4 ccm. of water.

For blue-black tones on gelatine-sized papers, use the following:—

Chloroplatinite solution	4 ccm.
Iron solution	6 ccm.
Oxalic-gelatine	1 ccm.

Dilute as suggested above.

In order to increase the keeping power of the paper, add to the sensitising solutions 1 or 2 drops of sodium platinic chloride solution. These sensitisers give soft prints; for more contrast add from 5 to 10 drops of a 10 per cent. solution of potassium bichromate.

THE SEPIA COLD BATH PROCESS.

For this process it is advisable to use only those papers sized with Agar-Agar, as already described, as it is easier to obtain brown tones than with arrowroot.

Yet another chemical is required, namely, citrate of mercury, and this is prepared by heating together 1 gramme of yellow oxide of mercury, 5 grammes of citric acid, and 20 ccm. of water till the solution is quite clear, when it should be filtered. The sensitising solution is:—

Iron solution	8 ccm.
Chloroplatinite solution	4 ccm.
Mercuric citrate solution	1-4 ccm.
Sodium platinic chloride solution	2 drops.

For rough surface papers add from 2 to 4 ccm. of water. If greater brilliancy is required, the quantity of sodium platinic chloride may be increased to 5 drops.

THE SEPIA HOT BATH PROCESS.

For this process either Agar-Agar or arrowroot papers can be used, and the following solutions:—

Chloroplatinite solution	4 ccm.
Iron solution	6 ccm.
Mercuric chloride solution (1:20	0 2-1 ccm.
Sodium platinic chloride solution	2 drops.

For rough papers add from 2 to 4 ccm. of water, and for greater brilliancy increase the sodium platinic chloride to from 5 to 10 drops.

IRON PAPER WITH PLATINUM DEVELOPER.

Although historical notes have been entirely omitted in this digest, it is but fair to point out that to Mr. W. Willis is due the introduction of the platinotype process, and this one in particular was described by him in 1888,* and he then advanced as the advantages of the process the greater keeping power of the paper, the greater brilliancy of the whites, and depth of the shadows, and further that the prints could be kept some days before development.

Hübl's formulæ for sensitising are as follows:—

I.

Lead iron solution	5 ccm.
Mercuric chloride solution (1:20)	0.2 ccm.

* "Photo Journal," March, 1888.

II.

Lead iron solution	5 ccm.
Chloroplatinite solution	0.5 ccm.

III.

Lead iron solution	5 ccm.
Chloroplatinite solution	0.3 ccm.
Sodium platinic chloride solution	0.4 ccm.

IV.

Lead iron solution	5 ccm.
Chloroplatinite solution	0.8 ccm.

All the above will keep well, but the chloroplatinite must be added just before use, and they should be diluted with from 3 to 6 ccm. of water. No. IV. is especially suitable for small soft negatives and portraits.

For line drawings, for which purpose it has been used for many years in the K.u.K. Militär-Geographischen Institut in Vienna, the following may be used:—

Lead iron solution	200 ccm.
Chloroplatinite solution	10 ccm.
Potassium chromate solution	10 ccm.
Water	200 ccm.

This is sufficient for twenty-seven sheets 66 by 90 cm., but as the solution keeps well, it can be prepared in any quantity.

Hübl points out that this process is cheaper than any silver process for line work, the consumption of platinum being only 0.2 gramme per sheet, and that a cheaper paper can be used than for silver paper, as it need not be absolutely free from iron.

Print-out Platinum Paper.

This process was discovered by Pizzighelli in 1887, and the sensitised paper actually contains the developer. If the paper is prepared with arrowroot, Agar-Agar, or Carragheen, the following may be used:—

Chloroplatinite solution	4 ccm.
Soda iron solution	6 ccm.

This may be diluted for rough surface papers with from 2 to 3 ccm. of water.

In order to do away with the preliminary sizing, gum arabic in the sensitiser, thus:—

Chloroplatinite solution	4 ccm.
Soda iron solution	6 ccm.
Gum arabic solution (1:2)	4 ccm.

For thin negatives from 3 to 10 drops of sodium platinic chloride or 1 per cent. bichromate of potash solution may be added.

E. J. Wall.

The Medal of the Society of Chemical Industry has this year been presented to Dr. Joseph Wilson Swan, F.R.S., a chemist and druggist, whose career, as Mr. Muspratt remarked in presenting the medal, partakes of the nature of a romance of hard work and indomitable perseverance. At the beginning of his speech, Mr. Muspratt said: "When any member switches on the curent as he lights up this evening, let him recall for a moment the fact that our city is now being honoured by the presence in it of one to whom we owe the incandescent electric lamp in its present form, and let him reflect how much poorer the world might have been but for the inventive genius of Joseph Wilson Swan." He then proceeded to give a vivid sketch of Dr. Swan's life-work, and concluded by saying that, in making the presentation, he had the honour to be the mouthpiece of the Society of Chemical Industry, and he considered the Society did honour to itself in asking the acceptance of the medal by Mr. Swan, who was a Chevalier of the Legion of Honour, Past-President of the Society of Electrical Engineers, and last, but not least, Immediate Past-President of the Society of Chemical Industry. In reply, Dr. Swan expressed himself as deeply sensible of the great honour done him, and said it was a great gratification to him that his work was so highly esteemed. Davy warned Faraday not to indulge in extravagant expectations of the rewards of Science, and said Science was a harsh mistress; but though her awards are not, as a rule, redundant, and are apt to be capriciously bestowed, Science gives more precious rewards than those the hand can grasp, and among those, said Dr. Swan, there are but few of greater value than that of which the Society's medal is a token.—"The Pharmaceutical Journal."

PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM.

Although smaller than some of the previous gatherings, owing, no doubt, to the after effects of the war, the Coronation postponement, and other causes, the Cambridge meeting of the Photographic Convention of the United Kingdom must be pronounced in all other respects at least as successful as any of its predecessors. Representatives of most branches of photography were present, and a noticeable feature was the attendance of a large number of professional men. We missed the names of Alex. Tate, George Mason, G. Watmough Webster, E. J. Wall, and other staunch supporters from the attendance book, but these old timers did not lose the opportunity of being represented by letter, and in spirit, in the course of the Convention week. The Convention is happy in respect of retaining the goodwill and wishes of those who have once become associated with it.

Cambridge seemed to have exerted itself to the utmost to do honour to its photographic visitors. Sir Robert Ball proved himself to be a working president in the best sense of the term, and on the afternoon of the garden party took the very greatest pains to explain the principal features of the observatory to the visitors. The thanks of the Convention are due, in a most emphatic manner, to Sir Robert, for the thoroughness and earnestness in which he carried out his presidential duties.

Amongst the local executive, the names of Messrs. F. H. Sanderson and H. A. Chapman stand out for special recognition, and these gentlemen may be assured that their efforts on behalf of the Convention visitors were thoroughly appreciated. But the record of thanks which the occasion demands would, we fear, make monotonous reading. It must meet the case, therefore, if we congratulate all concerned on the success of the Cambridge meeting. The weather at times on Wednesday and Thursday was dull and wet, but brilliant sunshine prevailed during the remainder of the week. The college authorities gave the photographers the "run" of those delightful buildings, and a large batch of good negatives should result. The three excursions attracted numerous atendances. For ourselves, Cambridge itself, with its lions constituted a magnetic attraction, from which we had no desire to be lured away by rival inducements.

The hospitality and courtesy with which the authorities and good people of Cambridge received the Convention will always be remembered with grateful appreciation. The substance of Sir Robert Ball's presidential address is given in another part of the Journal, as is also the communication made by Mr. E. Howard Farmer to the Convention. We append here a report of the business proceedings of the Convention:—

Practical Enlarging.

On Wednesday evening, July 9th, Mr. Thomas Illingworth took as the subject of a demonstration, "Practical Enlarging." They all knew, he said, to a certain extent, what photographic enlargement was. They had an idea, he supposed, that from a sort of magic lantern an image was thrown upon a screen, in front of which a piece of sensitised paper was placed, and afterwards exposed and developed. He would like to point out that there was as much difference between this idea of enlarging and skilled enlarging as there was between the man who went out with a 5s. camera, pressed the button, and allowed someone else to do the rest, and the man who could produce artistic pictures of inartistic sitters. When they saw some of the productions of their leaders, such as those of their esteemed past-president, Mr. W. Crooke, and others, who had educated the public to recognise the fact that photography could produce artistic pictures, worthy of a place in any home of taste, he thought they would agree with him that cheap productions had been useful in helping the public to distinguish the difference between rubbish and good work. Mention of the taste which could be exercised in the production of enlargements reminded him of the way in which vignetting enlargements had been abused. Some years ago it was the mode to have every enlargement vignetted. Whatever the subject might be, it had to be vignetted. It did not matter whether black boots were made white, or legs footless; so long as the inevitable vignette was there, satisfaction was obtained. He had seen heads vignetted on a 24in. by 20in. piece of paper, with a huge white plate sunk mount about 4ft. by 2½ft., and he had never seen one of these productions without thinking of the question, "What is an island?" An island was a piece of land surrounded by water. In the same way it might be asked, "What is a vignette?" the answer being, "A vignette is a piece of black entirely surrounded by a sea of white." If enlargements were still to be a power in the photographer's hands, this kind of thing would have to be done away with, and it could be. Enlargements made an artistic paper, many of which they now saw resembling the finest etchings, or photogravures, could not be anything except a source of delight to their owners. He thought they would find that enlarging was something that both professional and amateur photographers could not very well do without. To the former, if done properly, it was a source of increased business and profit. To the amateur, it should be a great assistance and pleasure.

The perfection to which enlarging had been brought made it unnecessary for the amateur to carry about a heavy kit of apparatus. After all, the proportion of successful exposures which were worthy of being permanently retained was very small. If a small camera was used in the field, the small proportion of selected negatives, and the small parts of those selected negatives, could be enlarged, because, in enlarging they could pick out just that part of the negative which composed the picture. Further, they could make the enlargement quite equal or superior to a print from the original negative. Proceeding to refer to processes, the speaker said that the simplest method was known as bromide enlarging, which consisted of projecting the image of the negative through a lens, either by daylight or artificial light, on to bromide paper, and exposing and developing it. This was the only process by which the negative was made into a direct positive right away, unless they considered solar enlarging on to the less sensitive papers. In England this was hardly worth considering. In the other processes it was usual to make a transparency from the original negative, and enlarge this on to a sensitive plate, thus making an enlarged negative from which prints could be taken at any time. This process was, perhaps, a little more troublesome than bromide enlarging, but once having obtained the enlarged negative, it could be used for making a print by means of any printing process, either carbon, platinotype, or gelatino chloride. As he was not speaking to laymen, he thought it would be better not to demonstrate the simpler process of bromide enlarging. What he proposed to do was, to make an enlarged negative for carbon printing, and to develop a carbon print from the enlarged negative. He would endeavour to show them in a simple manner how it was done.

Sir Robert Ball briefly addressed the gathering. He said the demonstration had been to him, personally, most interesting, and remarked that for astronomical purposes wet plates were not suitable. Really photography from an astronomical point of view made no progress until dry plates came in. Many astronomical photographs, however, were taken under much difficulty with the old wet plate, but the photographs taken under these conditions were only those of brilliant objects, like the moon, which required only short exposures. The president proceeded to speak of the application of photography to the discovery of planets, and said that when a photograph of the heavens was taken the telescope was moved so as to follow the stars correctly. Should there happen to be a planet in the field, its independent motion was such that it was not registered as a point, like a star; it made its appearance as a streak. In this way photography called direct attention to the planets, and many had been thus discovered. He had seen one plate in which there were no fewer than eleven little streaks, each one of which signified a planet. Three of these streaks belonged to planets which astronomers had not noticed before, and which, but for photography, would probably have eluded notice altogether. The planet was an unquiet sitter, but this unquiet sitter was precisely what they wanted, because by that fact it disclosed that it was a planet, and not one of the fixed stars.

The Annual General Meeting.

The annual general meeting of the members of the Convention took place on Thursday morning at the Guildhall. Mr. Thomas Bedding (vice-president) occupied the chair. The meeting first considered the question of which place should be visited by the Convention in 1903. The secretary read two letters of invitation which had been received, one from Perth and the other from Derby. Mr. W. Crooke said they had heard the invitation which had been received from Perth, and he thought he could have no opposition when he said that Scotland deserved a turn. He was certain that the visit to Perth would be of great interest to the majority of the English members. One argument against the visit was that it was such a distance for them to go. He said to those who advanced that argument, "Have I not come a distance for several years, and have my friends not come a distance?" They had sometimes to inconvenience themselves, and he was sure anyone who took similar trouble to go North would be amply repaid. He had great pleasure in proposing that the next Convention meeting should be held at Perth. Dr. Mann (Oxford) seconded the motion.

Mr. J. L. Lyell moved that they accept the invitation from Derby. He did so with some hesitation, because, being a Scotsman, it would be very convenient for him to go to Perth. However, he thought it would be unfair to ask a large number of their members to go so far North at great expense and inconvenience. Although they had been to Derby once before, he thought it was only fair to accept the invitation to visit that place.

The secretary said they had a direct invitation from Derby. It was equally direct with the invitation from Perth. Mr. Baldwin seconded the amendment that the Derby invitation should be accepted. Mr. Harold Baker supported the amendment, and said the distance to Perth was a great objection to the acceptance of the invitation from that place.

Mr. Bothamley said the whole of their experience led them to expect that they would be well received at either place, but he thought the question of distance to Perth was a very important one, especially just now. The postponement of the Coronation had kept several of their members away. It had, to a certain extent, broken the continuity of the Convention, and, if they went to Perth, they would go still further in the direction of breaking off a number of members, whom they did not wish to lose. He thought they ought to recognise that those members who came to the Convention for two days put themselves to much more inconvenience than many of those who came for the whole week.

The hon. secretary said he would like to go to Perth personally, but not as secretary to the Convention. His own affairs next year would not allow it. The members, when they came to the Convention meeting, came to a feast prepared for them, but they had no idea of what a lot of cooking there was to do before they arrived. He considered they should go to a place a little more central than Perth. It would be more convenient to a great number of their members to go to Derby.

Mr. C. B. Keene (Derby) said he had come to give the members a most hearty welcome to Derby. He thought they could promise the members quite as good a time as they were likely to have elsewhere.

Mr. W. E. Dunmore spoke against restricting the meetings of the Convention to as near London as possible. It was not fair to the rest of the United Kingdom. They had had a meeting at Oxford, and now they were having one at Cambridge, and he thought they had worked the southern part of the kingdom very well. If they had a meeting further North it would be only fair to the members.

Mr. F. H. Gandy (Derby) supported all that had been said by Mr. Keene in regard to the invitation from Derby. He could promise that they would have a most hearty welcome, and everything would be done to make the Convention a thorough success. The members would never regret accepting the invitation, which was most heartily offered them.

Mr. Crooke said it had been hinted that not so many members would go North if the Convention was held at Perth. His answer was that they would have the support of the greatest societies in the country if they went to Scotland. They would have the support of the Blair-Gowrie, the East of Scotland, the Edinburgh, and the Glasgow Societies. They would receive a large draft of members from all these societies, so that there was no need to dread the membership of the Convention. It would be large. Referring to the question of distance, the speaker said that if they travelled from London they would travel on the finest line of the finest system in the country, and get to Edinburgh in 8¼ hours. Perth, through the Forth Bridge, was one hour from Edinburgh.

Voting then took place upon the amendment that Derby should be visited. It was lost by 22 votes to 23.

Mr. S. B. Webber proposed a vote of thanks to the local committee, coupling with it the names of Mr. F. H. Sanderson, the chairman, and Mr. H. A. Chapman, the local hon. secretary. They had carried out their duties in an excellent manner. Mr. F. A. Bridge seconded, and said he had worked very comfortably with Mr. Sanderson and Mr. Chapman. The local committee had done very well indeed, and they, Mr. Sanderson, and Mr. Chapman, deserved hearty thanks. The chairman supported the vote, which was heartily accorded. Mr. G. Bingley proposed that thanks should be conveyed for the invitation to Derby. Mr. W. Teasdale seconded the proposition, which was carried.

Messrs. Schumann and Sanger Shepherd were re-appointed auditors.

A letter was read from Mr. Percy Lund, who suggested that at the next Convention meeting there should be an exhibition of prints made by the members.

It was agreed, on the proposition of Mr. Bothamley, seconded by Mr. Snowden Ward, that it was desirable to hold such an exhibition, to consist of work done at the present Convention.

New Council.

The chairman announced that the effect of the voting for the new Council was to leave the list on the voting paper as it stood. He therefore declared those members duly elected.

The following is the Council:—Dr. Bansall, Cambridge; Messrs. H. Walter Barnett, London; Harold Baker, Birmingham; G. B. Bainbridge, Newcastle-on-Tyne; Godfrey Bingley, Leeds; W. J. Croall, Edinburgh; and T. R. Dallmeyer, London; Dr. Dufton, Cambridge; Messrs. R. W. Dugdale, Gloucester; W. E. Dunmore, London; Alfred Ellis, London; S. H. Fry, London; F. Gandy, Derby; J. Pattison Gibson, Hexham; H. M. Hastings, London; E. J. Humphery, London; T. Illingworth, London; Sydney Keith, Hounslow; C. Phipps Lucas, London; and Percy Lund, Bradford; Colonel Lysaght, Pretoria, S.A.; Messrs. J. W. Marchant, London; and A. F. Mowll, Liverpool; the Rev. T. Perkins, Blandford; Messrs. Claude Rippon, Oxford; Ralph Robinson, Redhill; P. R. Salmon, London; F. H. Sanderson, Cambridge; A. Seaman, Chesterfield; Alexander Tate, Belfast; W. Taylor, Leicester; G. H. Tyndall, Ely; J. H. Walker, Leeds; E. J. Wall, London; and H. Snowden Ward, London; Lieut.-General J. Waterhouse, I.S.C., London; Messrs. S. B. Webber, London; G. Watmough Webster, Chester; J. B. B. Wellington, Elstree; and A. Werner, Dublin.

The Annual Dinner.

The annual dinner took place at the University Arms, Cambridge, on Thursday evening, July 10th. Nearly 100 members, including several ladies, assembled. Sir Robert Ball, the president, occupied

the chair, and among those also present were:—Messrs. C. H. Bothamley, Thomas Bedding, J. Stuart, and W. Crooke (vice-presidents), Mr. F. A. Bridge (hon. secretary), Dr. Bansall, Dr. Dufton, Messrs. Harold Baker, Martin Jacolette, H. Snowden Ward, F. H. Sanderson (chairman local committee), H. A. Chapman (hon. secretary local committee), E. Field, C. S. Addison, C. E. Goodrich, C. F. Charlton, G. Hardwick, O. Wehrle, W. Brockett, T. B. Hunt, J. Leach, and F. Stoakley.

After the loyal toast, Mr. Harold Baker gave "The Photographic Convention of the United Kingdom," coupling with it the name of the Hon. Secretary, Mr. F. A. Bridge. The proposer said he thought the prosperity of the Convention was assured if they could always have such successful meetings as the present one. They had had a magnificent series of excursions. He believed he had heard a little grumbling that they had been somewhat too architectural, but, at any rate, they would have a change next year, and he was glad to say they would go to Perth prepared to enjoy some of the most beautiful scenery in this island. With regard to Mr. Bridge, he was sure they felt enormously indebted to him for the great amount of work he had done for them during the last five years. They knew that whenever they wanted anything, Mr. Bridge would always go out of his way to help them in a most genial and delightful manner. They could form some idea of the great amount of work which the secretary had to perform when he told them that in connection with this meeting Mr. Bridge had written 600 letters, in addition to sending out circulars.

Mr. Bridge said that for the fifth time it was his duty and great pleasure to respond to the toast. He did not know that the Photographic Convention was in a very bad way. Judging by the appearance of that room, they certainly would not think so; judging by the excursions they had had, and the general amount of good feeling which had been manifested towards them while they had been in Cambridge, he thought they might say they were in a thoroughly healthy condition. He could not help feeling that the circumstances induced by the postponement of the Coronation accounted for the fact that there were not so many old members at the Convention meeting as there had been on some occasions. But although there were many members absent, he received letters and telegrams from them which showed that they were absent because they were unable to attend, and not because they did not want to attend. Of course, against this there was the fact that they had received several new members. Some were amateurs, some professionals. No distinction was made between them. There was one thing about which he was very glad; it was that, notwithstanding a remark which appeared a short time ago stating that the professional photographer was being warned off the Convention, they had more professional photographers now than they had ever had. He had always contended that the more photographers knew of each other, the better it would be for them. They would think less of themselves, and more of each other. He appreciated the good feeling which existed between all the members of the Convention and himself. The office of secretary was one which had some compensations. One consisted of responding to that toast, coupled with the privilege of proposing the next. There was no photographic society at Cambridge to assist in arranging for the visit of the Convention, but they were fortunate enough to get one man to take the matter in hand in the first place—Mr. Sanderson. He made up his mind that they should come to Cambridge, he got some good fellows to help him, and there they were. Mr. Sanderson had attended no end of committee meetings. The first question that had to be decided was, who were they to get for a good local secretary? Mr. Sanderson put his finger on Mr. Chapman. Mr. Chapman, with the modesty which always characterised really clever men, said he was quite sure he could not undertake the duties, but the result had certainly been all they could possibly have wished. He had much pleasure in proposing the toast of "The Local Committee," coupled with the names of Mr. Sanderson, the chairman, and Mr. Chapman, the local hon. secretary.

Mr. F. H. Sanderson said he was sure it would be utterly impossible for him to find words to express his feeling of delight at the fact that the Photographic Convention had been brought to Cambridge. They had endeavoured, so far, to do something to enable the members to enjoy themselves. There had only been one little failure up to the present; it was rather an important one. Sir Robert Ball undertook to do something for them, and it was rather doubtful whether it was going to be performed. Sir Robert said he would take charge of the weather. He would like to be able to convey to the members some idea of the pleasure the visit of the Convention had caused the local committee. The committee, as Mr. Bridge had said, were exceedingly good fellows; every man had done his utmost to make the meeting successful, and if they failed, it would not be for want of goodwill on their part. He trusted that when the members of the Convention left Cambridge they would take with them pleasant memories of their re-union here.

Mr. Chapman said he would like to thank Mr. Bridge for the help he had rendered to the local committee. If he had not given his time and labour to them unsparingly, they could not have succeeded. Mr. Bridge could not have done more than he had done, and he (the speaker) thanked him heartily. They trusted that all the members would go away feeling that the local committee had done their very best to provide them with a happy time.

"THE PRESIDENT."

Mr. Thomas Bedding, in proposing the toast of "The President," said no person of education in these days was ignorant, first of all, of the scientific standing of their president, and secondly, of his very charming personality. They had had delightful experiences of both. As president, Sir Robert Ball had imparted dignity to their proceedings. On Monday they listened to a very delightful address delivered in inimitable style. That address, he ventured to say, lifted them all from the common plane of everyday life, and took them into another, if a distant, world. Very few more words of his were needed to commend the toast to them. If he attempted to express all that he knew the members felt it might seem that he was indulging in excessive flattery, but, humbly voicing their ideas, he ventured to say that they appreciated the great honour which had been conferred upon the Convention by Sir Robert Ball. They valued the time, the labour, and the effort he had expended on their behalf. The work he had done for them, the care he had taken to interest them in the science with which his name was inseparably associated, would remain a pleasant page in the history of the Convention. He gave them, with great heartiness, the toast of "The President."

The president said he was very much obliged for the kind manner in which the toast had been received. It was a very great pleasure to them to see and receive the Photographic Convention on the banks of the Cam. Many of the members, he had no doubt, were visiting Cambridge for the first time. He did not know whether they expected to see the Cam so large as the Mississippi or not. Were they aware that they could be in "Paradise" to-morrow if they liked? All they had got to do was to go to Robinson Crusoe Island and get a boat, and he promised them that their peep into "Paradise" would be one of the most delightful experiences of their visit to Cambridge. It was a spot full of material for snapshots, if the photographers there would condescend to take such things. Mr. Bridge, the president proceeded, spoke to him just now as if he was an Irishman. Now in Cambridge they were nothing if they were not accurate. When Mr. Bridge described him as an Irishman, that was not a proposition of absolute mathematical precision. To be very strict about it, his great-great-great grandfather came from Devonshire, while his mother was a full-blooded Englishwoman. If they worked that out—and it was a nice little question to work out—they would find that seventeen-thirty-seconds of his person was English, and only fifteen-thirtyseconds was Irish. But as he had spent some years of his life in Ireland, he supposed he might claim to be Irish. His sojourn in this University had only been for a short period. The bulk of his life had been passed in Ireland, and his feelings were those of an Irishman. Malignant slander had even ventured to whisper that even should he try to pass as an Englishman, his speech would betray him. It had been said that he undertook to promise that the weather was going to be fine for the occasion of the Convention. The tale referred to something which he must have said at one of those meetings, one of the numerous meetings to which he was summoned, but which he studiously abstained from attending. On no occasion whatever, either in connection with the Photographic Convention, or any other, had he ever ventured to make any prophecy with regard to the weather. It was true that occasionally, when he had had to lecture to an audience, he had ventured to prophesy. He had never been found to be wrong yet, but that was because he had never prophesied anything that was to happen at an earlier date than 60,000 years hence. How little likely he was to give himself away by making any rash promises he might illustrate by what had occurred to him a short time ago. One of those energetic newspapers—he did not think it was the "Sporting Times"—wrote to him before the warm weather began, asking, "Can you give us a scientific explanation of the wonderfully cold weather we are having at this time of the year?" At first he was going to put the communication in the waste paper-basket. But he took a postcard and wrote "You have mistaken your man. My business begins 240,000 miles up, and as far on beyond that as ever you like. Clouds are not in my department." Concluding, the president said that if ever the Photographic Convention came to Cambridge again, he hoped that if he was alive and kicking they would have him as their president.

Mr. H. Snowden Ward responded for the toast of "The Photographic Press."

Mr. Martin Jacolette proposed "The Ladies," and the toast was responded to by Mrs. Snowden Ward.

During the evening the Cambridge Glee Singers (Messrs. E. Bowman, F. P. Dew, B. Baldwin Bales, and J. H. Tebbs) contributed the following items:—Part song, "Sweet and Low" (Barnby); glee, "By Celia's Arbour" (Horsley); humorous glee, "The Goslings" (Bridge); Swabian Volksleid, "Come, Dorothy, Come"; plantation air, "De Ole Banjo" (Scott Gatty), arranged by B. B. Bales, F.R.C.O. Mr. Joseph Reed, principal tenor of Trinity College Choir, and a member of Miss Clara Butt's Company, sang "An Evening Song"

(Blumenthal) and "Mona" (Stephen Adams). He also responded to an encore. Mr. E. Bowman contributed a laughing song; Mr. F. P. Dew sang "Thy Sentinel am I," and Mr. Arthur Baldwin gave a recitation. Miss Dorothy Chapman was the accompanist.

Lighting and Posing.

On Friday evening last Mr. Harold Baker gave a demonstration on Lighting and Posing. The lecture was illustrated by slides taken by electric and day light under varying conditions. The lecturer first dwelt upon the enormous difference produced by different backgrounds. One or two things photographers should bear in mind was that they were bound down to monochrome, and, therefore, they ought to pay more attention to light and shade. They were also restricted in the range of tone. There was, he supposed, no negative process which rendered tone and light and shade as they saw them in the subject. They might possibly secure, sometimes, a fair rendering of the actual subject in the negative, but they were largely restricted again in the printing process. He did not think there was any printing process which would reproduce the full range of tone, even the limited range of tone they got in the negative. That was another reason for care in light and shade. The lecturer gave a few demonstrations in posing in electric light, and then explained the use of the reflector so as to get rid of the shadow on the side of the face farthest from the light.

Illustrations of light and shade, and examples of good and bad posing were shown by means of slides.

Patent News.

The following abridged descriptions are specially drawn for the British Journal of Photography by Messrs. Hughes and Young, patent agents, 55 and 56, Chancery Lane, London, W.C., who will give advice and assistance free to our readers on all patent matters:—

Patent Applications.—No. 14,528.—Harold Dennis Taylor, Stancliffe Mount Villas, York. "Improvements in photographic lenses."

No. 14,602.—Joseph Mason and the British Mutoscope and Biograph Company, Ltd., Chancery Lane. "Improvements in and relating to mutoscopes or apparatus for displaying a series of photographs or pictures for producing animated effects.

No. 14,714.—Richard Fiedler, 18, Buckingham Street, Strand. "An improved method for developing, fixing, and washing photographic films and other flexible picture carriers."

No. 14,730.—Henry James Spratt, Alfred Sidney Spratt, and George Albert Spratt, Tudor Works, Tudor Road. "Improvements in photographic tripod stands, and in magazines hand cameras."

No. 14,749.—Theodor Heinrich Trankner and Fritz Perl, 1, Broad Street Buildings, Liverpool Street. "A new and improved pocket stand for photographic cameras."

No. 14,754.—Anton Sagl, 7, Elv Place. "Improvements in apparatus for taking, viewing, projecting, and reproducing photographs of movable objects."

No. 14,803.—Rudolf Krugener, 18, Buckingham Street, Strand. "Improvements in and relating to photographic cameras."

No. 14,833.—Austin Edwards, Chancery Lane. "An improved photographic film cartridge."

Patents Illustrated.—No. 5,356.—Photography. Patentees: E. S. Shepherd, 5, Gray's Inn Passage, Red Lion Street, High Holborn, and C. Jones, 11, Eaton Rise, Ealing.

Exposures: Determining.—Relates to a device for testing photographic plates and film for sensitiveness and speed, and testing and adjusting developers, etc. The device is made of two sheets of glass, between which are arranged the graded scale of colour-patches. The sections are marked with numerals to represent the series of tints of graduated densities or opacities. The vertical row of sections are coloured patches, and the rectangular portion is a strip of grey, forming what is known as the Abney Colour-sensitometer.

No. 5,438.—Photography. Patentees: H. E. Hickox, 13, Row, 136, South Quay, Great Yarmouth, and F. A. Phillips, Vicarage, Gorleston, both in Norfolk.

Cameras: Developing, fixing.—Relates to a camera specially suitable for ferrotype plates and combined with a change-box and appliances for developing and fixing the photographs. In the back view of the cameras is the exposure compartment, with the lens mounted in front. Alongside of this compartment is the compartment in which the ferrotype or like plates are stored.

No. 5,502.—Photography. Patentee: C. D. Abel, Chancery Lane.

Developing.—Relates to developing substances of the kind described in Specifications No. 5,207, A.D. 1889, and No. 25,002, A.D. 1893. The object is to prepare such developers in a stable form, ready at any time for use. This is done by mixing the organic compounds in the form of the free sulphonic or carboxylic acid with the inorganic salts in the anhydrons and perfectly-dry state.

New Apparatus, &c.

Messrs. Elliott and Sons, Ltd., have sent us samples of the carbon tissues and transfer papers they are now issuing. Amongst the latter are various tints and surfaces of several well-known drawing papers, such as Hollingsworth's, Whatman's, Joynson's, Pirie's, etc.; also thick and thin, single and double transfer papers of the ordinary kind, on fine, smooth paper. The tissues forwarded were ready-sensitised and of various colours, such as "Marine Blue," "Sepia," "Red Chalk," and "Engraving Black." On making some prints we found the tissues to yield excellent results. The pigment is evidently in a very fine state of division, and the colours good and what they purport to be. For example, the sepia is really the colour of sepia, and very unlike some of the browns one often sees in photographs and called sepia. The red chalk, again, is like the colour we see in red chalk drawings, and not the fiery red sometimes seen, and we note that the transfer paper is in no way tinted by the pigment as is the case with some red tissues. The engraving black is a colour we very much admire. It is a black, and is free from the blueish tint that some blacks have that rather reminded one of a bromide than a veritable carbon picture. We are highly pleased with the tissues and the transfer papers.

Mr. Walter D. Welford has sent us samples of new masks and discs he is now putting on the market. They are intended for use with portraits by double printing. The portrait is first printed with a clear margin, and then the border negative is put on and the second printing done, the first printing being covered by the blank in the centre. The border negatives, Mr. Welford tells us, are made by photographing the designs, thrown in strong relief in the lighting and then printed in carbon on celluloid. The examples sent us are decidedly novel.

A New Collodion Paper—"Leto."

Messrs. A. and M. Zimmermann, of 9 and 10, St. Mary-at-Hill, have sent us samples of Schering's new collodio-chloride paper—"Leto." It is of three grades—glossy, matt, and rough. The directions, issued with the paper, say for gold tones any reliable bath, such as is used for albumen or gelatino-chloride papers, may be used, and recommend one containing acetate of soda and sulpho-cyanide of ammonia. We, however, used the ordinary sulpho-cyanide bath. With that we obtained excellent tones from a warm brown to a deep purple black, which, on the matt and rough paper, were very like those of platinotypes. For red brown, warm black, and sepia, gold toning, followed by platinum, is recommended. The formulæ given are as follows:—

For tones from red brown to warm black.—Gold-platinum process.—For this process two toning baths are necessary, as follows:—First (gold bath): Water, 17 ounces; acetate of soda, 1 ounce; gold chloride, 1 grain. Second (platinum bath): Water, 9 ounces; phosphoric acid 1,120, 2 drachms; chloroplatinite of potassium, 7½ grains. Note.—The gold bath will not keep, and must be made up shortly before use only. The platinum bath may be used over and over again, but when exhausted a fresh one must be made; not, however, the old bath freshened by the addition of chloroplatinite of potassium.

Proceed as follows:—Printing must be carried on far into the bronzing stage, as the prints lose considerably in the toning process. Washing.—This must be done thoroughly, a slight trace of silver is apt to cause red or yellow patches on the prints in the toning baths. Wash in several changes until the last washing water is perfectly clear. Toning—Gold Bath.—After washing place the prints one by one in the gold bath, keeping same in constant motion to avoid uneven toning. Toning must not be carried on too far, but only until the prints have changed colour. A short immersion in the gold bath produces a brown-black and a long immersion a blue-black tone in the subsequent platinum bath.

Red-brown tones are obtained by a short immersion in the platinum bath, after the gold bath. After toning wash in two to three changes of water.

Platinum Bath.—After toning in the gold bath the prints must be well washed and placed one by one in the second or platinum bath. Keep the prints in constant motion to avoid uneven toning. Tone until the desired effect is obtained, and wash well in two to three changes of water. Fixing.—Fix for about ten minutes in: Hypo, 1 ounce; water, 20 ounces. Final Washing.—After fixing, wash for one hour in running water or eight to ten changes. Drying.—Damp off the moisture between clean blotting-paper and allow the prints to dry spontaneously, or they may be dried before the fire. Note.—Use only pure chemicals. Clean dishes are essential. Keep the prints in constant motion in all solutions. Wash well before and after each operation. A slight trace of hypo in the toning baths, or gold in the platinum bath, and vice versa, is fatal to the prints.

Sepia Tones.—Printing.—Print deeply. Washing.—Wash thoroughly, as previously noted. Toning.—After washing place the prints one by one in the following toning bath: Water, 40 ounces; acid phosphoric, 1,120, 6 drachms; chloroplatinite of potassium, 15 grains. Fixing.—After toning, wash and fix in: Hypo, 1 ounce; water, 20 ounces. Final Washing.—Wash for one hour in running water or eight to ten changes.

Messrs. Zimmermann inform us that they are now supplying the three grades of paper in sixpenny, post paid, packets, so as to enable anyone to test the paper at a small cost.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

July.	Name of Society.	Subject.
19	Ashton-under-Lyne Photo.	Ramble—Bredbury.
19	Birmingham Photographic	Annual Picnic.
19	Croydon Natural History	Oxted and Barrow Green Conductor, Mr. W. Whitaker, F.G.S.
19	Camera Club	Ramble—Saunton and Croyde.
19	Woolwich Photographic	Epping Forrest. Leader, H.G.Weekes
21	Southampton Camera Club	Demonstration of the Platinotype Process, S. G. Kimber.
22	Birmingham Photographic	A Social Evening. Chairman, Mr. T. Taylor.
23	North Middlesex Photographic	Slides of Canadian Scenery. By Members of the Toronto and Montreal Camera Clubs.

ROYAL PHOTOGRAPHIC SOCIETY.

The Proceedings of Council.

The Society's Jubilee.—In view of the approach of the fiftieth anniversary of the Society's foundation, the first ordinary meeting having been held on February 3rd, 1853, the council have appointed a committee to consider the steps to be taken to celebrate the event in a manner worthy of the Society and the occasion. The committee, which is constituted as follows, will report in due course:—Mr. Douglas English, Dr. Ernest C. Fincham, Mr. J. C. S. Mummery, Mr. Andrew Pringle, and Sir H. Trueman Wood.

The Society's Dinner.—The committee appointed by the council to report upon a suggestion that the Society should institute an annual dinner, having presented a favourable report, the council have decided to organise a dinner amongst the members of the Society and their friends, during the coming autumn, provided that a minimum attendance of 100 is assured. The date selected is Monday, September 29th, when it is expected that many of the provincial members will be in London for the opening of the exhibition, and the price of the ticket, exclusive of wine, will be half-a-guinea. The Dinner Committee has been re-appointed and charged with the arrangements. The secretary will be pleased to receive the names of members who intend to be present, and an intimation whether they will be accompanied by friends, as soon as possible, in order that the committee's work may be facilitated. A further announcement, indicating the place at which the dinner will be held, will be issued in due course.

The Journal.—Upon the recommendation of the Journal Committee it has been decided to abandon the use of the paper at present employed in the Journal as from the first number of the new volume, and to make use of a non-glossy paper as before, printing half-tone illustrations, if necessary, on separate sheets. The secrteary has been authorised to engage a reporter to record the business transacted and the discussions that take place at the meetings. The preparation of the reports of the council's proceedings for the Journal has been placed in the hands of the President and the secretary.

The provisions of a proposed agreement with Messrs. Hastings Bros., Ltd., whereby they become the Society's sole advertising agents in respect of the Journal, have been considered. The draft has been approved, and the secretary has been directed to seal the agreement, which comes into force on September 1st, 1902, when the existing arrangement with Messrs. Heywood and Co., Ltd., comes to an end.

The Members' Ticket.—The form and the draft of the members' ticket have been approved, and the ticket is issued to those who are entitled to receive it, with this number of the Journal. Members are requested to note that all of the meetings of the Society, which are specified on the ticket, will be held at 66, Russell Square, and not, during the exhibition, at the gallery as before.

The Fellowship.—Applications from a number of members, together with a report upon the statements of qualifications submitted, were considered by the council, and, in accordance with the standing orders, passed for ballot at the next meeting of the council. A report upon the fellowship by the committee was also considered, and referred to a joint meeting of the Fellowship and the Articles Revision Committees for further consideration.

Subscriptions.—It was resolved that a number of members whose subscriptions continue in arrear, notwithstanding repeated applications therefor, be removed from the register, in accordance with Article No. 18, which provides that:—"Any member whose subscription is twelve months in arrear shall not be entitled to attend or take part in the meetings of the Society, nor to receive the Society's printed papers, nor to vote. He shall be deemed to have forfeited his claim to membership, and his name shall be suspended on the notice-board unless the council give instructions to the contrary. His name may be removed from the register by order of the council, but he shall, nevertheless, continue liable to pay the arrears of subscription due at the time of his name being so removed."

It was further resolved that the list of defaulting members posted on the notice-board in accordance with the above article be removed in pursuance of the power to so order thereby vested in the council.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

July 10th.—Mr. Ernest Human in the chair.

Mr. R. P. Drage reported that Mr. Medland had informed him that a dark-room had been installed at the gardens of the Zoological Society for the purposes of plate-changing. The convenience was free to all employing a camera in the gardens.

A discussion took place regarding the photographing of the illuminations arranged in connection with the Coronation festivities.

Mr. Furley Lewis referred to a photograph of a similar kind he had made in Piccadilly Circus. The actual exposure of the plate totalled five minutes, but there were intervals when the lens was covered to avoid passing vehicles. Another speaker spoke of the necessity of observing whether electric or gas lights predominated in calculating exposure. There was also some care required if halation were to be avoided.

Mr. W. T. Wilkinson, referring to the backing of plates, said he had been making some screen negatives on dry plates, and one after another was marred by minute little streaks of different shapes. After some time he discovered that the marks were due to flaws in the backing He found that the best backing for this class of work was black paper wetted and squeegeed into close contact with the plate. In reply to a question as to the efficiency of a backing such as this, in which only a water contact was ensured, and not the optical contact of the backing medium, he said that for the special work referred to, namely, the making of screen negatives, it was certainly efficient.

Mr. Sims referring again to the photographing of illuminations, said that if the camera were gently tapped during exposure, a little movement was brought about, which, though hardly perceptible in the print, in slides projected on the screen gave a very pleasing effect, as of glimmer.

Mr. R. P. Drage said that it had been written that the backing of a plate allowed one to expose it without risk of over-exposure for many times' normal exposure. He had tried the experiment, giving on a slow process plate what he calculated would be fifteen times the necessary exposure. The results were very good indeed.

Mr. A. W. Bartlett mentioned a curious case of reversal during development. Two plates received identically the same exposure, the subject being the same. One was developed in a stale solution of hydroquinone, the image coming up in negative form but thinly. The addition of fresh stock solution caused almost immediately a general darkening of the plate, with the concurrent reversal of the image to the positive state. One or two of the high lights remained in the negative state.

Mr. Teape endeavoured to explain that the plate had been fogged by the dark-room lamp during development, and that on the addition of the new developer the fresh exposure was developed. The suggestion that the dark-room lamp was unsafe was not accepted, however. Mr. Bartlett promised to bring the negative to the next meeting.

Mr. J. S. Teape then described the method of boiling sugar for the making of caramel for backing.

A short discussion ensued on the fact noticed by several that commercial backing sometimes reproduced the pattern of its coating on development.

We have received a catalogue of photographic apparatus and materials from Messrs. Holmes Bros., Princes Buildings (near St. Peter's Square), 22, Oxford Street, Manchester. It is a neatly-produced volume of over 100 pages, and the goods listed and illustrated specially appeal to amateur photographers.

The Royal Cornwall Polytechnic Society's Exhibition.—The following is the schedule of the photographic section:—In all cases state whether the work is professional or amateur, and name process of production. All work sent for competition must have been executed within eighteen months of the date of this exhibition. Carte-de-visite portraits are excluded from exhibition, except when illustrating some special process or novelty. All enlargements for competition must be the work of the exhibitor. Information respecting the photographic department may be obtained from Mr. W. Brooks, Laurel Villa, Wray Park, Reigate (member of the general committee). Professional medals will be awarded for the following subjects:—Outdoor Photography: (1) Landscape, not less than 20in. by 16in. (2) Landscape, 12in. by 10in., and under. (3) Genre. (4) Architectural (exterior). (5) Instantaneous—including Marine. (6) Animals. (7) Enlargements. Indoor Photography: (1) Portraits, not less than 20in. by 16in. (2) Portraits, 15in. by 12in., and under. (3) Home Portraiture. (4) Still, Life, Flowers, etc. (5) Interiors—Architectural or otherwise. (6) Enlargements. Amateur: (1) Landscapes. (2) Architectural (exterior or interior). (3) Alpine Scenery—including Caucasian. (4) Hand Camera Work, twelve examples, not less than quarter-plate. (5) Instantaneous—including Marine. (6) Still Life. (7) Enlargements. X-Ray Work. Apparatus. Photographic apparatus generally, including the lantern and its appliances.

Commercial & Legal Intelligence

Messrs. J. H. Dallmeyer, Ltd., have declared and paid an interim dividend at the rate of 12 per cent. per annum for six months ending June 30th last.

In consequence of the Coronation being postponed, the date for the sending in prints for the Gem Dry Plate Coronation Competition has been altered to one month after the actual ceremony.

The Austin-Edwards Monthly Film Negative Competition.—The prize camera for current month has been awarded to Mr. S. Stewart, Norman Hyrst, Normanton Road, South Croydon, for his negative, "Seascape."

Messrs. Standring, Son, and Co., of 124, Market Street, Manchester, have recently made extensive alterations, to enlarge their photographic department, to meet the demands and requirements of their customers, and will hold a large and varied stock of apparatus, plates, chemicals, etc. There are two dark-rooms at the disposal of customers and tourists—one for changing, etc., the other for developing, etc.—fitted with every convenience.

About Advertising.—Make the advertising dignified. The worst advertising offence of recent years has been the degeneration of what is known as the Wanamaker style, as interpreted by more or less competent personages, who think they can write advertising, and who labour under the mistaken notion that flippancy is brilliancy, and that long strings of words that jingle are convincing arguments. It is poor policy to do such advertising. Nothing but dignified language, with as attractive display as it is possible to secure, and offering genuine goods at a reasonable price, is good advertising.

The Warwick Competitions.—The following is the list of awards of the Warwick Competition for current month:—£1 prize each: P. Craig, Avenue Theatre, Sunderland ("Anticipation"); H. Davidson, Railway Department, Government Buildings, Wellington, N.Z. ("Flower Study"); N. G. W. Davidson, 30, Snow Hill, Wolverhampton ("Inside View of a Conservatory"); E. J. Denney, The White House, North Walsham, Norfolk ("Norfolk Wherry"); F. W. Gregg, 37, Angell Road, Brixton, London, S.W. ("The Crypt, Canterbury"); H. P. Hopkins, Branksome, Weaponess Valley, Scarborough ("Reflections"); H. G. McBurney, photographer, 405, Stretford Road, Manchester ("A Portrait"); H. W. Price, Pretoria House, Portslade-by-Sea ("Borrowed Plumes, etc."); J. Welsh, Salisbury Place, Bishop Auckland ("Durham Cathedral"); G. Wilfrid, photographer, 46, Harrow Road, Leicester ("A Child Study").

Mr. E. Merck, of 16, Jewry Street, E.C., writes:—"The increasing demand for chemicals in a convenient form for making up small quantities of developers, toning solutions, etc., has prompted me to start putting up Merck's Photo Chemicals, in tablets and cartridges. I have pleasure in handing you herewith one box Rhodangoldbad (sulphocyanide-gold toning-bath) tablets, also one cartridge pyrogallic acid developer. I trust you will have an opportunity of having these samples tested, and I feel certain that you will find the resulting solutions fully satisfactory. Numerous amateurs object to compounding their own mixtures, and for these the cartridges and tablets are very handy, as they do away with all weighing. Tablets and cartridges are also found very convenient when travelling. I enclose a copy of my booklet on "Merck's Photographic Chemicals." The demand for this booklet has been very brisk, and there are only a few hundred copies left of the first issue. If any of your readers should wish to receive a copy, I think they would be well advised not to delay writing. The booklet is sent free of charge to any photographer (amateur or professional)."

A Camera Sneak.—Rupert Howard Sell was charged, on remand, at the Hastings Borough Bench, with stealing on June 23rd a camera, value 30s., the property of Henry Charles Edwards. It was alleged at the previous hearing that the prisoner hired the camera and afterwards pawned it. Prisoner had nothing to say, and was further charged with stealing a hand-camera, valued at 30s., the property of Arthur Eustace Marriott, of Robertson Street, Hastings, on June 20th. Thomas H. Buss said the prisoner hired the camera for a week, and gave a name and address. Thomas Rix, manager to Mr. Stratford, pawnbroker, George Street, Hastings, said that the camera was pledged on June 20th for 7s. Prisoner was also charged with stealing on June 21st a hand-camera valued at £1 1s., the property of Alfred Miles. Prosecutor said that on June 21st prisoner hired a camera for four days. John Alexander Middlemas, pawnbroker, of 20, King's Road, St. Leonards, said that on June 21st the prisoner brought the camera (produced) for sale for 10s. He said that he got it from Marriott's, and it cost 35s. Witness eventually gave him 7s. 6d. for it. Prisoner pleaded guilty to all the charges, and said he meant to return the cameras when he had money from home. Prisoner was sentenced to a month's imprisonment on each charge, the sentences to run consecutively.

The Capetown Exhibition.—The scheme for holding a British and Colonial exhibition at Capetown for a period of four months, from November, 1903, to February, 1904, is making definite progress. The patronage of his Excellency Lord Milner, G.C.B., G.C.M.B., the High Commissioner for South Africa, has been secured, while other distinguished men and public bodies whose support has been enlisted are the Right Hon. Sir J. Gordon Sprigg, Prime Minister of Cape Colony; the Mayor and Corporation of Capetown; the Chamber of Commerce of Capetown; Sir Frederick Young, K.C.M.G., Vice-President of the Royal Colonial Institute, and others. The reception accorded to the project by the mercantile community in South Africa is evidenced by, in the first place, the support of the Capetown Chamber, while similar support, or promises of support, have been received from other Chambers and merchants in the main cities of the several South African Colonies. Although adherence to the objects of the exhibition have poured in in vast numbers and from every corner of the Empire, the necessary labours for so large an undertaking as this, on a completely successful scale, have not been found possible of being advanced so far as to at present print the prospectus and the plans, but it is expected they will be issued shortly after the Coronation festivities. It has, however, been arranged that at a later date the Chamber of Commerce and the Town Council of Capetown, representing the leading merchants and business men at the Cape, shall appoint an Advisory Board, in order to forward the arrangements and interests of manufacturers participating in the exhibition. The site upon which the exhibition is to be held has already been chosen. It adjoins the Botanical Gardens, and is within five minutes' walk of the Town Hall. The contract for the construction of the necessary buildings has also already been signed. The promoter and general manager of the exhibition, Mr. A. P. Baker, F.R.C.I., who is now in England, having just completed a six months' tour on behalf of the exhibition throughout the South African Colonies, returns to South Africa in November, when the preliminary works will have made considerable progress. The number of applications for space from British and Colonial exhibitors is already large.—(Communicated.)

New Books.

Messrs. W. A. Mansell and Co., of 405, Oxford Street, London, W., are issuing an illustrated catalogue, which for the first time brings together in one list, and classifies on one system, the various series of photographs of pictures in Great Britain issued by different publishers, and includes besides some small collections and many odd subjects not hitherto catalogued. The publishers grant that no such list can be final or absolutely perfect, but, they add, so very many of the important works have now been photographed, that a catalogue of this kind had become most desirable, and subsequent additions to the matter can be incorporated in a new edition or dealt with in a supplement. The catalogue comprises 83 pages, specifying many thousands of photographs, and 197 illustrations. A charge of 1s. 6d. is made for the book, and for an illustrated guide to original pictures in the public and private collections of Great Britain the small outlay is well justified on the part of all art lovers.

"The Dictionary of Photography." By E. J. Wall, F.R.P.S. Eighth edition. 656 pp.; 135 illustrations. Price 7s. 6d. net. London: Hazell, Watson, and Viney, 52, Long Acre, London, W.C.

In his preface to the eighth edition of this standard book Mr. Thomas Bolas, the editor, thus summarises the additions that have been made to the volume since it last passed through the press:—"Nearly a hundred pages of new subject-matter, and about the same number of fresh headings have been added to the present edition, together with many new diagrams; but this bringing up to date has not increased the bulk of the volume so far as to render it unwieldly, thanks to a process of concentration and elimination applied to some of the less current articles. At the same time, it may be mentioned that this process of concentration has been more than balanced by the addition of references to original sources and the extension of the list of works comprised in the Bibliography. Since the issue of the last edition of the "Dictionary" the metric system has been placed on a satisfactory footing; this by more matured legislation than the unsatisfactory Weights and Measures Act of 1878. The cubic centimetre is no longer statutory in Great Britain as a fluid measure or measure of capacity, the cubic centimetre being now replaced by the approximately equal millilitre, or 1-1,000th of a litre. Other matters have been so re-ordered as to make the use of the metric system easy, certain, and exact." A glance through the book impresses us with its wide scope of reference. Wall's original publication has grown into an indispensable source of consultation, the completeness and thoroughness of which leave nothing to be desired.

Messrs. James Spicer and Sons, of Redcross Works, Redcross Street, Southwark Street, S.E., write:—"As a further addition to the already extensive list of photographers' requisites, we are introducing to the trade a new flexible plate-sunk mount in various tints, which we have called the "Phokus," specimens of which we now have the pleasure to place before you. These mounts have been produced in the following sizes:—Quarter-plate, 5 by 4, and half-plate. Each packet contains twelve mounts in assorted shades. Anticipating that it is of some moment to you to have an opportunity of seeing anything and everything new that may be produced, we thought that you would be pleased to see the samples which we now enclose for your perusal and acceptance." The "Phokus" mounts have a tasteful and refined appearance, and we have pleasure in recommending them to the notice of our professional and amateur readers.

News and Notes.

London and Provincial Photographic Association.—Throughout July and August the Thursday evening meetings of the Association will be open to any member or visitor who has any matter of photographic interest to bring forward. The special lantern evenings during the above period will be duly announced. Foreign and Colonial visitors are always welcome at the meetings.

Mr. Jas. E. Hunt, 141, Clarendon Road, North Kensington, London, W., writes:—"It may be of interest to many of your readers to know that the photographs taken by me of the King's Guests at Notting Dale, one of the poorest parts of London, have been sent to his Majesty the King, who has graciously condescended to view them, and has sent a letter expressing interest in same."

Messrs. Goupil and Co. have in course of preparation a series of photogravure reproductions of the famous Wallace Collection of Paintings, now permanently located at Hertford House, London, which was formed by three generations of collectors of taste and discernment, provided with ample fortune, and assisted by experts of unquestioned ability. The text is being prepared by Mr. A. G. Temple, Director of the Guildhall Gallery. The illustrations will consist of 100 full-page plates in photogravure, ten of them in colour, all on Japanese paper, and a set of 00 prints on India paper in different tints. The edition is limited to 240 copies, at £40 a copy.

The local press in that realm of enthusiastic, though few, photographers, Blairgowrie, has already noted the proposed 1903 visit of the Convention to their delightful neighbourhood, and expressed pleasure thereat. The executive of the local photographic association has already decided to place their club-room and dark-room at the service of the Convention. There has been some grumbling in recent years of the ascendency of architectural subjects in the various destinations of the excursions, but in the Blairgowrie district the landscape quite overshadows the "work of man's hands." Several celebrated photographers who have visited the district declare that it is made of "pictures."

Lord Cheylesmore, who died last week, bequeathed the whole of his collection of English mezzotint portraits to the nation, and they will shortly be transferred to the British Museum. This is the largest private collection of its kind, and numbers nearly 14,000. The works are scattered about England and the Continent, many of the finest specimens being in Paris, where they were displayed at the last Exhibition. Lord Cheylesmore began to collect mezzotints when he was quite a young man, and was an acknowledged authority. Several of the most valuable prints were bought at very low prices, and are now worth many times more than the amount paid for them. Among the collection is a work by Prince Rupert, who introduced the process of mezzotint into England in 1660.

The "American Stationer" makes the excellent suggestion that "a few flowers scattered here and there about the store will add to the attractiveness. Flowers are plentiful at this season, and cheap. Wild flowers are quite as good as the most carefully cultivated exotics grown. Woodlands, hillsides, and meadows yield an endless profusion, each possessed of some individuality of its own. Flowers are always attractive, and are never out of place. They give an air to a room which can be imparted in no other way, and they are so common anybody can have them. It is not necessary to undertake any elaborate arrangement. The more carelessly they ar placed around the more attractive they are, because they appear more natural that way. Use them freely all summer. During the hot weather they impart a sense of coolness which is refreshing, and amply repay any effort exerted to secure and arrange them."

Another New Element.—The cry is "Still they come!" for another new element has been discovered, this time by Professor Marckwald, of the Berlin University.— The new element, says the professor, is radioactive and of extraordinary energy, and he has separated it from the radio-bismuth. Herr Marckwald says he has found that the so-called polonium, found in uranium ore, consists substantially of ordinary bismuth and of a new metal in the proportion of 1,000 to 1. The new metal, he states, can be separated by electrolysis. The rays it emits are something like those of radium, but differ in being almost completely absorbed by paper as well as by glass. The chemical analysis of this new metal, its discoverer says, is rendered very difficult by the fact that one ton of ore contains hardly a gram of it, and a gram is but a little more than 15 grains. Whatever may be the practical value of the new element, it is clear that it will not be very cheap, unless, indeed, a new source from which it may be obtained is discovered.

Photographers as Dealers.—Mr. Esmé Collings, of Lyric Mansion, 175, New Bond Street, W., writes:—"In response to many requests from clients, Mr. Esmé Collings has determined to open an establishment at 52, Bond Street, for the sale of all photographic materials, and has also formed there the Amateur Photographers' Intelligence Society, by joining which members, for a small subscription per annum, will obtain very great advantages and aid in their work, as they will be able to receive all the instruction they require from the able staff of Mr. Esmé Collings, which will be placed at their disposal. Many an amateur has probably got "so far and no further," and then given up photography in disgust, just because he lacked a certain amount of knowledge which he didn't know where to go to for, and which an association of this sort will be the means of helping him out of his difficulties; and, when known, it ought to be a considerable help and boon to those who wish to do something more than press the button. To encourage good work, valuable prizes will be offered, and exhibitions held from time to time, and all information can be obtained from the Manager of the Amateur Photographic Intelligence Society, 52, Bond Street, W."

The Photographic Convention, which is being held at Cambridge at the time of writing these notes, commenced in most auspicious style, the weather on the first two days being glorious. As far as I have been able to discover, very few Oxford people attended, Sir William Herschel and Mr. Norton being the only members of the Oxford Camera Club that have made the journey to Cambridge, as far as I am aware. The opening ceremony on Monday went off very well, and by the number of badges taken up during the day the meeting promised to be a large one. The local committee had obviously been hard at work, and everything that was possible appeared to have been done for the comfort and convenience of visitors. It was a pity that in a year when such a rowing centre as Cambridge was the venue, the organisers should have selected the Henley Regatta week for the Convention, as that, no doubt, kept many, both in Oxford and Cambridge, from attending. I personally know of two or three who were thereby absent.—"The Oxford Times."

"A Theory of the Cosmos" is the title of an address by E. B. Knerr, before the Kansas Academy of Sciences. A brief summary is found in the final paragraph:—"Briefly stated, the conception of the cosmos which I wish to suggest is: The material universe is made up of matter in eternal motion. All is matter and motion of matter. The masses, as we know them about us, large and small, are made up of molecules in motion. These molecules may meet and rebound or swing about each other in their movements, but they are never in permanent contact. So small are they that their existence cannot be detected as individuals by any of our senses, yet their existence is established by the principles of physics. The molecules in turn are conceived to be made up of atoms, to satisfy the demands of chemistry. And now, I hold that the atoms must be subdivided into protatoms, to conform to the demands of etherics; that in the motion of these various aggregates of matter inheres the energy of the universe—as energy of mass motion in the movements of sensible masses; as heat in the motion of molecules; as chemism in the motion of atoms; and as light, radiant heat, electricity, magnetism, gravity, in the motion of the protatoms of the ether; that the ether itself is made up of protatoms, as yet unassembled into atoms, more or less evenly distributed, with absolutely void spaces between them; that across these spaces the protatoms move unhindered until they collide with other moving protatoms, when they rebound with undiminished energy because of their perfect elasticity; that the energy of this ultimate individual protatomic vibration is gravity; that this protatomic vibration becomes transformed in the atomic, molecular, and mass aggregates into the resultant energy of organised waves; that the waves which are emitted on the sides of bodies facing each other are more or less neutralised, thus allowing of a greater pressure on the outer sides, and thereby causing the bodies to be driven together. Finally, the theory presented discovers a complete cycle in the transformation of energy. Hitherto the energy dissipated into space has found no explanation for its conservation and return. The theory presented herein recovers that energy in gravity, ready to be again transformed in endless recurrent changes."—"Popular Astronomy."

The Croydon Camera Club's third annual river excursion, to which ladies and members of other photographic clubs are specially invited, will take place on Saturday, July 26th next. The programme will be on the same lines as last year, but more extensive. To meet the wishes of some of the members, it will be a whole-day excursion, but those who are unable to attend in the morning can join at Teddington at 2 o'clock, or Hampton Court at 3.30. Train from Waterloo at 9.20, calling at Clapham Junction 9.31 to Hampton Court; steam launch down to Teddington, arriving about 12 o'clock, leaving again at 2 o'clock, and calling at Hampton Court at 3.30, before proceeding to Chertsey for tea; returning to Hampton Court in time to catch the 8.40 to Clapham Junction and London. Tickets 5s. each, which includes L. and S.W. Rail, steam launch, and tea. Refreshments may be obtained on board, and a piano will be provided, and anyone willing to assist with a song or two will oblige by bringing their music. Early application should be made for tickets, and as all arrangements have to be made in advance, remittance must be sent with application to ensure being included. Those wishing to join the excursion at Teddington must give notice when applying for tickets, otherwise they will have to pay the usual fare. All communications should be addressed to the leader, Mr. Ben. E. Edwards, 44, Beulah Road, Thornton Heath.

Coronation Honours and Science.—The list of honours and promotions published in connection with the Coronation, so unhappily and inopportunely postponed, forms very instructive reading, writes a Fellow of the Royal Astronomical Society in the "English Mechanic," alike for its inclusions and omissions. The first thing that must strike every impartial observer is the long roll of names of comparative nobodies, whom mere money or official or political influence has enabled to foist themselves upon those responsible for their promotion as worthy of honour and dignity. The next, among scientific men, is the scant regard paid to merely intellectual qualifications, and the curiously select roll of those whose discoveries and achievements have contributed so marvellously to human advancement in recent years. Let us see a little how this latter

selection has been made. Imprimis, we have Lord Kelvin and Lord Lister, most righteously called to the Privy Council, and at the same time made members, with Lord Rayleigh, of the newly-instituted Order of Merit. And in this connection it cannot fail to be gratifying to every astronomer and physicist in the Kingdom to find that the King has enrolled in this exceedingly select order the venerable President of the Royal Society, Sir William Huggins, who, *facile princeps* among British spectroscopists and astronomical physicists, has been marked out for distinction by inclusion among twelve of the most eminent men who have ever served England in their various capacities. Passing now to new titles, I find two of the King's personal doctors are to be made baronets in conjunction with a highly successful solicitor, and an equally successful tea-dealer; Sir Andrew Noble probably gets in here as a really scientific gunner. The Knights are emphatically "a mixed lot." Coming now to the Order of the Bath, if we except Prof. Ramsay and Mr. Leslie Stephen, the whole of the K.C.B.'s have quite obviously received their promotion for political or social reasons, a remark equally applicable to the C.B.'s pure and simple; but why, I would ask, is the Astronomer Royal left out in the cold in the distribution of titles? He is, as everyone knows, "C.B." already (a distinction he now shares with Cole, the lace-making man). Why not, then, K.C.B.? Whoever is responsible for this is surely crassly ignorant of the state of the Royal Observatory when Sir George Airy died, and of its condition at this moment! I fear that Mr. Christie has not toadied the powers that be, nor puffed an advertised himself sufficiently. And once more, why, oh why is he passed over, to whose honour, profound acquirements, and unselfish efforts in the cause of science the scientific side of South Kensington is indebted for practically all the respectability it possesses? I mean, of course, Sir William Abney, a scholar, a gentleman of ancient lineage, and a single-hearted scientific man, who would have conferred at least as much honour on a baronetage as it could have bestowed on him. By the bye, in summing up these rewards, given for merely intellectual achievements, I find medicine figuring highly, literature certainly less so, and art at the bottom of the scale. The same sort of thing occurs in the South African list. A field-officer, a friend of mine, who was shut up in Ladysmith, and went through the entire campaign, has never once been mentioned in despatches, and is conspicuously absent from the list before me—but then his uncle is not a bishop, or his father a lord.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

MARKS ON PLATINOTYPE PAPER.

To the Editors.

Gentlemen,—I notice in the Journal, of July 4th, "Nemo" asks the cause of marks resembling white splashes on platinotype paper.

This is often caused by the paper being rubbed or scratched in taking out or putting into the tin before and after exposure, and even sometimes in shifting it about on the negative, when sighting for printing.

In working platinotype paper great care must always be taken to avoid all friction, or white splashes are sure to appear.—I am, yours truly, JOHN HOURSTON.

55, Dalrymple Street, Govan.
July 12th, 1902.

HILLSBRO' AND DISTRICT PHOTOGRAPHIC SOCIETY, SHEFFIELD.

To the Editors.

Gentlemen,—I beg to advise you of the formation of the above society, and I have been appointed secretary for the ensuing year.—Yours faithfully, W. T. FURNISS

256, Langsett Road.
July 12th, 1902.

THE DETENTION OF SPECIMENS.

To the Editors.

Gentlemen,—I should like to draw attention to the action of certain masters, and the return of photographs, specimens, and references, etc. Personally, I have found them most negligent. I applied for a situation enclosing photograph and copies of references, together with a stamped addressed envelope. Receiving no reply, I am only led to conclude the stamp from the envelope has been utilised for other business purposes, or that their business principles are bad. In conversation with other assistants, I find this same treatment has been received by them.—I am, yours, etc., VIRO.

July 11th, 1902.

THE ILLINOIS COLLEGE OF PHOTOGRAPHY.

To the Editors.

Gentlemen,—Enclosed you will find the Calender of Sessions of the Illinois College of Photography for 1902 and 1903. As you know, this is a new departure on our part, and, we feel sure, one that will meet with the approval and endorsement of the professional photographers throughout the country. In fact, we are so sure of this, and knowing your desire to publish anything of interest to the fraternity, that we would like to request you to publish it in the next issue of the BRITISH JOURNAL OF PHOTOGRAPHY. We also call your attention to the fact that we have added a two years' scientific course, for which there has been an ever increasing demand. Trusting that we are not asking too much, and that your professional courtesies may be extended to us, we beg to remain, yours fraternally,

L. H. BISSELL.

Effingham, Ill.
June 27th, 1902.

CALENDER OF SESSIONS.

of the

Illinois College of Photography, Effingham, Ill.,

For 1902 and 1903.

The Fall Terms of the Illinois College of Photography commence the first Tuesday in September, and the Winter Terms the first Tuesday in January.

At these dates we urge as many to enrol as possible. However, new classes are formed on the first and fifteenth of each month, so that students may enrol at any time.

OUR TERMS.

	Dols.
One month course	50
Three months' course	100
Six months' course	125
Nine months' course	150
One year	150
Two years	200

One month course, which is similar to a post-graduate course, is for professional photographers, or those who have had considerable experience, whose time is limited; 10 dollars will be charged for each additional week.

Three months' course is for students who have had experience, and wish a rapid course of study.

Six months' course is a popular course.

Nine months' course is for students wishing to take a thorough training in all branches of studio work, and after taking the regular six months' term, to have three months for special work, review, and practice. Students taking this course are urged to enrol with the fall September terms.

One year course, college year of nine months. Term commences in September and ends in June.

The two years' course, scientific course, in preparation for coming year, includes with the regular one year course, photo-lithography, half-tone, newspaper illustration, zinc etching, X Ray, astronomical, astro-physical and photo-micrography.

The two years' course entitles the student to a life scholarship in the college.

These prices go into effect September 1st, 1902.

BUYING A BUSINESS.

To the Editors.

Gentlemen,—In your issue of 27th ult., there appeared some advice, "How to Buy a Business, etc.," and "To Start One." The advice of the latter I thought very sound and practical, but on the former it struck me that if you never buy a business with any of the disqualifications mentioned—i.e., if you want to buy one you might wait a long time, the advice on this head is somewhat conflicting—e.g., "Never buy a business that has changed hands within twelve months, unless the business has been under management, and the proprietor has another business and unable to give it all his attention, and then the question arises what has he paid his assistants, and how many has he kept. . . . and they have been some time in his employ, and do not

mind if they stop or not, well and good," and then he says "Never buy a business when the operator or receptionist has been a number of years in the same business, when they are known as Mr. or Miss So-and-so. Better by half have a business when even the proprietor is not known to the customers too well." Now, it does not seem to me that these conditions make a bit of difference if you can ensure that neither of these is going to open an opposition studio to you in the same district. There is a good deal of the personal element in a photo business, and you cannot get rid of it. The question that seems to me to be first settled is, is the business sound, whether large or small? Is its reputation for good work satisfactory? With this, naturally, one may conclude the studio is well situated for light, etc. With these two satisfactory, the success of the purchaser will largely depend on his own ability for work and tact in management; for, however, good the business may have been, it will only be retained by these elements. For that reason I would rather pay some men to keep out of my studio than work in it. With good ability and tact, combined with a fair amount of capital, I believe you could make any place that has a decent reputation pay, and perhaps even better than your predecessor, more so at the present day than thirty years ago, as there is a certain element abroad that goes after novelty, which is in favour of the new man at the start; but woe betide him if he expects to live on this and does not maintain or improve upon the former work. More than ever do I think and am glad that good work is in demand, and those who think they are going to make a business pay because they have capital will find, sooner or later, it is not the primary element, necessary as it is, in conjunction with ability, though of the two I would choose the latter.—Yours, etc.,

EXCELSIOR.

[Our correspondent's interesting communication reached us too late for insertion in last week's Journal.—EDS. B.J.P.]

THE NATIONAL PHOTOGRAPHIC RECORD ASSOCIATION.

To the Editors.

Gentlemen,—In reference to your note in the July 11th issue, will you allow me to say that the National Photographic Record Association have already deposited in the British Museum photographs of Newgate Gaol, the Central Criminal Courts, Old Bailey, and of Holywell Street; the old houses in Wych Street, and also of the houses in the Strand, and many of the old courts, etc., round Drury Lane.—I remain, yours truly,

GEO. SCAMELL, Hon. Sec.

July 15th, 1902.
21, Avenue Road, Highgate, London, N.

CORONATION CINEMATOGRAPHY—THE SIZE OF THE MOON.

To the Editors.

Gentlemen,—It is curious, but true, murder will out. There was no concealing to the English about the photographs said to be taken at the seat of war in South Africa. They were all, or most of them, taken in Paris, France, at the Park "des Buttes Chaumonts," where some Apaches (as they are called in that quarter), were successfully trained to play the enemy in the bushes and mountains. Now, you say that Coronation photographs were taken in France, with trained actors of the gay capital. A Westminster Abbey must perforce have been imitated. I hear now that the place chosen for the operation was situated in a well-known hall, on the Boulevard de Clichy, and as it is very well lighted in day time, as well as at night, very successful cinematographs could be secured. This was done in the great hall to the right, and another trial of another kind was to be made in another part of the building to the left, but this has so far been postponed, and I am not allowed to mention it as yet. All good things come from Paree (France), bad things from other countries

In regard to the moon and its size, when near the horizon or high up, I am not prepared to say for sure, but it seems to me that at sea the sizes are just as different as on earth, and then the comparison with surrounding subjects does no more exist. How about that? Now, if, as a correspondent said two or three weeks ago, it rests with the eye and its construction, bringing the moon level with a looking-glass should magnify it just the same. May be, it will redden it also as seen at that point. I would rather believe it to rest with the air; but this is not science nor an explanation, but only an opinion.—Yours, very sincerely,

ALBERT LEVY.

Asnières (Seine).
July 5th, 1902.

A NEW PORTABLE ELECTRIC MACHINE FOR X-RAY WORK, ETC.

To the Editors.

Gentlemen,—I have for some time been experimenting with induction electric machines worked in compressed air, and find that the power of a pair of plates at atmospheric pressure can be increased many times when worked in highly compressed air.

I have now completed a machine, with ten ebonite plates, 8in. diameter, enclosed in a strong metal case of cylindrical shape, 10in. diameter, 4½in. long, with slightly rounded ends. The results obtained with this are as follows, using Leyden jars 2in. diameter, coated 2in. high:—

Pressure. lb.	Spark Length. in.
0	2½
15	5
30	7
45	8

this last being in length equal to the diameter of the plates used. At 45lb. the machine will give three 6in. sparks per turn of the crank handle. The air in the case being chemically dried, the machine will act independent of atmospheric conditions, so much so that it will actually work when completely immersed in water.

Its starting qualities are perfect; in any state of the weather sparks appear between the terminal balls the instant the handle is moved. The polarity never reverses. It is very strongly constructed and is not easily damaged.

The increased efficiency of this machine depends on the high insulating properties of the compressed air in which the plates work, which has the effect of preventing leakage in all directions, to such an extent as to raise their tension or voltage to that of plates quite twice their diameter. The effect of gases other than atmospheric air have not as yet been tried. A machine on this principle having ten plates 14in. diameter, enclosed in a cylindrical case of aluminium 18in. diameter, 6in. long, with slightly rounded ends, will give about the same power and length of spark as an ordinary Wimshurst with eight 30in plates, will be easily portable, occupy little room, and, power for power, will be considerably cheaper than an ordinary machine. Such a machine we intend shortly placing on the market, an ideal portable machine for X-ray and therapeutic uses. My invention of working a machine in compressed air is protected by patent (No. 22731).—I am, yours, etc.,

FREDERICK TUDSBURY.

Edwinstowe, Newark, Notts.
July 14th, 1902.

MURRAY versus KITTO.

To the Editors.

Gentlemen,—In your account of the trial "Murray v. Kitto," at the Devon Assizes, there is a mistake on the part of someone.

You say "plaintiff did not take in his first twelve months £100"—such a statement was never made, nor is it correct.—Yours faithfully,

PLAINTIFF.

July 7th, 1902.

*** Owing to pressure of Convention matter, several letters, notices of apparatus, answers to correspondents and other items are unavoidably held over.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY, 24, *Wellington-street, Strand, London, W.C.*" *Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

PHOTOGRAPHS REGISTERED:—

J. Leech, 4, South Row, Kell's, Whitehaven. *Photograph of Arrowthwaite bonfire.*

S. Lees, Queen's Promenade Studio, Douglas, Isle of Man. *Photograph of an exposure shutter.*

W. H. Duncan, City Studio, Midland Street, Hull. *Four photographs of Sergeant. W. B. Traynor, V.C.*

N. Powell, 62, Marefair, Northampton. *Photograph of decorated Town Hall.*

W. C. Lambert, 16, Upper Tollington Park, Stroud Green, N. *Photograph of Miss Hammond.*

L. Pedrotti, Main Avenue Buildings, Bulawayo, Rhodesia. *Eight photographs of Mr. Rhodes' Funeral.*

B. FRYETT.—Better consult our advertisement columns.

H. N. MORRIS.—The apparatus is not in the market.

NEMO.—We are obliged by your letter, and will make a note of its contents.

BOOK WANTED.—C. A. NEANE writes: "Would you kindly inform me the best book I could obtain on negative retouching?"—In reply: "The Art of Retouching," by Johnson; published by Marion and Co.

YELLOWED PLATINOTYPES.—T. BOSWELL.—The platinotypes have not faded as you surmise. The yellowness is due to the iron not being thoroughly removed by the acid baths. All you have to do is to again treat them with the dilute acid and you will find the yellowness removed.

GOLD SOLUTION.—NEMO.—The cause of the solution, when the chloride of gold was dissolved, becoming discoloured, and a precipitate was thrown down, is that the water in which the chloride was dissolved was not pure; or possibly the bottle was not clean. With pure water and a clean bottle no such thing would occur.

COPYRIGHT.—J. L. writes: "(1) If I copyright a photograph, can I sell the copies at any price I choose? (2) When I send a copy to be registered, how have I to know when it is registered? (3) Does 1s. 7d. cover all expenses to register a photograph?"—In reply: (1) Certainly you can. (2) If the photograph is sent to us to register, the registration will be published in the JOURNAL. (3) Yes.

MEMBERSHIP OF SOCIETIES.—"LIGHT" writes: "I shall be obliged if you will tell me how to become a member of the Professional Photographers' Association, and also the R.P.S.? I am a photographer of twenty years' standing."—In reply: Apply to the following:—Mr. Alfred Ellis, hon. sec., Professional Photographers' Association, 51, Baker Street, London, W.; the Secretary, Royal Photographic Society, 66, Russell Square, London, W.C.

SUN IN STUDIO.—J. W. writes: "Can you tell me a simple way of stopping the sun out of the studio? It is only this time of year that it gets on to the roof."—In reply: A very simple way is to stipple the glass over with starch paste to which a little whiting has been added. This can be cleaned off when the sun is no longer troublesome. Or tissue paper or tracing linen on light wooden frames may be temporarily fitted to the roof.

HOT WEATHER TROUBLE WITH P.O.P.—G. CROSS writes: "I am using ——'s P.O.P., toning it in the sulphocyanide bath, as recommended by the makers. But this hot weather the surface is so tender that the prints can scarcely be touched. I know that I can get over the difficulty by using alum, but I don't like to use that, on theoretical grounds. Can you tell me of anything else that will answer the purpose?"—In reply: Try a dilute solution of formaline; that will answer the purpose, and is free from some of the objections raised against alum.

ADDRESS WANTED.—T. W. STEVEN writes: "A fortnight ago I wrote you, asking the present address of Thos. Furnell, C.E., late Matlock Villas, Bishop Lane, East Dulwich, London, S.E. I have looked through JOURNALS for the last two weeks, but have not found any reference thereto. I am over twenty-five years a subscriber, and a member of the P.P.A., and think I am justified in asking this small favour."—In reply: Our correspondent's letter probably miscarried; we have not received it. We do not know Mr. Furnell's present address; it may be known to some reader of this column.

CARBON PRINTING.—C. BETTS writes: "The other day I sensitised some carbon tissue in a bath of bichromate of potash (¾oz. to the pint of water), and much of the colour came away from the paper, and some of it drained off when hung up to dry. Can you tell me how I have gone wrong?"—In reply: This is a hot-weather trouble. The solution was too warm. Cool it with ice, or place the solution in a cold place for some hours before it is used. The temperature of the solution at this time of year should not exceed 50deg. or 55deg. Fahr., as the tissue is more soluble in a solution of bichromate of potash than it is in plain water of the same temperature.

REMOVING SILVER STAINS.—H. E. HOWORTH writes: "I shall be glad if you could inform me how to remove silver stains from a negative. The stains are caused through damp whilst printing, and the negative is not varnished."—In reply: Some silver stains, if they are deeply in the film, cannot well be removed. Try this. Make a solution of iodine in alcohol to about the colour of pale sherry. Apply this to the stains with a pledget of cottonwool, and then put the negative in a solution of hypo. Repeat the operation, if necessary. If the stains are confined to the surface, this will usually remove them.

BOOKS WANTED.—"CAMERA" asks: "Would you please tell me which are the best books (professional, not amateur), to study, on the following subjects:—Operating, developing, platinotype printing, carbon printing, and toning? I am a retoucher, and would like to add a thorough knowledge, theoretical as well as practical, of these branches to that of retouching."—In reply: You will find the following useful:—"Instruction in Photography," by Abney; "Platinotype: Its Preparation and Manipulation," by the same author; "Manual of Carbon Printing," by the Autotype Company. A list of the principal works on photography will be found on pages 682-3 of the Almanac.

DEFECTIVE SLIDES.—"ANXIOUS" writes: "I should be very much obliged if you could advise me what to do in the following case. I have two 15 by 12 slides which have unfortunately been left out in the sun, and which have warped considerably. Is there any method by which I could bring them back to the original condition?"—In reply: We fear you will not be able to get the slides back to their original condition. The only suggestion we can make is that you send them to the maker. Possibly he may be able to do something with them for you. If the slides were made of well-seasoned wood they should not have warped with any reasonable exposure to the sun.

TONING TROUBLES.—G. L. writes: "I have been much troubled of late with irregular toning. I use the —— paper, and the warm-tone formula—gold, sulphocyanide, and sulphite. In the first place the prints are well washed, but not alumed before toning. The toning-bath is mixed about twenty-four hours before use, the gold—exactly the amount prescribed—being poured in slowly and the bath vigorously stirred. The sulphite is made fresh each day, and added shortly before use. When toning, I measure out enough bath for a sheet, put the prints in, and separate quickly. They soon turn a little weak, and then become warmer; at least, this happens to many of them, but one or two seem to miss their share of gold entirely and are not half toned when the rest are finished. On some the corners are restrained, and again some are patchy. For a time I suspected too much sulphite, but on reducing it the unevenness was still the same. If you can give me any assistance I shall be extremely grateful."—In reply: If you proceed as you say, there should be no uneven toning. The unevenness must be due to the manipulation. Possibly the silver is not thoroughly washed out of the prints before they are put into the toning-bath; or, may be, too many to be properly attended to are put into the solution at a time, and they are not kept constantly in motion.

*** NOTICE TO THE TRADE, WHOLESALE AGENTS AND BOOKSELLERS.—*A Contents Bill is issued with each number of the* JOURNAL, *and copies may be had on application to the Publishers.*

*** NOTICE TO ADVERTISERS.—*A Revised Tariff for advertisements in the* JOURNAL *is now in force. Blocks and copy are received subject to the approval of the Publishers, and advertisements are inserted absolutely without condition, expressed or implied as to what appears in the text portion of the paper.*

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*** The key to the Convention Group will be given with next week's JOURNAL.



SIR ROBERT S. BALL,

PRESIDENT PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM,
CAMBRIDGE MEETING, 1902.

Windsor Art Paper.
supplied by
ERNEST WESSON & Co.,
Photographic Mount Manufacturers,
122, Regent St., LONDON, W.

Negative by F. H. SANDERSON,
Post Office Terrace,
CAMBRIDGE.

HENRY GREENWOOD & Co., PUBLISHERS, 24, WELLINGTON STREET, STRAND, IN THE COUNTY OF LONDON.—July 18th, 1902.



MEMBERS OF THE SEVENTEENTH ANNUAL PHOTOGRAPH
HELD AT CAMBRIDGE, JULY

Henry Greenwood and Co., Printers and Publishers,
24, Wellington Street, Strand, London.



PHIC CONVENTION OF THE UNITED KINGDOM.
LY 7th-12th, 1902.

Negative by T. B. Hunt,
130, Fitzroy Street, Cambridge.

THE BRITISH

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*** *The Editor can only be seen by appointment.*

*** *We do not undertake to answer letters by post.*

EX CATHEDRA.

Mounting Prints. Every photographer must be familiar with the unpleasant effect produced by the expansion of the paper upon which a print is made. The face of a sitter may be distorted in length or breadth according to the direction in which the paper is cut. To meet this difficulty, a French firm, Messieurs Derepas frères, recently demonstrated at the Société Française de Photographie a new system of mounting prints in the dry state. Instead of pasting the prints directly upon the mount, a pellicular interleaf of adhesive material is introduced between the print and the mount, and the photograph is then made to adhere by pressure under heat. It is claimed that the prints retain their exact original size, that the print is completely isolated from the mount, and that the print remains perfectly flat, whether the mount be thin or thick. These are very decided advantages if the nature of the adhesive material is such that it remains unaffected by time. We remember the indiarubber mountant, which was very attractive, but useless, because it so soon perished. It is not reported how the pressure and heat are applied, nor of what the pellicular interleaf is made, but as the article is to be placed upon the market, we expect it will soon be on sale. If the price is moderate and the apparatus cheap and efficient, there should be a good demand on the part of amateurs, to whom the present system of wet mounting is a constant source of vexation.

Orthochromatic Plates. The large number of colour sensitizers which are now at the disposal of the dry plate maker have received but little attention, but their exploitation should bring a rich reward. To obtain a correct rendering with the colour-sensitive plates hitherto offered by the manufacturer to the photographer, it is necessary to use a suitable colour screen, which usually means a considerable prolongation of the exposure. Not only is the use of the screen an obstruction to work, but the prolongation of the exposure cuts off a large number of subjects from the field of photography with orthochromatic plates. From the "Allgemeine Photographen Zeitung," we gather that Demtz, of Munich, has made a step in the right direction by placing upon the market a plate which is ten to thirty times more sensitive to the visual than to the blue rays, even when used without a screen. For landscape photography the use of the screen with these plates is said to be quite superfluous, as it makes scarcely any difference in the length of the exposure. The Pervanto plate (for such is its name) should be of great use to many landscape photographers, especially if it is sufficiently rapid to permit of very quick exposures. Yet with such a plate, even if it does all that is claimed for it, we shall not have reached the ideal of orthochromatic photography. What we want is a plate of extreme sensitiveness, giving true rendering of colour, but which may be so far desensitized that it can be developed by yellow light. It is quite true that a plate may be developed to a given density, simply by correct adjustment of the developer and carefully timing the exposure; but there is usually a margin of error, and the photographer prefers to watch the progress of development, so that he may decide at the moment when he has reached the true effect. Has the cheap dry-plate driven the experimentalists from the field?

* *** *

Colour Photography. Dr. Miethe, in the July number of the "Atelier des Photographen," publishes another specimen of photography in natural colours taken by the application of the three-colour process, which he has worked out. Although this specimen is not so striking in effect as the one to which we drew attention a short time ago, it nevertheless is a charming piece of landscape, and might almost pass for a watercolour drawing. The scene is a beech wood, traversed by a footpath, upon which the fallen leaves of the previous autumn still lie scattered. The sunlight plays upon the foliage and the grassy slope, and the branches of the trees form a fretwork against the blue sky. The colour of the picture presents a range of tones in green and brown, with here and there pale blue tints and a suggestion of yellow. When we contrast the rich effect of colour in a print of this description with

the tame suggestion of such a scene, as given in a monochrome photograph, we feel impelled again to impress upon photographers how backward they are and what opportunities they miss in neglecting the three-colour process. We notice that the "Moniteur de la Photographie" has reproduced the paragraph we published a short time ago on the application of the three-colour process to portraiture. Monsieur Leon Vidal remarks that at the time of the Salon of the Photo Club in Paris he had a conversation with Dr. Miethe upon the same subject, and he adds that it is quite evident that portrait photographers, if they took up the process, would soon find a large number of sitters anxious to be photographed. At first it would only attract the rich, but as the colour process became easier to work sitters would be more numerous, and we have no doubt that a very lucrative business might be done.

* * *

Recent Electric Lights. It would scarcely be expected that a tramways exhibition would furnish much matter of photographic interest; yet, in one respect, the recent show at the Agricultural Hall furnished opportunities of inspecting exhibits that have a distinct bearing on matters photographic. We refer to the Bremer and the Union Electric Company's lamps. We have on sundry occasions brought before our readers accounts of the latest inventions in connection with electric lamps, as this form of illumination plays an increasingly important part in photographic technics. The Bremer lamp exhibited by the Westinghouse Company had been previously exhibited—at the Conversazione of the Electrical Engineers—but it flickered so much as to fail to indicate any special excellence; yet, at the Agricultural Hall, the difficulties had been surmounted, or nearly so. The difference between this lamp and other older types lies in an alteration in the make and position of the carbons; they are impregnated with a metallic salt, and are placed, instead of "end on," almost side by side. The light so obtained is excellent; its colour, also, is much pleasanter than that of the old arc, the effect being like a golden ball of light. Finally, there is said to be obtained from this lamp three times the light value possible with the old form. The other lamp alluded to is termed the "Flame" arc lamp, and in it the construction of the carbons again is varied, but not, as in the last, being impregnated with a foreign substance, but by introducing it—a mixture of certain fluorides—in the form of a wick or cone. The effect of this arc is stated to resemble that of the Bremer lamp, but the colour is slightly different. Again we have a three-fold efficiency promised to the users of the Flame lamp.

* * *

Benighted, or Prejudiced! Which? The annual report of the London Stereoscopic and Photographic Co., Ltd., which we published on May 2, has been reprinted in the July number of the new German photographic paper, "Photographische Kunst," which is published in Munich and Leipsic. The Continental photographic Press has not refrained from entertaining its readers with garbled and false news concerning the South African campaign, and we suppose the inclusion of the report to which we have referred is intended as an illustration of the badness of trade in this country, in consequence of the war. The chairman, at the meeting of the company, expressed the hope, which was speedily fulfilled, that the war in South Africa would soon be at an end, but this was so optimistic to the Teutonic mind that the Editor of "Photographische Kunst" felt it his duty to append the warning: "We have no belief in this announcement." In these days of rapid communication it seems almost incredible a photographic paper should be so badly informed that in the month of July it should still be ignorant of the fact that peace had been proclaimed. We know that the German Press, with few honourable exceptions, has studiously endeavoured to mislead the public concerning the Boer War, and amongst the worst offenders was the "Muenchener Neuste Nachrichten." We did not, however, imagine that the public mind had been so successfully hypnotized in Munich that the editor of an up-to-date photographic periodical should still be sceptical as to the early termination of hostilities when the Boers had actually surrendered and given cheers for their King with a heartiness which speaks well for their loyalty to Great Britain. But perhaps we must attribute the editor's state of mind to another cause.

* * *

Perpendicular Perplexities. In that clever and amusing publication, "Pictorial Comedy," there is a hit at the ubiquitous "snap-shottist" which will be relished by the superior persons who use a stand camera furnished with a swing back, a level, and, let us add, a level-headed user. There is, as is usual in these pictures, a *he* and a *she*, and the lady is showing her album of photographs to the gentleman, when this conversation arises:—

She: "That's one of the pictures I took with my Kodak while in Italy."

He: "What is it?"

She: "Well, that building that stands up perfectly straight is the Leaning Tower of Pisa, and those leaning buildings are the ordinary houses that stand near it."

This diverting example of modern topsy-turvy humour comes at a time when, owing to the recent collapse of the famous tower, or Campanile of St. Mark's, at Venice, attention is being called to the few buildings of the same character which can be found in Europe. There are many stories current to account for the slope of the famous tower at Pisa, which at one time, if we remember rightly, was accounted among the wonders of the world. But since then science and art have, between them, wrought such marvels that the seven so-called wonders have taken a back seat. One well-known Italian writer of the sixteenth century attributes the leaning of the Pisa tower to the circumstance that its foundations settled after the first three storeys had been erected, and that the architects were at fault in not taking steps to guard against such an occurrence. But it is now believed that the peculiarity of the leaning tower was an intentional freak, suggested, possibly, as a protest against mathematical exactitude. If the architects had found that their building was sinking down on one side while it was yet at a comparatively early stage of erection, they would surely have made fresh foundations, and commenced anew. And we also suppose that if the leaning was due to faulty foundations the Tower of Pisa would have had a much shorter life than the Campanile at Venice, the foundations of which were quite above suspicion. The collapse of the Venetian tower seems to be due to an old injury by lightning, and, according to eye-witnesses of the catastrophe, the building subsided slowly and gently. A cinematographic picture of the fall would have been both curious and interesting, but as it is we must be content with the many photographs which have been taken, and the many pictures painted in which this wonderful piece of architecture forms the principal feature.

Art Publications. It may not be generally known that at the Victoria and Albert Museum at South Kensington there is a library devoted to works upon art, which is by far the most completely equipped institution of the kind in the kingdom. Thousands of volumes are here, dealing with every conceivable branch of the fine arts, and it is open to the public, a weekly ticket, which also admits to the science library and the museum on students' days, costing only the small sum of sixpence. One of the most useful features of the library is the collection of art periodicals from all parts of the world, which are laid on certain tables and renewed week by week, for the edification of the students and visitors. An examination of these periodicals very quickly makes one aware that in this special department of literature Britain is far behind either France or Germany. Where we have three or four high-class journals devoted to art, these countries have at least a dozen each. Thus, in France, we find a review of art, ancient and modern; an illustrated review; a review of decorative art; a journal devoted to theatrical art; a review of Christian art; a journal of art and decoration; a gazette of the fine arts; a monthly review of art and industry; and other journals of minor importance. These publications find their counterpart in Germany, and in the case of both countries they are, with few exceptions, well printed on fine paper and superbly illustrated. It goes without saying that the bulk of the illustrations have a photographic basis, and those executed in colour, or partly in colour, are the best of their kind. The half-tone work leaves little to be desired, and the pictures generally compare favourably with those which are produced in our own country. It speaks well for the public taste abroad that technical journals of this kind should find patrons enough to keep them, not only alive, but in so flourishing a condition. We fear that an equal number of such publications here would not find readers enough to support them. Certainly, if there were the demand, we have talent enough over here to supply matter equally good; but the general public is content with subjects superficially treated in cheap magazines, which pride themselves upon the number of illustrations they can crowd between their garish covers, rather than upon the quality of the work. It pays the publishers better to meet the popular demand for inferior work than to aim at higher things, and it is just the same with regard to the literature provided for the masses. Possibly the pendulum will swing round the other way, and give us better fare in time to come; but there is little sign of it at present.

* * *

The Blackboard. The lecturer on photographic subjects is generally better off in the matter of illustrating his remarks than lecturers dealing with other subjects, for the obvious reason that a lantern usually forms part of his equipment, and the business of making a few slides for purposes of demonstration is to him a matter of mere routine. Still, even the photographic lecturer is occasionally compelled to call for the blackboard to help him in explaining better some little knotty point, and when the blackboard comes upon the scene there generally comes, too, a resigned expression upon the countenances of an expectant audience. There is, it is true, nothing very terrible in the appearance of a blackboard supported on its easel; it is the man in front of it who is dreaded, for that man, in most cases, has not the slightest knowledge of drawing, and his pictorial efforts to make himself understood would be ludicrous, if they were not so pitiable. For this reason we are glad to note that in the just issued supplementary regulations for secondary day schools and for evening schools, among the art syllabuses, there is provision made for instruction in "drawing on the blackboard," and we trust that, for the sake of their fellow-creatures, many students will take advantage of this tuition, or else for ever forswear white chalk. In the directions given in the publication referred to, it is laid down that "practice in this exercise should be directed to the acquirement, by students, of freedom and skill in using chalk or brush with tempera on the blackboard for the purpose of making drawings or diagrams in outline and in the mass on a large scale, and of illustrating various lessons to a class." The only objection which we should be inclined to offer to these instructions is with regard to the use of tempera, *i.e.*, distemper colour, as used by scenic artists, for this would be decidedly messy. The late Rev. J. G. Wood, the naturalist, was one of the most gifted of blackboard artists, and he used to carry with him on his lecture tours a flexible (canvas) blackboard arrangement, which could be laced tightly over a rigid frame when in use, or rolled up for travelling. He would use, in making one drawing, three or four differently coloured crayons, and it was quite a treat to see the masterly work growing beneath his clever fingers. He certainly never used liquid pigment, but contented himself with these coloured chalks, by which he was able to differentiate the various organs of an insect with great clearness and precision. We believe that his son uses this same method of illustration. The principal objection that can be urged against it is that it consumes much time, besides giving the lecturer an infinity of trouble. After all, there is nothing better than a good lantern slide, but if the lecturer must resort to the blackboard, let him first of all learn how to make an intelligent drawing.

* * *

Natural Phenomena. Photography has performed a wonderful and most useful work in making us acquainted with the beauties and natural features of the various countries of the globe. It is a true saying that "one half of the world knows not how the other half live"; but, thanks to photography, this ignorance is not nearly so great as it was a few decades back. We have only to refer to old books of travel to understand what caricatures of Nature were allowed to pass as correct illustrations of the world in which we live, and it is ludicrous to compare, say, the pictures of animals with the photographs now obtainable or with the living specimens to be seen in the Zoological Gardens. It was the same with pictures of natural phenomena, and stay-at-home people had to wait for the discovery of photography before they could glean any idea of the true appearance of things on the earth, beneath its surface, or in the realms of cloudland. It is permissible to believe that crude illustrations did as much as verbal description in discrediting what were known as "travellers' tales." The traveller of to-day may be congratulated on the circumstance that he can carry with him a trustworthy witness in the shape of a photographic camera, whose evidence no one would think of questioning. There are very few kinds of natural phenomena that have not been photographed, and the exceptions are found in those occurrences which are few and far between. We do not remember, for example, ever having seen the photograph of a waterspout, and this is somewhat remarkable, when we remember that it is an appearance which is occasionally seen on our own coasts. As all photographers are aware, such rare events invariably happen when the camera has been left at home. We have been as unfortunate in the case of a mirage, although we

have certainly heard of this peculiar atmospheric phenomenon being photographed. It has been doubted by some whether such an appearance is capable of yielding an image to the photographic plate, but such objectors must be ignorant of an experiment which was detailed some time back by an American technical journal. A flat sheet of iron was supported on trestles horizontally and heated from below by Argand lamps, while its surface was strewed with sand, thus imitating in a small way the state of the desert, where mirages are not uncommon. Reared up vertically at the end of this iron table was a scenic representation of palm trees, temples, etc., and in due time these became reflected as in a lake, the appearance being due to the refraction brought about from the unequal density of the different layers of air, as they became expanded by the heat from the sand. A kind of inverted mirage is sometimes seen at sea, when the temperature of the air is above that of the water. In this case distant shores and vessels are seen upside down, high in the atmosphere, although the originals are far away and hidden from the observers by the curvature of the earth. It is obvious that an ingenious photographer could, if he were so minded, as easily *fake* a picture of this kind as he can call spirits from the vasty deep.

* * *

The Great Star-Map—Then and Now.

We have at intervals devoted space to a description of the inception and progress of the great chart of the heavens, which began in 1887, and is still a long way from being completed. Our contemporary, "Nature," has a lengthy article by Mr. H. H. Turner, giving a review of progress up to date. It was, when the conception was first mooted, stated in the letter summoning the conference, "Ce grand travail . . . . pourrait être facilement executé on quelques années si dix ou douze observatoires bien reparties sur le globe pouvaient se partager convenablement la tâche." As Mr. Turner remarks, "quelques années" is somewhat indefinite; but it may be assumed that those who assembled in 1887 would have been shocked to learn that after a lapse of a dozen years scarcely a fifth of the work projected had been accomplished. "Yet a glance at the last comprehensive report . . . . shows it to be only too true." In June, 1900, of the 22,000 catalogue plates, 15,000 had been taken; but of the chart plates, less than 4,000 of the 22,000 had been taken. Of the former, only 4,000 had been measured, and of the latter a very small proportion. "Does this mean, then, that it will take sixty years to finish the whole?" The quality of the actual results so far obtained is excellent, those at Paris being reproduced by photogravure; but the aggregate cost averages over £8 a plate! Mr. Turner says: "If the 22,000 maps are completed in the style adopted by the French, the sheets, when piled on one another, would form a column thirty feet high, and weighing nearly two tons." The question naturally arises regarding the possessor of such an atlas, "What will be do with it?" The lenses to be adopted by all the observers were to be similar—telescopic lenses of 11½ feet focus—a "single" lens, in fact. This lens actually includes a field of view of two degrees only, and the practical photographer will naturally ask why a lens built like a photographic "double" lens should not have been employed. Our readers will be surprised to learn that at the conference on April 18, 1887, where no less than twenty-six distinguished astronomers were present, such a lens was never even mentioned! As Mr. Turner remarks, "this circumstance is almost bewildering." Professor Pickering was not able to attend this conference, but he afterwards wrote a letter suggesting a photographic doublet, and gave explicit details of his views of how to proceed; yet these embryonic photographers took no notice of his communication. Its real value may be gauged by the fact that Professor Pickering has in the interim himself photographed the whole heavens by this contemned doublet several times over. Mr. Turner speaks of a doublet being capable of covering an area ten times as large as that of the lens actually chosen; that would be between four and five degrees. We opine that even in 1887 the then available doublets might have been relied upon for a far larger angular aperture than five degrees, while of present day lenses, five times five would not exhaust the capabilities of a good anastigmatic lens, and this would reduce the number of charts required to less than 1-200th of that now being aimed at. Finally, we may quote Mr. Turner's concluding remarks. He says: "It is not, even now, too late to follow the excellent advice which was offered in 1887, only to be ignored. By adopting the doublet, the chart plates might be completed in a reasonable time and at a reasonable cost, though on a smaller scale."

DAGUERREOTYPES AND THEIR "RESTORATION."

It is not altogether surprising that the majority of the present generation of photographers know little—indeed, nothing whatever—of the Daguerreotype process, seeing that it ceased to be practised before many of them were born—indeed, some of them have never seen a picture by it. As a proof of that, we have more than once had Daguerreotypes sent to us by correspondents, asking by what process they were produced. and several have written to the same effect, after describing the pictures. Only a short time since we received one of these pictures from a professional photographer, who described it as "a portrait on tin," and asking how some portions on the face that had been injured by his handling could be remedied. Evidently he, like some other of our correspondents, had never seen a Daguerreotype before, and not knowing the delicate nature of the picture, it had suffered at his hands. Now there are, at the present time, many others who are exactly in the same position as those who have written or consulted us on the subject, and have, at times, these pictures brought to them to deal with. Therefore these notes, though not the first we have written on the topic, may be useful as avoiding damage to a valuable picture. We say valuable, because those who possess Daguerreotypes of their friends—mostly long since departed this life—must remember that few, if any, commercial results by this process have been produced during the last forty years. They are, therefore, looked upon by their owners very much in the same light as "family portraits" are. A further proof that they are valued by their owner is that they often go to considerable expense in having them copied and enlargements made from them; and if, while this is being done, the original becomes injured, or in some instances irretrievably ruined, the loss to them is great, and at the same time the photographer's reputation sometimes suffers. All this might well be avoided if the photographer understood the nature of the picture he had to deal with.

A Daguerreotype may be reckoned as the most permanent of all silver pictures, but, at the same time, it has to be admitted that the image is the most delicate of them all, as it may be entirely rubbed off with the finger. It is true that we sometimes hear that Daguerreotypes fade; but

they do not. The surface of the silver plate upon which they are made may become tarnished by exposure to the air, and the image thereby somewhat obliterated. But if the tarnish be removed, the picture is at once as good as ever it was. Where one has become so tarnished it is due to the picture not being made air-tight in its case, not necessarily because it was not made so by its producer, for the old Daguerreotypists, knowing the nature of the pictures, took the greatest care to make them secure against atmospheric influence. In nine cases out of ten that have come under our notice, the injury may be traced to the picture having been taken out, at some time or other, to be copied and then simply put back again without the trouble being taken to bind it and the cover-glass together, air-tight, as it was at first, the photographer possibly not realising that this was absolutely necessary for its future preservation; and, as a consequence, the atmosphere and the impurities it contains has had access to the picture; hence the cause of the deterioration.

"Restoring," or, rather, cleaning off the tarnish of a Daguerreotype is a very simple and safe affair in the hands of one who is practically familiar with the process. In giving instructions, as we here do, to those who are not, we should strongly advise them, in their first essay, not to make it on the customer's picture, but to practise on one or two that are of no value, if they can be obtained.

Here is the method. First take the picture out of its case, or frame, and carefully remove the paper, or, maybe, goldbeater's skin, with which it was secured to the glass and mat, both from the edges and back of the plate, and not allowing any particles to get on to the surface of the picture. Then blow off the dust, and flow over the plate a little alcohol, and rock it to and fro until it takes evenly; then wash under a gentle stream from the tap until all "greasiness" disappears. Have ready beforehand a tolerably strong solution of cyanide of potassium—say, about a drahm to the ounce of water; now take a glass measure with a little water in it, and add a small quantity of the cyanide solution, so as to make it of a strength of about eight or ten grains to the ounce and flow over the plate, and watch the effect carefully. It is well at first to pour the solution on and off, locally, the most strongly tarnished portions—always the margins, which take the longest time to clear. If in the course of a minute or so the tarnish begins to disappear, well and good; if not, add a little more of the strong solution. When the tarnish has all been removed—and it is best removed with as weak solution as possible—the plate must be well washed with a gentle stream from the tap, to get rid of all traces of the cyanide.

Now comes a very important part of the work, simple though it be, though it is not always carried out, except by those who are familiar with the Daguerreotype process. We now want a spirit lamp, a pair of pliers, and some pure, distilled water. After the plate has been well washed under the tap, it is held by one corner—say, the bottom left-hand one—by the pliers. It is then flowed over several times, back and front, with the distilled water, and finally drained from the right-hand bottom corner. From this stage the sloping position of the plate must not be changed. The opposite corner (diagonally) to that from which the water was drained is then brought over the flame of the spirit lamp, and as it begins to dry the plate is gradually raised, so that the drying proceeds slowly, but evenly. Any check in the drying would cause drying marks, which could not easily be got rid of. The reason why the final washing must be with distilled water is that if the picture were dried direct with the tap water upon it, there would be a film of lime, or other impurity the water might contain, left upon it, and thus mar its beauty. All that remains now to be done is to securely cement the picture, mat, and glass together, air-tight, with paper or goldbeater's skin; flour-paste is the best for the purpose, and place it back in its case, where it will endure for generations, for it is only the air, and the impurities it contains, that will injure a Daguerreotype.

In conclusion, we would once more enjoin those who are not familiar with this beautiful, though somewhat delicate, process to exercise the greatest care in the manipulation, or, better still, entrust the work to those who are. A Daguerreotype picture is one of the easiest pictures to copy, and a good one will yield a better copy than any paper print will do, if it is rightly lighted. We had intended to say something about that, but space will not permit in this article.

SOME POINTS IN CONNECTION WITH GOODWILL.

The expression goodwill is one which is now so frequently used that there is perhaps some apology needed for introducing the subject to the notice of the readers of this paper. There are, however, so many of us to whom a knowledge of the subject connected with the goodwill of a business may one day or other be useful, that I have ventured to write on the subject.

A definition of goodwill is by no means an easy thing to give—thus we have as the favourite one, "the benefit arising from connection and reputation, the probability of the old customers going to the new firm which has acquired the business," while Lord Eldon, in Crutwell v. Lye, said that "the goodwill of a trade is nothing more than the probability that old customers will resort to the old place." There are besides these numerous other ones, but the above are perhaps sufficient for our purpose.

Goodwill is a term not only applicable to a trade but also to a profession, and indeed in this latter case it is often the most valuable asset of the concern.

On purchasing, or negotiating with a view to purchasing, a business it will nearly always be found that an amount will have to be paid for the goodwill of the concern, and as this is not a tangible asset, it is at once asked in what way the figure is arrived at. The circumstances of each individual case can alone be taken as our guide, but it is generally conceded, as pointed out by Mr. L. R. Dicksee, F.C.A., in his excellent treatise on the subject, that the following circumstances must exist, and that the person to whom the goodwill passes must in all cases have:—

1. The right to carry on business at the same place as that at which it was formerly carried on
2. The right to use the old name, and to represent himself as the legitimate successor of the former proprietors.
3. Exclusive right to so represent himself.

As might be imagined, No. 3 has been fruitful of much litigation, but it was finally settled by the House of Lord in Trego v. Hunt [1896] App. Ca. 7), that "Where the goodwill of a business is sold (without further provision), the vendor may set up a rival business, but he is not entitled to canvass the customers of the old firm, and may be restrained by injunction from soliciting any person who was a customer of the old firm prior to the sale to continue to deal with the vendor, or not to deal with the purchaser." It is obvious, therefore, that the purchaser should be careful to protect himself from the competition of the vendor by enter-

ing into express stipulation with the vendor, binding him not to compete within certain limits.

The attitude of the retiring partner or partners is of very real value in estimating the value of the goodwill; e.g., can they assist, and will they do so, to make the new undertaking successful? will they oppose it? or are they incapable of doing either? Your actual position is one of great importance in determining the amount you should pay for the goodwill; thus, if you are becoming a partner in place of one who is retiring altogether from business, it is much more valuable than if you were merely taking the place of a partner who was expelled, for in the first case you would suffer no disadvantage by reason of the outgoing partner, but, on the contrary, would probably reap certain benefits he could give you, while in the second case you would be almost certain to have the disadvantage of the expelled partner setting up in competition with you. We may next consider the basis of our valuation of goodwill. This is generally taken upon a certain period's purchase of the average net profits of a business, e.g., the goodwill of a wholesale or retail trading business is worth from one and a half to four years' purchase, of a manufacturing concern from one to three years' purchase, and of a professional concern from one to two and a half years' purchase. Certain classes of enterprises will be worth a great deal more; for instance, the goodwill of this paper. Newspapers frequently fetch ten years' purchase of profits, and the reason is not difficult to comprehend.

Here we have the goodwill consisting chiefly of the name, for if, instead of being called The British Journal of Photography, it was called "The Mothers' Friend," I for one should have been the loser, for I should not have ever purchased a copy! Again, it matters very little to its subscribers whether the offices are in London or Manchester, and thus expenses can be kept down.

As regards a photographer's business, it is a most difficult matter to make any opinion on. So many things have to be taken into account. The business may have been built up entirely through the skill of the individual; in this case, the personality might not be able to be replaced, and so the trade would vanish. The increase or decrease of the profits must be carefully noticed, and the prospects of the future fully realised. Nothing in the nature of an extraordinary character would be taken into the account, as for instance, the prospects of extra business due to the Coronation. A business may show a decrease of profits for the last year or two, and yet the goodwill of it may be worth a considerable sum, for the loss may be capable of ready explanation, e.g., war or other national calamity, but it need hardly be stated that a decrease of profits is so very significant of non-success, in all ordinary cases, that it will require very striking evidence to justify it.

A photographer's business, in a very large number of cases, may almost be estimated on a trade basis, rather than on a professional one. I do not say this on hearsay grounds. I know it is a fact, and the reason of this is that the business could be equally, let us say, successfully worked by any photographer of normal merit and business capacity. It is quite another thing though with other cases. Thus if I was asked the basis on which I would estimate the goodwill of certain celebrated photographers' businesses in the West End, I should be inclined to say that it was so wrapt up in the genius and individuality of the owner, that in nine cases out of ten, it would be valueless as a commercial asset. Of course, if one felt sure of being able to turn out exactly similar work, the goodwill would be of greater value, and would be a perfect example of goodwill as a tangible asset—but the chances are against it.

An important item in professional photographic finance is what is known as repeat orders. There may be a large stock of negatives on hand, whose life is still existing; constant orders may be booked for prints from them, either for personal or private use, or for publication purposes. Here it is obvious that the existence of such an item would fall directly under the definition I have given of goodwill, and though the intending purchaser might feel quite justified in treating these negatives as stock, the seller would be equally entitled to have it dealt with as part of the goodwill of the concern. The merits of the claims would have to be most carefully gone into, and an equitable apportionment arrived at.

While, as I have previously pointed out, the goodwill is usually estimated as so many months' or years' purchase of profits, it is quite possible to conceive that in many cases it is easier and more equitable to take the bulk of the business done as the basis of our computation.

This is frequently resorted to in cases where the turnover varies according to the person who is managing at the time. As pointed out by Mr. Lawrence Dicksee, F.C.A., there is an opinion rapidly gaining ground that the amount of the capital employed and the amount of time and skill which the proprietors have to expend in managing the undertaking to produce the result, should be taken into the account. If this plan is adopted, the goodwill is provided for, not on the profits actually earned, but on the profits less interest on capital and less an amount estimated to cover those management expenses which have not already been charged up. This is a plan which is so obviously just and equitable to both parties that it is to be hoped that it will commend itself to the reader.

An illustration of the governing principle of this capital question will perhaps be of interest. Suppose the capital invested in an undertaking be £1,000, and that with this an income of £500 per annum is obtained, and again suppose that in another case the capital invested is £5,000, and yet only a similar £500 annual profit is realised, it stands to reason that the first business is worth a great deal more than the second one. But we have not yet made any allowance for interest on this capital. Let us make a calculation of this at five per cent. per annum. After making this deduction from the first, we have the net profit £450,—i.e., £500 less five per cent. on £1,000; and in the second case the net profit is £250—i.e., £500 less five per cent. on £5,000. These two illustrations will show the importance of charging interest on the capital employed.

The other point which I raised, namely that of the expenditure of time by the proprietor for the purposes of managing the business is also one of great importance. Mr. Dicksee has put it very tersely in his valuable treatise on goodwill, and I cannot do better than quote him. He says:—"It is important to remember that when a man pays for goodwill, he pays for something which places him in the position of being able to earn more money than he would be able to do by his own unaided exertions. To take an extreme case, for instance, no man who places any value upon his time would pay anything for an undertaking which, after providing five per cent. interest on its capital, did not show a further profit in excess of the amount which the purchaser might be sure of earning anywhere else, without any outlay whatever." The circumstances of each individual case have to be taken into account when making the calculation for the sum to charge for this expenditure of time. In all ordinary cases a large amount is not correctly chargeable, and where only a supervision is exercised the amount may be very small. In photographers' businesses it is usual for the proprietor to devote the whole of his time to the working of his undertaking, and so the whole of the net profits pass into his pockets. Here an estimate of the value of his labours should be made by the intending purchaser, in order that he

may be able to judge as to the value of the concern to himself.

It may be that the business is capable of making larger profits if it only gets into good hands. In connection with this point, it is very important to have produced to you complete accounts showing the income and expenditure in detail for, if possible, a period of three years. You will note the style and the quantity of the work done, and the number of people employed to do this work. From this you will be able to judge as to the economic management of the adventure. As I have said, be most careful to ascertain the exact position of the proprietor, his business capabilities, and the amount of time he expends on his duties. A very large amount of business is lost through an incapable or unenergetic manager, which could easily be obtained were the circumstances otherwise.

Do not, however, err on the other side, and over-estimate your own capabilities, as this is an error you may easily fall into, more especially if you have a plausible gentleman to deal with as the seller. I might point out here, in connection with the accounts, that sometimes money, which during the course of a year, amounts to quite a large sum, is frequently lost by not paying in cash, and so losing the discount. Discounts, of course, are of two kinds, viz., trade and cash. The trade discount is an allowance which is made to you by reason of you being in the wholesale business, and this amount should not appear in your accounts. Cash discount is, however, money earned by reason of your settling your liability within a certain time limit, and this should always be shown separately in your accounts, crediting your discount account, and debiting the personal account. Thus discounts appearing in the accounts as a source of profit are quite justifiable, provided they can all be accounted for. There are certain to be sources of income or expenditure which the purchaser imagines should figure in the accounts over and above the usual items. These should be looked into, and if not present, but yet which the purchaser feels should be included, an allowance must be made for them.

Such matters as the terms of the lease are outside the province of this paper, but they nevertheless require looking into, and are, indeed, the chief point almost where the continuance of the prosperity of the business depends upon it being carried on in the same place. A charge should be made for structural repairs and a depreciation be written off the furniture, etc. These items are charged to the income and expenditure account, or the profit and loss account, as the case may be, so as to show the net figure, at which the several assets are valued, on the balance sheet. It is important to see that this is done, as otherwise you would not be showing your real net profit in your accounts.

After these points have all been carefully attended to, we shall be in a very much better position to determine the actual value of the goodwill than we were before. Those businesses which only need a small amount of capital and involve the least amount of skilled attention, are the most valuable, and if there is anything in the connection which establishes a quasi-monopoly, as in the case of a newspaper, this will still further enhance its value.

In a photographer's business, in a large majority of cases, the ability to be able to continue the profession in the same place is of the utmost importance, for the vitality of the concern depends to a large extent on chance trade. One would therefore be careful to see that if the lease is a short term one, or nearly run out, that it would be possible to renew it. Ordinarily the renewal of a lease is accompanied by certain onerous burdens, such as increased rent, or the expenditure of a sum of money on improvements. These are points which require careful consideration, and to which too much attention cannot be directed. It is a very difficult matter to draw a distinction between chance trade and trade arising from a connection. Photographers, of course, do a very large proportion of their business on chance trade, for casual passers-by may be attracted by some exhibition in the window, and may go in and have work done for them on account of this alone. This is undoubtedly chance trade, and the situation of the place of business and the class of people who go to make up the population of the locality, i.e., whether they are permanent residents or visitors, will determine its extent. On the other hand, a good connection may have been worked up for the business, and a reputation established outside the immediate locality. This is a most desirable state of affairs, and a business so happily situated will be able to obtain for its goodwill a large sum of money. If the photographer's business is one of portraiture only, it is so largely of a personal character, and is so intimately wrapt up in its proprietor, that the complete transfer of the concern to a new purchaser might be attended by anything but happy results. In this class of case it is exceedingly advisable to endeavour to arrange for the continuance of the services of the predominant partner, at least until the new partner has comfortably established himself.

But if besides ordinary portraiture such work as trade printing is carried on, the exclusive personal character of the proprietor in all ordinary cases is not so easy to demonstrate. It would naturally be assumed that the old customers would continue their patronage, notwithstanding the change of proprietorship. It can, I think, be clearly taken for granted that where there is profit there is also a goodwill, and inasmuch as profits fluctuate so will the value of the goodwill vary from time to time. This variation will not, however, be so violent as that of the profits, for, as I have said, it is customary to estimate the goodwill on an average of the profits over a period, and not on the actual profits of any one particular period.

Goodwill is such a very fluctuating asset that it is an exceedingly difficult matter to at any time state its value. It is clear, though, that there is a value attaching to the goodwill of a prosperous business, and so it is nearly always introduced into the accounts.

Where it is possible to do so, Mr. Dicksee thinks that the value of the goodwill should not be stated or appear in the accounts, and this is the view generally taken by accountants.

The basis on which this opinion is stated is that goodwill is a "fixed asset," and as such, according to Mr. Justice Romer, it is incorrect to take into account its fluctuations when arriving at the profits. "Floating assets," on the other hand, should always be taken into account at the true value on the date of the balancing. Fluctuations of goodwill are not taken into account for several reasons, but it is sufficient here to say that were these fluctuations taken into account the effect of a good year would be to exaggerate the business done, while if a loss was made the unfortunate position would be most ridiculously accentuated.

As a matter of bookkeeping, goodwill generally appears in the accounts, and where a sum of money is paid for it by the purchaser of a business he will almost always be sure to wish to see it in the accounts.

The capitalisation of any expenditure is a matter which should only be done after careful thought, but there are certain cases where a large expenditure may be incurred for the purpose of creating a goodwill which can properly be treated as a capital charge. Where the purchase of a goodwill has been affected by a sole trader or a firm, it is a matter of considerable importance as to how the purchase price should be treated in the books. Without doubt, it should be entered up to the debit of the goodwill account; but it is also equally advisable to get rid of it as quickly as possible.

When you come to sell the business you will not care to show what you paid for the goodwill, and yet you wish to show it in the accounts. The profits cannot with any justice be written off against the goodwill, for the goodwill has no connection with the profits in the sense that it is of a wasting nature. The proper way to treat it is to debit your capital account and credit your goodwill account with the whole amount as soon as you possibly can.

I should, with great pleasure to myself, like to pass from this stage of our inquiry on to the purely legal side of the question, but I do not see how I can possibly do so and yet keep this article within proper limits, while maintaining its interest to ordinary readers. The amount of litigation which has taken place over the subject in its many aspects would compel me to go very much too far into details to do any credit to the matter, and would involve an amount of space being devoted to it which would be out of place in a magazine of this class. I have endeavoured to place before the reader a simple and yet thoroughly practical résumé of the principles of goodwill, and for further knowledge of the subject I can only advise him to consult Mr. Lawrence Dicksee's most admirable treatise on the subject, published by Messrs. Gee and Co., 34, Moorgate Street, E.C., which I can unhesitatingly recommend as the best work I know of dealing with the subject generally. It has, moreover, as an introduction, a valuable chapter on the law relating to goodwill from the pen of the late Dr. Stevens. I have found this book so valuable to myself that I have adopted its arrangement for the basis of this article, and I have drawn freely upon it for the purposes of illustrating my remarks. I will conclude by giving an example which actually came before me in practice the other day. A proprietor of a small newspaper wished to dispose of his interests in the concern, and I was asked by the intending purchaser to look into the matter on his behalf. The seller wanted six years' purchase of the net annual profits, based on the average of the last three years. The accounts, such as they were, showed a certain profit to have been earned, but on more complete examination I ascertained that no interest had been charged on the capital employed, nor had any allowance been made for the time expended by the proprietor in the interests of his business. After making allowances for these essential charges and adjusting other matters, I found that instead of a profit a loss was being made, when the affair was brought down to a cold business basis and all sentiment eliminated. Notwithstanding this, I was, however, convinced that there was a certain value attaching to the goodwill of this quasi-monopoly, and suggested the offer of a small nominal sum for the full proprietary rights in the magazine. This course met with the approval of the intending purchaser. The case is interesting as indicating a very peculiar set of circumstances, but I need hardly say that it is very rarely that such a course of action could be advised. The nature of the business and its future prospects were the points on which the decision chiefly turned.

Each case of goodwill must depend so much on its own individual merits or defects that the possibility of any hard and fast rules being laid down is not practicable; but a knowledge of general principles will do much to smooth the road to a correct valuation being made.

AN ACCOUNTANT.

BOOTH AND OPENSHAW, LTD.—The above-named company has been registered with a capital of £5,000 in £1 shares. The objects of the company are to adopt an agreement with G. G. Mackay and J. W. Openshaw, and to carry on the business of chemists, druggists, dealers in proprietary articles, manufacturers of photographic and scientific apparatus and materials, etc. No initial public issue. The first directors (to number not less than two nor more than four) are G. G. Mackay (chairman) and J. W. Openshaw. Registered office: 7, Darwen Street, Blackburn.

IN WET PLATE DAYS.

HE was a grey-headed old chap, and the very type of a man who has "seen better days." He had a "pitch" on the borders of a certain common near London, which shall be nameless. I had often noticed the pathetic-looking figure of this ancient photographer, and had noted how his broken-down camera and well-worn lens seemed to be part of him. One day, I thought I would try and get a peep into his past, and after a little preliminary skirmishing I induced him to become quite talkative. But it must not be supposed that the following narrative was run off from his lips just as I have written it. There were many pauses, and many little words of encouragement from me, which I have purposely omitted, which helped to grease the wheels of his elocutionary apparatus. However, here is the gist of his story, in his own words:—

"Business bad? Why, it's awful bad. The boys and girls seem to have left off being vain, leastways, they don't come to have their portraits took as they used to do. Even the lovers fight shy of me. Instead of coming to me to have their liniments pourtrayed, they stops away, and saves their money. I only remember one time when business was worser, and on that occasion I am sorry to say I fell in with a dishonest pardner, and was led away, quite innercently, so to speak, from the path of rectitood, which I have always regretted to my dying day—altho', while it lasted, mind yer, there was apence in it. Well, I don't mind if I do, thankee, sir. Say a pint of four 'alf, and here's my respecs.

"It may be twenty-five years ago, p'r'aps more than that. I never kep a diary—but if you're curious-like about the exact year, you can easily spot it by making inquiry at the Government Office where they takes count of the weather. They remember that year, for that summer was about the wettest ever known until this year 1902, as ever was, which this present for May and the best part of June has been werry hard to beat.

"The rain came down that year in a way which would have staggered Shem, Ham, and Jacob, with all their experience of Jupiter previous. Not a shower or two, now and then—don't misunderstand me—but one broad sheet of water. Of course, it knocked all my business on the head, except for washing plates, and with no business, I had no plates to wash. I had a pitch on Yarmouth Sands, but, lor' bless yer, how could you expect anyone to have their pictures took when they looked like drownded rats in mackintoshes?

"There I stood, week in and week out, wet through most of the time, with very little to eat or drink to keep the cold out, and wondering all the time whether cyanide was nice or nasty. About one hundred yards from my pitch there was another bloke, by name Jem Barnes, who was much in the same plight. He was a photographer by profession, like myself—but now we was both dismal images of the unemployed. We had, up to this time, mind yer, looked upon each other as rivals, and had not spoke to one another for weeks, unless it was to exchange a swear word or two, just out of compliment like; but now, as we were brothers in distress, we were drawed towards one another in joint sympathy, like a blooming magnet and a tenpenny nail.

"One morning he comes up to me, does Jem Barnes, and he says, confidential like, 'How goes it, mate?'

"'It don't go at all,' was my answer. 'It's stopped, stagnated, and busted up.'

"'How would it go as a limited liability concern?' says he.

"'Find the capital,' I says, 'make me managing director, at twenty quid a week, and I'll make you a present of my perambulator-tent, bottles, silver bath, and the whole bag of tricks, including the tent and the puddles on the top.'

"'It ain't good enough,' he replied; 'but,' he added, 'I think we might do a little biz together without any kid. And

if you'll come and see me to-night at the bar of the Blue Anchor, where I lodges, we'll talk over the matter, and fix it up, if we agree on the main points.'

"That same evening we met, and formed a syndicate of two, with a joint capital of three pound ten, which was reduced to thirty bob after we had visited a second-hand slop shop, in order to get ourselves a fashionable rig out.

"'It's no use to enter upon any new speculation,' says my pardner Jem, 'unless you are well dressed.' By which it will be seen that my new pardner was a bit of a philosopher, as he truly was, besides being a downy card, as you will presently see. 'When your object is to get anything out of the noble British public,' says Jem, 'you must pretend to be quite independent of 'em. Why,' he added, 'the Archbishop of London hisself couldn't carry on his business for a single day, if he allowed his trousers to get frayed at the ankles.' 'What do you say? The Archbishop don't wear trousers? Well, it's time he did—that's all I can say."

"'Jem Barnes did not unfold all his scheme to me, but in outline it was something like this. We was to pick out the best of the apparatus we owned, and sell the rest. Then we was to take one town at a time, going round to the shops and the private houses, offering to take pictures of the premises, money down. There was to be no credit, and no bad debts, and each day, after deducting expenses, we was to divide the plunder. The scheme was a single one, but it required two persons to work it properly, one to do the touting and the other to take the pictures.

"As Jem declared that I had the gift of the gab, and that he couldn't open his mouth without putting his foot into it, I became touter to the concern, and Jem had the care of the camera and portable dark-room, which was half tent and half box on wheels. You'll understand that there was no such thing as dry plates then, so that we had to cart about a lot of bottles, a supply of water, glass plates, and the dickens knows what. The wet collodion positive process was then worked by all photographers on the road, and Jem Barnes's idea was to take a picture which could be shown as a positive, and to point out to our customers that paper prints could be took from it and delivered a few days later.

"Our arrangements were soon complete, and we were soon jogging along a country road towards a certain town—no, I won't tell you it's name, for, to tell you the truth, I'm not altogether proud o' my connection with it. We were so disgusted with Yarmouth and all its works, that we did not care to try our luck there; besides, there were too many on the job there already. The weather had cleared, and it was now as hot and dusty as before it had been cold and wet. We knocked at one or two doors without success, and getting, figurative-like, more kicks than 'apence. At last we got our first customer. It was a villa residence, with a paterfamiliar in white waistcoat and a big watch chain on the doorstep, his missus with the baby in her arms at the winder, the other children at another winder, and the servants to fill in the chinks, to say nothing of a cat and a dorg—a smelling around at the back of the picture. After one or two trials a good photograph was obtained and approved—and half a quid paid down on account, and noted by me in a book kept for the purpose. Old white waistcoat was far too fly to pay down all the money before he had the pictures, and I don't blame him, neither. We were quite as successful in other quarters, and at the end of our day's work, found ourselves with four pounds to the good, paid for pictures which were to be printed and forwarded to their respective owners in a week's time.

"'Hadn't we better lay in a fresh stock of glass?' I says to Jem, one evening, when we was dividing the money.

"'No," says Jem. 'I've plenty to go on with—besides,' says he, 'that's *my* department. You stick to yer book, and keep your collar clean, that's *your* department.'

"That's how he shut me up, guv'nor, and I tell it to you so that you'll understand that, in what follered, I was drawn into it unbeknownst.

"Good fortune continued to shine upon us, as the poet says, and the entries in my book, and the money in our pockets increased and multiplied. But those entries bothered me a bit, for I knew that they meant so much work not yet begun—I mean, the printing of the promised pictures. So, at the risk of treading on his toes, I tackled Jem about the arrears.

"'Oh,' says he, in a easy kind of way, 'plenty of time for that; we can begin printing when the weather gives out, and we can't do any outdoor work.'

"And so things went on for two or three days more, when people who had been expecting their pictures stopped us in the street, and began to say nasty things, one going so far as to threaten to put the police on to us. Jem put 'em off with one excuse or another, until at last I got tired of the thing, and determined to have it out with him. So that night I went to the pub where I knew I should find him. There he was, sure enough, and half boozed. I could do nothing with him. At last, after trying all I knew to make him look seriously on the matter, I says, 'Well, give me the negatives, and I will print them myself. You can help with the washing and toning—and then we can begin again with a clean slate.

"Jem leered at me in a most aggravating manner, and he says, 'Negatives? What negatives?'

"Now, I put it to you, sir—don't you think you'd have lost your temper if you had been treated the same? Here I'd been talking about those blessed negatives for half an hour or more, and this drunken fool turns round and says, 'Negatives? What negatives?' as if he'd never heard of such things.

"'Why,' says I, trying to keep cool, 'the negatives as we've took of the different houses we've taken.'

"'There ain't no negatives,' says he.

"'No negatives?' I roared.

"'Not a blessed one," says he. "I wiped off every one as soon as it was approved. They was all took on one bit of glass, and I broke that yesterday. Cheer up, old cock, and have a drink.'

"Well, sir, you might have knocked me down with a feather. But I soon found out it was true. Jem had used the same sheet of glass for every picture, wiping off the image each time to make room for the next.

"I soon saw that that town was no place for me, so early the next morning I took my share of the traps and bolted.

"Did I ever see Jem again? No, but I saw his name in a local paper soon afterwards, and it wasn't among the births, marriages, or deaths, neither—it was six months' hard, and he deserved it, too."

THE Scotch Observatories.—It is announced that the observatories at the top of Ben Nevis, and that in Fort William, are to be closed at the beginning of October next, in consequence of the want of funds to keep them going. Since the commencement of the work in 1883 the cost, including the making of a bridle-path up Ben Nevis and the erection of the buildings, has been about £24,000. Of this sum some £17,000 has been received from private subscriptions. The London Meteorological Council has contributed £100 a year for the Ben Nevis Observatory and £250 since 1890 for the Fort William one. Now the directors have received definite information that whether the observatories are continued or not, the sum for the latter will be discontinued at the end of the current year. In connection with this subject we see that Sir John Stirling Maxwell has given notice that he will, in the House of Commons, as yesterday, ask the Lord Advocate "whether he is aware that the observatory on the summit of Ben Nevis is about to be abandoned on account of want of funds; whether any application has been made through the Scottish Office for assistance for the observatory from the public purse; and whether, if such application has been refused, he will state the grounds of the refusal?" As the question was only to be put as yesterday, we cannot say what was the reply given. But it will be interesting to learn what it was

MOLECULAR STRAIN THEORY OF VISION AND OF PHOTOGRAPHIC ACTION.

[Reprinted from the Journal of the Royal Photographic Society.]

I.

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Introduction.

Nature has been arbitrarily divided into the artificial classification of the sciences. But one science imperceptibly merges into another, and in the borderland there is no sharp line of demarcation. We shall, this evening, have to enter a region where three kingdoms meet—physics, chemistry, and physiology. If we wish to see things rightly we mush place ourselves so as to survey the range of phenomena as a whole.

As an example of the difficulty of including any particular group of phenomena within an artificial classification, let us take the subject of the formation of latent images, which for convenience is known as photography. These images are by no means formed by the exclusive agency of the stimulus of light, but they are also formed by the stimulus of cathode discharge, by the Röntgen rays, by the chemical stimulation of emanations from various active bodies such as radium or uranium, also by electric and mechanical stress. Note in connection with this that the visual effect may be produced not by light alone, but by the mechanical stimulus of a blow, or the stimulus of an electric shock. Even when we confine our attention to the action of light—that is to say of ether waves—we find that the images are formed not only on plates made of sensitive silver compounds, but on plates of pure silver and gold. Some impression of a molecular change—which may hardly be called chemical—has in these latter cases been impressed by ethereal disturbance. The impress of molecular changes are produced not only by visible light, but also by invisible light in the ultra-violet region. We have light again at the other end of the scale, in the region of electric radiation. Do these long ether waves produce no change in matter? You have heard a great deal lately of messages sent through space without connecting wires. It would perhaps cause surprise to you that in virtue of your charter you may claim that achievement as your own. The vastness of the photographic empire has not yet been fully realised. The electric wave which carries the message is known to be invisible light. I hope to demonstrate the fact that the detector by which the message is received—the coherer so called—is nothing more than a linear photographic plate.

Object of the Present Inquiry.

With reference to photographic action, various facts are known which cannot be well explained from purely chemical considerations. It will be shown that when a substance is molecularly strained, its chemical activity is modified in consequence of the physical strain. The acted and unacted portions will therefore be unequally attacked by a developer. In the case of a compound the strain produced may cause a modification which renders it susceptible to decomposition by the action of a reducing agent. The observed evolution of chlorine when moist AgCl is exposed to the long continued action of intense light is often adduced in support of the chemical nature of photographic action. This extreme case of dissociation cannot, however, be regarded as representative of the action of light in the formation of latent images. In ordinary photographic action we have merely the effect of a moderate stress producing the corresponding strain (with concomitant variation of chemical activity), and not the disruptive effect of a breaking stress.

We have seen that the latent image is formed not only on sensitive plates but even on inactive sheets of metal; that these impressions are formed not only by the stimulus of ether waves but also by mechanical stimulus. If we wish then to obtain an understanding of the phenomenon at all adequate, we have to detect and trace the molecular changes produced in matter by the action of different forms of stimuli.

In the case of action of radiation, we have to find means for measuring the minute changes produced on the extremely thin surface layer. It is preferable to begin with the study of radiation effect on some elementary substances, thus avoiding secondary complications. It is also necessary to be able to follow all the stages of the change. I shall briefly describe how these ideal requirements may be realised by the use of conductivity and electro-motive variation methods, which not only enable us to detect extremely minute molecular changes, but also to follow these moment after moment in a continuous manner.

I have to describe the molecular effects produced on matter by the action of invisible electric radiation, and will then show how these effects may be graphically recorded by means of "response curves" obtained by the method of conductivity variation. I will next explain how by the use of electro-motive variation methods the molecular effects produced by mechanical stimulus or by visible light may also be exhibited in the form of response curves.

It will be shown that pursuing diverse modes of inquiry, concerning the action of various "molecular receivers," we are led to a great generalisation on molecular stress and strain. We shall find that the effects of stimulus in the retina, in the photographic plate and in the coherers so-called, are but particular expressions of molecular response. The conclusions arrived at are not merely theoretical; they necessarily follow from the experimental results which I have obtained, some of which will be presently described, and will offer a simple explanation of various obscure phenomena of photographic action, such as the relapse of the invisible image, recurrent reversals, dependence of photographic effect on the time rate and others.

Molecular Changes produced in Matter by Electric Radiation.

The effect of electric waves on a mass of metallic particles is often to produce a diminution of electric resistance. It used to be thought that electric disturbance produced minute induction sparks which caused the welding of particles, hence the diminution of resistance. From this theory of coherence it follows that the diminution of resistance should take place in all conducting particles, and that the diminution should be permanent; in other words, the effect should be non-discriminative and there should be no self-recovery. In carrying out a systematic investigation on the effect of

electric radiation on all elementary substances and a large number of compounds, I found, however, that instead of the action being non-discriminative, two opposite effects are produced; in the positive class of substance the effect of radiation is a diminution of resistance, whereas in the negative class the effect is an increase. Further, the conductivity variation is in several cases not permanent; such substances quickly recover and attain their original conductivity on the cessation of radiation, as if a force of restitution were called forth to restore them to their original condition. Again, if the substance is subjected to the continued action of radiation, the conductivity variation reaches a maximum value, which depends on the intensity of radiation. On the cessation of radiation there is an immediate recovery. The state of balance between the conductivity distortion produced by radiation and the force of restitution on one hand, and the different equilibrium positions with different radiation intensities on the other, point to the effect being due to some strain produced by radiation. The conductivity variation takes place even in platinum immersed in naphtha. It is evident that the effect is due, primarily, to some physical change.

Physico-Chemical Changes produced in a Strained Substance.

If a substance be molecularly distorted by the action of an external agent, we may naturally expect that there would be produced changes in the physico-chemical properties of the substance. As a familiar example take the case of phosphorus molecularly changed from the yellow to the red variety by the action of visible radiation. We find that in the allotropically modified condition the red phosphorus has become less active chemically, insoluble in CS_2 and of higher specific gravity. Similarly, in other properties, such as its elasticity, its position in the voltaic series, its electric conductivity, are likely to undergo a corresponding modification. The same molecular change seen from different aspects will appear to be diverse. Looking from an electric point of view, we do find that the conductivity of red phosphorus is different from that of the yellow variety. We thus see the possibility of measuring the molecular change by measuring the correlated variation of any of the properties described above. The choice of a particular method will be governed by special convenience under given conditions. We may thus use the following method for detection of strain effects:—

(1.) Method depending on the variation of adhesive power; *e.g.*, in the Daguerreotype plate the mercury vapour adheres in preference to the light impressed portions only. Images may similarly be developed by water vapour.

(2.) Method depending on the variation of chemical activity undergone by a strained substance or the method of photographic development. The acted and unacted portions are differently attacked by the developer. The action is not altogether independent of the effect described below.

(3.) Method depending on the variation of electric potential by which an E.M.F. is produced between the acted and unacted portions of a substance originally iso-electric. On making suitable electrolytic connections, a galvanometer indicates a current originated by the differential action of the stimulus, the intensity of the current giving a measure of the molecular effect produced.

(4.) Method depending on the conductivity variation produced by the strain.

The first two methods are well known to you. Here I have an experiment which is highly suggestive. A strain image was produced by laying a stencil on a photographic plate and electrifying the stencil. It has been subsequently developed. I placed the same stencil on a clean sheet of glass—note that here we have no sensitive salt, nothing but the chemically inactive sheet of glass. There is no visible change on the glass; you can detect nothing even under a microscope. But breathe over the plate, and the latent image comes out absolutely the same in all details as the image obtained on the photographic plate.

For the purpose of investigation of the changes induced by stimulus, the method of development is not satisfactory, inasmuch as the final effect alone is here detected. We miss the most important preliminary stages by which the ultimate result is brought about. It is necessary to have some means of studying all the stages of change in a continuous manner, so that the important preliminary phase of "molecular negotiation" may not be missed. The above ideal requirement may be realised as said before by taking advantage of the conductivity or electro-motive variation methods.

Method of Conductivity Variation.

It is often forgotten that the conductivity of a substance does not depend solely on the chemical nature of the substance; the state of molecular aggregation also plays an important part in determining the conductivity. As an illustration, take the case of carbon, which exhibits wide differences of conductivity in the two allotropic states of graphite and diamond. Suppose a piece of carbon in an intermediate state between diamond and graphite, and suppose an external force distorts it to a small extent towards the more conducting graphite state (that this supposition is not purely hypothetical will be seen from Crooke's experiment of conversion of diamond into graphite by the stimulus cathode discharge). This distortion would be attended with an increase of conductivity, from which latter the extent of distortion may be inferred. Now during the distortion from equilibrium position, a force of restitution will tend to restore the substance to its original neutral condition. If the distortion does not proceed beyond the elastic limit, then on the cessation of the distorting force the substance will recover its original state, and this will be evidenced by the restoration of its original conductivity. But if the distortion is of a sub-permanent type, then mechanical vibration or heat may hasten the recovery of the substance.

Mechanical Model.

Here is a model (Fig. 1) of the sensitive substance with its three main conducting aspects—the diamond or non-conducting

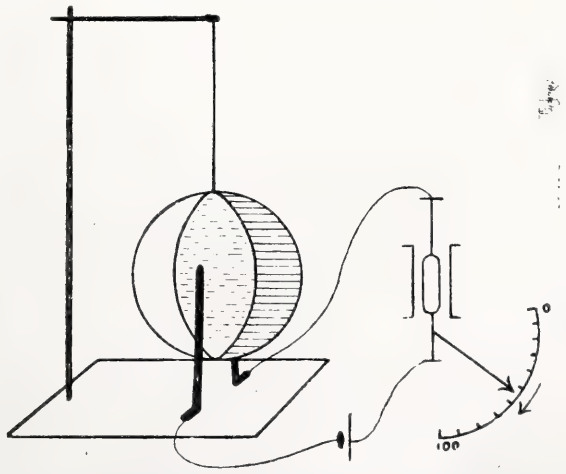


Fig. 1.—Model to explain the conductivity variation produced by molecular distortion. The three main conducting aspects are represented by different shadings.

aspect, the intermediate or semi-conducting aspect, and lastly graphite or conducting aspect. Let it be interposed in an electric circuit, with an interposed galvanometer. If the stimulus of radiation distorts it to a more conducting state, the increased galvanometer deflection will show it, but if the distortion is in the opposite direction, there will be a diminution of current. We have thus a representation of effect exhibited by two classes of substance—positive and negative. In the former radiation produces a diminution, and in the latter an increase of resistance. If the substance is self-recovering, then the conductivity variation will be transient—on the cessation of disturbance, the recovery will be shown by the galvanometer spot creeping back to its original position. The galvanometer needle thus moves in perfect response to the varying strain produced in the sensitive substance by the action of stimulus. The invisible molecular distortions are revealed by the visible deflections of the galvanometer needle. Curves of molecular effect due to the action of radiation may thus be obtained with the galvanometer deflection as ordinate and the time of exposure (or recovery) as abscissa. The rising part of the curve represents the effect of stimulus, and the falling part, the recovery. It is thus seen that these curves faithfully represent the invisible molecular strain effect due to the stimulus, and the after-recovery from the strain.

The curve of response, depending as it does on the molecular distortion and recovery from the strained condition, will be modified by an important factor—that of molecular friction. The second mechanical model will give us an insight into some of the most obscure response phenomena, not only in the realm of the inorganic, but also in the world of the living.

Model Exhibiting the effect of Molecular Friction.

Torsional pendulum.—This torsional pendulum—a wire with a dependent sphere—will represent to us the molecule. By the stimulus of a blow, there is a torsional distortion produced. You see the response and recovery (Fig. 2). There is no friction, and there is a persistent after-oscillation. (*a*) I introduce friction by raising a vessel full of sand which touches the pendulum. You observe that there is now a damping of oscillation. (*b* and *c*) Under greater friction there is a response, but the recovery is gradual. (*d*) Increasing the friction still more, we have a response, but no recovery. (*e*) The pendulum is arrested in its strained position. When the friction is too great, there is no response.

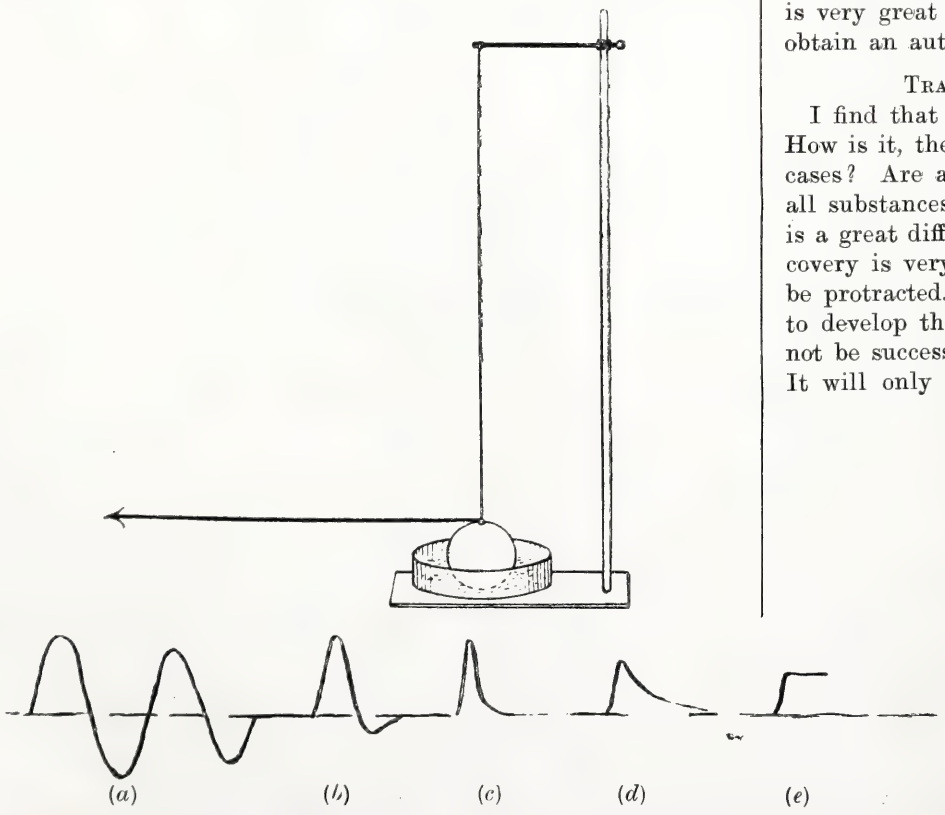


Fig. 2.—Model showing the effect of molecular friction in modifying the response curve: (*a*), (*b*), (*c*), (*d*), and (*e*) show the effects of gradually increased friction. (*a*) Persistent after-oscillation; (*b*) and (*c*) damped vibration; (*d*) recovery prolonged; (*e*) recovery arrested.



Fig. 3.—Different stages in the transformation of a coherer from a non-recovering to a self-recovering condition. (*a*) Response without recovery; (*b*) tendency towards self-recovery, owing to increased molecular mobility conferred by warming; (*c*) a more perfect stage of self-recovery.

If the conductivity variation produced by radiation is an expression of molecular distortion, we may expect all these phases repeated. First, in the case of non-recovering coherers the molecular friction is considerable. You observe a response without recovery. If we tap the pendulum arrested in its strained position, the friction is removed, and there is recovery. We do the same to the coherer—mechanical taps bring on immediate recovery. But we may get recovery without tapping. We must increase the molecular mobility. This may be done by warming. And you see how the receiver became self-recovering (Fig. 3). There are other substances in which the electric elasticity is very great and molecular friction small; in these cases we obtain an automatic and quick recovery (Fig. 4).

Transient and Permanent After-effects.

I find that all substances are sensitive to electric radiation. How is it, then, that we can obtain light images in only a few cases? Are all substances sensitive to light? Though almost all substances are molecularly affected by radiation, yet there is a great difference in the permanence of after-effect. The recovery is very quick in some cases, whereas in others it may be protracted. It is obvious that any method which attempts to develop the after-effect a long time after the exposure will not be successful in cases where there is a quick self-recovery. It will only be successful when the strain effect is more or less permanent. It is thus seen that it is quite possible for

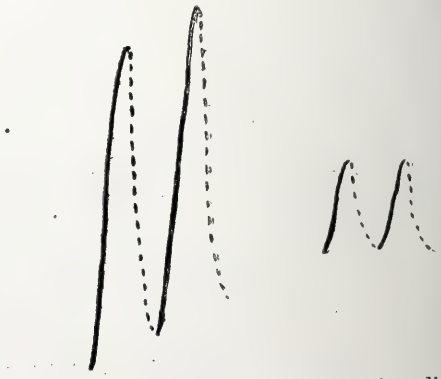


Fig. 4.—Responses of the artificial retina. (a) To flashes of electric radiation; (*b*) to flashes of light. (Thick lines represent the effect of radiation; dotted lines, the recovery.)

a substance to be sensitive to radiation and yet show no effect capable of photographic development, owing to self-recovery.

Relapse of Invisible Image.

The above considerations offer a simple explanation of the obscure phenomenon of the relapse of invisible image. Recovery is only a question of time, with certain substances it is immediate, with others it takes a little longer time as in daguerreotype, where the latent image disappears in the course of several hours. In the ordinary photographic plate the recovery may not take place for years. An instance has, however, been brought to my notice where the latent image on a film had disappeared after a year, the film afterwards becoming as good as if it had never been exposed.* We have seen how the strain effect of electric radiation was transient in some cases, whereas it was persistent in others. It is evident that in order to make the after-effect more or less permanent and thus render it developable, self-recovery should be retarded. There are two ways in which this may be done:—(1) Even a highly elastic substance may be rendered more or less permanently distorted by straining it beyond the limit of elastic recovery; (2) or the presence of an "arrestor" may prevent the self-recovery of the sensitive material by increasing the molecular viscosity; of this latter I shall speak presently.

Permanence of the after-effect by overstrain.—In many cases where images cannot be obtained with ordinary exposure they can be obtained with excessive strain caused by prolonged exposure. Thus Moser and Waterhouse obtained invisible images on plates of silver or gold. These images could be developed not only by mercury or water vapour, but also by ferrous sulphate or pyrogallic developers. All these results derive an additional interest from the fact that most of the phenomena that occur by exposure of ordinary photographic plates containing haloid compounds of silver can also be observed upon a silver plate exposed to light.

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* I am indebted to Mr. R. P. Drage, Grove Park, Chiswick, for the above curious instance of disappearance of image.

New Books.

The Homeland Handbooks.

From the Homeland Association for the Encouragement of Touring in Great Britian, St. Bride's House, 24, Bride Lane, Fleet Street, London, E.C., we have received No. 25 of the series of Homeland Handbooks, entitled "Evesham and Neighbourhood." It includes the beautiful village of Broadway under the Cotswold Hills, illustrated with original drawings by E. H. New and B. C. Boulter.

The book is written by Mr. William Smith, and is published locally by Messrs. W. and H. Smith, Ltd., Journal Press, Evesham. It contains information for use of visitors to the ancient town and the river Avon, and is the only handbook dealing adequately with the churches and villages surrounding Evesham.

The book is published at 1s. paper cover, 1s. 6d. cloth, with an Ordnance Survey map.

We have also received No. 21 of the series, entitled "The City of St. Alban: Its Abbey and Its Surroundings," by C. H. Ashdown, F.R.G.S., F.C.S., illustrated with original drawings by Duncan Moul.

The book contains information for the use of visitors to the Abbey and city, and is the only handbook dealing adequately with the churches and villages surrounding St. Albans.

The book is published at 1s. paper, with an Ordnance Survey map.

"Encyklopædie der Photographie," Vol. 39. Die Entwicklung der Photographischen Bromsilbertrockenplate und die Entwickler. By Dr. R. A. Reiss. Halle a/S: Wilhelm Knapp.

The object of this volume is of a purely practical kind, as it is intended that the work should be a guide to the professional and the amateur for the development of the dry-plate with any of the numerous developers now in general use. The author does not enter into a discussion of the various theories of development, nor of the nature of the latent image, but describes the procedure of development and gives instructions for the use of the various reducing agents. Illustrations are also given of a good negative, and of defective negatives of various kinds. The volume will be of great use to those who require a handbook to this branch of photography, written in a clear and concise manner.

The Ross Bird Stalker: A Book for Field Naturalists. By Charles Dixon. Illustrated. Price 6d. London: Published by Ross, Limited, 111, New Bond Street, W., and 31, Cockspur Street, S.W.

"Bird Stalker" is the happy title conferred by the author of this little book (who is a well-known writer on natural history subjects) upon the prism binocular of Messrs. Ross. Mr. Dixon is justified in emphasising the value of the prism binocular in the hands of naturalists and others. "It would be difficult," he remarks, "to over-estimate the increased amount of interest which the prism binocular has brought into out-of-door study. The ways of wild creatures (especially birds) are always fascinating, and their observation is one of the most attractive and harmless pursuits in which any person can indulge, by way of a soothing and ennobling recreation. Anything, therefore, that can increase the pleasure of this nature-watching or render its accomplishment easier and pleasanter, is sure of a welcome, and deserves a wide measure of popularity. It would be vain on my part to attempt to commit this added interest to paper; all that can be done after the experience derived from a most exhaustive trial and severe test is strongly to recommend the use of the prism binocular to every person fond of open-air natural history. The absorbing pleasure gained from watching the ways of birds, their sprightly actions, modes of feeding, courtship, nest-building, attendance upon their young, and a hundred other matters will be immeasurably increased by the use of such an auxiliary to human eyesight as the prism binocular. Until he has used it that naturalist must remain practically in ignorance of a world of observation lying beyond his reach." Here is a note upon some of the field applications of the prism binocular which are well within ordinary reach:—"I have often found birds and beasts alert and nervous, as if fully aware that they were being watched, within the range-limits of the old-fashioned field-glass; with the prism binocular this difficulty is practically overcome by the much greater distance at which observation can be made, and with enormously-increased and finer powers of definition. This is an item of exceptional importance, especially in the case of the larger and invariably shyer birds and animals. One or two instances may here be given to illustrate the truth of these remarks. A number of rabbits amongst short grass and dead bracken, and absolutely indistinguishable to the naked eye, were shown as round objects of some kind by the ordinary field-glass, at a distance of four hundred yards; with the prism binocular they came out in clearest detail, the exact attitudes each was sitting or lying in being shown. At forty measured yards the pupil of a rabbit's eye was brought out with beautiful clearness, the ordinary glass giving a general view of the eye only. At three hundred yards I was able clearly to identify a Missel-thrush on the bare turf, the round spots on the breast and the large size of the bird being conveyed in a most attractive manner; my ordinary glass brought out a mere light-coloured lump—a bird of some kind certainly, but its identity a mere matter of guesswork. With the old glass at two hundred yards, Jackdaws perched on the top of an old oak tree looked like starlings; with the prism they were easily identified, the blue-grey nape patch showing out very clearly, and the difference in size between the two species was readily suggested." Mr. Dixon writes interestingly throughout of his observations of birds, etc., by means of the beautiful instrument which he describes, and he appends some valuable hints on the care and use of it. The book has many illustrations from negatives by Charles Reid and other natural-history photographers, and altogether is a delightful introduction to the special capabilities of one of the most attractive instruments of observation with which optical science has provided us.

We have received from the Messrs. Marion and Co., Ltd., of 22 and 23, Soho Square, London, W., a packet of "Russet" printing-out paper, which produces results of a pleasing brown colour. The image simply requires washing in water and then fixing in a weak solution of hypo.

Mr. A. J. Newton has been appointed principal of the London County Council School of Photo-Engraving and Lithography. Mr. Newton was formerly the manager of photo-process works in Norway, and has until recently acted as chief assistant at the London County Council school at Bolt Court.

London and Provincial Photographic Association.—The Thursday evening meetings throughout July and August are open to any member or visitor who has any matter of photographic interest to bring forward. Visitors, especially Colonial and foreign, are always welcome to the meetings, at the White Swan Hotel, Tudor Street, Fleet Street, E.C.

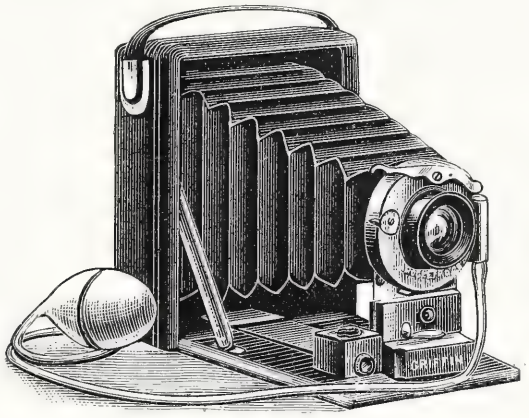
We are sorry to have to announce that on Friday last the only son of Mr. E. J. Wall met with a bicycle accident, from the effects of which he died on the following day. He was a bright lad, of great promise, and we are sure that the heartfelt sympathy of our readers will be extended to his bereaved parents in their trial. Mr. Wall himself is only just recovering from the severe accident he met with in December last at the European Blair Company's Works.

A new publication, "The Writer's Year Book," is announced this week. It is described as a commercial directory for professional writers, photographers, and artists, giving the address, rates, and time of payment, and conditions of contributorship of 500 magazines, papers, syndicates, and agencies purchasing MSS., photos, or drawings. It is published at 1s. 6d. by "The Writer's Year Book" Company, Granville House, Arundel Street, Strand.

New Apparatus, &c.

The "Pocket Poco Camera." Sold by John J. Griffin and Sons, Ltd., 20-26, Lincoln's Inn Fields, W.C.

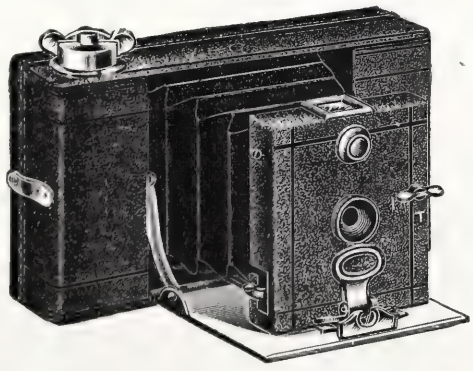
Messrs. Griffin write:—"The intention in introducing this camera is to place within the reach of all at a reasonable price an intrument which will turn out the very finest photographic pictures at the least expenditure of inconvenience to the worker. The Pocket Poco can be slipped into the pocket or carried in the hand with the greatest facility, and it can further be attached to a stand for time exposures or portrait work. The lens is of the rapid-rectilinear form, thus making it useful for every class of photography. The selling price for camera complete with one slide is 37s. 6d.; extra slides 1s. 6d. each. These latter perhaps merit attention in that they meet the often-expressed wish of certain experienced photographers who believe in the principle of one slide one plate—a simplification which prevents double exposures and involves in the case of Pocket Poco slides no additional bulk or weight over the book-form of slide."



The instrument when closed measures 5¼ x 4¼ x 1⅞ inches, with a draw of 6 inches. The body is of mahogany, covered with seal-grain leather, and has a leather handle; the fittings are nickeled brass, and the shutter is lacquered. The bellows is of lined Russia leather. Other features are a ground-glass focussing screen, a sliding front, reversible finder, a bulb and tube controlled shutter, doublet lens, and two tripods. The Pocket Poco is a model of compactness and portability, and is beautifully finished. That it takes these single metal slides is in our eyes not the least of its many recommendations.

The "Roll Film Folding Little Nipper." Sold by W. Butcher and Sons, Camera House, Saint Bride Street, E.C.

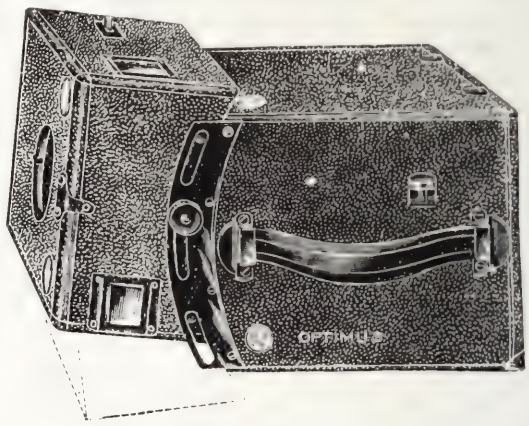
Messrs. Butcher, who have paid special attention to the production of small cameras, have added a Folding Nipper to the series. The type of instrument will be well understood from the illustration, and it has all the principal features commonly looked for in cameras of this construction. It folds into a very small space, and may be carried in the pocket without the slightest inconvenience. A touch opens the camera, and the movement of a catch imparts rigidity to the body. Taking spooled film, a tiny circular red window allows the number of the film to be exposed



to be seen; there is a central finder, and pressure of the lever at the side releases the shutter. Nothing could be simpler or more compact. Daylight cartridges at 7d. per spool (six exposures) are sold for use in the camera, as a guide to the manipulation of which Messrs. Butcher issue a clearly-written book of instructions. Nowadays roll films are so common that one would imagine books of instruction for them would be unnecessary. The Roll Film Nipper will no doubt be very popular with a numerous class.

The "Optimus Doppa Magazine Hand Camera." Manufactured and sold by Perken, Son, and Co., Ltd., 99 Hatton Garden, London, E.C.

By releasing the screw shown at the side of the illustration, the front portion of the Doppa camera may be either raised or depressed. Thus the rising and falling of the lens is so arranged that its centre is always opposite the centre of the plate, no matter in what position the swing front may be. It is therefore the equivalent of a swing back. The camera carries 12 ¼ plates, and is furnished with two finders, two levels,



and Optimus 5 by 4 rapid Rectilinear lens. The price complete, covered in leather, is £6 15s., and the outside dimensions are 9in. by 5in. by 6in. The Doppa is well and strongly constructed, and should appeal to the many photographers who appreciate the special convenience it gives for raising or depressing the lens as the exigencies of the subject to be included on the plate may necessitate.

"The Ilford Camera." Sold by Ilford, Ltd., Ilford, London, E.

The hand camera which the renowned company at Ilford has just introduced to the photographic world has certain features which mark it out as essentially an instrument for practical—or, as they are sometimes fantastically termed, "serious"—workers, to distinguish them from the growing horde of aimless snap-shotters and film-spoilers that constitute the rank and file of the great photographic army. The camera is simple in conception, strongly built, and easy to use. Our first impression on seeing the instrument was: "Here is a camera not for one season, but for many." It seems to have been constructed with special regard to strength and durability—unlike many other modern hand cameras which err on the side of fragility. Measuring 9 x 5 x 6¼ inches, the Ilford camera

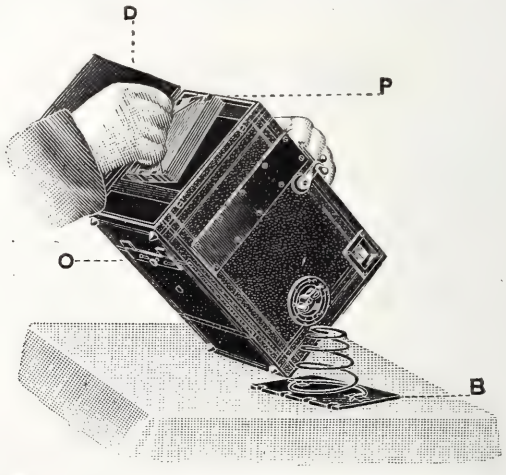


FIG. 1.

is well proportioned and uncumbersome, and unloaded weighs under four pounds. The body is of mahogany, covered leatherette, and it carries a charge of 40 cut films in two packets of 20. The lens works at f/8, and is controlled by a Unicum shutter, giving time and shutter exposures down to 1-100th of a second; whilst an exposure indicator, two large brilliant finders, and two tripod sockets complete the details of the instrument. Adjustment of the focus is obtained by actuating a small arm, shown on the right side of the camera in the appended cuts. The essentially novel feature of the Ilford camera is the system of changing adopted with the cut films that are used in conjunction with separate backings. The principle of that system will be best grasped by a reference to the following illustrated description:—

To Load the Camera.—To load the camera (which must be done in the dark room) open the door at back (D. fig. 1) and remove the diaphragm with spring (B. fig. 1.). Take a packet of films from the box, hold by the edges, gently withdraw the cardboard shield from in front of the first film, and place the packet within the magazine as shown in fig. 1.

Unwind the string from the hook, hold the packet of films and backings in position with the left hand, and with the right hand carefully loosen and withdraw the string by the hook. Repeat with a second packet of films, and replace the diaphragm. Close door. The camera is now fully loaded.

To Change the Film.—Move the handle H. from above downwards, as shown in figs. 2 and 3. Hold the camera with front tilted downwards, as

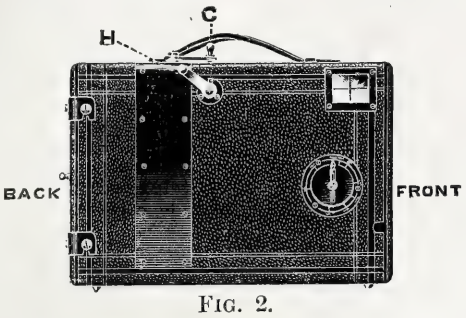


FIG. 2.

shown in figs. 1 and 3 and draw handle C. (fig. 2) smartly to the right out from the camera (fig. 3). Draw the handle C. (fig. 3) home, that is to say, to

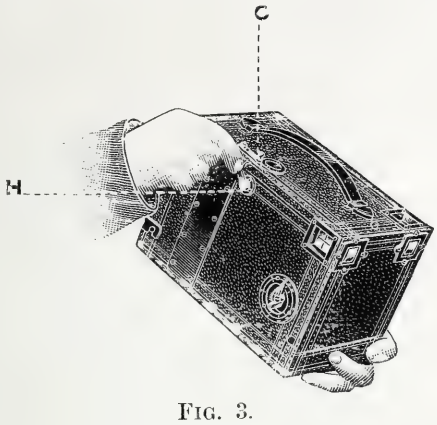


FIG. 3.

the limit of motion. This releases the exposed film. Push the handle C. back into position (C. fig. 2). This releases the backing. Move the

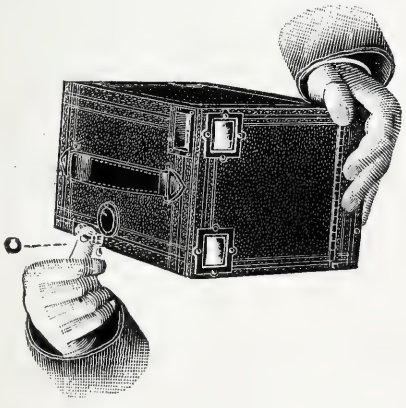


FIG. 4.

handle H. back to position, and on no account omit this between each change of film and backing. The flap must be closed after each change,

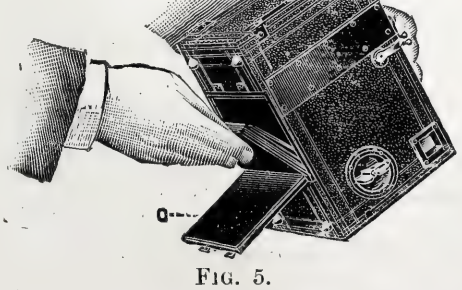


FIG. 5.

and you must never attempt to move the handle C. (fig. 2) before depressing the handle H. as shown in fig. 2. During the entire operation of changing the camera must be tilted downwards as indicated, or the film and backing will not drop into the well. The camera must never be pointed straight downwards in changing, but tilted as shown. When the camera is used horizontally it must be restored to the vertical position before changing. Changing must not be attempted with the camera held horizontally.

To Remove the Films.—The exposed films must be removed in the dark room only. The door below the camera (O. fig. 4) is opened, and the films and backings removed as shown (fig. 5). Separate the films from the backings, and develop in the usual way. Or, pack the exposed films face to face, without anything between, in clean brown paper, and place in an original box, until ready to develop.

Although specially adapted for cut films, it has occurred to us that the changing system does not debar the use of plates—a point that may be worth the consideration of Messrs. Ilford.

We welcome the Ilford camera as a sound, practicable, workmanlike machine, and are glad to perceive signs that it is but the forerunner of other instruments. It sells for £5 5s., and is full value. An extra quality camera is listed at £8 8s., which carries a Ross symmetric anastigmat lens, and a Lopra shutter.

Commercial & Legal Intelligence

THE Spoiled Snap-shot.—A West-end photographer applied to Mr. Marsham, at Bow Street Police Court, last week, for advice in what he said were peculiar circumstances. He explained that on Tuesday week he was employed by the proprietors of a Sunday newspaper to take a photograph of the King as his Majesty was leaving Buckingham Palace. He took a hand camera with him, and was fortunate enough to select the gate through which his Majesty passed. He was just photographing the carriage (which was a closed one) when a detective seized him by the arm, and shook it in such a way as to prevent him taking a good picture. He regarded the case as of some importance, and wished to know, for the guidance of himself and others in the same way of business, if the detective was justified in acting as described. Mr. Marsham: I am not inclined to express an opinion offhand. Have you been summoned? The Applicant: No, sir. It is a case of considerable importance to those connected with the press. Mr. Marsham: Perhaps you had better write to the Commissioner of Police. Were you causing an obstruction? The detective may have had instructions. The Applicant: I was causing no obstruction. There were not more than half-a-dozen people near the gate. The detective said I was taking an abominable and contemptible advantage of the King. He also informed me that I was a mean and contemptible cur. Mr. Marsham: Who was he? The Applicant: A Scotland Yard detective. He said he would make it warm for me in future. Mr. Marsham: You were interfering with the King-s privacy. I think it was arranged that his Majesty should go away as quietly and as privately as possible. The Applicant: It was a closed carriage. Mr. Marsham: It may have been against his Majesty's wish to take a photograph of it. You may have been considered by the detective to be interfering with his Majesty's comfort. The Applicant: I had no intention of doing so. Police-Sergeant Ford (warrant officer): This occurred outside our district, your Worship. Mr. Marsham: I think it was specially desired that the King should go away privately? The Applicant: I should like your advice for my future guidance. It is a case of some importance. Mr. Marsham: I cannot say much about it. If the case comes before me, I shall know how to deal with it. The detective may have been instructed to act as he did. You had better go to Scotland Yard.—"The Morning Post."

THE Teb Competition.—The following is the list of prizes in this competition:—Half-plate: First, £5 5s.; second, £3 3s.; third, £2 2s.; and twenty of 21s., £21. Cabinet: First, £5 5s.; second, £3 3s.; third, £2 2s.; and twenty of 21s., £21. Five by Four: First, £3 3s.; second, £2 2s.; and fifteen of 21s., £15 15s. Bullet, or 3½ by 3½: First, £3 3s.; second, £2 2s.; third, £1 10s.; and fifteen of 21s., £15 15s. Quarter-plate: First, £5 5s.; second, £3 3s.; third, £2 2s.; and thirty of 21s., £31 10s. C.-de-V., Nipper 2, or 3½ by 2½: First, £3 3s.; second, £2 2s.; and fifteen of 21s., £15 15s. Scout 2, F.P.K., Memo Frena, 3¼ by 2¼, or Brownie 2: First, £3 3s.; second, £2 2s.; and fifteen of 21s., £15 15s. Scout 1, Brownie, or 2¼ by 2¼: first, £2 2s.; second, £1 1s.; and twenty of 10s. 6d., £10 10s. Nipper 1, Bantum, or Pocket Kodak: First, £2 2s.; second, £1 1s.; and twenty of 10s. 6d., £10 10s. Midget: First, £2 2s.; second, £1 1s.; and twenty of 10s. 6d., £10 10s. Making a total of £231 9s. The rules are: (1) The Teb Photo Xmas Card Competition is free to all photographers, amateur or professional. Prints by any process may be submitted, and the subjects can be of any description, as each class of subject will be judged on its merits. (2) All prints must be mounted on or in one of the Teb Photo Xmas Cards taken from box purchased. (3) Prints which have been entered for competitions before and have won prizes will not be eligible for this competition. (4) A coupon will be included in each box of cards, which must be filled in and forwarded with the print. It must be quite understood that only one print can be submitted with each coupon. If the mount is of a paste-on type, the coupon must be pasted on the back of the mount. If a slip-in mount is used, the coupon must be pasted on the back of the print, and inserted together in the mount. (5) For prints which are required to be returned, there will be found a space on the coupon in which to mention same, and a stamped addressed envelope with the number of the coupon and size of print distinctly marked on the outside, must be enclosed with the print to

ensure the return of the correct print without delay. (6) In all cases the decision of the judges shall be regarded as final and without appeal. (7) Any number of prints can be submitted by each competitor, but each print must bear a coupon. Competitors cannot obtain more than one prize for any one size print, but may compete for prizes in each size. (8) All winning prints become the property of Messrs. Chas. Tyler and England Bros., Ltd., together with the right to reproduce them; but none will be returned unless stamped address envelopes are sent (see rule 5). (9) Prints must be received by Messrs. Chas. Tyler and England Bros., Ltd., 79, Copenhagen Street, King's Cross, London, N., not later than December 24th, 1902, and the small label attached to coupon must be pasted on the outside of wrapper. (10) The result of the competition will be published during the first fourteen days in January, 1903, in the "Amateur Photographer," "British Journal of Photography," "Photography," and the "Photographic Dealer." The judges are Messrs. R. Child Bayley (editor of "Photography"), Thomas Bedding (editor of the "British Journal of Photography"), Arthur C. Brookes (editor of the "Photographic Dealer"), and A. Horsley Hinton (editor of the "Amateur Photographer").

PHOS, LTD.—A winding-up order having been made on June 17th against this company, the usual meetings of creditors and shareholders were held last week at the Board of Trade offices, Carey Street, W.C., Mr. G. S. Barnes, Senior Official Receiver, presiding. Addressing the creditors, the chairman said that he had that morning received from the directors a statement of the company's affairs, in which the unsecured liabilities were estimated at £3,407, but that sum did not include large claims made against the company by certain omnibus proprietors. Claims of that character had already been made by Thomas Tilling, Ltd., for £1,964, and by the London General Omnibus Company, Ltd., for £6,000. The liabilities on debenture bonds amounted to about £5,000, while the assets were estimated to produce £6,614. A question would arise as to whether or not the debentures were duly registered in accordance with the provisions of the recent Act, but assuming that they were valid it seemed that there would be practically nothing left for the unsecured creditors. The business of the meeting was to appoint a liquidator. Mr. Beyfus, on behalf of the trustee for the debenture-holders, who was in possession of the company's assets, stated that there would not be sufficient to satisfy the claims of debenture-holders. The creditors resolved that Mr. F. D. Leslie, accountant, should be nominated to the post of liquidator of the company. At the shareholders' meeting the chairman reported that the company was registered on April 29th, 1901, with a nominal capital of £30,000, which was increased in May, 1902, to £60,000. It was formed to acquire the business of the Phos Acetylene Gas Syndicate, Ltd., which was registered in August, 1900. By an agreement dated April 29th, 1901, the company agreed to purchase the whole of the syndicate's undertaking, to discharge its debts (£755), and to allot to the syndicate or its nominees £15,000 fully-paid shares in the company. No valuation of the syndicate's property was obtained, the terms of the purchase having been fixed by the directors and shareholders of the syndicate. The whole of the original capital of the company was issued (including the £15,000 issued as fully paid to the syndicate), and shares were taken up by shareholders in the syndicate and by persons introduced by the chairman. On July 29th, 1901, an agreement was entered into under which the company acquired the exclusive licence to manufacture (under patent rights granted to Mr. T. G. Allen) generators of acetylene lighting and heating for a term of four years. The principal part of the business of the company was the lighting of omnibuses, for which a considerable number of lamps and generators were made, a stock of about 5,000 being now in hand. Contracts for lighting were entered into with the following omnibus companies:—The London General Omnibus Company, Ltd., Thomas Tilling, Ltd., the Westminster Omnibus Association, the Victoria Omnibus Association, the Atlas and Waterloo Omnibus Company, the Star Company, and the Camden Town Company, the average contract price being 2s. a lamp per week. Owing, as the secretary stated, to the neglect of the omnibus employees to give proper attention to the lamps, the supply of carbide was exhausted, and the light failed sooner than should have been the case, the result being that journeys were lost by the omnibus proprietors, who consequently made heavy claims for damages against the company. In March, 1902, the company gave notice of their intention to terminate the contracts and discontinue the lighting. The failure of the company was attributed by the secretary to the unsuccessful termination of the lighting contracts. The shareholders were unanimously in favour of the Official Receiver's continuing to act as liquidator of the company, and the chairman intimated that this difference of opinion as to a liquidator between the creditors and shareholders would be reported to the Court for settlement.

THE Application of Science to Industry.—Interesting, if in some respects depressing, reading is provided in the report presented by a sub-committee of the Technical Education Board to the London County Council at its meeting on Tuesday, July 15th. The sub-committee had been appointed several months ago to inquire and report "as to the need and present provision for special training of an advanced kind in connection with the application of science (especially chemistry and electricity) to industry." The importance of the report may be estimated from the names of the witnesses examined, as well as from the actual signatories. Verbal or written evidence was given by twenty-six scientists or manufacturers of the highest position, including Sir W. Ramsay, Sir Bernhard Samuelson, Sir Henry Roscoe, Professors Dewar, Perkin, Meldola, Ayrton, Armstrong, Dr. Clowes, Dr. Thorpe, Mr. J. W. Swan, Mr. Thos. Tyrer, Mr. B. S. Rowntree, Sir Arthur Rücker, and other equally distinguished chemists, physicists, and manufacturers. The sub-committee included Sir Philip Magnus, Dr. Leaf, the Rev. R. S. de C. Laffan, and other educational experts, with Mr. H. J. Powell as chairman and Dr. W. Garnett as secretary. The sub-committee gave particular attention to (1) the loss of business in the United Kingdom, so far as it is owing to inferiority of scientific training; (2) the nature of the training required, the present provision of such training in England, and especially in London, together with the means of bringing the training within reach of those who require it. The loss of business in the department of manufacturing chemistry is particularly dealt with; of this the most conspicuous instance is in the manufacture of the aniline dyes and coal-tar products generally. "The original investigations and discoveries on which this industry is based were made almost entirely in England, and the manufacture was largely carried on near London, which, owing to its gasworks, is the largest producer of the raw material. From 1858 to 1872 the United Kingdom made more coal-tar colours than any other country. The business has now practically passed out of our hands, not a thousand workpeople being employed in it in the United Kingdom The raw material is exported, to return to us again in more costly form. . . . Of the colouring matters used by the Bradford manufacturers, about 80 per cent. is now of German manufacture." "Madder and cochineal," says Mr. A. G. Green, "have been replaced by alizarine and azo-scarlets, the employment of many dye-woods has greatly decreased, whilst logwood and indigo are seriously threatened." The complete capture of the indigo market by the synthetic product, which would mean a loss to our Indian dependencies of £3,000,000 a year, is regarded by the Badische Company as absolutely certain. Several witnesses express the conviction that if Hofmann, who so greatly enlarged the field of knowledge opened up by the discoveries of Dr. Pekin, could have been induced by pecuniary considerations to remain in England, the bulk of this immense industry would have remained in our hands. Most of the witnesses are agreed in condemning the ignorance and apathy of the manufacturers, who "preferred a knowledge of the benzol market to a knowledge of the benzol theory," while the restrictions of the patent laws are also held to be in a measure, but not by any means wholly, responsible. It is pointed out, too, that among other far-reaching effects, "the coal-tar industry in Germany has given birth to the manufacture of sulphuric anhydride, of synthetic medicinal agents, perfumes, sweetening materials, nutritives, photographic developers, and antitoxins." Other branches of manufacturing chemistry have been equally seriously affected. The adaptation of condensing plant to the Westphalian coke ovens has rendered Germany independent of English tar and ammonia; by the development of the ammonia-soda process she no longer requires English alkali. This process was discovered in England by Dyer and Hemming, who were unsuccessful in their attempts to put it on a practical basis. The process, as now worked by Brunner, Mond, and Co., was invented by a Belgian chemist, in consequence of his superior knowledge of chemical engineering. The report refers to another typically English industry which has been similarly lost, i.e., the manufacture of fine glass for scientific and optical purposes. "A generation ago the bulk of this manufacture was in English hands. After long-continued experiments in the laboratory, German chemists have succeeded in introducing such modifications in the manufacture of optical glass that the opticians have been enabled to place on the market lenses approaching more closely to mathematical perfection than any previously manufactured in this country." Several subsidiary industries have been created in Germany, such as the manufacture of thermometers for accurate measurements, of X-ray tubes, the manufacture of lamp-chimneys warranted not to burst, and of boiling-flasks warranted not to crack. As a result of the liberal and repeated subsidies made by the Prussian Bureau of Education and the Legislature for experimental purposes, "the manufacture of high-class lenses for photographic cameras, microscopes, telescopes, and field-glasses, as well as of thermometer-glass tube for accurate measurements, has practically been lost to this country, and the bulk of these articles is now imported from abroad." With regard to the second main point which occupied the attention of the committee, the state of scientific education in this country, valuable statements and recommendations are made in the report. The main causes of failure are said to be (a) the lack of scientific training of the manufacturers themselves; (b) the defective state of secondary education; (c) the insufficient supply of young men thoroughly trained, not only in scientific principles, but in their application to particular industrial processes; (d) the lack of any sufficiently equipped and endowed institution for advanced technological training. As remedies, the report recommends improved teaching in the secondary schools; less attention to the hampering restrictions of the exigencies of particular examinations; the reduction of the fees in the existing colleges in London to £20 a year; and improvement in their equipment and accommodation by a system of co-ordination. There is a general opinion among the experts consulted that there is a great need for an institution devoted to post-graduate study in advanced technology, applied science, and original research. The chemist, it is stated, should have a general knowledge of engineering, and the engineer of chemistry. A course in chemistry of at least five years (some professors recommend six years even) is considered essential for those who are to be leaders of chemical manufacture. Such a course requires endowment: scholarships for such post-graduate study are regarded as a sine quâ non, and while the sub-committee press no specific recommendation as to whence the money should proceed, they express a strongly-worded hope that in a mater of such national concern something may be done, out of public or private funds. Satisfaction is expressed by more than one witness at the creation of a new chair of organic chemistry in the University of London—the only previously existing chair devoted to that branch of chemistry being at Owen's College, Manchester. Those who have worked at the laboratories in Bloomsbury Square under Professor Collie will be glad to hear that the post he is to fill is one of the greatest responsibility and importance.—"The Pharmaceutical Journal."

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

July.	Name of Society.	Subject.
26.....	Birmingham Photographic	Half-day Excursion to Westwood Park and District. Conducted by Mr. Harry Goode.
26.....	Croydon Camera Club	Third Annual River Excursion. Organiser, Mr. Ben. E. Edwards.
30.....	North Middlesex Photographic	Technical Meeting.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JULY 17TH.—Mr. H. C. Rapson in the chair.

Mr. Furley Lewis showed the negative and a bromide enlargement of a night view in Piccadilly Circus, showing the buildings illuminated by the electric light. As stated last week, the plate was exposed about five minutes, in bits during some seven or eight minutes, in order to avoid the traffic. The plate was backed with Indian ink, a medium which has answered very well in this speaker's hands.

Mr. P. Everitt said that he had photographed the Canadian Arch, with its illuminations, giving an exposure at f/7 of four seconds, but he thought fifteen would have been better. There was, however, a fair amount of detail, and the print showed what a short exposure with such subjects would produce.

Mr. Henderson advised Mr. Lewis to apply ferricyanide to the negative he showed; he was sure the result would be much improved. He thought a great deal of the backing mentioned by the first speaker, but said that with the plate mentioned as being used (Paget XXXXX), no backing was required.

Mr. J. S. Teape showed negatives of a geometrical design on backed and unbacked plates in illustration of the value of backing as a preventive of halation. The unbacked plate received an exposure of 1in. of magnesium at 12in., and was quite spoiled by the halation. The backed plate (having but a thin wipe of backing) received at the same distance the light of 12in. of magnesium, but there was no trace of halation. Both plates were developed with hydroquinone.

Mr. Henderson said that an efficient backing could be made of lampblack, with a little caustic soda to remove the grease, and a little metagelatine as the vehicle. It was not common knowledge, he thought, that a weak solution of gelatine coated upon the back of the plate prevented halation to a large extent. This backing, of course, had no coloured matter in it. He did not for a moment suggest that it should be adopted in preference to orthodox backings, but mentioned it for its scientific or practical interest.

Mr. J. S. Teape said that some time ago the last speaker had referred to the addition of sulphides to the developer for brown tones. Mr. Teape had first tried two minims of ammonium sulphide per ounce of pyro developer, but only succeeded in fogging the emulsion without any noticeable change of colour taking place. The sulphide reduced to quarter-minim per ounce still fogged the plate, as was seen in an example passed round. The conditions under which Mr. Henderson conducted his experiment being yet unpublished, it is, of course, of no avail to judge his method by the present experience.

NORTH MIDDLESEX PHOTOGRAPHIC SOCIETY.

JULY 16TH.—Mr. J. W. Marchant gave a lecture on "Platinotype" for beginners.

He set forth the simplicity of the process, and told what precautions were necessary for success. He developed a number of prints supplied by the Platinotype Company, and also some of his own, and gave some to those who had not used the process before, to develop at their own homes.

SOUTHAMPTON CAMERA CLUB.

THE members of the above-named Club held their fortnightly meeting at the Philharmonic Hall, on the 21st inst., under the presidency of Mr. G. Vivian, when Mr. S. G. Kimber gave a demonstration on the Platinum Printing Process. The demonstrator very ably enlarged on the expeditiousness, simplicity of working, artistic effectiveness, permanency, and comparative cheapness of the process, and gave very useful practical demonstrations by developing and clearing a number of prints and explaining the formula. A large number of very excellent specimens, illustrative of the process, were passed round for inspection in conjunction with a number of bromide specimens for comparison. Mr. Kimber then gave a demonstration of a new toning process for the production of platinum prints of various brown to golden tints with a warm bath, the formula, which is not yet generally known, being given. The prints produced by this process were very beautiful, and were highly commended, the results being pronounced to be all that could be desired. The new printing-out platinum paper was also demonstrated with. It was, however, observed that this process is really a reintroduction, having been brought out several years ago. The demonstration was highly appreciated, and a thoroughly-earned vote of thanks was accorded to Mr. Kimber, who briefly acknowledged the same.

News and Notes.

THE Albion Albumenising Company, 128, Sauchiehall Street, Glasgow, send us their illustrated catalogue of photographic apparatus, appliances, and chemicals. It occupies over 150 pages.

THE new catalogue of the Tella Camera Company, 110, Shaftesbury Avenue, W.C., contains, amongst other new features, a useful photographic guide to London. The catalogue sells at 4d.

THE Photographic Club, Anderton's Hotel, Fleet Street, E.C.—There will be an exhibition of pictorial photographs by members of the club, on July 30th, at 8 p.m.

MESSRS. O. SICHEL AND CO., of 52, Bunhill Row, London, E.C., send us their latest illustrated trade price list of photographic apparatus, materials, frames, etc. The list extends to over eighty pages.

THE "Handy Guide to Photographic Requisites" is the title of the price-list of photographic apparatus, materials, and pure chemicals issued by Messrs. Reynolds and Branson, Ltd., 14, Commercial Street, Leeds. It occupies nearly 100 pages.

FROM a report which has reached us, the South Londoners visiting Ireland are being favoured with ideal weather. Coupled with a plethora of subjects upon which to expose, many good results should be shown during the coming season.

FROM Messrs. Gold, Smith, and Co., "dealers in everything photographic," we have received a catalogue of photographic mounts, albums, cameras, and sundries. It occupies 174 pages, is well-produced, and lists a large variety of photographic material.

MESSRS. ROSS, LTD., 111, New Bond Street, W., have issued an abridged catalogue (1902) of lenses and photographic apparatus. A feature of the book is found in the particularly fine illustrations from negatives by Mr. J. A. Sinclair, Mr. Fellows Wilson, Mr. Walter Burke, and others.

WE have received an advance press copy of the Great Eastern Railway Company's freshly-illustrated "Tourist Guide to the Continent," published at the price of sixpence. Among its new features are particulars of the new tours in the Tyrol, express services to Norway, Denmark and Sweden, via the Royal Mail Harwich-Hook of Holland Route, of new tours in the Luther Country, and Thuringian and Hartz Mountains, a series of Continental maps, and a chapter—"Dull Useful Information"—giving particulars as to the cost of continental travel.

THE Photographic Camp, which is pitched upon Glover's Island, near Hampton Ferry, Evesham, was duly opened on Thursday last, with Captain Walter D. Welford in charge. Amongst the campers are lady and gentlemen amateurs from Oxford, Morecambe, London, etc. The first few days proved exceedingly fine as regards the weather, but even the wet Saturday evening offered no bar to the enjoyment. Hand cameras have been very much in evidence, other amusements being cricket, swimming, boating, fishing, washing up the dishes, etc. The first camp, although not large, is a very distinct success.

A FIRST list of photographic reproductions to be purchased at or from the Bodleian Library, Oxford, is now ready. None of these reproductions can be given away or exchanged for similar reproductions issued by other libraries, and orders by post must be accompanied by a remittance which shall include the cost of transmission. The issue of such reproductions by the Bodleian has only lately begun. To what extent it can be continued depends (1) on the amount of support given to it, particularly by other libraries, and (2) on the amount of time which the librarian can find for selection and annotation. As regards the Palæographical Collotypes, he makes a special appeal for the support of other libraries, since there is no chance of their being bought by the general public in numbers sufficient to cover the cost of a negative and even twenty copies.—"The Publishers' Circular."

AN exhibition of portraits and ideal heads by Carl J. Blenner, of New York, is now on view at the Graves Galleries, 6, Pall Mall, S.W. We have so repeatedly advised photographers, whenever a good opportunity presents itself, to go and see the works of their brother artists, that we feel more than justified in bringing this exhibition to their notice. There are eighteen works exhibited, and a careful study of each of the pictures cannot fail to be of very great interest to the photographer who claims to give artistic treatment to his subjects. The work exhibited shows most careful execution and good taste in arrangement and posing. The expression is invariably one of sympathy, which is most agreeable to the person looking at the picture. The technique exhibited by Mr. Blenner is of a high order, and the individuality of each sitter has been carefully studied, with the result that a pleasing harmony pervades each picture. The colouring is rich, though never too high, and the flesh tints are particularly good. The hands are well managed, and in the head-and-shoulder studies one is usually introduced either holding some flowers or resting on the drapery. The introduction is pleasing, as it takes away from the bareness of the picture and gives the effect of a softer balance. A favourite method of Mr. Blenner is to allow the hair to hang down over the far shoulder, thus using it as a background to emphasise the outline, and leaving the near shoulder bare to give full strength to the model. The lighting is excellently handled in each case, and the backgrounds, being very simple, set off the work to the best effect. No. 13, "Sylvia," pleased us the most, the slight forward bend of the body and the backward poise of the beautiful head, together with a most sympathetic treatment and softness of colouring, will make us long remember this charming specimen of Mr. Blenner's art. No. 14 follows very closely on the above, but all the others are charming, and we leave it to the visitor to decide which he fancies the most. We will close by stating that many of the specimens exhibited could be produced by pure photography in the hands of the right man, barring the colouring. On this account alone we strongly advise those of our readers who can do so to visit Messrs. Graves' galleries.

THE Use of a Simple Camera for the Purposes of Surveying.—It is rather surprising that photography has not made greater advances in its application to surveying purposes. The chief advantages of photographic surveying are that the data in the form of photographic plates can be obtained very quickly, and this in a region subject to much rainfall is a very important one. The disadvantages of the photographic method have been chiefly in the great amount of office work necessary to prepare the maps. The instruments that have hitherto been constructed have been generally very complicated, and in addition to being expensive are liable to get out of order. The main point kept in view in designing this camera has been simplicity of construction and of such a portable nature that it will not be a burden to carry it in mountainous districts. The camera consists of a fixed focus-box, provided with a good lens, which is as free as possible from optical distortion. The principal point to be observed in the construction of a camera for surveying purposes is that the focus length should be the same in taking all the pictures, otherwise there will be no unit of distance upon which to base the distances to be measured in the photographs taken. At the back of the camera and immediately in front of the photographic plate is a metal frame, which contains marks which indicate the line of the horizon and a line at right angles to it, which furuishes the system of axes, to which all the measurements on the plate are referred. By the substitution of these measured distances on the plate in a simple line or formula, the distances of objects several miles away can be accurately determined. The camera has been tested by going outside of the city about four miles and photographing prominent objects in the city, and the distances so obtained have come close to the distances determined by the much more laborious and expensive methods of triangulation. The chief use of a simple and portable instrument of this kind is in a region which is very mountainous, and it is desired to rapidly obtain a reconnaissance map of some accuracy. The instrument will be put to this test in an exploration trip in the Rockies of BritishColumbia during the coming summer.—HOWARD W. DUBOIS, in the Journal of the Photographic Society of Philadelphia.

SCIENCE in America.—From time to time the status of pure science in America is made the subject of more or less acrimonious discussion. One of the most trenchant opinions which has been delivered in some time on the subject comes from the pen of Prof. Carl Barus, of Brown University, who writes in a recent number of "Science" with a candour that is refreshing. Among other things, our self-distrust is sharply criticised. We are not quite certain that we have among us a great savant until we are told so by foreign scientists. Contrasting the reception accorded to a German scientist in Germany and a French scientist in France, it must be confessed that we treat our own men rather shabbily. Whenever he reads a scientific paper before some learned society, the German chemist or biologist, figuratively speaking, takes off his hat to the work of his countrymen. The Englishman waxes enthusiastic over results achieved by British men of science, and a Frenchman will pay many a graceful compliment to some scientific compatriot who has worked in the same field. That science should know little or nothing of patriotism may be true enough. The pessimistic Schopenhauer even went so far as to declare in his clever, bitter way that patriotism in science was bpt another form of bigotry. But if Ancient scientists should not flaunt the stars and stripes in the face of the foreigner, yet they should at least take a certain pride in what their countrymen have accomplished. For Americans the aristocracy of science resides in England, although it cannot be denied that the Continent too has its attractions. Professor Barus tells us that our scientific men are apt to outgrow, first the American Association, then the National Academy, and finally even their own country. All this may seen to point to a well-devised scheme of gradation. But the question arises: Can we ever hope to reach intellectual maturity in the eyes of the world if we belittle the dignity of our own institutions? Self-confessed incompetency, says Professor Barus, may be a virtue, but one should at least first be sure that the incompetency really exists. Although we cannot agree with the Professor in believing that if Europe were to close her gates to American scientific research, no greater blessing could befall us, we do believe that American achievements in scientific research should receive as full a meed of recognition in this country as they do in Europe.—"The Scientific American."

SOME Little-Known Effects of Light.—About 1889, Shelford Bidwell succeeded in producing magnetic polarity in a piece of soft iron by causing a beam of light to fall upon one end of it. The iron was prepared by magnetising it and then reversing the current until the magnetism disappeared. When this state was reached it was very susceptible to the influence of mechanical vibration as well as to light. Two years ago an American investigated this and confirmed Bidwell's results. The second effect of light discussed was its pressure. In 1631, Kepler explained the repulsion of the tails of comets from the sun as due to the pressure of sunlight. At that time the emission theory of light was in vogue. In the next century Euler likewise held to the belief that light exerts a pressure, though he was an advocate of an undulatory theory. About the middle of the eighteenth century, experiments were made to establish the pressure of light, but they failed. In 1873, Clerk Maxwell, in his epoch-making treatise on electricity and magnetism, asserts that light exerts a pressure, and that the pressure due to sunlight upon a surface of 1 sq. ft. is equal to the weight of .0000000882lb. In general, he calculates that the pressure upon a square unit of area is numerically equal to the energy contained in one cubic unit of the incident beam of light. Three years later, Bartoli, reasoning from thermodynamics, reached just the same conclusion as Maxwell. In November, 1901, there were published two articles giving accounts of the actual measurement of the pressure of light. In both vanes were suspended by a vitreous thread in a vacuum, and when the light fell upon the vane it turned, being thrust away by the beam. Both observations—those of Lebedew in Russia, as well as those of Nichols and Hull in the United States—showed that there was a reasonable agreement between the amount of the pressure as calculated from the intensity of the incident radiation and that calculated from the elasticity of the suspending thread. We have, therefore, good experimental evidence, not only that light does exert a pressure, but that its amount is that given by Maxwell's rule. The pressure of sunlight is about .6mg. per m² or about 3.4lb. per sq. mi. when the light is absorbed. It is twice as much when reflection takes place. If a cube of water 1cm. on a side is exposed to sunlight so that the latter strikes one of its sides perpendicularly the attractive force of the sun in 10,000 times as great as the thrust away from the sun due to the sunlight. Diminish the cube until each side is half as long as before. Now the attraction of the sun sinks to $\frac{1}{8}$ of what it was before, while the pressure of light is $\frac{1}{4}$ of its former value. It is thus seen that as the dimension grow less the sun's attraction falls off more rapidly than does the pressure of light. If, therefore, the lessening of size be carried far enough, a cube will be found for which the pressure of light just balances the attraction of the sun. This occurs when the cube is .0001cm. on a side. For a sphere, the equality of the two forces is reached when the diameter is .00015c. If vapour be formed from a comet, and afterwards condense in spherules smaller than this, they would be driven from the sun by the pressure of its light. Conditions might arise such that more than one size of drops be formed. Then the comet would have more than one tail, and as the relation of attraction to pressure changes with the size of the drop, the curvature of the tails would be different. Should the drops be larger than the critical size given above, attraction would preponderate and the tail would curve toward the sun. There seem to be some difficulties in the way of accepting this explanation of comets' tails.—GEORGE FLOWERS STRADLING, in the Journal of the Photographic Society of Philadelphia.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

THE DETENTION OF SPECIMENS.

To the Editors.

Gentlemen,—I noticed in last week's Journal a complaint from "Viro." I, too, have had the same experience. Some little time ago I made application to a photographer in the North, I received no reply for nearly a fortnight, and then it was to say he was satisfied. Another application I made through your office was returned without a word inside, after keeping the specimens for a week. I made another application last week. The photos have just been returned to-day to say "I have settled." This is really too bad for an assistant, who is out of work and only has one set of specimens. I hope all who see these letters in your Journal will return specimens within a day or two, as it is very inconvenient to we assistants.—Yours truly,

B. L. C.

THE DISCOVERER OF COAL GAS.

To the Editors.

Gentlemen,—Both Murdock and Minckelers doubtless deserve the honour of being tableted and monumented (as you remark, on page 563), for applying coal gas to practical purposes.

But it seems to me that to call either of them the original producer of gas indicates a distinctly flatulent disposition on the part of their Belgian and Cornubian admirers. As a suitable corrective, one ventures to prescribe Dr. Clayton's letter to Boyle in the Transactions of the Royal Society for 1739, for it appears that, as early as 1688, or thereabouts, this Dean succeeded in evolving gas—coal-gas, that is to say, for I know nothing about his pulpit oratory.—Yours truly,

J. DORMER.

July 18th, 1902.

CINEMATOGRAPHY IN NATURAL COLOURS.

To the Editors.

Gentlemen,—My attention has been directed to an article "The Coronation Disappointment," appearing on page 523 of the July 4th issue of your Journal, which I have perused. It appears that this article is directed against the Warwick Trading Company. While no name is mentioned, the trade nevertheless perfectly understand to whom portions of the article refer. For your information I beg to advise that we have produced a representation of the Coronation for the benefit of provincial and Colonial people, in order to give them some idea of the ceremony. We have gone to considerable trouble, and have spent a large sum of money in producing this picture as accurately as possible, and have received the sanction and assistance of the officials, without which assistance we could hardly have anticipated so correctly the order of the ceremony, nor have been able to reproduce

the robes, regalia, and Abbey arrangements. It was far from our purpose to place this film on the market other than as a representation of a rehearsal of the Coronation, and we consider the intended slur in the article unjust to us.

Furthermore, with reference to the taking of the Coronation procession in natural colour, we regret that, whoever is responsible for this article, he allowed his ignorance of the progress made by us in colour photography applied to cinematography to commit such ignorance to print. If you had taken the trouble to investigate, it would have afforded us much pleasure to enlighten you on these matters. We enclose herewith a clipping of a positive print made from the first negative taken through the three-colour screens, with an exposure of 1-32 of a second, through the red screen. If this is not convincing to you, we shall be pleased to project the results on the colour machine. We did not intend to make this public until we had got the invention into marketable shape; but rather than allow you to wallow in ignorance in these matters we think it only charitable to enlighten you, if possible, in order to avoid a similar error in future on behalf of the writer of the article. However, we demand that you publicly retract the inference conveyed in your article as to the impossibility of the production of animated pictures in natural colour, and a letter of apology to us. With reference to looking to cheap advertisement by conceiving of "an outrageous unfeasibility," for the purpose of attracting free newspaper paragraphs, we beg to advise you that we are particularly sensitive to a "stab" of this nature, as we are beyond such small practices. We were under the impression that the BRITISH JOURNAL OF PHOTOGRAPHY was an organ devoted to the advancement of photography, and not one to hold up to ridicule a stride forward, simply because it was unable itself to conceive of the great progress we have made in colour photography. A little investigation and probing into the truth of matters before committing a like error in future is a bit of advice we give you gratuitously, and may save you a lot of trouble.—Yours very truly,

C. URBAN, Managing Director.

The Warwick Trading Company, Ltd., 4 and 5, Warwick Court, High Holborn, London, W.C.
July 10th, 1902.

[Mr. Urban is offended with us, apparently, because we used, in relation to these made-up Coronation films—which, by the way, are not peculiar to his firm—the word "travesty," and he has kindly sent us an enlargement of one of these pictures of Westminster Abbey, in which the entire breadth of the nave is filled in by six young ladies, packed as closely together as they would be in an omnibus! We now learn from his letter that the film was put forward as a representation of a *rehearsal* of the Coronation ceremony, but his circular states that it is "supplied to the trade on and after Tuesday, June 24th, on condition that same is not exhibited before Thursday, June 26th." If only a rehearsal, why this restriction as to date? Our note concerning colour photography was prompted by a paragraph in one of the daily papers—which Mr. Urban endorses by reproduction in the circular referred to—to the effect that it was intended to take pictures of the Coronation procession "at the rate of one-seventieth of a second, alternately through red, blue, and green screens." If Mr. Urban has succeeded in reducing exposure through the red to this small fraction of a second, he has certainly beaten all previous records.—EDS. B.J.P.]

To the Editors.

Gentlemen,—My attention has been called to a letter in your issue of July 11th, signed by Mr. Turner, and contradicting a "serious misstatement" of yours concerning cinematography in natural colours. It is my business as a specialist in animated photography to keep abreast of the times and to be familiar with every new advance in the science which is made or mooted. Possibly my evidence may throw some light on the difference of opinion.

Your correspondent appears to be mistaking the means for the end, and to suppose that the production of a tricolour record constitutes an animated photograph in natural colours. The difficulties in producing even the tricolour record are so great—owing to the very limited exposure which must be given—that it is, practically speaking, impossible to obtain a pure red-sensation image. Every three-colour worker realises the primary importance of colour filters, which are dyed deeply enough to extinguish all but their own respective colour-rays, and that necessitates a longer exposure than is at present possible in cinematograph work. We are, therefore, limited to pale tints for our colour filters, and with the abandonment of our pure screens we forfeit our claims to all but a vague suggestion of the rich colours of nature. But the difficulties of *taking* the colour record fade to nothingness compared with the difficulties of *projecting* it upon a screen. Take the analogous case of projection chromoscope, originated by Ives, of Philadelphia. He had everything in his favour. Plates to work with instead of films, and plates are far more rapid, unlimited exposure and simultaneous projection. His colour records were each nine times the size of the corresponding record in cinematography. Each stood on the screen continuously, whereas, in our case, the different colour impressions have to take their place in turn, and even then they are separated by a period of darkness covering the change of pictures. Here he would gain an advantage of, roughly, six times the luminosity of the animated picture. Without counting the considerable difference in transparency between celluloid and glass, it is obvious that Ives had fifty-four times as much light to work with, other things being equal. Yet with a powerful arc lamp his pictures did not exceed a few feet in diameter. Can it be fairly denied that your editorial paragraph was correct in saying that, up to the present, animated photography in colours is impracticable? You naturally—and, I think, rightly—looked at it from the point of view of the spectator. It cannot be granted that a natural colour animated photograph has been produced until it has been thrown upon a screen of reasonable size. The light difficulty is not the only one by any means, but it will suffice.—I am, yours, etc.,

July 21st, 1902. CECIL M. HEPWORTH.

A DISCLAIMER.

To the Editors.

Gentlemen,—Owing to a great deal of misconception in the photographic world, I would be much indebted to you if, for the general information of your numerous readers, you would kindly allow me a little of your valuable space, to plainly state, once for all, that even before the erection of my present studios, I had ceased all interest and connection with my former address—The Nook, 1, Titchfield Road, Regent's Park. That the "trade name" of "Madame Garet-Charles" was ever since entirely discontinued, and that, if any person makes use of my name in any way, it is done without authority and sanction from me.—Thanking you in anticipation, I am, dear Sirs, yours faithfully,

GEO. GARET-CHARLES.

The Nest, 49, Acacia Road, Regent's Park, N.W.
July 14th, 1902.

WARNING TO PHOTOGRAPHERS.

To the Editors.

Gentlemen,—I shall be obliged if you will give publicity to the following case of theft and fraud. On Wednesday last an individual called and asked to see me. He was asked to sit down, I being engaged at the time. On going to inquire the nature of his business, he politely lifted his hat, and, with an effusive smile, asked if I wished to engage a canvasser. I said, "No," and after a few moments talk he departed.

Now for the sequel. On Saturday afternoon a gentleman called to have a group taken, having made, he told me, an engagement with my canvasser. It appears this individual, taking advantage of my momentary absence from the reception-room, stole some of my account forms, and, passing himself off as a canvasser in my employ, succeeded in swindling this gentleman out of 8s. 6d. The receipt he gave on my account forms is signed, C. Gordon, artist. He informed me that he had just left a firm of Glasgow photographers. Description: Height, about 6 feet, wearing black morning coat and vest, light tweed trousers, light dented tweed hat, clean shaven, English accent, and drops his h's. Any information regarding this man will be gladly received by me, or chief constable, Burgh Police, Dumfries.—Yours truly,

ROBERT DAVIDSON.

Studio, English Street, Dumfries.
July 21st, 1902.

*** The key to the Convention Group is unavoidably held over till next week.

*** NOTICE TO THE TRADE, WHOLESALE AGENTS AND BOOKSELLERS.—*A Contents Bill is issued with each number of the* JOURNAL, *and copies may be had on application to the Publishers.*

*** NOTICE TO ADVERTISERS.—*A Revised Tariff for advertisements in the* JOURNAL *is now in force. Blocks and copy are received subject to the approval of the Publishers, and advertisements are inserted absolutely without condition, expressed or implied as to what appears in the text portion of the paper.*

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Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY, 24, *Wellington-street, Strand, London, W.C.*" *Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

PHOTOGRAPHS REGISTERED:—

J. Ramsden, 63, Granby Street, Leicester. *Three photographs of kittens with boots and brushes.*

T. S. Davis, Corn Market, Halifax. *Two photographs of Parish Church, Halifax.*

H. H. LEE.—Very good.

GEO. FRANKLIN (Lucerne).—The "Moniteur de Photographie," published at 55, Quai des Grands Augustins, Paris.

VARNISH FOR FERROTYPES.—"PHOTO" writes: "Can you give me the formulæ for making varnish for ferrotype dry plates?"—In reply: Dammar varnish is what is usually employed for glass positives and ferrotypes. A good formula is an ounce-and-a-half of dammar dissolved in a pint of rectified benzol. If it is a little too thick, add a little more benzol.

FERROTYPE PHOTOGRAPHY.—J. BENGHIAT AND SON write: "Do us the favour to inform us where can we get a book dealing in dry collodion photography, as we want to study this branch for the purpose of making ferrotype dry plates."—In reply: You cannot do better than get Abney's book, "Photography with Emulsions." It may be had through any of the dealers or booksellers.

COPYRIGHT.—"ALPHA" writes: "Can you tell me whether English copyright of photos extends to books published in America; if not, what course must be adopted?"—In reply: English copyright does not extend to America. There anything published here can be copied without let or hindrance. We are not familiar with the copyright law of America; but we think that works made copyright there have to be printed in the States.

PHOTOGRAPHING CUT FLOWERS.—C. J. E. writes: "Will you tell me what you consider the best book on photographing (cut) flowers? If there is no book on the subject, could you refer me to any articles?"—In reply: There is no book published on the subject. The matter is simple enough. Arrange the flowers artistically, and use orthochromatic plates, and a colour screen, if the colour of the flowers require it.

BROMIDE PRINTING.—R. W. WICKS writes: "Can you inform me if there is a machine on the market for printing on bromide papers in continuous lengths? I am acquainted with some of English make, but they do not appear to be satisfactory, and I write to ask if you know of anything in this line of German or American manufacture."—In reply: We know of no machines for the purpose on the market, of either German or American make.

ADDRESS WANTED.—"PAPER-WEIGHT" writes: "Will you be good enough to give me the address of a firm who manufacture glass paperweights, suitable for photographic purposes? I require some of convenient shape, to take photographs 2¾in. square. I may add that I have tried to obtain them from Messrs. Marion, Fallowfield, and Houghton without success."—In reply: We think you will be able to obtain them from Messrs. Faudell Phillips and Co., Newgate Street, E.C. If you cannot obtain them from that firm, we cannot say where they are to be got.

CAMERA WANTED.—H. CARRIGG writes: "I should esteem it a favour if you could answer, through the columns of your paper, the following:—I want a hand camera, 5 by 4, RR lens, to hold 12 plates, means to take out as many as are exposed without interfering with those unexposed, and not to cost more than, say, £4. I should like to know a reliable make, and where to get same."—In reply: It is, as we have often said, against our rule to recommend any particular maker's goods. Your best way will be to get price-lists from different makers, such as Houghton's, Adam's, Fallowfield's, and the like. We may mention that the price you name is a very modest one, seeing that a high-class RR lens alone comes to about the sum you propose to expend.

BLEACHED LAC.—D. LAWTON writes: "In your issue of March 29th, 1901, page 197, the following reference is made to a certain German bleached lac. The article is entitled 'Lac Varnishes for Gelatine Negatives':—'We have, however, had a sample of bleached lac that was entirely soluble in spirit, and gave a perfectly clear and transparent solution. It was obtained in Germany, and evidently by treatment in the bleaching the insoluble portion had been removed.' I shall esteem it a favour if you will kindly give me the name of the German manufacturer of this article, so that I can get a supply."—In reply: We do not know the manufacturers of the bleached lac in question. It might possibly be obtained through Liesegang of Düsseldorf, or Romain Talbot, of Berlin.

COPYRIGHT.—A. M. writes: "Some time ago the Mayor of this borough was invited to have his photograph taken by a professional photographer. He presented a copy to the Mayor. In compiling the "official programme" for the local Coronation celebrations the Mayor desired his photo to be inserted therein, and he sent this same photo to the printers for a block to be made from it. The block was made and the photo inserted into the programme. The photographer now demands one guinea for the right of reproducing the photo. I have ascertained if it has been registered, and I find it has not. Can he legally claim the guinea? The Mayor did not pay for the photograph."—In reply: We do not think a legal claim can be sustained if the photograph has not been registered.

ENLARGING CAMERA.—"ENLARGER" writes: "Enclosed is a sketch of an enlarging camera I want to make, and I should be glad if you could tell me the length of the box from A to B to enlarge up to 1/1 plate. I want to make it fixed. The size of the plate to be enlarged is ¼-plate, and under. The length of my 1/1 plate camera from E to F is 18in. Would it be best level, or raised as C D?"—In reply: The length of the box must depend upon the focus of the lens used in making the enlargement. If you refer to the table for enlargements given on page 1,127a of the Almanac, you will see the length of box required to suit the focus of your lens. The centre of the plate and the negative should be in the axis of the lens.

FOCAL PLANE SHUTTERS.—"PHOTOPHIL" writes: "(1) Would you consider the use of a focal plane shutter advisable in view of rapidity of exposure and sharpness of image, where the latter is for very great enlargement, as for projection on screens? Instantaneous views, not in direct sunlight, and often late in the afternoon. (2) With these same objects in view, would any great advantages be obtained by employing the new Zeiss lenses (planars, I think), considering that the moving objects are in widely distant planes?"—In reply: (1) A focal plane shutter would fulfil the requirements very well, particularly with very rapidly-moving objects. (2) The planar is a very rapid lens; but for obtaining objects in different planes in sharp focus the lens will have to be stopped down: that is so with all lenses with large apertures.

THROWING DOWN SILVER.—"THOMAS" writes: "I use Eikonogen developer for plates, and, on account of awkward dark-room, have to place plates into hypo after developing, without washing, or with very slight rinse; the hypo therefore becomes very full of developer, and very discoloured, before it is replaced, and I find I cannot precipitate the silver from it. I have used spirits of salts and sulphurated potash and salt, but all without effect, as I can prove by steeping a coin a few inches below the surface for a few minutes, when it becomes quite silvered. Will you kindly tell me how I can precipitate it so that it can be sent to the refiners?"—In reply: Sulphide of potassium, if it is good, used by itself, will throw down all the silver the solution contains. You need not, with it, use either salt or acid. Possibly the sulphide you are using is not good.

SPOTS IN P.O.P.—"METALLIC SPOT" writes: "I have a small photographic business, which is in charge of an assistant, and with the P.O.P. paper I am using black spots occur fairly frequently. I shall be glad to know the cause of this, and whether there is any way of avoiding or remedying them when they have actually occurred, and what is the practice with professional photographers respecting them if they cannot be taken out. Are the affected prints thrown to waste in a small business where prices are somewhat low, or are the customers expected to take them, as I want to turn out my work without any defect whatever, but the cost of material would be considerably increased if the paper is to be thrown away?"—In reply: The P.O.P.'s now on the market are so perfect that we have little hesitation in saying, without seeing them, that the spots are due to something in the manipulation of the paper, maybe from particles of iron in the washing water, or other causes. Of course, customers are not expected to take defective prints, and when they occur they should be thrown away. The spots may be avoided with greater care in the work; of that we have no doubt.

STUDIO BUILDING.—"SEMPER FIDELIS" writes: "I thank you for your reply to my inquiries on the above subject of studio building, and I have reconsidered the matter of the north light, and am about to start building a studio facing due south. What I wish to ask you now is, seeing that I have an unobstructed south light, what height must I put up my wall on the north side (A) and south side to take front light (B) in plan. The north wall is a present 9ft. high. I still intend to build it on the lean-to design, and I thought of building up a low south wall, and the remainder in wood framework, covered outside with galvanised iron, and the inside with matchboard. The total length of the studio will be 25ft. east and west, and width 10ft. 9in. Do you think this is large enough for the general run of work? Of course, I know it will not do for very great group work. Also, will you tell me what amount of glass I shall require on the front and top? And do you think that covering with galvanised iron would be too hot for summer work? I have followed out your instructions, and have one of Bolas' books on studio building, and also H. P. Robinson's 'The Studio, and What to Do in It,' but none give any information on the amount of glass in a south-light studio, and only deal with the north lean-to and ridge-roof houses. Also, what angle will the pitch of roof take for same?"—In reply: We should say, make the south wall about 14ft. high. Ten feet nine is rather narrow; a foot or two wider would be better, and a little more length would be more convenient, if it can be obtained. Five feet six at either end may be opaque and the rest glass; you will then have the opportunity of working from either end of the studio, as occasion may require. We should advise you to have some thick roofing-felt under the galvanised iron, which will subdue some of the heat.

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*** *The Editor can only be seen by appointment.*

*** *We do not undertake to answer letters by post.*

EX CATHEDRA.

A Question of Lens Construction. Dr. Rudolph has written to the "Central Zeitung für Optik and Mechanik" to correct a mistaken assertion which Herr K. Martin has made concerning the Anastigmat recently introduced by the Rathenower Optische Industrie Anstalt. Herr Martin claims that every previous Anastigmat was dependent upon the use of heavy Barium Crown glass. It will be remembered by those who have followed the development of modern lenses than Mr. Dennis Taylor claimed that the Cooke lens could be made from the older kinds of glass. Dr. Rudolph not only points out this fact, but also draws attention to Alvan G. Clark's lens patented in the United States in 1889. This lens was manufactured for some time by Messrs. Bausch and Lomb, and is said to have been well corrected for flatness of field. Dr. Rudolph adds that the difference between this lens and that of Herr Martin can be but slight, and is restricted to small variations of the radii and thickness of the lenses. The kinds of glass used are the same in both cases. Dr. Rudolph also draws attention to the Planar and the Unar, neither of which contains heavy Barium Crown.

* * *

Photography in South Africa. During the past twelve months, or from the time that peace was thought to be in sight, we have received letters from correspondents asking the probable prospects of photographers emigrating to South Africa. Our advice has in each case been to wait until peace is well established before starting for the new Colonies on account of the general stagnation of trade there, particularly in articles of luxury, or such as were not absolute necessities. Peace is now happily restored, but we expect that some time must elapse before business is fully re-established. Be that as it may, however, we have noticed during the last few weeks several advertisements in the "situations vacant" columns of our journal for retouchers, operators, etc., wanted for South referred. The salaries offered may appear high to many, pounds a month, with second-class fare out paid. These salaries appear to be on a liberal scale, but it must be understood that the highest-class work is demanded in return for them. We may say, from what we have learnt of the state of photography in the large towns of South Africa, there is very little prospect for those who can produce only mediocre work, and they had better stay at home. But that there are now openings for high-class workers is proved by the advertisements to which we have referred. The salaries offered may seem high when they are compared with some paid here. But there is one thing that should be considered, and ascertained, before starting for our new Colonies, namely, the cost of living in the towns where the business may be situated, as compared with what it is in England. In some cases it is considerably higher, which is a set-off, and this matter should be taken into consideration by would-be emigrants. If five pounds will only purchase there as much as three pounds ten or four pounds will here the salaries are very much discounted. Anyhow, there is no question that there are good openings just now for really skilful photographers in the large towns in South Africa, though it is doubtful if there are for mediocre workers.

* * *

Photographs as Evidence of Identity. In some of the law courts, more particularly the Divorce Court, judges have refused to receive photographs as evidence of identity, and rightly too we think in many cases, seeing the extent to which retouching is at present carried by some photographers. A case bearing on this matter came before the Divisional Court on Saturday last. It appears that an Italian was charged before one of the London magistrates, under the Extradition Act, with a fraud committed in Belgium. The prisoner was identified by witnesses from photographs as the man who committed the frauds. Upon this evidence the magistrate committed the man to Holloway Gaol for fifteen days, with the view to his extradition. Since the committal the prisoner has been able to bring forward evidence that at the time the frauds were committed in Belgium, and for ten days afterwards, he was serving in the Italian Army. It might be thought by a layman that under these circumstances the magistrate

might be able to re-open his inquiry before sending the man out of the country to take his trial abroad. Such, however, does not seem to be the case. If the evidence brought before him is such that he would commit a prisoner for trial here he can commit him for extradition, and cannot re-open the inquiry afterwards. Neither, it appears, have the superior courts the power to interfere, even if the *alibi* set up by the prisoner is beyond dispute. Although the courts themselves are powerless to do anything, a way out of the difficulty has been found. It seems that the Home Secretary is empowered, though not compelled, to sign the order giving up the prisoner at the end of the fifteen days. It was understood that as witnesses were coming from Belgium for putting the question of identification beyond doubt, the signing of the order would be suspended. The Attorney General, though resisting the granting of the writ, said that he would see that the prisoner did not suffer in consequence of what seems a decided imperfection in the practice of extradition. On the face of it, this case shows that photographic portraits are not to be relied upon as evidence of identification, for it is clear that if the man was serving in the Italian Army at the time the frauds were committed in Belgium, and was not discharged until ten days afterwards, he could not have committed them. Still, it is hard on the man, and all through the photographs and to the witnesses swearing to his identity from them.

* * *

English Manufacturers and German Critics. In our issue of the 18th April under this heading we drew attention to the comments which had been made in the "Central Zeitung für Optik and Mechanik" upon some very crude ideas which had been expressed by Mr. Angus in a discussion at the Optical Society. The remarks which Mr. Angus made on that occasion have been republished in the "Leipziger Neuste Nachrichten," and they are again brought out under a new guise for the delectation of the readers of the "Central Zeitung." Whilst we agree with Mr. Angus in the high opinion he has expressed concerning the excellent work done in optics by certain German firms, and cannot say too much in their praise, we differ from Mr. Angus in attributing the slow progress here in this department to indifferent technical education. We have pointed out some of the causes, and we would now indicate another. The "Central Zeitung" boasts that at Jena 120,000 to 200,000 marks is spent annually for the salaries and the cost of experiments of the staff of 18 mathematicians, physicists, and chemists, who are all men with university degrees. A simple calculation will show that this is but £330 to £550 for the salary of each man and the cost of the experiments upon which he may be engaged. Where are the men of the same standing in London who would be content to do the same work on such terms? But whilst Mr. Angus and the German Press of the Anglophobe type attack us in their particular ways, it is not without some amusement that we read in the same number of the "Central Zeitung" an article on the new equatorial at Oxford. This paper informs its readers that the instrument, although not the largest in the world, is fitted with so many improvements that it must be classed with the most modern. It was constructed by the celebrated optician, Sir Howard Grubb, of Dublin, and the glass was cast by Mantois of Paris, by whom all the large telescope discs are made. The secret of annealing the glass is also known by Chance Bros., of Birmingham, which firm is without a competitor in the manufacture of lenses and prisms for lighthouses. The firm of Mantois also cast the 1,000 m.m. disc for the Yerkes telescope. A description is given of the mechanism with which the Oxford equatorial is fitted, and the writer states that the clock is of the same construction as those which Sir Howard Grubb has supplied to the Greenwich, Cape Town, Melbourne, Mexican, Perth (West Australia), Madrid, Cork, etc., Observatories. Verily our opticians are ignorant men! Perhaps their work will be vindicated at the day of judgment.

* * *

Hint for Snapshottists. The amateur photographer of jocose tendencies, whose general aim it is to take hand-camera pictures of ludicrous things, is often put to it to find subjects for his pleasantries. An episode which strikes him as being so funny in the streets does not raise a smile when transformed into a photograph, even when he goes into an elaborate explanation of what it really means. Probably he has long ago settled down into the belief that the English are not a funny people, and cannot see a joke without that surgical operation which has so unfairly been considered necessary to those who live north of the Tweed. But has he tried a church bazaar? We confess that it does not sound exhilarating, for what is generally understood by a church bazaar is a place where perfectly useless articles are sold at exorbitant prices. Church bazaars have, however, improved of late years, and one of the chief attractions is a competition devised for the purpose of making the clergy of the parish appear in as ridiculous a light as possible. Sometimes they are set to darn stockings, to hem handkerchiefs, or trim ladies' hats, and unkind persons have been known to remark that this work is sometimes better performed than the more legitimate duties pertaining to the parish. But it has been reserved for Slough to start an entirely new kind of competition for those who are entitled to use the prefix Reverend, and, according to the account published in the "Daily Telegraph," the proceedings were productive of great fun. It was a washing competition which so amused the visitors to the bazaar, and we learn that three clergymen competed for the prize, whatever it was. "Each of the rev. gentlemen was provided with a bowl of water, a piece of soap, and a dirty duster, which had to be washed in three minutes. A committee of three married ladies found the dusters of the Rev. —— and the Rev. —— so clean that they were unable to determine which was the better, and got out of their difficulty by giving two prizes." Now is not this a dainty dish to set before our merry friend with the hand camera? We occasionally hear of persons of position "washing their dirty linen in public," and deplore the circumstance, but never before have we known it done in this very literal manner. The practice opens up all kinds of possibilities for church bazaars. It used to be the custom at country fairs for yokels to grin through a horse collar, the one who grinned the best winning a prize. Slough might adopt at its next bazaar a competition of this kind. In a few years it may be too late, for motor-cars will then have rendered horse collars obsolete.

* * *

The Control of Development. The following experiments, which are given in an article by Karl Schaum and Wilhelm Braun in the "Photographische Mitteilungen," show that the addition of potassium chloride and potassium iodide have considerable effect, in opposite directions, upon the development of silver bromide and silver iodide. A number of bromide plates were cut into strips and exposed in the Scheiner sensitometer. This instrument is a copy of the rotary disc, with graduated apertures, used by Hurter and Driffield in their experiments concerning the speed of plates. The exposure given was 15 seconds at 25 c.m. from the standard light, and all the strips of one

series were developed simultaneously in the same vessel for the same length of time with 10 cc. of a one in three solution of sulphate of iron and 30 c.c. of a one in three solution of potassium oxalate, acidified. The temperature of the developer was 16 deg. C., and the period of development four minutes. The following table gives the results in degrees of the Scheiner sensitometer:—

Number of drops added to the developer	0	10	20	30	40	50	60	70	80
Water, without addition of haloid.....	13	13	13	13	13	12	12	12	12
Chloride of potassium.....	13	15	15	15	15	14	14	14	14
Bromide of potassium.....	13	10	10	8	6	5	4	1	0
Iodide of potassium	13	10	10	8	5	0	0	0	0

From this it will be seen that chloride of potassium acts as an accelerator, whilst iodide of potassium is a more potent restrainer even than bromide of potassium. But the addition of iodide of potassium prolongs very considerably the time requisite to fix the plate. Instead of five minutes, two to three hours were found necessary. This is due to the conversion at the surface of the plate of the bromide to iodide of silver.

A similar series of experiments was made with chloride plates, with the exception that the developer was reduced to half strength and the exposure increased to $2\frac{1}{4}$ minutes at 10 c.m. distance from the standard light. The following are the results:—

Number of drops added to the developer	0	10	20	30	40	50	60	70	80	100
Water, without addition of haloid.....	10	—	—	10	—	—	9	—	—	9
Chloride of potassium	10	10	10	10	10	11	11	11	11	—
Bromide of potassium	10	5	4	4	0	0	0	0	0	—
Iodide of potassium...	10	5	0	0	0	0	0	0	0	—

In this case chloride of potassium also appears to have a slight accelerating action when used in quantity, but it is attended by a yellowish veil. The clearest plates were those developed with iodide of potassium, but the fixing again proceeded very slowly.

* * *

Combined Developers. Dr. Lüppo-Cramer contributes a paper to the "Photographische Correspondenz" upon the question of mixing various reducing agents in the constitution of the developer. There is a prevalent opinion that a combination of metol and hydroquinone offers considerable advantages, and Dr. Lüppo-Cramer's experiments appear to confirm this. To a 50-gramme solution of anhydrous sulphite of soda in one litre of water 15 grammes of metol, or hydroquinone were added. The alkali was the usual 10 per cent. solution of potash. It was found that 25 c.c. of the metol solution, plus 25 c.c. of the hydroquinone, had greater developing power than 50 c.c. of metol alone, using the same amount of alkali, 50 c.c., in each case. Scarcely any difference in the result was found, even when the proportions were changed to 20 c.c. of metol to 30 c.c. of hydroquinone, but with 10 c.c. of metol to 40 c.c. of hydroquinone a small falling off of energy was perceptible. As the power of metol as a developer is twice that of hydroquinone, it is evident that a combination of both possesses distinct advantages. The influence of bromide in the developer, for cases of over-exposure, was also tested. 10 c.c. of metol with 40 c.c. of hydroquinone were compared with 50 c.c. of hydroquinone alone, but in the latter case only 5 c.c. of a 10 per cent. solution of bromide of potassium were used, whilst 10c.c. were added to the metol-hydroquinone. Notwithstanding the double quantity of bromide, the metol-hydroquinone had over-developed the plate by the time the image began to appear with hydroquinone alone. The plates were given about four times the normal exposure. Another series of experiments showed that the presence of bromide did not counteract the advantage of combining metol with hydroquinone. Normally exposed plates were developed with the following solutions:—

a.—50 c.c. metol + 40 c.c. water + 50 c.c. potash + 10 c.c. bromide of potassium.

b.—10 c.c. metol + 40 c.c. hydroquinone + 50 c.c. potash + 10 c.c. bromide of potassium.

c —50 c.c. hydroquinone + 50 c.c. potash + 5 c.c. bromide of potassium.

With a and b the image began to appear almost simultaneously after 20 seconds, but with c a minute and a-half elapsed before there was visible effect. b gained in strength more rapidly than a, and there was considerable difference between them before traces of the image were seen with c. This shows that hydroquinone reacts in combination with metol, notwithstanding double the quantity of bromide, although it may not have sufficient energy to do so in the absence of metol. Other experiments were made with glycin, eikonogen, and pyrogallol.

* * *

Landscape Photography. All careful photographers who are engaged in outdoor work are careful to take note of all the circumstances under which each exposure is made, and, as we all know, there are capital books to be had in which such particulars can be chronicled in their respective columns. But if we would make such records of our work as valuable as possible we ought to include full particulars with regard to time of day, state of light, and weather conditions generally. Experience can be more quickly gained in this way than by reading many books, and a most valuable lesson is engraved upon the receptive faculties by looking through such records and comparing them with the results actually attained. By such an examination we are able to weigh the effect of actual sunshine at different times of the day and year, and it is not too much to say that when a photographer has obtained a clear estimate of this important factor, he has made a great stride forward. The tyro will start on a brilliant sunshiny morning full of enthusiasm, and with hopes of what he is about to accomplish in the way of picture making. He will get to work early, and possibly make half-a-dozen exposures before noon. The experienced hand will, on the contrary, avoid the early glare, and will wait until the sun is low enough to cast long shadows across the sward, and provide that breadth of light and shade upon which a good picture so much depends. Looking through the records of past work, the course which we just now recommended, the landscape photographer will generally find that his successes were taken either on dull days or on bright afternoons at a time when the sun has lost a considerable portion of its activity. This is more especially the case with woodland and lake scenery. In photographing a glade in a wood in actual sunshine it is almost impossible not to get a "chalk and soot" result, by reason of the strong contrast between the lights and shadows. Such a photograph should be reserved for quite a dull day. And it is the same with lake scenery. When the hills around are bathed in brilliant sunlight they are flat, faint in outline, and exhibit no detail on their slopes. But on a cloudy day all this is changed, and most lovely contrasts of light and shade become apparent. An experienced man who recently returned from a tour of the English lakes was able to point with pride to an admirable

series of views which he had taken. But the best of all was a view of Rydal Water taken, as he explained to us, just at the commencement of a thunderstorm. If photographers would take a comparative set of morning and evening pictures at the same spots they would learn more about landscape work in a week than they could otherwise acquire in a twelvemonth.

* * *

Students' Work. A profitable hour or more may be spent in looking through the exhibition of students' work which was opened last week at South Kensington, in the gallery above the Indian department. This consists of selected works of schools of science and art, and art classes throughout the country, and may be regarded as the cream of the work done by students during the past year. We naturally turn to that part of the exhibition which is of interest to photographers, and endeavour to review the progress made in book illustration, designs for colour work, and the like. In the opinion of the examiners, who, strange to say, do not number a photographer among them, the work, as a whole, hardly reaches the level of former years. But a note is added, at sight of which we rejoiced greatly: "The examiners are, however, pleased to observe that this year there is less extravagance and affectation." In other words, the imitators of all that was bad and ridiculous in the work of that wonderful draughtsman, Beardsley, have ceased from troubling. There is good work to be seen here, and a silver medal has been well bestowed upon Geraldine Morris, of the Birmingham School of Art, for a capital set of pictures in line. The examiners point out that "more attention appears to have been paid this year to the adaptation of the drawings to the various processes of reproduction," and they here refer to works in colour, some of which are really excellent. There are only a few designs for posters, and this they regard as a healthy sign that students have spent their time upon less ephemeral kinds of design. Although we are principally interested in this particular department, the rest of the exhibition was most interesting to us, affording as it does a fair review of the progress of art studies in Britain. And every phase and application of artistic principles is sampled here, from painting and modelling from the antique and the living figure, to designs for laces, embroidery, wall-papers, and metal work. The successful students have shared among them prizes in the shape of five gold medals, eighty silver medals, two hundred and twelve bronze medals, and four hundred and forty-two books. But let it not be thought from these figures that it rains prizes at South Kensington. There were more than forty-one thousand works sent in for this annual competition among students, and only one-eighth were fortunate enough to claim admission. The examiners include many well-known painters and other experts, and their work has been done with a thoroughness and discrimination which all will applaud, except, perhaps, some of the disappointed ones. The exhibition is one which all interested in art matters should see. It is open to the public every day, and there is no charge for admission.

* * *

Country Fairs. It seems a pity that the era of the old-fashioned country fair departed before that of the hand camera commenced, for there were many quaint features of these curious gatherings of merry-makers which were well worth photographing. Word pictures we have of country fair life, as we have of the old coaching days, in the pages of Charles Dickens, and drawings of some of these fairs, notably that of St. Bartholomew at Smithfield, have been left to us by Rowlandson and other caricaturists. We are aware that there have been within recent years certain so-called revivals of country fairs, and that photographs have been taken of incidents connected with them, but as a rule they have been poor imitations of the real thing. A little picture which we lately came across in the portfolio of Maclise's drawings, belonging to the Forster collection at the South Kensington Museum, brought these fairs once more to memory, and also served to show the prototype of that modern instrument of torture known as the steam roundabout. It is a pencil sketch labelled "Donnybrook Fair, August, 1826," and its principal feature is the "Roundabout" of the period, although possibly it had then quite a different name. Its construction was very simple, the whole arrangement depending upon a stout pole driven into the earth. Upon the top of this was fixed a movable ring—much like that attached to the ordinary "giants' stride"—and to the ring is fastened the rods supporting an annular platform upon which are fixed alternately wooden horses and small carriages, or cars for the less venturesome. The construction is actuated by a number of men running inside the platform, and keeping it turning round and round, and we have little doubt that it gave as much pleasure to its riders as does the gorgeous steam-driven and electrically-lighted monstrosity of to-day to its votaries. To those who do not care to participate in the cloying pleasures of the roundabout, the Donnybrook fair pattern is much to be preferred, for attached to the modern appliance, and worked by an auxiliary engine, which never stops, is a mechanical pipe organ with alarming sonorous properties. As it generally plays one air over and over again, for its proprietor is too busy attending to his customers to change the ditty for a fresh one, and as it is always in direful need of tuning, the modern roundabout is a nuisance to all who live within hearing distance of it, and many are the actions at law which have been brought on this account. It is a matter for regret that the less objectional features of the country fair have altogether disappeared, and that this relic of the past, improved beyond recognition, and rendered so hideously noisy, should have survived. The old roundabout could be constructed for about twenty pounds, while the modern one, with its dynamo and other fittings, costs a thousand or more.

* * *

Touching Retouching. So long as men and women remain as they are at present constituted, so long will photographers need to resort to retouching. We know that there is a praiseworthy, but very small, minority who care not how they look, and who disregard the ravages of time. These are they who look upon wrinkles and crows'-feet on the human face much in the same loving way in which an artist contemplates the cracks and lichen marks in an ancient wall. Such persons would appear to venerate the marks left by the footsteps of Father Time, instead of trying to hide them, as most of us prefer to do. There is no doubt whatever that most people hate wrinkles, abhor that increase of adipose tissue which age brings about, take care that no grey hairs are brought with sorrow to the grave, if a bottle of dye is within reach, and are therefore inclined to bless the retoucher who, with a few deft movements of his lead pencil, is able to obliterate these signs of increasing years. But why let matters get to this stage when a little repairing work will make good the original structure? The Campanile of St. Mark's would not have come to grief if timely measures had been adopted for its preservation, and we may well take a lesson from the recent catastrophe in Venice. Certain advertisements, which are more frequent in ladies' magazines and religious publications than elsewhere, point to remedies for all our

ls, and we can repair our frames by the judicious ex-nditure of a few sovereigns. Are you too short? So-and-'s patent heels will at once add a cubit to your stature. your nasal organ tip-tilted? Somebody else's "nose achine" will stop its upward course. Are you wanting rotundity in those portions of the figure which, accord-g to the Greek sculptors, should be fleshy and prominent? nith's embrocation rubbed on the place will cure the il. The latest of these advertisements appeals to those whom nature has been too liberal in the matter of chins. is known as the —— chin strap, and is said to be "invalu-le for restoring or retaining lost contours of the face and ck. It can be worn during the long hours of sleep, when e muscles relax." By such simple appliance can the uble chin be divorced and once more revel in single essedness. In addition to these contrivances for bring-g ordinary looking persons more into line with the recian ideal, we have advertisers who beautify the com-exion, and who improve the hands and nails; others who ake moustache and whiskers blossom as the rose in the e sex, or stop a tendency in the same direction in the her. Indeed, there is no part of the human frame which, cording to these ingenious advertisers, cannot be moulded the most perfect form. Now, it is quite evident that if ese renovations become common as blackberries in Sep-mber, or as bicycles all the year round, the occupation of e retoucher will be gone. Everyone will become so rfect in form and beautiful in detail that there will be blemishes to cover, and no lines to fill up. Important this matter is from a photographic point of view, it has so a serious commercial aspect, for if these things come to ss there will surely be a slump in the lead pencil dustry.

A COOL STUDIO.

LTHOUGH the light may be everything that can be wished r at present, the summer heat makes the studio anything t a pleasant room to work in. The heat is different to at of the sun in the open, having a stagnant dry quality out it that is trying to the system. It is equally trying, if t more so, to the sitter, less accustomed to the peculiari-s of a glass room. As, apart from a question of physical mfort, the ill effects upon both the photographer and his stomer are certain to be reflected in a greater or less gree in the picture, it would be good sense, as well as od business, to attend to every method of cooling down. he frequent and complete renewal of the air in a room is e best and freshest means of doing so, and the chief ans to this end is thorough ventilation. Unfortunately, t weather lasts, by comparison, for such a short time the year in our climate, that rooms are built more th a view to the retention of heat than its rapid dissipa-n. They will not admit of thorough ventilation without aughts, and it is not safer to sit in a draught in summer an in winter. The strong suggestion of stuffy, property" smell in most studios proves that they are no ceptions to the general rule, as far as ventilation is ncerned. In the old wet-plate days the dominant hereal smell of the collodion was not disagreeable to us rsonally, nor, we are disposed to believe, to the majority those who had the benefit of it in the photographic udios of the day. It is not unlikely that it had a slight hysiological soothing effect upon the nerves. But that s gone, and the whiff to be distinguished nowadays is a int smell of ammonia, which is not disagreeable, if pyro-mmonia be the developer, or a faint smell of methylated irit, which, on the other hand, well fulfils its designed rpose of being very disagreeable.

If reasonably plentiful, opening skylights and windows at the sides will do a great deal towards ventilation and coolness. Still with these only there is not as a rule sufficient stir in the body of air in the studio, especially towards mid-day, and in the afternoon, after the morning breeze has died down, and before the evening breeze has set in. In many large and well-appointed studios electric fans placed in the right spots will serve the purposes of ventilating and cooling very effectively and elegantly. Electric fans, however, must be regarded by the great majority of photographers as unattainable luxuries. But the great bottom, essential principle of good ventilation, viz., a continuous circuit of air, is a very simple one, and can be applied in any studio by the exercise of a little common sense and ordinary arrangement, without the use of a fan. Some mechanical guidance must be given the air to circulate. A short piece of candle burning at the bottom of a tumbler will soon go out, but if the tumbler be divided lengthwise into two divisions by a piece of cardboard coming as near the flame as possible, the candle will go on burning until it is all consumed. The circulation of air necessary to the combustion of the wick and wax has been set up by the presence of the cardboard, the air travelling down one side and up the other. The same principle must be applied in the studio. How it should be done in a particular one depends, of course, upon its particular construction, the position of doors and windows, and the amount of "nous" and mechanical ingenuity possessed by the man in it. Backgrounds properly placed will often serve on a large scale the function of the cardboard referred to, help out ventilation and promote coolness. They can easily be put on one side when a customer comes in if in the way. If the whole of the air be kept gently moving, instead of being allowed to remain stagnant, the result will be a sweet-smelling and cool studio. Most studios need the former quality at other times than exceptional, hot summer seasons. The same means will give it at all times of the year. A thoroughly ventilated studio in winter is infinitely more agreeable, as well as far healthier, than one made hot and stuffy by the usual stove. The dread is of the danger of catching colds. There is far less danger of catching colds in a cool, well-ventilated room than in a hot, unventilated one. True ventilation does not mean cold draughts, but it does mean better health, higher vitality, and greater capacity for work all round, both in summer and winter.

Cool suggestions would also help out the photographer very materially, and be gratefully accepted by the photographee. The electric fan, for instance, would be much heightened in effect if a dozen coloured ribbons were so arranged in front of it as to wave in the currents of air produced. A glass bowl half filled with melting ice would have a good sub-conscious effect upon the feelings of a sitter upon a piping hot day, and its subtle favourable impression be faithfully preserved upon the sensitive plate to the improvement of the image upon it. If ice be unattainable, the drip of water in a glass filter might take its place, backed by a row of half-a-dozen delicate ferns kept well watered. A proffered drink out of the clear and cool-looking tumbler would be gladly accepted by the majority of sitters, and if not accepted the courtesy that offered it would tell. In the case of children it would be still more valuable. The fractious irritation of a child in a studio is not unfrequently due to thirst. We cannot give children and dogs too much to drink in hot weather. A large bowl of water with gold fish lazily swimming around, again, is not only a pretty ornament, but looks refreshing on a hot day. So do breezy enlargements of waves, large cool spaces under the shade of trees, and a host of other simple

things that might be suggested, well within the means of all photographers. They are good paying properties. The golden rule of the doctor is, "First study your patient, and then his disease." It will prove an equally golden rule to the photographer, and the best study he can make of his client on a hot summer's day in a glass studio is how to make him feel cool.

The personal appearance of a photographer can contribute to the same end, and re-act to his business advantage. A white drill coat, for instance, or even a complete suit of white, looks, and is, cool and agreeable. Every man is more amiable, and so more capable of delicate work, in loose white in summer than in black. There is a belief in the orthodoxy of black in business. It is a survival of dark ages, and ridiculous. It simply wants a man with a little backbone to over-ride such nonsense. The great majority of customers have more commonsense and good feeling than shopkeepers credit them with, and would be better pleased at being attended to by men and women looking, feeling, and acting at their best in the cool ease of light clothing in summer, than in the regulation black. There are doubtless exceptions, but they ought to be educated to a common sense view of things.

These are minor matters in themselves, perhaps, but they contribute essentially to the promotion of coolness in this hot weather, and that is no minor matter. It is the men who recognise their value actual and psychological and act upon the knowledge, that get on, attract customers, and enlarge their bank balances. And what photographer will regard the last result as a minor matter?

WITH A HAND CAMERA.

In the many articles which have been written, and the lectures delivered on work with the hand camera, we have observed that while much attention has been given to the instrument itself, to the best kind of lens to employ, to the finder, to the vexed question of magazine versus dark slides, and to many other mechanical details, little has been written, or said, about the art involved in actually taking the pictures.

Some will affirm that in manipulating a hand camera art has no place, a bold assertion, which is probably based upon a tacit acceptance of the familiar "You-press-the-button" formula. But we venture to say that, in most cases, a considerable amount of painstaking—which we have all been told is nearly akin to genius—is necessary in the handling of a "snapshot," or hand apparatus, unless, indeed, we are content to produce very feeble and valueless pictures.

Let it be at once admitted that there are certain subjects, suitable for hand camera work, in which control over the composition of the picture is quite useless to attempt. For example, in photographs of athletic sports the competitors must be taken as they jump over an obstacle, as they run past the winning post, or in some other pre-determined attitude or position. The operator has little choice in the matter. Again, in the case of a sunset sky, there is little to be done beyond pressing the button, except to seize the most effective moment. Sky changes, although they appear to be gradual, are in reality very rapid, and the difference of a minute or so may make or mar a picture. But in the pourtrayal of such natural beauties the careful worker would, no doubt, see the advantage of expending two or three plates upon the different phases of the effect. Again, in pictures of the sea rolling in and breaking on the shore, the precise moment must be taken when the foremost wave is curling over, and when, if the wind is strong enough, its crest is being carried away like smoke. Or, should the shore be a rocky one, the time chosen will be either when the wave has just expended itself in a fountain of froth or when, having receded, the water is running off the rocks in streams of silver. In such cases, it is quite evident, that the best effect can be obtained by waiting for the proper moment before the plate is exposed.

When, however, we come to consider street scenes, which perhaps, on the whole, are most frequently the subject of the hand camera man's attention—they certainly have been so lately in London—it is a different matter altogether. A crowded thoroughfare is like the variegated design of a quickly rotated kaleidoscope, in that the details, both of form and colour, are ever changing. Except that in a modern crowd, in a modern city, the various tones of colour are confined within very narrow limits, artists who have attempted to represent the streets of London must often have wished that the old sumptuary laws with regard to costume were still in force, not because he would wish in any way to curtail individual extravagance with regard to raiment—which was the ostensible purpose of those laws—but because they had the effect of prescribing certain forms of costume to different classes, thus affording a pleasant variety which is altogether absent from the national dress to-day. This feeling was emphasised a short time ago when we became acquainted, at the seaside, with a fine-looking, bronzed mariner, who all the week presented a splendid picture in the becoming garb of a coastguard, but extinguished his personality most completely on Sundays under a terrible black coat and a silk hat. It is these horrible black coats that go far to spoil the picturesque appearance of our streets, and in avoiding them comes in the question of art as applied to hand camera work in our thoroughfares. From a photographic standpoint, the cut of a coat, or the style of headgear, adopted by the man in the street is, of course, unimportant. It is of the general sombre effect when such individuals are massed together that the artist complains. Happily, the weaker sex, although they are governed by the dictates of fashion to a greater extent than are their fathers and brothers, have the good sense to wear white, or light-tinted dresses, in the summer time, and they will often redeem a view by their bright appearance, which would otherwise be full of gloom. The hand camera man, in producing a successful street picture, must, perforce, often wait for the ladies.

To explain more fully what we mean, let us suppose that with our best hand camera we have taken up a position at some commanding point in the London streets, say at Piccadilly Circus, looking East. It is a decidedly pleasant prospect that we have before us; the handsome façade of the Pavilion Music Hall occupying the middle distance, and the bronze fountain with the groups of idlers and flower girls in the foreground. At least, not in the immediate foreground, for we must stand back at a sufficient distance to include the figure of Mercury at the top of the fountain, and we have, therefore, a belt of roadway in front that must be filled in in some way. There are plenty of omnibuses and other vehicles passing and re-passing, but we must look upon them as necessary intruders, and wait until chance, or the policeman, stops the stream of traffic to let pedestrians cross the road. Now is our time, and it is here that the opportunity for a little art, or astuteness, steps in.

A group of men in their sombre garments crossing that road gives no relief to the composition, and their black coats stick uncomfortably against the equally dark fountain basin. Our finger is on the button, but we must keep it still. Presently there comes along a group of daintily-dressed women; perhaps a nurse in white, wheeling a perambulator with a linen sunshade. We wait until these figures occupy the right position, or what we conceive to be the best place for our purpose, press the button, and feel sure that we have secured, barring acci-

ents, a more satisfactory picture than if we had paid attention o none of these details.

As all good photographers know, one of their most difficult asks is to arrange a group artistically, and the larger the umber of figures comprised in that group, the harder the task. Heads must not form horizontal lines across the plate, nor ust arms and legs combine to score it with vertical ones, herefore there is always much shifting of figures and altering f individual positions. So that it comes about, on such occa- ions as Convention meetings, when a group of the members is nvariably photographed, that a long time is occupied in ar- angement and adjustment.

Now, if all this preliminary business is called for in the ase of people who are aware of what is being done, and who re ready to do all in their power to promote the success of the icture, how must the photographer be handicapped who is aking a busy street scene, the performers in which are quite blivious of, or indifferent to, his intention? We apprecate a ell-posed group, for we know the trouble which it has entailed n its producer. Should we not appreciate still more a snap- hot street scene in which the grouping is good, and at the ame time natural? Surely such work must be regarded as artaking of art.

It is not alone contrast that has to be secured in hand camera ork, although, as we have seen, contrast is all important, pecially in the foreground of our picture, where figures can e coaxed to afford the necessary relief. In street scenes we e confronted by numbers of parallel lines. Where these form e horizontal lines of buildings they can be disregarded, for ctorially they are not parallel, they converge to a point. But e may often be troubled with such lines close to the camera, hen it may be impossible to move the instrument for fear of crificing the more important parts of the picture we are out to photograph. It may be a line of low wall, or the curb the pavement; whatever it be, the man of artistic instincts ill foresee, without much reflection, that the line will mar s picture, unless it be broken. If he be lucky, a figure or two ay come along at the right moment, and in the right place cure the evil. We have known a case in which a man with a arrow was induced to stand for a moment to break such a line, nd the picture was a great success.

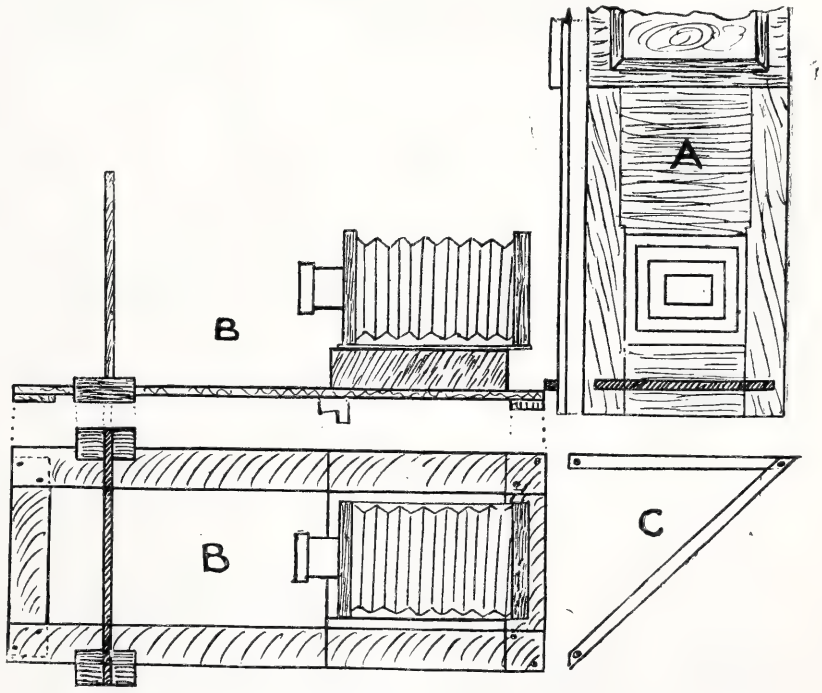
Instances might be multiplied to show that the man with hand camera must not regard himself as an automaton, who as merely to press the button, and leave the lens to do the st. That the large majority of hand camera workers do look pon their work, or rather their pastime, in such a light, we el certain, both from observing their hap-hazard method of andling the instrument, and the few presentable photographs hich snapshotters produce.

A SUPPLEMENTAL catalogue of photographic apparatus, chemicals and aterial, has been issued by Messrs. McGhie and Co., 75, St. Vincent reet, Glasgow.

"THE Literary Year-Book, 1903."—The seventh issue of "The Literary ear-Book" will contain a considerable amount of new matter; the whole the information collected in previous years being thoroughly revised d amplified. The first part of the volume will contain an exhaustive view of the Year 1902, by Herbert Morrah, based upon the plan general the most valuable works of reference, and conveying, in the form of interesting narrative, a complete impression of the literary activities d tendencies of the period under notice. The second part of "The terary Year-Book" will contain all the usual directories in amplified rm. A vast amount of fresh information has been collected, which, it believed, will be found thoroughly trustworthy and up-to-date. The reign information has been made a special feature, and will be found t only interesting but reliable, and of the greatest value to editors, d to all concerned in the wider relations and appeals of literature. re will be taken to make the list of photographers as complete as ssible; so that its utility to journalists, illustrators, and contributors periodicals may be of the greatest.

A COPYING AND ENLARGING APPARATUS.

FOR anything above quarter-plate negatives, the amateur is not likely to indulge in artificial light when he wishes to produce an enlargement. The professional, of course, uses daylight for such work. Possibly those who make enlarging a special business have artificial illumination to fall back upon, but now, as ever, the use of an elaborate copying and enlarging camera is unusual. The dark room is invariably the camera; when only an occasional job is to be done, the window is blocked up so far as all white light is concerned, with the exception of a small portion, and the sensitive paper is affixed to a board carried by an easel. Copying and enlarging cannot be sent away, even by those who would prefer to leave such work alone, and photographers in small towns are glad to pick up such work and save that part of their business from falling into the hands of the tout who may be encouraged to make an inroad on other forms of photographic work. In advising and assisting a photographer in a small way of business the device I am about to describe was hit upon. It practically converts a dark room, or a small room with only one window, into an enlarging camera at a minute's notice,



with but little trouble, and forms for other operations a copying apparatus for the studio that can be turned to any light, be readily fixed or unfixed, and be put up, too, with focus to a given scale, centring and squaring facilitated, and even assured by marks that having once been determined, may be relied on for future use. Of course, there is no special novelty in any part of it. I venture to send this description of it to the JOURNAL, however, under the assured feeling that amateur and struggling professional may alike welcome it. No special skill is required to put it together, no apparatus beyond the ordinary camera and lens is required (and these can be removed, used for any calling sitter, and replaced in a moment), yet it is simple and efficient. It may be beaten for simplicity, efficiency, and cheapness, and, if so, may give rise to the publication of something better; but those who read this article, though they may be disappointed at finding nothing new in it, will probably consider its publication justified.

The first portion (A in the rough sketch) blocks the window. In this instance, the window was four feet high by two feet broad, and opened into the room like a door; it is just as

well suited for an ordinary sash, perhaps better, for if the window consists of small panes of glass, the lower sash has only to be pushed up previous to affixing the blocking frame. Four strips of wood are taken, say one inch thick and three inches wide; these are joined preferably by a mortice, but can, of course, be mitred, or if the photographer is not a good carpenter, they can be half cut away at the corners, and the join made by overlapping the pieces into one another and screwing. This frame may be covered with thin board or card, leaving an aperture at the top to be covered with ruby glass and cherry fabric. It is better, however, to have the medium, whether paper or glass, in a frame hinged for opening or removable at will. An aperture at the lower part is also left to which a series of plate-holders (carriers), from say 12 by 10 downwards, can be slipped in or out of two grooved slips attached to the framework. The height of this lower aperture, the aperture for the negative, will depend on the height of the camera in the portion about to be described. The upper aperture or ruby window may be at any height convenient to the worker. Should this part of the apparatus be used only for converting a room, a bathroom for example, into a dark-room, the lower aperture can also be closed with a light-filtering medium. Four wooden buttons or four bolts will keep this window cover in its place, enabling it to be affixed or removed as readily as a shutter, and strips of felt or list glued on to it will give a light-tight joint with the frame of the window. The narrow strip of wood in the sketch near the foot of this frame or shutter is merely to establish a guide or connection with the platform that is to carry camera and screen.

The platform of the portion (B in the illustration) that carries camera and screen is, like the other, a frame formed from four planks, but as they need not be flush with one another, the readiest way to join them is to screw on the end pieces underneath. The screen is a little more than twenty-four inches square, and can be moved backwards and forwards on tightly-fitting runners, as shown in the sketch. Big screw eyes working from below can be used if so desired to clamp it firmly in position on to the frame. A platform is erected at the other end to carry the studio camera, the height of this being constructed to suit the centre of the lens, which should be centred with the screen. Two slips of wood are nailed on to this platform, so that the camera shall have no lateral adjustment; the camera may be moved backwards and forwards, but always remains square to movable screen and window. A light box will serve for this platform, or it may be built up from plank; the most convenient material for constructing the whole apparatus is, in this country, imported flooring-board, which is cheap, cut to six-inch widths, planed, tongued, and grooved, necessitating very little work and no tools beyond saw, hammer, screw-driver, and bradawl.

This portion of the apparatus forms a capital copying camera in itself. If a copy of a photograph is required, it is only necessary to put it on a table in any part of the studio most suitably lighted, adjust the photograph to be copied on the centre of the screen, adjust screen and camera, and expose. Marks made by pencil or chisel on the frame and platform and marks on the camera for the focus may be made once and for all for various degrees of magnification or reduction, and need not be gone over again every time the apparatus is required, and at any time the camera may be removed and placed on the studio stand, to be used for its legitimate purpose. The length suitable for the framework will, of course, depend on the length of focus of the lens; assuming the lens to be of nine inches focus, a length of six feet will allow of enlargement and reduction up to nearly six diameters.

To use this apparatus as an enlarging camera, the portion B is attached to A, which has already been placed in position on the window. The narrow strip on A and a support on B, as shown in sketch, will enable it to be wedged in position over the sink, or it may be stood on a table or tressels of the required height. The ground glass of the camera is turned on its hinge over the top of the camera, and any leakage of light between camera and negative is blocked out by using a dark cloth. Should a greater amount of enlargement than six diameters be required, it is only necessary to bring the portion B further away from A and block up intervening space between camera and lens with cardboard and cloth. Of course, an extending piece may be made to the platform if desired. Modifications will naturally occur to anyone constructing a copying and enlarging camera after this model, in order to suit his own special requirements.

It only remains to reflect light into the apparatus. The figure C represents two slips of oak or teak to be attached to the window frame; this being done to both the right and left sides of the window will form a support for a reflector. This reflector need be nothing more than a sheet of white paper on board or light frame, and will give plenty of light for enlarging. A mirror would reflect a patchy light if the sky were uneven, and besides, it might be blown down, or fall and break, which would be unlucky—for anyone standing below.

C. Ray Woods.

Cape Town, June 23rd, 1902.

MOLECULAR STRAIN THEORY OF VISION AND OF PHOTOGRAPHIC ACTION.

[Reprinted from the Journal of the Royal Photographic Society.]

II.

Phenomena of Reversal.

Reversed effect due to sub-normal intensity of stimulus.—A very curious effect I have often noticed is the following. If the effect of normal intensity of electric radiation is to produce a diminution of resistance, or say positive effect, a feeble intensity of radiation gives rise to negative effect. It thus happens that when a receiver is subjected to continued radiation, the first moiety absorbed falls below the critical intensity; there is thus a preliminary negative twitch followed by the normal positive response.

Reversal due to continued radiation.—If the receiver is subjected to the long continued action of radiation there is produced a reversal. In some cases I have even noticed recurrent reversals.

Artificial Retina.

The receiver hitherto described responds to invisible electric radiation. But I have been able to construct others which respond to all lights—visible and invisible. Last year I exhibited at the Royal Institution an artificial eye, which in many respects was an improvement on the human organ. It also exhibited an automatic recovery just like our own eye. This artificial retina has, with regard to spectral vision, an enormous range extending far beyond the visual limits. It perceives light waves several miles in length; it can also see waves less than one-fifty-thousandth part of an inch. But we can reduce its power to a merely human level by substituting a water lens instead of the glass substitute for the crystalline lens, when the invisible radiations are absorbed by water and prevented from reaching the sensitive layer.

The following records, Fig. 4, show how the receiver exhibits responses when alternately acted on by light and electric radiation, and how similar in every respect are the two sets of responses.

The responses obtained with this retina are in every way rrespondent to the visual responses.

Electric Theory of Vision.

According to this theory, the visual impulse is an electric npulse (an electric impulse in the optic nerve is known to oduce visual sensation). The nerve is a conductor of electric rrent, and the brain an extremely delicate detector of current. he most difficult part of the subject is to explain the production nd regulation of visual current in response to the fluctuating imuli of the incident light on the sensitive substance in the tina.

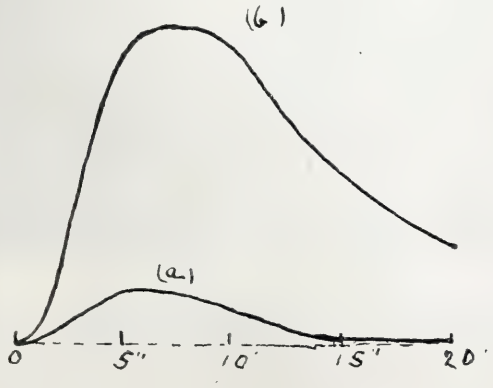
Retinal Current.

If there are electro-motive elements in the retina, then the sual current may be supposed to be regulated by the conducvity change of the sensitive layer under the action of radiation. ut it is not even necessary to postulate the existence of any ectro-motive element. I will show that the stimulus of light self will give rise to an electro-motive variation. Let us rst take a frog's retina, and see what takes place under the tion of light. We shall find out whether exactly similar henomena is not repeated in an artificial substitute. We ke first a frog's retina, and see what takes place under the eans of non-polarising electrodes, one with the cornea and the her with the optic nerve (the slight existing current may be lanced by a potentiometer). On now exposing the retina to ght, a responsive galvanometer twitch will be produced. On opping the light, the galvanometer deflection will show revery. We next take a rod of silver and beat out one end the form of a hollow cup, sensitising the inside by exposing for a short time to the vapour of bromine. The cup is filled ith water. We have thus an arrangement somewhat rembling the eye, the sensitive layer corresponding to the tina, and the less sensitive rod corresponding to the nerveump. Connections are made with the galvanometer by means non-polarisable electrodes, one contact being made with the nsitive layer inside the cup, and the other with the rod.

Retinal current in response to light has been observed by olmgren, Dewar, McKendrick, and others. I have also obined similar responsive currents with the inorganic substitute r the retina. The response curves of the real and artificial tinæ are under all possible variations absolutely alike. I ill now try to interpret the meaning of a few curves obtained ith the artificial retina, and tell you how by their means I as able to discover some unexpected peculiarities of our own sion.

Effect of Light of Short Duration.

If we subject the sensitive cell to a flash of light, the effect not instantaneous, but grows with time. It attains a maxi-



G. 5.—Response curves for flashes of (*a*) feeble and (*b*) strong lights.

um some little time after the incidence of light, and the fect then gradually passes away. If now a flash of light of stronger intensity falls on the cell, it will be found that the after-effect persists for a longer time (Fig. 5). The following visual analogue is interesting. If a bold design be traced with megnesium powder on a blackened board, and placed in a dark room, the observer not being acquainted with the design, and the powder is fired, the instantaneous flash of light, besides being too quick for detailed observation, is obscured by the accompanying smoke. But if the eyes be closed immediately after the flash, the feebler obscuring sensation of smoke will first disappear and leave clear the more persistent after-sensation of the design, which can now be read distinctly. In this manner I have often been able to see distinctly, on closing the eyes, extremely brief phenomena of light which could not otherwise have been observed.

After short exposure the after-effect is positive, there being no reversal or interval of darkness between the direct image and the after-image, one being merely the continuation of the other. In the next type to be presently described, there is an intermediate reversal.

After-oscillation.

When the silver cell has been subjected to strong light, the current of response attains a maximum ; on the stoppage of light there is an immediate rebound towards recovery. In this rebound there may be over-shooting of the equilibrium position, and an after-oscillation is thus produced (Fig. 6). Translated

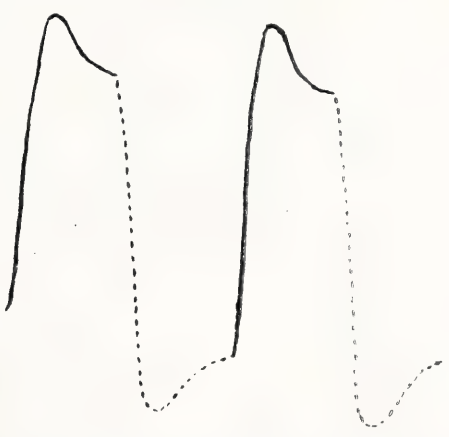


Fig. 6.—After-oscillation on the cessation of light. Thick lines represent the action of light, dotted lines the recovery and after-oscillation.

into the visual circuit, this would mean an alternating series of after-images. On the cessation of light of strong intensity and long duration, the immediate effect would be a negative rebound ; the next rebound is positive, giving rise to a sensation of light. This will go on in a recurring series. If after staring at a bright object, preferably with one eye, one looks on a dimly lighted wall, both the dark and the bright phases will be noticed alternately. The negative effect is usually explained as due to fatigue. That portion of the retina affected by light is supposed to be "tired," the negative image being due to fatigue or exhaustion. If this were the case, we should expect that this fatigue, with its consequent negative image, would gradually and finally disappear on the restoration of the retina to its normal condition. We find, however, that this is not the case, for the negative image recurs with alternative positive image. The accepted theory of fatigue is incapable of explaining the phenomenon. The observed effects point to a process of after-oscillation, exactly similar to that found in the sensitive cell.

Binocular Alteration of Vision.

It was while experimenting on the phenomenon of recurrent vision that I discovered the curious fact that, in normal eyes,

the two do not see equally well at a given instant, but that the visual effect in each eye undergoes fluctuation from moment to moment in such a way that the sensation in one eye is complementary to that in the other, the sum of the two sensations remaining approximately constant. Thus they take up the work of seeing and then relatively resting, alternately This division of labour, in binocular vision, is of obvious advantage. As regards maximum sensation in the two retinæ, there is then a relative retardation of half a period. This effect can be exhibited by means of a stereoscope carrying incised plates through which we look at light. The design consists of two slanting cuts; one cut slants to the right, and the other to the left. The right eye sees the one, and the left the other. On looking through the stereoscope, the two images will be superposed, and we see an inclined cross. After staring at the design for some time, if the eyes be closed, the after-effects will be perceived. Owing to the retardation of half a period, it will be found that the after-image is not a complete cross. Only one luminous arm of the cross shoots aslant the dark field and then slowly disappears; after this the second arm (perceived by the other eye) shoots out suddenly in a direction athwart the first. This alternation proceeds for a long time. That this is due to physical causes is seen from the fact that early in the morning, after long rest, the period is shortest; later in the evening, the period is lengthened (from about four to seven seconds). Again, if one eye be cooled and the other warmed, the oscillation in one eye is quicker than in the other; we thus obtain visual beats.

These after-effects sometimes persist for a very long time. It sometimes happens that owing to weariness the recurrent images disappear, but afterwards at most unexpected moments they will spontaneously reappear. In connection with this, the revival of images (on closing the eyes at night) that have been seen during the day is extremely interesting.

Another striking way of exhibiting the alternation is to look at two different sets of writings with the two eyes. The resultant effect is a blurr, due to superposition, and the inscription cannot be read with the eyes open. But on closing them the composite image is analysed into its component parts. We are thus enabled to read better with eyes shut than open!

Visual Impression of Lightning.

In photographs of lightning it is sometimes found that the image comes out (1) as bright core with dark border, and (2) with dark core and bright edges. If we look at a single discharge from an electric machine and immediately close the eye, we shall find exactly the same phenomenon reproduced. That is to say, we see a bright line of discharge bordered by intense dark edges—the edges being much darker than the rest of the dark field. After a while, owing to reversal, we find the inner core becoming dark and the edges becoming bright. One explanation of this curious phenomenon is the following:—We have seen that the molecular effect of electric radiation below a certain critical intensity is opposite to the normal effect. Now the image cast on the retina is sharp in the centre, gradually vanishing at the edges. It may thus be that at a certain limit the radiation intensity is below the critical value, hence the opposite effects at the centre and the edges.

The same cause—molecular strain—which gives rise to the photographic image also produces the visual impression. The difference lies in this. The retinal images are transitory; there may be sight echoes which grow fainter and fainter, at last merging into memory. In the photographic plate something is wanted which will arrest the fleeting image. We shall presently see how this may be accomplished.

The responses in the artificial retina, normal or abnormal, are exactly the same as that obtained with the real retina. The observed visual phenomena follow as a matter of course from the correct interpretation of the response curves. From observing the peculiarities of an artificial organ we are even able to discover unsuspected peculiarities in our own.

Vital Response.

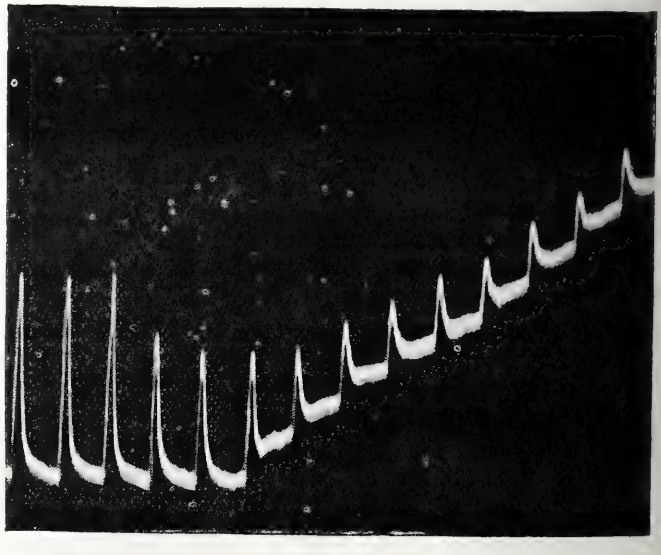
But the vitalists may object and say that vision is a phenomenon peculiar to the living. The visual responses are regulated by "vital force," which is much more subtle than mere physico-chemical forces which govern the world of brute matter. Let us now examine what is meant by this vital response, and what are its characteriestics.

The effect of stimulus on living substances is usually detected by two different methods. Mechanical response is obtained in the case of contractile tissues such as muscles. But in others—nerve for example—stimulus causes no visible change, the excitation of tissue may, however, be detected by the electromotive changes caused by the stimulus. The advantage of the electric mode of detecting response is its universal applicability. In cases where mechanical response is available, as in muscle, it is found that simultaneous mechanical and electrical records are practically identical. The intensity of electrical response is found to depend on the "livingness" of the tissue. When this activity is diminished by anæsthetics the intensity of electric response is also correspondingly diminished. When the tissue is killed, the response disappears altogether. Hence physiologists declare that "the most general and most delicate sign of life is the electrical response."

A living tissue is irritable, that is to say, stimulus evokes a molecular disturbance with its concomitant electric disturbance. On the cessaton of stimulus the electric disturbance gradually disappears; a living tissue is, however, ever responsive; it responds to a second stimulus, and exhibits subsequent recovery. A living thing is capable of dying; we may hasten death by the action of poison and at the approach of death the electric response disappears. The effect of poison in abolishing response is thus regarded as the physioligical test of a vital phenomenon.

Response in Ordinary Plants.

The gap between animal and metal is very great. I there-



Before. ↑ After.

Fig. 7.—Anæsthetic effect of chloroform on the response of plant. Uniform stimuli were applied at intervals of one minute. The rising part of each portion shows the effect of stimulus and the falling part shows recovery. The first three are the normal responses, after which, on the application of chloroform, the "electric pulse" underwent a rapid decline.

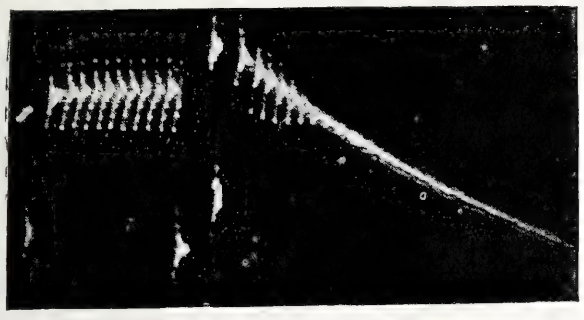
fore undertook an investigation on the responses in the transi-

tional world of plants, to find out whether they resembled the animal responses. Some sensitive plants are known to exhibit response, but it was thought that it ended there, that ordinary plants exhibited none.

Here is a leaf stalk of cabbage. I stimulate it by pinching, and you observe the immediate electric response; you see that the stimulus of a pinch or vibration evokes an electric twitch, followed by recovery. To show that the response is physiological, I poison the plant or kill it by hot water; the response, you see, has now disappeared. I chloroformed a plant, and you see in the record the gradual abolition of the electric "pulse" under the anæsthetic action (Fig. 7).

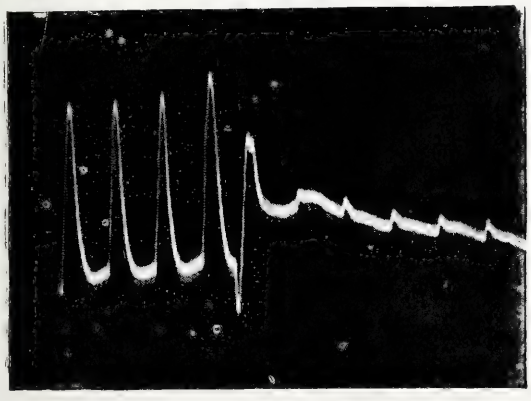
Vitalism.

From the observed fact—that a tissue when killed passes out of the state of responsiveness into that of irresponsiveness—



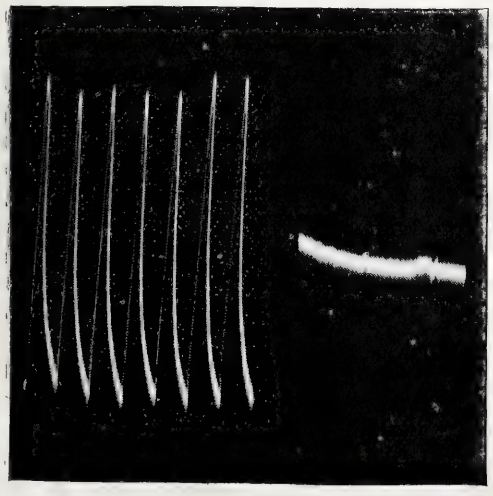
(a)

Before. ↑ After.



(b)

Before. ↑ After.



(c)

Before. ↑ After.

Fig. 8.—Effect of the same poison in abolishing the response in (*a*) nerve (Waller), (*b*) plant, and (*c*) metal.

and from the confusion of "dead" things with inanimate matter, it has been tacitly assumed that inorganic substances must necessarily be irresponsive. From this false assumption, that the inorganic is irresponsive, it was argued that the responsive phenomenon must be quite distinct from the physico-chemical phenomenon, and must be due to a mysterious "vital force."

This unexplained phenomena of response "became the starting point," to quote Verworn, "of vitalism, which in its complete form asserted a dualism of living and lifeless nature. The vitalists soon laid aside, more or less completely, mechanical and chemical explanations of vital phenomena, and introduced as an explanatory principle an all-controlling, unknown, and inscrutable 'force hyper-mechanique.' While chemical and physical forces are responsible for all phenomena in lifeless bodies, in living organisms this special force induces and rules all vital actions. In place of a real explanation, a simple phrase such as 'vital force' was satisfactory. Thus it was easy to 'explain' the most complex vital phenomena."

From this position, with its assumption of the super-physical character of response, it is clear that on the discovery of similar effects amongst inorganic substances, the necessity of theoretically maintaining such dualism in Nature must immediately fall to the ground.

Inorganic Response.

Taking a piece of metallic wire, I substitute it for the plant, all the rest of the apparatus and connections being precisely the same as before.*. I now stimulate the metal by mechanical stimulus—a tap or vibration—and you observe that the galvanometer spot on the scale, hitherto quiescent, moves, thus exhibiting the current of response. I stop the disturbance, and you see the spot creeping back to its original position, exhibiting a complete recovery. A difference of electric potential, sometimes very considerable (4 volt) is thus produced between the excited and less excited parts of the same wire which was orignially iso-electric. The more excited portion of the wire becomes, generally speaking, zinc-like, and the less excited copper-like. We may express the same fact by stating that the chemical activity of the stimulated portion of the wire has become relatively greater than the unstimulated portion.

As long as the wire is excited, so long will the electric response persist. Greater intensity of stimulus will produce stronger response. Finally, just as the response of animal tissue undergoes modification by various chemical re-agents, being excited by stimulants, lowered by depressors, and abolished by poisons, so also we find the response of metals undoing similar exaltation, depression, or abolition by the action of various chemical re-agents. These three records show how the same poison kills the response in nerve, plant, and metal (Fig. 8). Still more curious is the phenomenon, known not only to students of physiological response, but also in medical practice, that of the opposite effects produced by the same drug when given in large or in small doses. We find the same phenomenon reproduced in an extraordinary manner in inorganic response—the same re-agent which is a poison in large quantities acting as a stimulant when applied in small doses. We see that the "vital" response so called is in reality a physico-chemical phenomenon. We have thus in the artificial retina a mechanism whose action explains that of the real retina.

I have shown how all matter—living and non-living—is responsive to all kinds of stimulus; how the molecular disturb-

* For detailed description of experimental arrangements, see "Response in the Living and Non-Living." (Messrs. Longmans.)

ance thereby caused expresses itself in various ways; how the question of molecular friction determines whether the after-effect should be transitory or permanent. We have seen how the curves of response obtained by such widely different methods as those of conductivity or electro-motive variation are yet exactly similar.

Instead of applying mechanical stimulus we might apply the stimulus of light, and we would get exactly similar results. The study of the response curves given by a wire under mechanical stimulus will give us a general insight into the molecular effects produced by various stimuli under diverse conditions.

JAGADIS CHUNDER BOSE, M.A., D.Sc.

PLATINOTYPE PROCESS.

III.

PRINT-OUT SEPIA PAPER.

Sepia tones may be obtained by this process either by the use of palladium or mercury salts, but the former require absolute dryness and the use of a photometer whilst printing, and there is a great tendency for the shadows to be brown and the half-tones grey.

The sensitiser with palladium is:—

Chloroplatinite solution	4 ccm.
Soda iron solution	6 ccm.
Chloropalladinite of potash solution (1:10)...	2 ccm.

The paper should be sized with arrowroot.

For the mercury process (3) solutions are required:—

I.

Chloroplatinite solution .....

II.

Sodium ferric oxalate	40g.
Gum arabic (powdered)	40g.
Sodium oxalate solution (3 per cent.)	100 ccm.
Glycerine	3 ccm.

A few drops of sodium platinic chloride, or 1 per cent. bichromate solution, should be added to every 10 ccm. The sodium oxalate solution should be heated to 40 deg. or 50 deg. C., then the ferric oxalate and glycerine added, and the warm solution added to the powdered gum in a mortar with continual rubbing, and then the mixture filtered through a clean cloth into a wide-mouth bottle. It is advisable to add a few drops of a 1 per cent. solution of potassium chromate, or 10 per cent. solution of sodium platinic chloride solution to every 100 ccm. of this mixture.

SENSITISING THE PAPER.

A great deal of the success in the home preparation of platinotype paper is dependent on the operations of sensitising and drying the paper: one of the most important points is freedom from dust during drying and also freedom from anything like the products of burning gas.

For measuring the small quantities of liquids required, pipettes are better than the ordinary measures. In most of the formulæ will be found the term "drops." These should be calculated as 20 drops being equal to 1 cubic centimetre; and they can be conveniently measured by obtaining a piece of feeding-bottle glass tube drawing to a fairly fine point, and closing the other end with a blind teat. A trial with various sized holes in the glass will soon give one that will deliver the correct sized drop, or of course they can be measured in a finely-divided 1 ccm. pipette.

Another and most important point is the light in the room whilst sensitising, and in fact when mixing the solutions, for it must not be overlooked that they are in themselves sensitive to light. A bright gas light or even diffused daylight is quite sufficient to cause enough fog to give degraded high lights, so that it is advisable to use a yellow medium to filter the light, and even through this bright sunlight will cause fog.

In all cases the sensitising solutions must be distributed with brushes, but these must not be bound with metal, which would reduce the sensitising solutions, and give rise to endless trouble in the shape of black markings; nor must the brushes be too soft, otherwise they will absorb too much of the sensitiser; nor too hard, in that they will then cause streaks. For small sheets a round hog's hair glue brush, bound with string, can be used, whilst for large sheets a brush somewhat similar to a nailbrush with a handle on top is more convenient. It is also advisable to have a soft long-haired flat brush, which serves to even out any possible brush-marks.

The paper should be fastened by drawing-pins to a flat board, but care must be taken not to touch these whilst sensitising. The necessary quantity of sensitiser should be poured on to the middle of the paper, and rapidly distributed with the round brush, and if rapidly and lightly done first along the length and then across the breadth there will be no need for using the flat distributing brush, this latter being specially useful for large sheets; on the slightest sign of any dry places, the brush must be laid aside, for if the brush be used over such places, it causes streaky marks. Sensitisers containing sodium ferric oxalate must be lightly rubbed, preferably with circular strokes, with the flat distributing brush till all sign of glaze from the liquid is seen, otherwise crystals form on the surface. The distributing brush must also be used with all sensitisers containing gum or gelatine, as with these solutions innumerable small bubbles are formed, which, if allowed to dry, cause white or light spots, therefore the distributing brush must be used till the surface is dry.

It may be noted here that Hübl has proved that the sensitising solutions will keep for months in the dark.

DRYING THE PAPERS.

It may be taken as a general rule that artificial heat is absolutely necessary to dry platinotype papers, except in exceedingly dry and warm climates, and it is also advisable not to use a room too cool for sensitising. For drying a normal heat is 50 deg. to 60 deg. C.; at the same time it must be noted that from one-half to one hour is sufficient to ensure perfect dryness.

In sensitising for the cold bath process, the paper should be left for ten minutes before being subjected to artificial heat, and in the print-out process artificial heat is unnecessary, except in very cold and wet weather.

PRINTING, DEVELOPING, ETC.

Little need be said as regards the printing of platinotypes, as this is fairly well known, except to lay stress upon one or two points. It is well known, of course, that damp has considerable influence on the result, and indeed it causes loss of sensitiveness, fogginess, and want of depth in the shadows; it is, therefore, necessary to keep the paper as dry as possible whilst printing, especially in the winter or autumn, or when there is a good deal of moisture in the air, and therefore the negative should be well dried and preferably varnished, and the pads of the printing-frame be indiarubber.

It is advisable to use a photometer, and one made of fairly transparent paper is preferable, with gelatino or collodio-chloride paper, and it must not be forgotten that platinotype paper is from twice to four times as sensitive as the silver papers. Hübl strongly advises a trial printing with a small strip of the paper under a typical part of the negative, because the spectral sensitiveness of the silver papers is not quite the same as that of the platinotype, the former being more sensitive to the violet, the latter to the blue. For this reason, too, he

strongly recommends a particular make of photometer consisting of ten scales, half being covered with yellow glass, which cuts off the violet and transmits only the blue. It is obvious from this that yellow negatives will give more brilliant platinotype prints if covered with a blueish glass, and that blue-black negatives should be covered with a yellow glass, so as to limit the active light to the blue and blue-green rays. Bright sunlight gives also flatter prints than diffused light. A statement has been made that green glass over the negative gives more brilliant prints; but this is only correct for a given colour of negative and particular colour of glass.

The cold bath paper requires printing out to nearly full depth, and with this, and with all the papers in fact, too bright a light should not be used whilst developing. The developer may be a 1:3 or 1:5 solution of potassium oxalate, and the solution must be neutral; or a better developer still is Willis' phospho-oxalate solution:—

Neutral potassium oxalate	100 parts.
Potassium phosphate	50 parts.
Distilled water	1,000 parts.

The print should be immersed face downwards, drawn through the developer, and turned over and left, or placed on a sheet of glass, face upwards, till full depth is obtained, and then transferred to the acid bath. For large prints it is preferable to place them face upwards on a sheet of glass, and develop them with a brush and a developer containing one-sixth of its volume of pure glycerine, the use of which prevents any lines showing.

If the prints are over-exposed or greater brilliancy is required, the developer may be diluted with from four to six times the quantity of water, or, what is better still, add from two to five per cent. of a one per cent. solution of potassium bichromate. Willis suggested the use of .1 to .3 of potassium nitrite, and Von Janko the addition of .5 to 1 per cent. of ammonium persulphate.

For the hot bath paper the same developers, made acid, may be used, but heated to from 50 deg. to 75 deg. C. The lower the temperature of the developer, the slower the print develops, and the hotter the developer the quicker it develops, so that the former may be used for over-exposure, and the latter for under-exposure. This paper does not want printing so much as the cold bath; in fact, the delicate half tone should not be visible.

The iron paper with platinum in the developer can be best treated in small sizes by floating on a small quantity of developer in a dish; for large prints this becomes somewhat expensive, and therefore brush development can be used, but there is considerable danger of brush-marks, unless glycerine be used in the developer, and this causes somewhat harder prints, and in fact requires that the paper should be exposed longer, as it prevents the appearance of the finer details.

The normal developer is:—

Chloroplatinite solution	1ccm.
Phospho-oxalate developer	8-12ccm.

That with glycerine is:—

Chloroplatinite solution	1ccm.
Phospho-oxalate developer	8ccm.
Glycerine	2-4ccm.

About 20ccm. are required for a sheet 50 by 60cm.

For line work with this process the best developer is:—

Potassium oxalate (sat. sol.)	450ccm.
Chloroplatinite solution	12ccm.
Glycerine	50ccm.

and 30ccm. are sufficient for a sheet 66 by 90cm.

For the print-out process it is necessary that the paper be damp if the image is to print right out in the printing frame, but if it is too damp it may actually spoil before the details are impressed. The best way is to pin the sheet face downwards to the lid of a box, and place over a dish filled with water at 40 deg. C. for from one and a half to two and a half minutes, the older the paper the longer the time.

The developer for the cold bath, sepia paper, should be acidified with ten per cent. of oxalic acid, and the phosphate developer is preferable.

For the hot bath, sepia paper, the following is the best developer, and it should be heated to 70 deg. C.:

Potassium oxalate	100 parts
,, phosphate	50 ,,
Citric acid	20 ,,
Potassium chloride	10 ,,
Water	1,000 ,,

For sepia paper, Mr. Chas. F. Inston recently suggested the following developer:

Potassium oxalate	62 g.
Mercuric chloride	6 ,,
Potassium citrate	10 ,,
Citric acid	16 ,,
Water	450 ccm.

For use this is mixed with an equal quantity of water. As an improvement on this, which throws down a heavy precipitate, he now suggests two solutions:

I.—Potassium oxalate	142 g.
Water	1,000 ccm.
II.—Potassium citrate	22.2 g.
Citric acid	35.7 ,,
Mercuric chloride	13.4 ,,
Water	1,000 ccm.

For use mix in equal parts. The print must be printed deeper than usual.

Notwithstanding the fact that a sepia platinotype paper can be obtained commercially, a peculiar perversity, exemplified with other processes also, has induce some experimenters to obtain sepia tones with the ordinary black platinotype papers, Mr. Peebles Smith (Amer. Am. Phot. 1897) suggested developing the cold bath paper with the following developer, for which four stock solutions are required:

I.—Potassium oxalate	250 g.
Distilled water	1,000 ccm.
II.—Cupric chloride	31 g.
Distilled water	1,000 ccm.
III.—Mercuric chloride	62.5 g.
Distilled water	1,000 ccm.
IV.—Lead acetate	16 g.
Distilled water	1,000 ccm.

For use mix 3 parts of No. 1, and 1 part of No. 2, then add, with vigorous shaking or stirring, 1 part of No. 3 and finally $\frac{1}{4}$th part of No. 4. Filter if necessary and heat to from 80—85deg. C. The prints are developed and fixed in the usual way. Increase of the proportion of mercury will give warmer tones, and other variations may be obtained by substituting sodium acetate or phosphate for the oxalate.

For fixing, as is well known, three acid baths are used, and the first should be a two per cent. solution of hydrochloric acid, in which the print should be left for five minutes, and then it should be transferred to a somewhat weaker bath for fifteen minutes, and thence into the third bath, and then well washed. It is advisable to neutralise the last traces with about a .2 per cent. of washing soda, but this should not be used till after the prints have been washed a little time. It is not advisable to wash platinotypes too long, and three or four changes in from one-half to one hour is quite enough.

F. J. WALL

THE THEORY AND PRACTICE OF INTENSIFICATION.

Part I.

The subject of the intensification of the photographic image, with which I am about to deal in these pages, is one which has, from the earliest days of the history of photography, received its share of attention, and one that, from time to time, has engaged and served to display the abilities of all classes of photographic workers.

There has, doubtless, now and again been a certain tendency to subordinate theory to practice in the working out of the problems dealing with intensification and intensifying processes, but not perhaps a greater tendency in this direction than what we meet with in other fields of photographic inquiry.

In dealing with the subject on the present occasion, I do not propose to bring any startling novelties, in the shape of new intensifiers, before the readers of the Journal. My main object rather will be to show that the evolution of our existing processes of intensification offers a most interesting and instructive theme for study, and that the nature of that phenomenon itself, and in particular the chemical reactions upon which it is based, are worthy of the most careful attention.

At the outset we seem to require a working definition of what is meant by the words, "the intensification of the image," in the sense in which the phrase is employed by photographers. There are—somewhat unfortunately—two possible definitions of the word "intensification" as applied in this special connection. The first is simply "a strengthening"; the second, "an increase in density." These, it is important to note and bear in mind, are not necessarily synonyms in a practical sense any more than they can with propriety be regarded as interchangeable expressions. The first (in the majority of cases, at least) implies and includes the second, but the latter does not in all cases imply and include the first. Let me prove this by a practical illustration. In the process of intensification by the application to the image of a solution of mercuric chloride, and the subsequent treatment of the resulting compounds with a suitable reagent, we have an example of "increase of density," brought about by the formation of a deposit possessing a molecular weight greater than the atomic weight of silver. If, however, the action of the mercury solution has been such as to convert a large percentage of the original silver into chloride, and this chloride is afterwards treated with a reagent which transforms it into a compound more non-actinic and therefore less opaque than the image in its primary state, it will be readily understood that we will then have merely "increase of density" without any compensating "strengthening" of the image. In such a suppositious case it will, of course, be necessary to speak of the image as "toned," not as "intensified," there being, properly speaking, no intensification in the strictly photographic meaning of that word.

Intensification, it therefore will be seen, must be defined as "a strengthening of the image," and not, as it frequently is, as "an increase in density." As to the latter expression, a few words of explanation are also necessary, seeing that the term is involved in the definition which has just been given.

Density, as the word is understood in physics, is the ratio which exists between the mass and the volume of a body, and is accordingly defined in terms of these two factors.

If, as is, for the sake of convenience, the established rule in practice, the volume of the body is regarded as constant, we may then say either, that density is the mass of unit volume, or, what amounts to the same thing, that the density varies directly as the mass. If, however, on the other hand, we regard, as we are quite at liberty to do, the mass as the constant quantity and the volume as the variable, we may then say, conversely, that density is volume per unit mass, or, again, paraphrasing our second definition, that the density varies inversely as the mass. Finally, if we choose to combine our second and fourth definitions in a comprehensive general expression, we may then say that density varies directly as the mass and inversely as the volume.

We cannot, however, avail ourselves of this strictly scientific definition of density in speaking of the bodies, be they simple or compound, by which the photographic image is strengthened in the process which we call intensification. The reason is that the physical definitions of density above stated assume that one of the factors—either the mass or the volume, but by preference the latter—is a constant quantity. Now, in the chemical reactions just alluded to, mass and volume alike are variable quantities, and only in rare and exceptional cases do we find that either remains unchanged throughout the course of those operations by which the desired alteration in the appearance of the image is effected. Clearly, then, it is evident that we cannot estimate photographic, as we do physical, density, by a process based upon the ratio of constant volume to changing mass, or yet by its converse, the ratio of constant mass to variable volume. We must, therefore, endeavour to find a definition more suitable to the circumstances.

Intensification being essentially a chemical process, and as such one in which any change in constitution must needs be effected in accordance with the law of fixed proportions, and, further, weight and mass being proportional, we can, if we choose, in place of the unit of the latter, employ the respective atomic, or molecular, weights of the reacting bodies as one of the factors for the estimation of density.

As regards the other factor, there is more difficulty. We cannot, as before, employ the volume, because, in the case of solid and liquid bodies, this varies in a manner much too complex to permit of the fluctuations being expressed in a simple statement, like the law of constant proportions. We may, however, obtain a fairly satisfactory substitute, if, in place of a conception involving the consideration of space of three dimensions, we introduce one dealing with space of two dimensions only—*i.e.*, surface. We can then—having first chosen a suitable standard of measurement of this new quantity—define density as molecular (or, in certain cases, atomic) weight per unit of surface. It is really immaterial what unit we employ in actual measurement. It may be the square millimetre, the square centimetre, or the square inch. We may, indeed, if we think fit, call the superfices of the film itself the unit of surface, and this, as a rule, will be found the most convenient plan.

Of course, it will be understood that anything like actual gravimetric determination of the infinitesimally small quantities that are engaged in intensifying, and similar photographic reactions, is out of the question. We can state these quantities merely in a comparative form, one exhibiting their relative, but not their real, magnitudes.

Leaving intensification proper, something must be said in regard to intensifiers These, according to the scheme of classification adopted by some writers on photography, may be divided into two classes—viz., intensifiers acting (1) by substitution, and (2) by addition or augmentation. Auric and platinic chlorides furnish instances of those of the first class, whilst intensifiers of the ferricyanide type may be taken as representatives of the second. As a matter of fact, however, the vast majority of intensifiers act by augmentation, and, therefore, come under the second category.

Another scheme of classification might be suggested, founded upon the circumstance that some intensifiers act directly upon the silver image, whilst others, again, produce no intensifying effect until the metal has been converted into a salt or mixture of salts by a preliminary treatment with certain reagents. In carrying out the division on these lines we might speak of intensifiers of the first class as direct, and those of the second as indirect or intermediary. The uranium ferricyanide intensifier may be cited as an example of the former, and by substituting lead ferricyanide for the uranium compound a bath is obtained which possesses no intensifying properties, but acts nevertheless on the image in such a way as to bring it into a state capable of being strengthened by the subsequent application of an intensifier of the second or indirect type, such as a soluble sulphide or other suitable reagent.

In regard to the intensifiers of the last-mentioned class, those who are responsible for our photographic terminology appear for the most part to have overlooked the very real difference which I have here pointed out as existing between the intensifier proper and the auxiliary bath, and, in point of fact, the latter, as often as not, is styled by them the intensifier. In speaking, at a later stage, of the different forms of intensifying bath which come under this particular head, I shall, purely for the sake of convenience, adopt a middle course in preference to adhering to the strictly scientific classification, and speak of the dual combination formed by the auxiliary bath and true intensifier as itself the "indirect intensifier."

Intensifiers, again, might be classified according to the chemical character of the intensifying deposit formed upon, or compound formed with, the metallic image, but to do this properly the division into classes would probably have to be carried out to an extent which would defeat the object in view.

A similar objection would equally apply to any attempt that might be made towards a classification, based upon the chemical composition of the intensifiers themselves. On the whole, therefore, the alternative schemes of division above described are better suited to meet the requirements of practice, particularly the second, which, as I have already said, I shall adopt in these pages.

I shall now pass in review and briefly consider the leading physical and chemical properties of the products of the action of intensifiers upon the image. As to the first, the only physical properties with which we as photographers are concerned are those upon what may be termed the relative opacity of the image depends. These are three in number—namely, density, volume, and colour. A definition of the first has already been given. Owing to the fact, previously alluded to, that most of the intensifiers in everyday use react with the metallic silver of the film to form additive compounds, it follows that intensification is, generally speaking, accompanied by increase in density.

Such is not, however, the case with the intensifiers, which act by substitution—viz., the chlorides of platinum and gold. The former, for each molecule of metallic platinum which it deposits from solution, removes from the image four molecules of silver, whilst auric-chloride, notwithstanding the fact that gold is a monovalent element, acts as though the metal were trivalent, removing three molecules of silver for each molecule of gold, which it deposits in exchange. This anomalous behaviour of platinum and gold solutions supplies us with a reason—one of several that may be advanced—that serves to account for their unsatisfactory character as intensifiers.

A noteworthy fact in regard to the reagents which have been found to possess a special value as intensifiers is that they almost invariably

possess high molecular weights, and consequently act upon the image to form compounds of a density much exceeding that of silver in its uncombined state. The atomic weights of the respective metallic constituents of those reagents, too, are correspondingly high, being, in round numbers, 200 for mercury, 207 for lead, and 239 for uranium.

Volume, the second of the properties I have mentioned above, is a factor of some importance in our study of the physical conditions upon which successful intensification depends. It is a most interesting circumstance, and one, I believe, for which no adequate explanation has hitherto been suggested, that the various additive compounds formed with silver—bodies differing widely in their properties and chemical composition—by the action of the different classes of intensifying baths in use at the present day, possess, nearly all, abnormally high molecular volumes, higher, that is to say, than we should expect them to be after taking into consideration the several molecular weights of the compounds in question.

To elucidate my subject, it is perhaps proper that I should here give a definition of what is meant by the expression *molecular*—or, as it is sometimes styled, *specific—volume*. In chemistry, the term is applied to the quotient which is obtained by dividing the molecular weight of a compound by its specific gravity. It may with equal propriety be defined as the product of the molecular weight and the reciprocal of the specific gravity. For practical reasons it is generally more convenient to employ the latter definition.

In the case of an element, the term atomic volume is employed, the atomic weight being substituted for the molecular weight in making the necessary calculations.

As a practical illustration, let it be assumed that we desire to ascertain the molecular volume of chloride of silver. The molecular weight of this compound is 143.0, and its specific gravity is 5.50. Dividing the former by the latter, we have for quotient, 26.0, the molecular-volume required. The same result is obtained, and with a greater degree of expedition, if we multiply 143.0, the molecular weight, by the reciprocal of 5.50, *i.e.*, .1,819.

It seems exceedingly probable that the high molecular volume that characterises the compounds formed during the operations of intensification is a phenomenon that has a very intimate relation to the colour and degree of translucency or opacity exhibited by these bodies. We find in certain modern photographic processes, *e.g.*, in what is known as the "ripening" of emulsion during the operations of gelatino-bromide dry-plate manufacture, that a progressive increase in the volume of the molecules or molecular groups of the silver haloid is accompanied by a correspondingly characteristic change in the colour of the sensitive compound. In the present stage of our knowledge it is impossible to formulate the conditions or state the principles upon which the inter-relation of molecular volume and specific colour depends. It is, nevertheless, possible, by the simple method of a study of the volumes of the compounds obtained in the processes of intensification, to gain information which may help at some future date to solve this important problem in chemical physics.

Colour, however, as I have already indicated, occupies an independent position among the properties which require to be taken into account in our examination of the optical characteristics of the products of intensification. Chemical composition, as may naturally be supposed, exercises an important influence in determining the colour of compounds, but, in addition to this, such factors as the temperature, the relative state of aggregation of the reacting bodies, the strength of the solutions employed, etc., contribute each its special share towards the result.

As a general rule, our existing intensifiers act upon the image by diminishing its actinic qualities, the colour of the compounds formed by them—ranging usually from yellow through orange and red to a medium shade of brown—being more non-actinic than that of the silver deposit obtained in the process of development. Such a result, looked at from a practical point of view, may seem at first sight an undesirable one; but in reality considerable advantage is gained by employing a bath of this particular type.

For one reason, the warm colour, by imparting a certain degree of hardness to the negative image, contributes in no small measure towards that increase of strength which is the object sought by the intensifying treatment. Besides this, in the case of a deposit of comparatively non-actinic quality, an extremely thin film of the new compound is sufficient to give that measure of intensity in which the image was lacking, and there is thus less risk of the original gradation of the subject being impaired. Lastly, owing to the light shades of colour produced by these baths, the growth of the intensification is more easily watched, and the operations are, in consequence, more readily under control.

As the chemical properties of the intensifiers require to be dealt with in considerable detail, I shall reserve my treatment of these for the next article, in which I shall speak of the different kinds of intensifiers employed in photography, with the object of exhibiting their comparative merits and defects.

MATTHEW WILSON.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

August.	Name of Society	Subject.
1.....	Croydon Natural History.....	Photographic Section Meeting.
2.....	Croydon Camera Club	A Three-day Trip. Directed by Messrs. W. H. Rogers and F. W. Hicks.
4	Camera Club.....	Ramble—(Bank Holiday.) Clovelly.
5.....	Rotherham Photographic	*Carbon Process.* A member.
5.....	Southampton Camera Club.....	Print Competition—*Snapshots.*
6.....	North Middlesex Photographic	Seventh Lantern Slide Competition.

Commercial & Legal Intelligence

AT the Liverpool Assizes, on Friday last, John Hunter (57), described as a photographer, was found guilty of having by false pretences obtained 2s. 6d. from one Lilly Lunn, at Morecambe, on May 15th. The money was obtained in part payment for photographs which were not delivered. Prisoner had been previously convicted of a like offence, and was now sentenced to twelve months with hard labour.

WILLIAM GERECKE, LIMITED.—The above-named company has been registered with a capital of £2,000 in £1 shares. The objects of the company are to acquire the business of manufacturers of and dealers in musical, photographic, and scientific instruments, apparatus and accessories, mechanical and other novelties, etc., and to take over the business carried on by W. Gerecke, at 8-9, Goring Street, London. No initial public issue. Registered without articles of association.

HENRY MATTHEWS AND COMPANY, LIMITED.—The above-named company has been registered with a capital of £15,000 in £10 shares (600 preference). The objects of the company are to acquire the business carried on at Lewins Mead, Bristol, and elsewhere, as Henry Matthews and Co., and to carry on the business of manufacturers of photographic and scientific apparatus and materials, etc. No initial public issue. The first directors (to number not less than two, nor more than four) are G. F. Matthews (chairman) and J. G. Dennehy. Qualification £100.

RE William Henry Parkinson, of 115, Newton Street, Bradford, artist and photographer.—The first meeting of the creditors interested under this failure took place on Friday last, at the offices of the Official Receiver (Mr. J. A. Binns), Manor Row, Bradford. The summary of accounts showed liabilities amounting to £1,831, of which £614 would rank against the estate for dividend. The assets are estimated at £502. The bankrupt attributes his insolvency to competition, which has within the last two years reduced his business as an artist and photographer to one-half, and to the necessity of paying interest on money borrowed to enable him to purchase his business premises. Mr. John Butterfield, chartered accountant, was appointed as trustee with a committee of inspection.

SUICIDE With "Intensifier."—At the Liverpool City Coroner's Court, Mr. T. E. Sampson held an inquest on the body of William Wylie Innes, aged thirty-nine years, who lived at 134, Jubilee Drive, Kensington, Liverpool. The deceased was a healthy man and a teetotaller, but was unaccountably jealous of his wife. In consequence of the bickering which ensued, the wife left him on the 15th inst., and had not since been seen by any member of her family. On the evening of the same date the deceased walked out of his kitchen, where he had been for some time by himself, and said to his brother, "I have done it. I've taken about a gill of it," at the same time handing over a bottle labelled "Mercuric Intensifier.—Poison," which he had been in the habit of using for photographic work. The brother administered an emetic, and a doctor was sent for. He was taken to the Mill Road infirmary, where he died on Wednesday night as a result of the poison. Before he died, Innes ejaculated, "It's all through a woman." The jury returned a verdict of "Suicide whilst temporarily insane."

THE Coal Tar Industry in Germany.—The report of Consul-General Francis Oppenheimer on the trade of the Consular district of Frankfort-on-Main for the year 1901, contains some interesting particulars concerning chemical industries in Germany. Frankfort, he states, is surrounded by some of the most important chemical factories in Germany, and in no branch of industry has German education borne better fruit than in the chemical industries; the benefit being often acquired at the expense of British competitors. Though the United Kingdom was the cradle of the manufacture of aniline dyes, she was soon outstripped by Germany. During the first period of Germany's success the United Kingdom at least furnished the raw materials, but since the use of the coke furnaces in Germany has become general, in which the secondary produce is collected, she finds at home sufficient coal tar to supply practically all she requires. A recent exhibition in London of artificial dye-stuffs produced in Germany, together with specimens of a great number of fabrics and materials—from silk to wax—to which they can be applied, showed,

Mr. Oppenheimer thinks, the excellence of the German manufacture.—"The Pharmaceutical Journal."

An Unfortunate Position.—At the Marylebone Police Court, a middle-aged woman sought advice of the magistrate as to whether or no she could obtain any redress against a coachman under the following circumstances. On Saturday her daughter was married, and when the ceremony was all over the whole of the wedding party assembled in the yard in front of the house and arranged themselves in position to be photographed. All went well until the photographer was on the point of removing the cap, when, to their surprise and disgust, a coachman, who had been washing his carriage hard by, turned his hose upon them, drenching one of them to the skin, and spoiling several of their dresses.—Mr. Curtis Bennet: He had as much right to wash his carriage as you had to have your wedding group taken.—Applicant: Yes, but we asked him kindly to wait, and he refused.—Mr. Curtis Bennett: He was not bound to. Perhaps he was obeying his master's orders.—Applicant: Can we get no recompense for the damage to our dresses? We were all in position when it happened.—Mr. Curtis Bennett: It was a very unfortunate position. (Laughter.) Anyhow, you cannot get recompense here. You may try what you can do in the county court.

A Candid Witness.—A case which created some amusement came before his Honour Judge Whitehorne at the Birmingham County Court on Wednesday last. Eva Harrison, photographer, of Bright's Buildings, John Bright Street, sued J. Pearce, of Kensington Gardens, Balsall Heath Road, for 15s., the cost of half a dozen photographs. The case for the plaintiff, as presented by Mr. Adcock, was that the defendant was foreman supervising the rebuilding of the studio in John Bright Street. The plaintiff's operator took his photograph, and remarked: "It is splendid."—His Honour (who had been handed the half dozen photographs): I rather agree.—The defendant: It looks well, does not it? (Laughter).—His Honour: It does.—The defendant stated that the operator asked him to have his photograph taken. He inquired of him one day, "Are you busy?" and he replied, "No, I never profess to be busy." (Laughter.) He was photographed at the invitation of the operator, and when shown a proof he inquired the price, and was told that it was 5s. for one, and he said in jest, "Oh, I will have half a dozen."—His Honour: You said that, did you?—Defendant: Yes.—His Honour: You are not the first man who has had to suffer through jesting. I think you must pay for them.—The photographs were then handed to the defendant, and his Honour remarked that he was one of the most candid witnesses he had ever heard.

Re Arthur Duncan Thomas, Cinematograph Exhibitor, 60, Chandos Street, Strand, W.C.—The public examination of this debtor was appointed to be held at the London Bankruptcy Court on Tuesday last before Mr. Registrar Linklater. It appeared that debtor went on tour with an animated photographic apparatus. At present he was out of engagement, but assisted the Warwick Trading Company, who were photographic manufacturers of Warwick Court, E.C. He had no agreement with them for salary, but they paid him from £2 to £3 per week. He had had no permanent address for the last five or six years, as he was travelling about the country for the greater part of the year. He had no fixed place of business. He did fairly well until October last, when business fell off, owing to the falling off of the interest of the public in the war, and also to the counter attraction of the pantomimes. The address mentioned in the receiving order at 60, Chandos Street, Strand, W.C., was where Mr. Gibbons, a cinematograph manufacturer, carried on business. In December last he purchased the business of debtor for £700, of which £350 was cash down, and of the balance £100 was still owing. Debtor left that address in March last. The Warwick Trading Company had some machinery and negatives of his, which would be handed over to the trustee. He had no notice of the bankruptcy proceedings until the Official Receiver's inspector called upon him. He alleged his failure to have been caused through insufficient capital and temporary falling off of interest in animated photographs relating to the Boer War. The statement of affairs filed by the debtor disclosed unsecured liabilities amounting to £7,498 8s. 8d., and assets estimated to produce £416 7s. 2d. Eventually the examination was ordered to be adjourned.

British Mutoscope Company, Ltd.: A Hopeful Outlook.—The fourth ordinary general meeting of the British Mutoscope and Biograph Company, Ltd., was held on July 24th, at St. James's Restaurant, Regent Street, W., Mr. W. T. Smedley (the chairman) presiding. The secretary (Mr. A. G. George) having read the notice convening the meeting, the chairman, in moving the adoption of the reports and accounts, said he would, in the first place, refer to the balance sheet, and give the shareholders some explanation as to the figures which were contained therein. On the assets side it would be seen that the mutoscopes and reels out on license, patent rights, and goodwill stood at £202,024, as against £214,004 last year. That amount had been reduced by the receipt of a sum of money from the liquidator of the London Company, on account of shares which the Mutoscope Company held in that company, which was now in liquidation. The plant and machinery, biographs, cameras, and negative and positive films, as at February 28th, 1901, amounted to £18,563, and from that they had written off depreciation at the rate of 10 per cent., or £1,856, leaving the item at £16,707. The additions to plant during the year amounted to £3,276, the figure now standing at £19,983. That increase was largely accounted for by the increase during the year in the biograph. The item of expenditure on experiments and work in progress, which amounted to £764, was entirely a new item, and he considered it one of the most valuable assets, relatively, in the balance-sheet. It represented the Kinora and a number of new devices which the management had been engaged in during the year. The stock-in-trade amounted to £7,457, which was a reduction of about £500 as compared with the previous year. The investments at cost, less provision for depreciation, stood at £28,769, and showed an increase of upwards of £10,000. That increase was in connection with the amount they had invested in the British United Automatic Machine Company, Ltd., which was now operating most of the mutoscopes throughout the country. With regard to the profit and loss account, that showed a balance brought from the previous year of £15,325, while the profit for the year under review amounted to £8,895, making a total of £23,730 to the credit of that fund, or sufficient to have paid a dividend of 9 per cent. per annum. The profits for the year amounted to £17,425, as against £19,865 last year, or a reduction of £2,400. The profits of the year might have been made considerably larger, but owing to the position of the cash account there was no possibility of a dividend being paid, and they had therefore taken the opportunity of writing down everything they could in the balance-sheet. There was £23,720 to the credit of the revenue account, and that, if the company had been in possession of funds, would have enabled the board to pay a substantial dividend. They would find that the total liabilities appearing in the balance-sheet this year were £29,502, while last year they amounted to £43,782. During the year they had reduced the liabilities of the company to the extent of £14,200, and that was where £14,000 of the profits had gone to. The liabilities of the previous year were £46,000, so that between 1900 and 1901 they had been reduced by between £3,000 and £4,000, and during the past year they had been reduced to the extent of over £14,000. The British Automatic Machine Company had been formed with a capital of £10,000, the whole of which was held by their company, and that company had been provided with the means of acquiring the assets of all local companies, including those of the South Coast Company. In all, there were eight local companies whose businesses had been taken over. At the present moment about 2,500 of the machines were out and at work with the British United Automatic Machine Company, and more were going out week by week, and by the end of the present year they would have 5,000 machines in operation. The question they had to face was whether they would be successful or would they be as unsuccessful as the local companies were. He was of opinion that by concentrating the whole of the management under one company, by which they saved eight secretaries, eight boards of directors, and eight offices, they would succeed, because they would effect a total saving as compared with the expenditure of the local companies of something like £12,500. (Applause.) Then there would be no rent to be paid to this company, while the other companies had to pay a rent of £1 per machine, and that would bring the saving effected up to £17,500 a year. If they estimated that they would make a profit of 2s. 6d. per week on the 5,000 machines which were out, it would give them a revenue of £32,500 a year, while if £20,000 or £25,000 were put down for expenses, which was a very liberal estimate, it would leave a profit of from £7,500 to £12,500 a year. They had contracts with railway companies for nearly 2,000 machines, and the profits from those machines were in most cases very satisfactory. He found the profits on the North Eastern Railway averaged in one district 5s. 5d. per week; in another, 4s. 7d.; and in a third, 3s. per week; so that his calculation of 2s. 6d. per week was a very fair average. The profits on the biograph had been more than in the preceding year, and for the present year they would be larger still. At the present moment the biograph was in operation at the Palace Theatre, and at the Wolverhampton Exhibition, and making very fair profits. With reference to the studio, that was a thing that was flourishing at the present moment. They had passed through many vicissitudes, but they had got that into commercial lines, and the turnover was increasing month by month. The postponement of the Coronation was a serious loss to them, because they had made arrangements with the American press and the illustrated press in London which would have produced a profit of at least £500 or £600. In the ever-ready department the profits were not quite so large, but in the advertising, mutoscope, and other departments the returns had been satisfactory. Mr. James Gatecliff, in seconding the motion, said the company was in a much stronger financial position than they were a year ago. He had every confidence in the company, and believed that in a year hence they would be able to pay substantial dividends. Subsequently an extraordinary general meeting was held, at which resolutions were passed authorising the directors to issue the 25,000 shares of the unissued capital as cumulative preference shares of 7 per cent., giving them the right to priority in the distribution of assets in case of liquidation. A vote of thanks was given to the chairman and directors, and the proceedings terminated.

Mr. J. B. Crawford writes:—"'C. J. E.,' in your last issue, asks for a book on photographing flowers. Will you allow me to recommend to him No. 13 of the Photo-Miniature series, 'Photographing Flowers and Trees,' Dawbarn and Ward, Ltd., price 6d.?"

The Photographic Camp which was pitched at Glover's Island, near Evesham, closed on Saturday, after ten days' enjoyable outing. The places visited last week included Stratford-on-Avon, Cleeve Mill, Harrington with its picturesque cottages, Fladbury Mill, Chadbury Mill and Weir, etc. Before separating, Councillor Till, of Lancaster, expressed the thanks of the campers to the captain, Mr. Walter D. Welford, for all the labour and time he had expended over it. Mr. Welford said in reply that the evident enjoyment of those who had participated made his work quite a pleasure, and he hoped the campers would show further appreciation by coming again next year, when the camp would be much larger and be pitched for a longer time.

News and Notes.

London and Provincial Photographic Association.—Throughout August the Thursday evening meetings will be open to any members or visitors who have objects of photographic interest to bring forward. Colonial and foreign visitors are always welcome at the meetings, White Swan Hotel, Tudor Street, Fleet Street, E.C.

Plate Lifters.—"Invention" writes:—To avoid during photographic development the necessity of touching plates, which is particularly inimical to success in hot weather, some sort of plate lifter should be employed. Many types can be obtained, but a piece of string laid in the dish will serve very well. Its ends will extend over the sides of the dish, and by holding them the plate can be lifted until it is in a position to allow its edges to be held between finger and thumb without fear of damaging the sensitive surface. Cannot some of our readers design a cheap and simple plate lifter which shall meet the requirement?

The Photographic Convention of the United Kingdom.—As already announced, the Convention of 1903 will be held in Perth. July next seems a "far cry"; but the good folk of Perth appear to be already "eager for the fray." The president of the photographic section of the Perthshire Society of Natural Science, Mr. Henry Coats, when in London a few days since, had a long interview with the hon. sec of the Convention, Mr. F. A. Bridge. The whole of the arrangements were carefully gone into by these gentlemen, and practically the entire programme will very shortly be ready to be placed before the council for its consideration.

Southern Societies' Exhibition "Combine."—The three societies mentioned below have decided to arange their exhibitions under conditions which should appeal strongly to exhibitors. The dates have been arranged in order that exhibitors may enter their pictures for all three exhibitions, and those who do so will, without any extra charge, have their pictures packed and carriage paid between the exhibitions, and in addition to the club awards a special award, given by the combined societies, for the best work exhibited in all three exhibitions. The names of the societies and dates of exhibitions are as follows, and entry forms, with full particulars, can be obtained from the respective secretaries:—Southampton Camera Club (S. G. Kimber, Oakdene, Highfield, Southampton), November 13th to 19th; Hove Camera Club (A. R. Sargeant, 55, The Drive, Hove), November 27th to 29th; Southsea Photographic Society (F. J. Mortimer, Ordnance Row, Portsea), December 15th to 20th.

It will be remembered that Mr. J. Gibson, F.C.S., of this town, gave a course of twelve lectures on "Elementary Photography" under the auspices of the Local Technical Education Committee in the Board Room, Town Hall Buildings, last winter. Hopes are now being freely expressed that the County Council will grant the practical assistance necessary so that the lectures may be continued during the coming winter. But as this would be an entirely new addition to the Council's education agenda, there is some doubt as to whether they will grant monetary aid. However, facts are the strongest proof that they ought to do so. Last year's lectures were eminently successful. They were begun by the local committee as an experiment, and results showed that the number attending them were greater than any of the other evening classes could boast of. For the present I will not say more than express the hope that the county educational officials will give the matter serious consideration. —"Hexham Weekly News."

Sixpennyworth of Photographic Appliances.—It is difficult to conceive when the minimum in price of photographic apparatus will be reached. We recently saw in a stationer's window cameras "with outfit" marked up for the small sum of sixpence. As the shop was one at which we occasionally deal, we went in and made a small purchase—not of a camera—to interview the proprietor. He told us the camera had a lens, and when we examined it we found it had, or at least a piece of glass. It was furnished with an instantaneous shutter, and a strap handle to carry it by. The "outfit" consisted of a dry plate and the necessary chemicals for its development, and all complete for the modest sum of sixpence. He told us he had sold a lot of them, and that looks well for photography, for if a boy or girl purchases one of these "outfits" and manages to get in the first essay an image of some sort or other, a thirst will be created for something that will yield a better result. Many of our best amateurs were in the first instance induced to try their hands at photography because they could do so at the cost of a few shillings, and there is no telling how many of the purchasers of these sixpenny outfits may eventually become skilled photographers. What struck us most when examining this apparatus was, What was the price at which it was produced? The shopkeeper would require probably not less than 20 per cent. profit, and the thing possibly had passed through the hands of one or more middlemen before it reached him. At what price was it supplied by its manufacturer?

The National Art Competition.—The exhibition of the things sent in for competition this year by art and branch schools, science classes, and art classes to South Kensington, according to the examiners, shows no great advancement. Fewer things were sent in than last year, yet the examiners had to go through no less than 41,649 works. Of these, something less than 6,000 were adjudged worthy of competing, and 739 were awarded prizes. But it is noteworthy that less than half the gold medals that were awarded last year were bestowed this, and only 80 silver ones, as against 127 last summer. Proportionate reductions also appear in the number of bronze medals and of book prizes. It seems that Birmingham produces more students that find favour in the judges' eyes than any other town, while Liverpool comes as a good second. It is very satisfactory to see, in this competition, that local industries are duly considered by the students. That is as it should be, as it shows that the object of these schools is being fulfilled. Thus, for example, Ireland sends largely designs for crochet and Limerick lace, Taunton patterns for Honiton lace. From Birmingham come designs for buttons, jewellery, silver plate, etc. Belfast sends suggestions for damask drapery, Bradford again studies woven materials, while Manchester chiefly concerns itself with designs for printed muslins, cretonnes, and the like. These art schools should de much towards keeping art industries in this country, and we should have seen from the examiners' report that this year's competition had shown an advancement on last year's, instead of, on the whole, a falling off in the merit of the works submitted.

Substitutes for Pulp and Paper Material.—"It will probably be many years yet before we exhaust all our resources of spruce for the making of wood pulp," says a writer in the New York "Sun." "Still, an area as large as Rhode Island is stripped of its spruce every year to supply the mills that make newspaper alone; and many of the manufacturers think it is none too early to begin experimenting with other material for paper-making to supplement the spruce supplies, and even to take their place if we cannot grow crops of spruce fast enough to meet the demand. Some good use is found every year for plants that were supposed to be useless. In the museum at the botanical garden are specimens of rugs and other articles made of a variety of sedge that is found widely in our Northern States. This grass was supposed to be worthless a few years ago, but somebody discovered that it supplies a good strong fibre, and to-day it is being turned into binder's twine, rugs, and other things that are worth having. Two materials new to paper-making are now attracting attention. One is bagasse, the refuse of the sugar mills, which hitherto has been pure waste, except a small part of it used as fuel. A paper mill in Texas is now using bagasse to make paper, and the product is said to be excellent. It is predicted that the day is soon coming when all the bagasse from our Southern sugar cane fields will be used to make paper; thus bagasse will be another of the waste materials diverted from the waste heap and turned into a source of wealth. Another kind of paper material is rice straw, very little of which is now used except to provide bedding for cattle. It has been known for a long time that good paper could be made of this material; but, for some reason, it has not been utilised to any extent. There are great possibilities before Louisiana and Texas in the manufacture of paper from these two new materials. All the same, it would be folly to permit our spruce forests to become exhausted. The timber that is sent to the mills for pulp wood should be replaced by another planting, as with any other crop. It is getting rather late for any woodsman to remove a crop of timber without the slightest idea that a later generation will take another crop from the same ground. Canada is the great preserve of the whole world for future supplies of pulp wood. Her spruce resources have scarcely been touched, though her southern forests have been badly depleted. The country has a magnificent belt of spruce, extending from the south-east in Quebec far north-west to the Mackenzie River. Not a bit of this spruce has yet been utilised, and will not be till railroads are extended to it; but the railroad projects now under way will before very long tap this greatest of all resources of pulp supply."

"The Coronation was a Wonderful Sight!"—It may or may not be true that Mr. T. J. Barratt, the peerless advertiser of Pears' Soap, has offered to rebuild the absquatulated Campanile of St. Mark's—for a consideration; but even he must have admired the splendid audacity of the "Peer's Daughter" who criticised the Coronation in the July number of the "Lady's Realm." Never did magazine have such an advertisement. Everybody was asking every other body if they had seen the "Lady's Realm," which as a consequence of "rushing into print" immediately rushed out of it, and is now at a premium. "The Coronation was a wonderful sight—for those inside the Abbey, at all events. The magnificent display of jewels and orders, the richness of colour of the mass of beautiful crimson robes of the peers and peeresses, the glitter of the hundreds of coronets, and the kaleidoscope of brilliant tints worn by the many other spectators, formed a never-to-be-forgotten picture. (A kaleidoscope 'worn' is indeed a novelty.) Then the procession next day, not a little increased in impressiveness by the millions and millions in the streets, on the stands, and filling every window! The gala-night at the opera was a disappointment to many, no doubt, but certainly not to all. Seldom have we had a worse chorus." Unfortunately, in order to heighten the vraisemblance of her criticism of this uncrowned Coronation, and this opera without words or music, "A Peer's Daughter" said some rather unkind and, under the circumstances, unjustifiable things about the manner in which the singers—or "stars of song," as she calls them—acquitted themselves on the night of that Coronation—which has not yet taken place. Of course Messrs. Hutchinson and Co., the publishers of the very popular "Lady's Realm," were quite unaware that this peer's daughter had been "saying things she didn't ought'er," but they were responsible, and they at once expressed their regret and their willingness to do what they could to make reparation, which ultimately took the form of a cheque for £100 to Mr. Neil Forsyth, of the Royal Opera, and an apology to the stars in the columns of "The Times" and "Telegraph." Mr. Forsyth has given the money as a contribution to the King's Hospital Fund, so all's well that ends well, and the August number of the "Lady's Realm" is, if possible, to contain a portrait of "A Peer's Daughter" in the family jewels and "the beautiful crimson robe" which she wore in Westminster Abbey at the Coronation. Anticipatory accounts of the Coronation were numerous; many tons of them were doomed to blush unseen, but the most unblushing of all was unquestionably that of the presumptive and withal too previous peeress in

whose interests Messrs. Hutchinson have "already made an alteration in their literary staff." When she looks at her invitation card, which she "wonders if those present in the Abbey thought of preserving," and which "looks very well framed in a narrow dark oak frame," she should remember that although a cat may look at a King she cannot see him if, like the Spanish Fleet, he is not yet in sight.—"The Publishers' Circular."

THE Third Chicago Photographic Salon.—The Art Institute of Chicago has the honour to announce that, under joint management with the Chicago Society of Amateur Photographers, the Third Chicago Photographic Salon will be held in the Galleries of the Art Institute, from December 16th, 1902, to January 4th, 1903, or later. All persons interested in pictorial photography as a means and medium of artistic expression or interpretation of truth, beauty, emotion, sentiment or ideality are cordially invited to submit works for the judgment of the Jury of Selection under conditions hereinafter set forth. The joint management of the Third Photographic Salon is unanimously agreed to maintain the standard of this annual exhibition on the highest plain of artistic excellence. Only such works as give evidence of individual artistic feeling, expressed in accordance with the canons of the fine arts, will be accepted by the Jury of Selection. Dexterity of technique in the mechanical and chemical processes of photography will be considered in judging works, but it will be completely subordinated to that composite of imaginative, creative and technical quality which is the essential of the fine arts. The Chicago Photographic Salon owes its very existence, as a permanent institution under the patronage of the Art Institute, to the fact that it stands for the modern aspiration toward truly artistic photographic expression, as contra-distinguished from mere technical merit. Artistic merit is the primary consideration of the Salon management; technical merit is secondary. The photograph which nobly expresses a noble conception of truth, beauty or ideality is a work of the fine arts precisely as if it had been executed by the painter or the etcher or the sculptor in pigments or lines or in plastics. The personnel of the Jury of Selection insures judgment of the works submitted to it on the broadest and most catholic principles of the fine arts. No awards are offered, and no charge will be made to exhibitors. Each exhibitor will be furnished with the official catalogue of the Salon issued by the Art Institute of Chicago, which will be official notification of acceptance or rejection of the works submitted to the Jury of Selection. Exhibitors may submit any number of pictures, but not more than ten pictures by one exhibitor will be hung. The pictures will be hung in the gallery on a background of dark green burlap. They will be judged by the north light of a single large window. All pictures submitted must be separately framed (with or without glass) or matted under glass. The title of each picture and the exhibitor's name and address must be clearly written on the labels provided, which must be attached by the exhibitor to the back of each picture. Nothing may appear on the front of the picture except the title and exhibitor's name. No accepted pictures may be removed before the close of the exhibition. Arrangements will be made for the sale of pictures if desired, subject to a commission of 15 per cent. All pictures must be forwarded at owner's risk, carriage prepaid, and delivered at the Art Institute not later than 5 p.m., Monday, December 1st, 1902. Return charges must be collected by carrier. All communications and all pictures submitted must be addressed to the Chicago Photographic Salon, Art Institute, Chicago, Illinois, U.S.A. It is understood, unless expressly forbidden by the exhibitor, that the Art Institute of Chicago and the Chicago Photographic Salon shall have the right to reproduce any accepted picture in the official catalogue, or in a souvenir to be prepared during or after the Salon or in such art and photographic journals as may comply with the regulations made by the Salon Committee. The management will use all reasonable care to prevent any loss or damage to pictures in its charge, but will not be responsible for any damage.

IT is in the nature of things that an exhibition bearing on a subject popular but not precisely defined should be something of an experiment. What the promoters of the movement which resulted in the opening of the Nature-Study Exhibition by the Duchess of Devonshire in the Botanical Gardens yesterday desired to ask was what means are being taken to teach young England, which dwells greatly in cities, the facts and interests of natural history, and how far these are successful. The reply was spontaneous, and came from a very wide public. On the whole there can be no doubt that there is abundance, far more indeed than could possibly be expected, of the kind of sentiment and appreciation of natural history in very many branches which is of real value both as an intellectual pleasure and a source of mental refreshment. No one can complain of the list of exhibitors. It was what is very seldom seen in this country, comprehensive of most classes of society, rich and poor, of the highly educated, and the National School boy or girl. Eton and St. Paul's, agricultural colleges, ladies' colleges, schools of gardening, and boys and girls from the county councils' schools, and, not the least important to the nation, the children, almost to the youngest, in the thousands of Board schools in the great towns and in the rural districts had sent the work, while the bodies and instructors concerned in their training had added their schemes of work and teaching. The best results are obtained at the bottom and at the top, the former, to take a typical instance, in the case of some of the great urban Board schools, and the latter in a few of the great public schools. In the opinion of those best qualified to judge before the exhibition opened, much of the work sent in by the boys of St. Paul's School was good enough for a place either in one of the large museums or to illustrate scientific treatises. But there is something equally attractive, if not so finished, in the excellence of the work done by the quite young children in the Board schools of London, Liverpool, and Manchester, or among the collier towns of Wales. The older boys in the Liverpool schools can combine for organised expeditions in their holidays. They prepare for this by making model maps in plaster and colours of the districts to be visited, take photographs, explore the geology and flora, and record all this in their diaries. Manchester teaches all its children, from the babies upwards, to see, draw, model, and write about natural objects. The nature calendars in black and white done by the children are excellent, and quite tiny boys and girls get chances for drawing "real things," such as only very attentive and careful parents would put in their children's way among the classes which pay heavily for education. Some of the Welsh schools, such as those of Clue, near Barry, and Newport, showed admirably conceived schemes and their results. The agricultural colleges showed specimens illustrating the subjects taken for their diplomas. Original drawings by Miss Ormerod were shown by Bunbury School, near Tarporley, in Cheshire. In a new subject such as natural history everyone had a chance. Capital raised maps of Plymouth Sound and neighbourhood came from a Plymouth Board School at Laira Road, and others from Ventnor National School. A few very good field diaries and admirably illustrated sets of notes on the development of plants, were shown by young ladies at the Clergy Orphan School for Girls. They had also stuffed some birds and mounted some nests and eggs, but it is evident that "all is conscience and tendre heart" for it was carefully noted that the birds were found dead and the nests deserted. The Froebel School is great at aquariums, which the girls tidy, and which would have avoided all chance of censure from the author of "The Water Babies." Eton Museum sent sets of annelids, mollusca, and other invertebrates, some very rare specimens being shown of the former. The work of St. Paul's School was entirely from the hands of the boys, and attracted a crowd round the cases from the first. Complete cases showing every part of the life of a moth, from the egg to the perfect insect, all the plants, and stages of the larvæ, modelled in wax and correctly coloured, cases of various tree-trunks with the insects which find protective mimicry on them attached, and coloured plates and collections of butterflies, set and arranged as if by a museum expert made up the greater part of this exhibition, some of the authors of which are probably destined to distinguish themselves in what the late Sir William Flower always desired to see recognised as a profession, the curatorship of museums. Lady Warwick's School at Bigod in Essex, Swanley College, and the Surrey and Hampshire County Councils sent work illustrating their sphere of usefulness in the practical side of nature study; and Allen's Girls' School at Dulwich and Tiffen's Boys' School at Kingston send particularly good examples, the former of the growth of plants in chemical solutions and the latter of photographs of the geology shown in quarries, pits, and hill-sides of the Thames Valley.—"The Times."

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

A CURIOUS PHENOMENON.

To the Editors.

Gentlemen,—A few afternoons since I was taking a few snapshots on the shore at Leigh-on-Sea. It was a cloudy day, no direct sunlight. On developing one of the negatives there appeared a perfectly sharp and distinct image of a small disc, about one-sixteenth of an inch diameter, with rays proceeding from it of different lengths. The longest was half across the plate, and as fine and as clear as though ruled by a pen. As the position of the sun was rather to the back of me, it was quite out of range of the lens. I noticed nothing of the kind when the exposure was made, and felt very puzzled to account for the effects. I showed it to some friends at the time, but they were equally unable to account for it. I placed it in the rack to dry, with the intention of forwarding it to you to examine, but when it was quite dry this abnormal appearance faded completely away, and in twenty-four hours after there was not a trace left of the impression, which only remained whilst the film was damp. I should like to know if any one else has had a similar effect, and how can the fading out of a sharply developed image from the rest of the view be accounted for? It is something quite new to me, at any rate. A powerful magnifier showed the disc and lines, homogeneous and opaque. The plate used was a Cadett professional, metol and quinol developer, and according to the scale one-twenty-fifth of a second exposure.—Faithfully yours,

EDWARD DUNMORE.

Westcliff-on-Sea, Essex.
July 25th, 1902.

CHROMATYPE.

To the Editors.

Gentlemen,—Will you allow me to communicate to your numerous readers who practice chromotype and similar printing methods, a new sensitising bath for the same. The object is to render the prints easier

of treatment, under slight errors of exposure or sensitising. The general treatment is otherwise the same as described in my instructions.—Yours faithfully, J. R. Gotz.

Graphic Art Society, London Office, 215, Shaftesbury Avenue, London, W.C.

July 21st, 1902.

[The following is the new sensitising bath referred to by Mr. Gotz. Some hints for the general working of the process are also appended.—Eds. B.J.P.]

Chromatype: New formula for sensitising.—Distilled water, say, 80 oz.; bichromate of potassium, 3 oz. After the solution is cooled add 1½ oz. potassium chlorate ($K.Cl.O^3$) (pur. pulv.) The sensitising bath should not be above 50 degrees. Fahr. The drying room should be cool, temperature about 55 deg. to 60 deg. Fahr. The developing or etching bath is composed as follows, say: In one gallon of water dissolve 80 grains of carbonate of potash (pur. pulv.). Add from two to three ounces fine sawdust, used as specified in general directions. In cases of over exposure or too slowing drying of the sensitised pigment, the developing or etching out of the image will thus be easier than with the old baths. The soaking (tepid water bath) previous to development should in no case be omitted. Development by the sawdust treatment should be complete in five minutes for a moderate size print, and ten to fifteen minutes for a large size.

HINTS ON CHROMATYPE.

Sensitising.—The sensitising bath should be a golden yellow, and the time not over one minute, the pigmented paper being drawn several times through the bath. Over sensitising does not lead to good results, but often to slow development and flat prints.

Drying.—The sensitised paper should dry within three hours, when a quicker mode of drying is desired a dose of absolute alcohol may be added to the sensitising bath in the proportion of about 5 per cent. of the volume of the bath. The drying room must not be damp. Gas must not be burned in or about the drying room. Fresh pure air is necessary for drying.

Development.—After washing out the bichromate, we recommend the soaking of prints in lukewarm water (75 deg. to 80 deg. Fahr.) for, say, a quarter of an hour preparatory to development, this may be either in a separate dish or the one preparing for the etching bath, but it must not be left too long or allowed to get too hot, as development would then be uncontrollable. Correct treatment provided, the developing should be complete in five to ten minutes. The prints when fully developed may be washed in tepid water and the high lights and heavy shadows cleared by gentle treatment with the soft painting brush, the print must be held completely under water during this operation. If necessary the image may then be developed a stage further until the desired result is obtained.

Retouching.—Spotting and retouching are best done with the brush and unsensitised pigment, which is used as a palette. Shadows may be strengthened by the same means. The print should be slightly damp during these operations, which will obviate the retouching being visible on the finished print.

BORACIC ACID.

To the Editors.

Gentlemen,—Conversation turning one day on the use and abuse of boracic acid, I thought I would try what its action was in photographic chemistry. My day for active photography being over, I amuse myself principally with experiment. The results obtained from the above may interest your readers. First, as an element in the developer, it produces a deep red-coloured fluid, that may be of service in some measure as doing away with the use of the very deep red glass during development of highly sensitive isochromatic plates. It keeps for some few weeks as a stock solution, retaining its power while gradually deepening in colour, but will not keep when diluted for use.

After many experiments with different proportions, I find the following the best, although possibly open to improvement:—

Bicarbonate of potass (KHC03)	60 grains.
Boracic acid	100 grains.
Water	5oz.

Boil these together, and when thoroughly dissolved filter through cotton wool pressed tightly into the neck of a glass funnel.

Then

Potassic hydrate	60 grains.
Water	5oz.

Dissolve and mix with the above. Filter again and add

Hydrokinone	90 grains.

For use, one part to 10 water.

It is slow in making the image appear, but then the development quickens. It should leave the part of the plate resting on the rebate of the slide, white to the end.

Perhaps I may just add the formula I have hitherto used with perfect success:—

Potass-hydrate	500 grains.
Boro-tartrate of potass	100 grains.
Meta-bi-sulphite of potass	300 grains.
Water	10oz.

Dissolve and filter through cotton wool as above, and add

Hydrokinone	100 grains.

Use, one part to 10 water. Keeps well.

Secondly, the effect of boracic acid on the toner.

You have printed my formula in the Almanac. I have tried to make it up to keep, hitherto without success. Somehow, the bi-carbonate would not keep in solution. Now here the boracic acid is a decided success.

Stock solution.

Bi-carbonate of potass	1oz.
Boracic acid	1 dram.
Water	20oz.

Gold solution as usual, 15 grains in 15 drams of water, 2 or 3 grains of powdered chalk, stirred up and filtered. Relative proportions for use:

Stock solution	1oz.
Gold solution	2 drams.
Water	20oz.

This gives a neutral tone, which has been much approved.—I am, sirs, yours, W. T. F. M. Ingall.

PLATINUM PRINTING.

To the Editors.

Gentlemen,—In last week's Journal there is an account of a demonstration at the Southampton Camera Club by Mr. S. G. Kimber of the platinum printing process. Mr. Kimber seems to be able to get brown, and even golden, tones on platinum paper. Could you persuade him to publish the formula for these tones, as I am sure the subject would interest many of your readers?—Yours, etc.,

Platinum.

CINEMATOGRAPHS IN NATURAL COLOURS.

To the Editors.

Gentlemen,—Mr. Hepworth, in replying to my letter which appeared in your issue of July 11th, favours us with what he is pleased to call "his evidence," and proceeds to give details, created by his own imagination of things which he has never seen. Mr. Hepworth begins by saying that I have mistaken a tri-colour record for an animated picture in colour. Such a supposition merely shows that he does not approach the subject with an unbiassed mind, hence his first mistake. Mr. Hepworth goes on to suggest that the colour screens used by me are not pure, and, therefore, I can only claim a vague suggestion of the rich colours of nature. How Mr. Hepworth can tell what screens I use without seeing either them or the results obtained by them is an achievement that might have done him credit had he not said that they would not reproduce the rich tints of nature, for in this he has made another mistake. It is, however, with reference to the light obtained through Ives' lantern kromscope as compared with the colour cinematograph that he blunders most conspicuously. The specimen of mathematical reasoning by which he states that "he makes it obvious" that the light obtained in the colour cinematographs is only a 54th part of that obtained in the lantern kromscope would certainly be the redeeming feature of this "evidence" if it were anywhere near the truth. In conclusion, allow me to state a few facts for the benefit of Mr. Hepworth and any others who may be similarly interested. On a film which has been specially sensitised tri-colour negatives can be obtained, if necessary, at the rate of 35 per second (1-70 of a second exposure), and prints from the film when projected by means of a suitable mechanism are seen in all the rich colours of nature and without any want of illumination whatever. It is not possible even in a matter of weeks to put an undertaking of this description in commercial form; many things have to be arranged for, not the least of which is the designing and building special machinery for sensitising the films in total darkness; but if Mr. Hepworth or any other self-styled expert will just refrain from rushing into print with fancied facts and theories, their reputation, such as it may be, will not be put in jeopardy by writing about that on which they have no information.—I am, yours faithfully, Edward R. Turner.

8, Queen's Road, Hounslow, July 28th, 1902.

THE PHOTOGRAPHIC DRAPER.

To the Editors.

Gentlemen,—Kindly allow me a little space in your valuable paper to call the attention of your readers to the above subject. Is it not a

scandalous shame that in a little country district (wherein there are two or three bona-fide photographers, who find it as much as they can do to eke out a living), that a draper, who has a flourishing business and who is also an amateur photographer, should attempt to take the bread out of other's mouths by canvassing and doing work as a professional man? Cannot the Professional Photographers' Association take this matter up and protect professional photographers from the ravages of "would-be" amateur professionals? Why, in the name of mischief, can't a man stick to his trade as a draper and let others live? You fancy, Mr. Editor, a window full of hosiery and 12 by 10 bromides. My motto is, every right-thinking man to his own trade. Don't be always on the grab. Be content to prosper as a draper, and not be for everlastingly dabbling in trades you don't understand. There is no trade that suffers more by pirates than photographers.—Yours faithfully, W.

July 28th, 1902.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY, 24, *Wellington-street, Strand, London, W.C." Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

PHOTOGRAPHS REGISTERED :—

J. Hourston, 3, Lily Bank, Girvan. *Photograph of view of Barr. Photograph of ruins of Kirkdandie.*

ERRATA.—STUDIO BUILDING.—"SEMPER FIDELIS."—In answer last week, for "make the south wall 14ft. high," read, make north wall, etc.

A. E. BLACKHAM.—The work is susceptible of considerable improvement. The prints have been returned.

ADDRESS WANTED.—G. B. MCCLELLAND writes: "Can you give me the address of the St. Louis Photo Jewelery Company in London, for button, broaches, etc., for small photos?"—In reply: We do not think the firm named has a London address.

COLLOTYPE MACHINES.—B. AND CO. ask: "Can you please tell us who are the best makers of collotype machines for steam power? We are told they are only made in Germany, but we cannot learn where. If there are any makers of them in England, we should prefer English ones."—In reply: Messrs. Furnival and Co., St. Bride Street, E.C., are makers of collotype machines.

COPYRIGHT.—"A. L." says: "Kindly enlighten me on the following:—(1) If a photograph is made copyright, and published, and it does not bear the word 'Copyright,' is anyone allowed to copy it? (2) If it need not bear the word 'Copyright,' how is anyone to know whether it is copyright or not?"—In reply: (1) The picture need not bear the word "Copyright." (2) Only by searching the register at Stationers' Hall.

FADED FERROTYPE.—"S. S." writes: "I have a ferrotype brought to me to make an enlargement of, as the party is dead. It was, I am told, taken at a fair, and is now very much faded. Can you tell me of any means by which it can be restored, so that I can make a better enlargement of it?"—In reply: We cannot. Had it been a glass positive, instead of a ferrotype, it is possible, notwithstanding its deterioration, that a fairly good enlargement might have been got by employing it as a negative.

COPYRIGHT QUERY.—"IN DOUBT" writes: "Many photographs are published of paintings in the National Gallery of Pictures in which there is no existing copyright. Now, cannot I, or anyone else, copy any of these reproductions without infringing the law, seeing that there is no copyright in the originals?"—In reply: Although there is no copyright in the originals, there may be, and probably is, in the photographs. Few photographers who copy the pictures in our national collections fail to make their reproductions of them copyright.

LIGHTING AND POSING.—"ERIMUS" writes: "Re your report of Harold Baker's paper at the Convention, in the JOURNAL. Is there any likelihood of your printing his paper in full; or, failing that, do you think I could by any means get a copy? I should like very much to have a copy, as it would be a great help to me, as I have to work Adamson's light."—In reply: Mr. Baker gave a similar address to the members of the Royal Photographic Society some years ago. Write the Secretary, 66, Russell Square, London, and he may be able to supply you with a copy.

CHARGES FOR MOUNTS.—"DOUBTFUL" writes: "I ordered 1,000 cabinet mounts and 1,000 c.d.v. mounts from samples, with prices marked on them. They have charged me 4s. per 1,000 more for c.d.v. than price marked on samples, also 10s. for cabinets. I have refused to pay more than price marked on samples. They are threatening to take proceedings against me. What should I do? Fight it out, or pay up?"—In reply: You appear to have good ground for resisting payment of the extra charge; we advise you, however, to be guided by the advice of a respectable solicitor.

ADDRESS WANTED.—F. A. S. JOHNS writes: "Would you be so kind as to give me the address where to obtain the self-developing Ferrotype Camera (Victoria size)? I know Mr. J. Fallowfield has one in his list, but there is another maker, whose camera is somewhat smaller. It has a sliding arrangement to change the plates, the latter being drawn into position by a tube and ball."—In reply: We only know of the apparatus as supplied by Mr. Fallowfield. If there is another form, we have no doubt that he would obtain it for you. Better communicate with him.

METHYLATED SPIRIT.—D. CONROY says: "I want some methylated spirit, stronger than the ordinary, and free from the mineral spirit. The oilshop stuff will not do. It must be .805, the same strength as absolute alcohol. Can you tell me of any firm of chemists where it is to be obtained?"—In reply: If you want methylated spirit free from the mineral oil, you will have to obtain a licence from the Excise authorities to purchase it; but then you will not be able to get it the strength you require, as it is not allowed to be produced. If you must have .805 strength, you will have to have unmethylated alcohol.

SILVER-BLOCKED MOUNTS.—"REGULAR READER" writes: "I bought a quantity of mounts only a fortnight ago. They were supposed to be blocked in silver. They looked very nice when I received them, but on going through a few of them to-day I was surprised to find the silver changing colour. Will you kindly tell me the cause of this, and whether I am entitled to fresh ones (in place of these) from the firm where I ordered them?"—In reply: If the mounts are not to your order, or not according to sample, you are certainly entitled to fresh ones that are. Better communicate with the firm who supplied them.

THE ROYAL ARMS.—"PENDENNIS" writes: "I have for some years done photographic work for a County Council school, at the order of the Principal of the school, and lately I have taken certain photographs by direct orders from the Organising Secretary of the County Council. I suppose this is doing work for Government, and I have wondered if I should be entitled to make use of the Royal Amrs. Do you think I am so entitled, and, if so, where should I apply for permission?"—In reply: The fact that you have done work for a County Council school does not entitle you to use the Royal Arms. This is a privilege obtainable by Royal Warrant. If you make use of the Arms without such authority you run the risk of being proceeded against.

EXHIBITING PHOTOGRAPHS.—"W. M." writes: "Will you kindly inform me if a professional photographer has any right to display in a showcase or shop-window photographs which have been taken by them and paid for by the sitter? For instance, my wife has a photograph taken by a well-known West-end firm, which is approved of and paid for. Later I find the photo displayed in a window-case, and on asking for its removal am told that I should be pleased to think that the photo was thought good enough for exhibition."—In reply: If the photograph was taken and paid for in the usual course of business, the photographer has no right whatever to exhibit it. He can be restrained from doing so by injunction from the Court of Chancery. Two, if not more, cases have been decided on the point.

*** Many letters, answers to correspondents, etc., are unavoidably held over.

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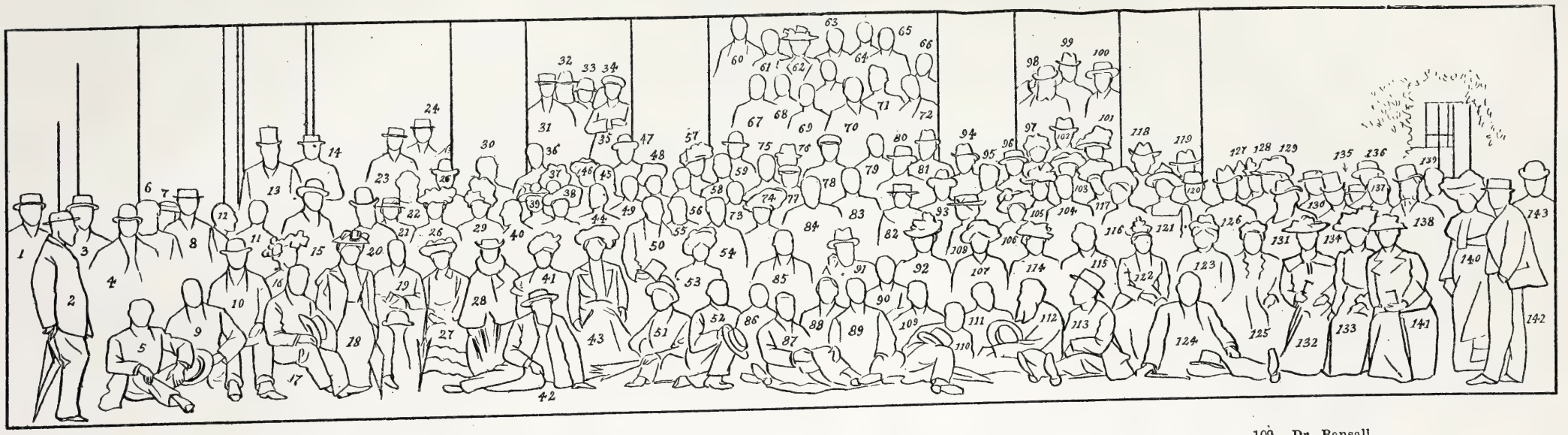
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*** *The Editor can only be seen by appointment.*

*** *We do not undertake to answer letters by post.*

EX CATHEDRA.

X-Rays from Light. M. Albert Nodon has been making some striking investigations in this direction. When light rays or ultra-violet radiations are thrown upon a thin conducting plate they give rise on the dark side of the plate to certain radiations. An examination of these rays shows them to possess properties intermediate between Röntgen rays and those emitted by radium. They are not kathode rays, for they easily pass through metal and black paper.

* * *

Rainbow Reflection. In a scientific contemporary there have recently appeared a large number of letters on this question. Of course, a particular importance was years ago given to this topic by an obiter dictum of Tyndall, who said that a rainburst could not be reflected in a sheet of water, a statement which afterwards he qualified by saying that the rainbow seen in the sky and that in the water were not the same, the rays that were reflected to the eye from the water not being the same rays as those which, entering the eye, gave a rainbow image there. Some of these correspondents produced an artificial rainbow by a garden hose and jet, and saw it reflected in a tub of water; another held a mirror on his nose, and saw a reflection, but could not get one from a mirror on the ground, and believed it impossible with a 3.30 p.m. sun. Still another observer saw a rainbow reflected in the water of a lake while he was in a train, and, strange to say, the rainbow reflection followed the train for some distance. Who will be the first to settle the matter by taking a snapshot of the next rainbow he sees reflected, either in a ditch, a bucket, or a lake?

* * *

Reduction and Intensification. We see in the "Photographische Correspondenz" that Professor Lainêr has recommended iodide of potassium and hyposulphite of soda as a reducer, where very slow action is required. To 100 parts of a 25 per cent. solution of hyposulphite of soda add one part of iodide of potassium. The reduction proceeds very slowly indeed, without loss of detail. A perceptible difference may be seen in about an hour, and if immersion in the bath be prolonged for eight or ten hours extremely foggy negatives may be cleared. The gelatine is not attacked, but slightly hardened by this bath. Those who wish to obtain a very dense negative with mercuric chloride, may do so by immersing the plate, after it has been bleached, in the following solution:—

Water... ... ... 100 grammes.
Sulphocyanide of ammonium ... 3 grammes.
Chloride of gold (1 per cent. solution) 10 c. c.m.

The film intensifies evenly through shades of brown to violet black. The bath must be allowed to stand for half-an-hour before use, and it may be kept for several days. This process is taken from the "Allgemeine Photographen Zeitung."

* * *

A Copyright Question. The "Photographische Correspondenz" draws attention to the fact that a number of Vienna porcelain manufacturers have been threatened with legal proceedings for the recovery of damages for infringement of copyright. The porcelain painters have been industriously copying photographs of works of art belonging to German publishers, and they feel so injured by the proprietors, who object to the theft of their copyright, that they have petitioned the Ministries of Commerce and Justice to obtain the insertion of a clause in the law of copyright to protect them in earning their living by such depredations. This petition for the protection of artistic theft is one of the most plausible pieces of casuistry we have read for some time. The porcelain painters plead that it is well known to the authorities that their art depends for its highest development upon the support of the cultivated arts. They draw their ideas from published specimens of works of art, wood engravings, lithographs, colour prints, and photographs. They follow the traditions of the old imperial porcelain works, and produce artistic, decorative work which provides them with bread bought with foreign money, for most of their works are

sent abroad. In former times mythological and classical subjects were their chief source of inspiration, but they have to adapt themselves to the times, and are compelled to turn to photographs of modern pictures. As soon as a work of art is photographed and thousands of copies have been distributed, it becomes an industrial product, and should no longer be protected from imitation. The work of the porcelain painter is not mechanical or chemical. The pictures are drawn by hand, and the scheme of colour is the invention of the same individual. Something quite new has thus been created, and the law should protect the artist instead of taking the bread out of his mouth.

* * *

What Protection of Copyright is there in Germany? The editor of the "Photographische Correspondenz" very justly replies to this petition of the porcelain painters that it discloses surprising ignorance of the state of the law, and that their future depends not upon industrious interpretations of works of art, but upon independent creation of similar genre and figure studies. The French can illustrate novels by photographs from living models, and why should not the porcelain painters copy photographic studies made by themselves? The following statement quoted from Dr. Eugen Kraus elucidates the legal aspect of the case, and may be of interest to English photographers, not a few of whose pictures appear in the German Press:—

1. A photograph is only protected against reproduction by photographic processes.

It is therefore permissible to copy a photograph by hand, and make a picture from it. The latter may be photographed.

2. There is no doubt that a photograph may not be used as the support for a painting (*i.e.*, painted over) in Germany and Hungary, as it is forbidden in both countries to photograph a picture, or reproduce it by any mechanical means. It is doubtful, however, whether the Austrian law is equally stringent, as it only forbids photographic reproduction.

3. It is incorrect to state that a work of art becomes an industrial product as soon as it has been photographed and thousands of copies have been sold.

Attention is also drawn to the fact that the law provides:—

1. Copies of works of art can only be used upon industrial products with permission of the author.

2. If a copy of a work of art is placed upon an industrial product with permission of the author the protection against further unauthorised reproduction remains, excepting in the case of other industrial products.

3. In the latter case, however, further reproduction may be prevented by the protection given under the law of trade-marks.

It must be remembered that this statement of the law applies chiefly to the copyright in works of art. Photographic copyright in Germany, in some respects, is in a very unsatisfactory condition, and we think English photographers would do well to obtain reliable information concerning their position before giving permission to German publishers to reproduce their pictures.

* * *

Flashlight photography. According to "La Photographie Française" Monsieur Martel has made good use of the magnesium flashlight in photographing some of the large cafes and subterranean passages which are to be found at Padirac, Pargitoz, Aven-Armand, and Saint Murcel. The problem of photographing these places has been approached in various ways. It has been attempted by screening the lamps, placed at various distances behind rocks, but the effect has not been all that could be desired. To give an adequate idea of the extent and sombreness of these uncanny caves, the effect of aerial perspective must be preserved. The light used must be sufficient to penetrate a considerable distance, and provide sufficient detail in the background. If the lights are placed at various distances and screened, the effect is lost, and a flat picture, misrepresenting the extent of the cavern, results. M. Martel has therefore adopted another method by using only one source of light, which he prefers to place in the rear, above the camera. The quantity of magnesium consumed is, of course, considerable, and the difficulty of obtaining sufficient exposure, before the amount of smoke generated is sufficient to veil the surroundings, has to be overcome by using a very small camera and a lens of large aperture. In difficult cases the size of the plate was reduced to 8 by 9 cm. Two specimens of these photographs are reproduced in "La Photographic Française." One of them shows the stalagmites at Aven-Armand (Lozère), where they reach a height of about one hundred feet. The effect of these gigantic columns, shrouded in obscurity, is very mysterious.

In connection with this subject we are reminded of a new method of using magnesium and aluminium recommended by C. Martin in the "Bulletin du Photo-Club-Belge." Take 2 to 5 grammes of magnesium powder, and mix it in a saucer, or upon a tile, with a small quantity of water, to a moist paste. Cover it with dry magnesium powder and ignite it with a piece of lint dipped in alcohol. As soon as the moistened magnesium begins to burn an extremely bright and intensely actinic light will be emitted. If aluminium powder be prepared with a little water in the same way and covered with magnesium powder, upon ignition the aluminium will burn with still greater intensity than magnesium. This method is specially recommended for interiors, caves, etc., as very little smoke is formed.

* * *

Fiduciary Astronomical Photographs. The suitability of photography for providing data for measurements in various astronomical researches is well known, but the exact value to be attached is governed by a variety of factors. Seeing that in photographing stars the object, whatever its brightness, is nothing but a point—and a point still, however powerful the telescope used—it will be easily understood how great an amount of care and judgment is required, in measuring the star images on the plate, to fix upon a standard of measurement to indicate the visual brightness which is labelled as of the first, the second, and so on, magnitude. We have recently drawn attention to the present state of forwardness of the great star atlas and to the remarkable neglect to use any but what is virtually a superior and long-focus landscape lens, and we cannot but think that as the completion of the atlas is shown to be possible at a very distant date under existing plans, a reconsideration of the question of the best lens to be employed will be forced to the front. At a recent meeting of the Royal Astronomical Society, a paper bearing upon this subject was read by Mr. Filey. The subject actually was the measurements of Swift's comet from photographs taken with a portrait lens of 30in. focus and 5in. aperture. But it was stated that in addition to the value of the comet plates obtained by these means, it would be interesting to determine the degree of accuracy obtainable from measurements of stars taken with an ordinary portrait lens and to find if such photographs were worth taking trouble over to measure and reduce. Now, any practical photographer is aware that a portrait lens of five inches

ameter must be an instrument of a very high class if its finition is to be of a critical nature. Certain well-known names will at once occur to the reader as being e very makers of such lenses, where a reasonable expectation of accurate defining power might be held. And, as an "ordinary portrait lens," the indefinite description ll almost raise a smile. If such investigations are to of any value at all, the lens chosen for testing should one of proved excellence, as otherwise the whole case uld be ruthlessly prejudiced against the class. Mr. ley came to the conclusion that 0.83 seconds of an arc s the limit accuracy. Petzval, in his original calculations, laid down the extent of deviation from an actual int that should be producible by his lens, and, indeed, is on record that when a lens giving still closer definition s made he rejected it on account of its departure from s calculated results.

* * *

duciary hotographs. At the same meeting, the value of photography for astronomical measurements was exemplified in Mr. Hinks' per on the reduction of photographs of Eros for the termination of solar parallax. The conclusion he rived at was that the direct comparison of simultaneous otographs by linear reductions is the most convenient ethod. The proposition he made was that seven or eight servatories, spread over as long an arc of longitude as ssible, should agree upon a common list of comparison ars, and measure all their plates taken within a period nine days. It might then be possible within the course two or three years to ascertain whether that planet ll give as good results for parallax as other less favourly situated minor planets. Still bearing upon the same bject, a paper was read a few days after those we have en treating of by M. Prosper Henry, the exact title ing, "the influence of the photographic magnitude of ars upon the scale of reduction of a negative." Sir D. Gill oposed the comparison of results by the eye and on the otographic negative, but M. Henry suggested a purely otographic method, a portion of the sky being taken a given plate with a short exposure, and, afterards, with prolonged exposure, the pointer micrometer ing slightly displaced between the two exposures. This an had been adopted with the large telescope at Meudon, d full details of the results were read at the meeting.

* * *

e Silver esidues orth Saving? This is a query that may well be answered alike both in the positive and the negative, according to circumstances. the case of a professional photographer, they certainly e; but in the case of amateurs it is more than doubtful, ough we are aware that some who are of an economical rn of mind think they are worth saving, and do save em; but we are inclined to doubt if they save much by e trouble, and the same may be said with professionals a small way of business if the time involved, little as it , is taken into consideration, seeing that gelatine plates d papers contain so little silver that can be recovered; d, when it is recovered, the price it realises is so small. t the present time standard silver is but a trifle over s. per ounce—a little while ago it was something below at figure. Some years ago it was proved by two well-nown experimentalists that some dry plates contain less an a grain of silver per quarter plate, and a little over others. But it was sufficient for the purpose; indeed, me of the best brands contain the least quantity of lver. Now, taking the grain to the quarter plates as the tandard, we find that a dozen plates contain but twelve grains of the metal, or a hundred and forty-four grains to the gross—well, say, a hundred and fifty grains. Supposing a third of this is required to form the image, and probably it is more, we have only, without waste, one hundred grains recoverable—that is, roughly, one ounce of silver from five gross of plates, value 2s. 0½d., out of which the refiner's charges have to be paid. Bromide papers stand in about the same category as dry plates, and probably contain less recoverable silver. P.O.P.'s contain a larger proportion of recoverable silver than either plates or bromide papers, but it is very much a question as to whether it pays an amateur, or a professional in a small way of business, if his time in other directions is of value, to trouble about saving his silver residues. The case was widely different in the old collodion and albumen paper days. Then, with little trouble, not less than 70 to 80 per cent. of the silver used was recoverable, and, when recovered, its value was double, and more, than what it is at the present time.

* * *

Photographic Mounts and their alleged injurious Action. Too often when photographs show signs of fading, or develop yellowness in the lights, or become spotty, the mounts are suspected of being the cause when they are perfectly innocent of it. It is very exceptional, when the deterioration becomes manifest, for the photographer to attribute it to, or even have a suspicion of, his own faulty manipulation; the mounts are at once suspected as being the cause, however pure they may be. But supposing that they really do contain a trace of pernicious matter, is that likely to have an injurious action on a modern photograph such as a gelatine chloride (P.O.P.) print, or at least within a very brief period, such as they are frequently charged with having? Let us just look at the conditions as they exist. The image is formed in the film of gelatine on the surface of the paper, or, rather, the baryta coating upon it, which is insoluble. The paper which supports that is considerably thicker than that used for albumen pictures, even if it were the "ten kilos "kind. Hence it will be seen that there is a greater thickness of insulating medium in the P.O.P. print, between the image and the mount, than in the case of an albumen print, as in that we have only the thin paper itself, and nothing more beyond the mountant. Now let us look at the conditions of the modern gelatine print. Here we have the mount, then the mountant; next a tolerably thick paper, then the baryta coating, which may well be considered an impervious layer, and then the gelatine picture. Under these conditions it is a little difficult to conceive how, even if the mounts did contain some little impurity, that they would have any pernicious effect on the image, if the photograph were kept under the ordinary conditions that such pictures are usually kept, or at least within a few months or even years. It must not for a moment be assumed that in the above remarks we are in any way defending impure mounts. When a photographer purchases his mounts he ought to be supplied with such as will not injure any kind of photograph that may be mounted upon them. Our object is merely to point out that when gelatine prints show deterioration within a short time of their production the mounts, even if they are faulty, are scarcely likely to be the cause, as so many of the correspondents, who, from time to time, have written to us on the subject, have suspected.

* * *

Mutability of Things. If the question were put as to what is really permanent, it would be a difficult one to answer. It certainly would not be a modern photo-

graph by whatever process it were made—whether silver, carbon, or platinotype. The last-named is, theoretically, if care be taken that all the last traces of iron are removed from the print. So is the carbon process, provided that permanent pigments be employed. But there is another factor in the case, namely, the paper, and that applies to all processes, as well as to engravings and printed matter generally. No one for a moment doubts the stability of a steel or copper plate engraving, yet the paper changes with age, particularly if long exposed to light, when the print is said to "mellow," and it certainly enhances its beauty, as the extreme whiteness of the paper becomes subdued. In a photograph any such change, unfortunately, is by no means an improvement. The old papers, which were entirely made from rag, were not prone to this rapid change by exposure to light; but in modern paper, even of the best kind, rag is but little used—in some not at all. Wood fibre, and that from Esparto grass, and the like, has taken its place. If a freshly-planed deal board be taken, and a portion covered, say, with black paper, and exposed to sunlight for a day or two, it will be found that the exposed portion has been considerably darkened; indeed, if a negative had been used, a positive print would have been obtained; and, curiously enough, paper made with some sorts of wood fibre seem to be more sensitive to light than the wood itself. Some wood pulp boards we have found to change considerably with only a few hours' exposure to bright sunlight. A striking illustration of the mutability of things was the Canadian Coronation Arch in Whitehall. It will be remembered that the ground work of it was gilded, or rather, bronzed canvas, and very gorgeous it was. We passed it a few days after it was dismantled the first time, and then the change the groundwork had undergone was very manifest. Where the large black letters, "Canada, Britain's Granary," were,, there was a strong impression, sufficiently strong to be read from Trafalgar Square. The exposed portion of the gilded groundwork had darkened, while the protected part (by the letters) retained their pristine condition. This change was not due entirely to the action of light, for it was largely supplemented by the action of the impurities contained in the atmosphere of London. But all photographs, more or less, are subjected to the same influences.

* * *

Frivolity at the Photographic Club.

A few weeks ago the members of the Photographic Club found a subject for discussion in the absurdities of modern "picture" making, as demonstrated by some of the specimens of bad technical photography and eccentric mounting to be seen occasionally in what has come to be regarded as the *Art* sections of our exhibitions. Eventually it was decided that the members present should prepare some unusual examples, and invite their fellow members and their friends to see the results of their labours. On Wednesday week the function took place, and a large number availed themselves of the invitation. The collection is not a large one, but is certainly contains some original and unique specimens by various processes and on all kinds of mounts, from corrugated packing to wall-paper. The contributions of the majority of the members have taken a burlesque form; some few, however. have taken the matter seriously, and sent some very good work, but even these have misleading titles. For instance, there is a picture of a diver at work at the bottom of the sea, and this is labelled "Far from the Madding Crowd." A silhouette portrait of a lady against a diaphanous window is called "The Curfew Hour," and so on. One picture about the size of a carte de visite in a rough-stained frame about nine inches wide has been christened "Much Ad About Nothing," and next to this is a "creation" bearin this remarkable title:—"As when some quiet City lane midnight hour, by conflagration's lurid glare, is lighted a with sunset glow. And heavy-booted guardians of th peace fright homeless feline wanderers.—Bakespeare. We do not propose to criticise the exhibition, but it is cer tainly worth seeing, and will be open again on Wednesda evening next from 8 to 10 p.m., when the members will b glad to welcome any visitors to their club-room at Ande ton's Hotel, Fleet Street, E.C.

CLOTHES: PHOTOGRAPHICALLY.

It is rather a trying conclusion to a thoughtful mind tha worth—or seeming worth, which, as the available asset in life, comes to much the same thing—should be so largely dependent upon clothes. The general aspect of the question has been handled once and for ever by Carlyle in his "Sartor Resartus." The special photographic side remains, however, open to comment without an undue sacrifice of modesty. Clothes deserve high consideration if the most pleasing effect is to be gained in a picture generally, but especially so in the case of a photographic picture, into which the broader, or eliminative, treatment of the artist cannot enter. The artist has also the advantage over the photographer in that he is in a position to select the most suitable form of dress. No one makes an advance visit to a studio to inquire as to what would be best to wear in a proposed photograph. If he did, probably the photographer would be nonplussed for an answer. He would not have given it a thought himself. Still, there is no reason why he should not do so, and a change for the better be attempted upon broad lines in this direction. A few pictures in his window embodying improvements, especially if arranged so as to contrast with those they are improvements upon, would soon bring about a change by instructing the public as to the best lines of dressing for a photograph.

We must keep within twentieth century bounds in any advocated change, or we will enter upon the practically ridiculous, however artistically, desirous. The graceful folds of a toga-like dress are thus without the range of that which can be adopted. A Roman senator, doubtless, looked as dignified in his robe and sandals as he would have looked foolish in a frock coat and button boots. The Chairman of the Municipal Waterworks Committee, on the other hand, however strong and worthy a man, could not afford to-day to exchange his frock coat for the toga. Things must be looked at with a fitting sense of proportion. Industry and commerce are the salient features of the age, and not dignity or art. The folds of the toga would not answer for the inspection of a colliery, and its loose ends would be dangerous amongst the rolls and wheels of a mill. But whilst accepting such limitations broadly, the severe cut and detail of modern dress should be reduced as far as possible for a photographic picture. A man photographs far better in flannels than in a frock coat. If it must be a frock coat for the local directory or commercial "guide," let there be some arrangement or accessory that will take away from, or hide something of, its inartistic form. In any case do not add the distraction of an elaborate orchid as a "button-hole." Clothes, again, with pronounced or formal patterns are bad. The assertion, or re-iteration, of pattern unconsciously chains the eye, and claims the attention that should be given to the face and figure.

In the case of women the same considerations hold. The matron with the ample bust, confined apparently by a

cast-iron corset, rivetted on, would look far better if a light, fleecy shawl were thrown over her shoulders to somewhat soften over-harsh lines. Ladies with slim waists like to show them, and it is very natural that they should, as long as the slim waist has got to be accepted as an item of beauty. Still, the idea that should strike the observer should be, "Here is a sweet face—and a fine waist too," and not, "Here is a fine waist belonging to this face." The distinction can be brought about by means of judiciously-arranged dress. They are fine points, and the differences are small, but it is amidst the small and not the great that genius finds profitable action. Another very common fault with ladies' dress—photographically we hasten to add, for we would not presume to criticise it otherwise—is over-elaboration of ornament. If it be the lace, the frilling, the chatelaine, rings, bracelets, hair-combs, and so on that are wanted, well and good, the lens will picture them admirably to the uttermost hair's breadth, but if character or beauty in a face, elegance of form, or ease of pose are desired, the detail, however good in itself, must be kept as low as possible. How much they detract from breadth of artistic effect we realise occasionally when looking at "The Picture of a Lady" by some well-known artist. The eye cannot in the case of the highly-detailed photographic picture do two such dissimilar things at the same time as to take in the detail, and form an opinion of the picture as a whole.

It is breadth of treatment that tells, and should be aimed for. To this end the plainer, in reason, the dress, and the softer its lines and folds, the better. If a good-looking woman could only realise how much better she would look in a plain than in an elaborated dress—in a picture, at any rate—she would shed much of her tinsel and gimcracks before entering the studio. Fashion must be considered to a degree, of course, in any working plan. Commercially, fashion is in favour of the photographer. The changes in dress and headgear are so frequent that to be quite "up to date" a woman should be photographed at least once a year. But artistically it is against him, owing to the blind rush for what is "fashionable," without a thought as to how it may match the individual face and form. The photographer must do his best under the circumstances to keep out by vignetting, etc., the most pronounced artistic crimes in modern dress. That is, if he be allowed to, for if the fashionable dress be desired in all its detail, why, it must be given, and there is an end of it. Bread and cheese before art any day. The pity is that it cannot be bread and cheese and art.

Briefly summarised, the points it has been desired to bring out in the foregoing are that the artistic best should be made of clothes in a photographic picture. In men they should be loose, and sit with evident ease and comfort, or if a touch of something more formal be needed it should stop short of severity. In women harsh, stiff outlines should be draped, soft falls given to folds, in the plainest dress that fashion will admit of, and as little ornament as possible worn either upon the dress or the person.

If followed, the results will certainly prove acceptable, and, a good test of excellence, permanently acceptable. The clothes will have been given their true and subservient function of setting off the body, instead either of being ignored, or the body made to act as a dummy core for setting off the clothes.

East End Appreciation of Art.—We are informed that 24,000 people have visited the Japanese Exhibition at the Whitechapel Art Gallery during the first five days it has been open. Almost all these people were obviously from the neighbouring districts in the East End.

JOTTINGS.

Monsieur P. Nadar, the distinguished Parisian photographer, has recently visited London for the express purpose of studying the working of the Professional Photographers' Association. I understand that the information he obtained is likely to be of assistance to him in organising work amongst French professional photographers, and it is probable that the P.P.A. will be made a corresponding society of a kindred institution in Paris. Only the other day an American Professional Association sought its advice and help in exhibition matters. It is gratifying to perceive that its influence grows with its age. This is a suitable opportunity for mentioning the fact that the "P.P.A. Handbook No. 3" will shortly be issued to members. It is marked "private and confidential," but I take it that I shall not be adjudged guilty of high treason if I go so far as to indicate its principal contents. These include a list of the newly-elected officers, the rules, byelaws, a condensed report for the year 1901-1902, list of discounts to members, particulars of fire insurance, useful advice on copyright, list of members, membership application form, and other matter. The actual number of members is between 530 and 540, and every single one of them had paid his subscription on June 30th last. Will the disgraceful creature who, over the signature of "A Photographic Dealer," prints, every now and then, malodorous mixtures of spite, falsehood, and mean-spirited innuendoes against the Association, put that in his pipe and smoke it? Always assuming that such a blot on his trade and his sex is capable of practising this manly habit, which I very much doubt. Faugh! The world has no use for such as he. My experience of photographic societies is second to that of no man in this country, and I assert without fear of contradiction that a more virile, better administered, useful, and "live" society that the P.P.A. is not listed in the Almanac Directory.

For many years I have been familiar with the name of a photographic preparation known as "Bates's Black," but it was only the other day, at the conclusion of a morning's ramble amongst the beautiful Surrey lanes, that I stumbled across Messrs. Bates's studio in a quiet corner of the delightful old riverside town of Chertsey. There is a saying, attributed, I believe, to the late Sir Henry Taylor, that "the world knows nothing of its greatest men." This, in a measure, is applicable to photographers. In the course of my numerous wanderings I am constantly coming across skilful workers who for some reason or other seem to shun, or at any rate not to court, publicity. Messrs. Bates, if they will let me say so, have been too long afflicted with this rare form of modesty; and it was both a surprise and a pleasure to me to note, in the short time I passed in their studio, that behind that modesty stands an amount of solid, genuine photographic ability which deserves to be better known. Their portrait work is refined, pleasing, and technically sound. Their *clientèle* is a large and aristocratic one, including county notabilities; a great many of their sitters journey specially from London to Chertsey. There are few photographic studios situated twenty miles or so from town which possess this feature. Messrs. Bates also have an amount of technical thoroughness largely in excess of that of most of their brethren. They design and make their own frames, and Mr. Bates, senior, speically paints all the backgrounds that are used in the studio. I was shown two very attractive and dignified specimens of portraiture, representing the Earl and Countess of Lucan in their Coronation robes. The sepia platinotype mounted on that favourite support, Japanese vellum, is also one of the firm's specialities. I must compliment Messrs. Bates on being well abreast of the times in photographic por-

traiture. It is, alas! too often the case that professional men progress steadily in the opposite direction. Quite recently I have heard that the firm is opening a branch in the neighbouring town of Egham. I wish them success in their efforts to popularise good photography amongst the educated classes.

From Chertsey to Calcutta is a very far cry indeed. Obviously, the two places have nothing in common, except that they both commence with a "C"; but at Calcutta there has long been located the great Indian firm of photographers, Messrs. Johnston and Hoffmann, another name not by any means familiar in the mouth of the photographic man in the street. Yet, I suppose, goregous Indian princes and the cream of Anglo-Indian society, male and female, are as common in their Calcutta studio as graceful English women and their cavaliers, are in the ateliers of Bond Street, Regent Street, and Baker Street, London. Under the supervision of one of the partners, Mr. E. Buckland, himself an old Anglo-Indian, Messrs. Johnston and Hoffmann have recently opened a branch in London. This is a large private house, No. 31, Devonshire Street, Portland Place, W. The only external evidence that a photographic studio exisits inside is an uncommonly small brass plate on the door, which timidly records the fact. This is not the first instance that has recently been brought to my notice of the great landlords of London being chary of letting their houses to photographers, who might, not unreasonably, put up prominent signs to attract attention. The entire house has been expressly furnished and adapted for photographic portraiture; and the reception, dressing, and business rooms, are well proportioned and tastefully fitted. One here gets that soothing sensation of ease and roominess combined with freedom of movement always noticeable in West End mansions; and in this respect Messrs. Johnston and Hoffmann start their London branch with an immense advantage. The studio is spacious and well illuminated, and under skilful control capable of yielding a great variety of effects in lighting. The most recent addition to London's photographic studios is complete, handsome, and dignified, and is conveniently situated for the class of sitter Messrs. Johnston and Hoffmann will undoubtedly attract. The firm's Indian reputation is a very great one, and no doubt will follow them to London, and stand them in good stead here. I was much interested in a fine series of Indian architectural studies, printed in carbon, which was shown to me by Mr. Buckland. They would look well in the technical or professional section of the forthcoming R.P.S. exhibition.

The letter of Mr. Charles Urban, the Managing Director of the Warwick Trading Company, which appeared in the JOURNAL of July 25th, seems to suggest that when its author left America for this country he omitted to include amongst his luggage a handbook to polite letter-writing. I have met Mr. Urban personally, and have the greatest admiration for his business methods, but I do not think that his attitude in response to the criticisms of his Coronation cinematographic enterprise is one that will meet with his own approval six months hence. It is notorious that public entertainers—for such I may, without offence, so class Mr. Urban in this particular instance—are excessively sensitive to criticism, forgetful of the fact that even if it be hostile, criticism is in itself a compliment. Mr. Urban's projected representation of the Coronation ceremony was in the nature of a stage performance, and was surely open to public comment. But this is the minor point; what is of major importance is the claim made by himself and others for the production of cinematographs in "natural colours." At the risk of being politely told that I "wallow in ignorance" in these matters, and though Mr. Urban and others may succeed in the application of trichromatics to cinematography, I venture to doubt if the results can be properly and accurately described as "natural" colours. They may be "colour photographs," and perhaps "photographs in colours," but I think I am right in suggesting that amongst those who have given the subject careful consideration—I, for one, commenced the wallowing process a good many years ago—the term "natural colours" is solely applicable to the Lippmann process. Here your picture is the result of the direct action of light plus development. It is, indeed, a case of practice confirming theory. Ever since the very dawn of photography, the aim of the experimentalist has been to produce a direct photographic record of colour, and though it must be admitted that the Lippmann process is by no means a complete solution of the problem, yet, as it is the only method which imparts to a sensitive surface a true impression of the bases of all colour, namely, light waves of different lengths, it has perhaps the greatest right of any process to be termed "natural," in that the results are produced by direct natural agency alone. Let Mr. Urban experiment with the Lippmann process, and get good results in the seventy-fifth of a second, and he may claim to have made very great progress indeed.

Hitherto the name of Carl Zeiss has been principally associated in the minds of photographers with the production of third camera is the "Minimum Palmos," also of square form and entered the field of camera construction. A batch of circulars before me deals with these instruments, some of which may be specified. The first is the "Palmos" roll film camera, which is of the now familiar folding type; a second the "Universal Palmos," a hand or stand camera of landscape form, one of the features of which is a double slit focal plane shutter. The third camera is the "Minimum Palmos," also of square form and fitted with a focal plane shutter. The Palmos changing box and roll holder are adjuncts of these cameras. Briefly, the Zeiss "Palmos" series of hand cameras covers the whole of the available field, that is, they are designed to take roll film, cut film, and plates. The roll holder and changing box may be adapted for other cameras. This departure of Messrs. Zeiss was, I believe, contemplated last year, but it is only comparatively recently that the cameras have reached this market. As far as one can judge from the illustrations, the cameras are very strongly built; they certainly emanate from scientifically trained men who realise the importance of well and accurately constructed instruments for producing photographs. At the present time nearly every chemist's shop is stocked with photographic apparatus, a large proportion of which cannot possibly be in practical use a year hence. It is a distinct advantage for the future of photography, when houses of the eminence of Messrs. Zeiss set themselves the task of boldly entering into competition with cheap cameras, etc., in the only effective way—that is, by means of best quality or highest grade apparatus. I must confess, however, there seems little hope of making the great mass of the public realise that the photographic camera is, after all, an instrument of precision and not a nursery toy; thanks, of course, to wholesale enterprise and the commercial instincts of the British shopkeeper, who is commonly credited with the most cheerful readiness to sell anything or everything for a profit, even his wife or his mother-in-law.

The changes that are constantly, nay, almost daily taking place in the photographic world, remind one of nothing so much as that joyful spectacle of illusion-loving youth, the transformation scene in a pantomime. From Zeiss cameras we pass to Wellington Carbon Tissue. Messrs. Wellington and Ward have for a long time been working out pigment printing at Elstree, and although very little publicity has been given

to this departure it is tolerably well known that a Wellington tissue will shortly be placed on the market. At Cambridge some excellent prints in this medium were shown me by Mr. H. H. Ward. Another introduction of the firm, which is ready for the market, is the Wellington transparent celluloid film. This film, says the firm, is "the result of many years of careful experimenting, our object being to make a film as perfect as is possible before putting it in competition with others. The film is transparent, without joins in the raw material, and is coated with an emulsion of extraordinary speed, combined with perfect quality." This will make the third, if not the fourth, rollable film which is the outcome of native enterprise, and the point is worth noting in view of the fact that only a year ago one British firm alone was actively engaged in its manufacture. Photographic England is apparently taking the memorable advice of the present Prince of Wales, and is "waking up." It is to be hoped that a similar spirit of alert adaptation to the needs of the time is manifesting itself in other branches of industry. "Nature," "The Times," and other high-class journals, a Parliamentary Commission, and several learned societies have recently addressed themselves to a study of the causes of England's setback in industrial progress during the last thirty years. It is not pleasant reading for any thoughtful man who has the welfare of his country at heart. But as a straw shows the direction of the wind, it may be that the undoubted increase in native photographic activity is a sign that the dormant energy of the British producer has at last been roused. A few years ago, British paper-coaters were said to be restricted to foreign sources for their supply of paper, but I am assured that this state of things has been altered, and that paper of home manufacture is now available. In the quality of its gelatine dry plates, England's supremacy has never been seriously threatened, although, perhaps, there is room for advance here in sensitising surfaces for work in colour photography.

It was the late Mr. Gladstone who once unbosomed himself of the confession, after one of his retirements from office, that he had a preference for a position affording him "greater freedom and less responsibility." For a long time now a large and kindly public has borne with me in the foible of making this page of the JOURNAL the vehicle of purely personal expressions and preferences; so perhaps a more than usually pointed specimen of "the first person singular" will not be resented. Well, I am on the side of Mr. Gladstone. July 4th last was a great day for me. It was American Independence Day; the anniversary of my own appearance upon this perturbed planet; and the date when I handed over the seals of my last photographic office to my friend, Mr. William Grove. After eleven years passed on the active executives of nearly a score of photographic societies, I think I may fairly claim to be allowed to stand down for a while, and concentrate myself on the work of my old love, the "B. J." The "sweets of office" in photography are fought for with a resolution and tenacity that is incomprehensible to one who has never aspired to them, but whom Fate has elected to take by the scruff of the neck and fling right into them. If the metaphor is obscure, the meaning, I hope, is clear. I need hardly say that absence from the committee-room in no way diminishes the interest I feel in the various societies of which I have the honour of being a member. Will secretaries please note? The same band of persevering pilgrims along the path of photographic progress would also earn my undying gratitude if they would try to realise that the winter months have for me some other occupation than the reading of papers before their esteemed and admirable societies. One of the terrors of my calendar is the autumn avalanche of requests to figure in syllabuses "now in course of preparation." Messieurs, the spirit is willing, but the flesh is weak. I have other objections besides purely personal ones. There is the matter of principle. My opinion is that the photographic society which is not self-supporting, and does not, or cannot, draw its photographic pabulum mainly from internal sources, has not established its right to live. Take away trade demonstrators and good-natured philanthropists, of which I am fantastically supposed to be a type, and you could read the burial service over these societies in batches of a dozen a time.

COSMOS.

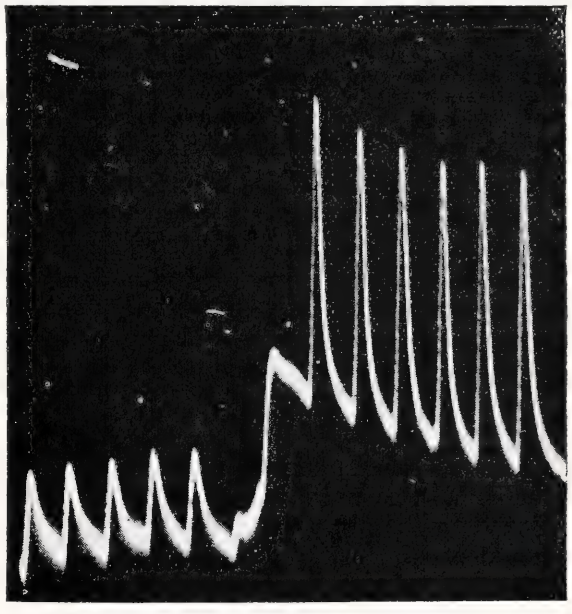
MOLECULAR STRAIN THEORY OF VISION AND OF PHOTOGRAPHIC ACTION.

[Reprinted from the Journal of the Royal Photographic Society.]

III.

EFFECT OF ANNEALING.

IT is obvious to you that if we remove in any way the molecular friction, the response will be enhanced, in other words, the wire will be more sensitive to the same stimulus. Here you



Before. ↑ After.

FIG. 9.—Stimulating action of Na_2CO_3.

see the response of the same wire before and after annealing. In the latter case the response is nearly three times as strong. Sometimes the wire falls into a sluggish condition, and there is no response. But annealing makes the wire sensitive. You will at once notice the meaning of annealing in enhancing the sensitiveness of the photographic plate.

EFFECT OF STIMULANTS AND DEPRESSORS.

The action of Na_2CO_3 as accelerator and of KBr as retarder is known to you. Curiously enough, the former agent is found to act as a great stimulant (enhancing the response) (Fig. 9), and the latter as a depressor of response (Fig. 10).

RELATION BETWEEN STIMULUS AND MOLECULAR EFFECT.

If the intensity of stimulus is increased, the molecular effect as exhibited by response is also found to increase. But the curve showing the relation between stimulus and response is not a straight line. In the first part it is slightly concave to the abscissa (representing the molecular effect); it is then straight, and in the last part concave. A limit is approached as the intensity of stimulus reaches a high value. You will notice an exact parallel in photographic action.

Effect of Superposition.

If the stimulus is very feeble it hardly produces any effect, but single ineffective stimulus becomes effective by superposition. I give a typical curve which shows the effect of continued stimulation; it shows several distinct stages (Fig. 11).

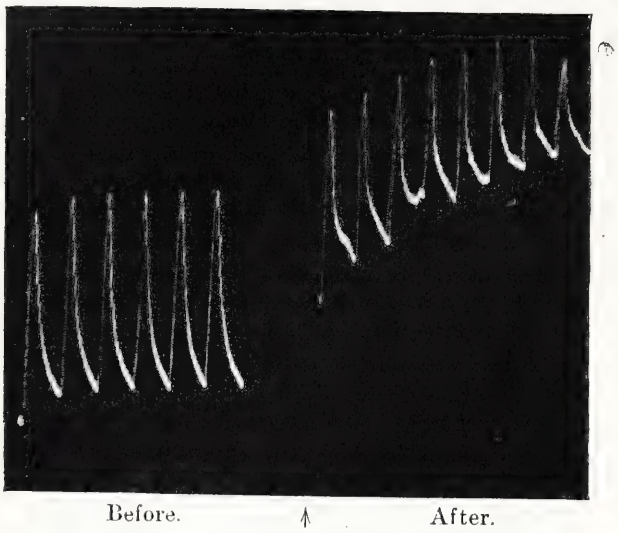


Fig. 10.—Depressing action of KBr.

(1.) A short latent period, when there is apparently little or no action, or even a transitory negative action.

(2.) After this stage the curve rises almost in a straight line. This is the stage of increasing action.

(3.) The curve then reaches a maximum and becomes horizontal, after which it begins to fall, and may reach the original neutral line.

(4.) After very prolonged stimulation, I have sometimes found the curve proceeding in the negative direction, thus exhibiting molecular reversal.

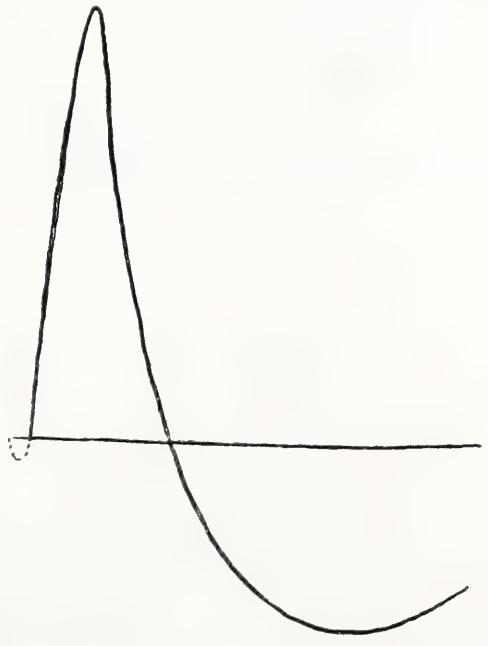


Fig. 11.—Curve exhibiting the molecular effects under continuous stimulation.

All these peculiarities I find not only under the continued stimulus of mechanical vibration (electro-motive variation method), but also under light (electro-motive variation), and also under electric radiation (conductivity variation method).

The first part of the curve, or the latent period, is very suggestive as regards the obscure phenomenon of photographic induction. "When a mixture of chlorine and hydrogen which have been kept in the dark is exposed to the light, there is either no hydrochloric acid or only a very small quantity formed in the first moment, but the rate of formation increases so that the quantity formed in a given time, e.g., one minute, continues to increase until it attains a maximum. Bunsen terms the gradual increase in the action induction. If the gaseous mixture has been once exposed to the light, it will retain in the dark for about half-an-hour, its capacity of forming HCl in the light. If the gas has remained in the dark for a short period, and is again brought into the light, it requires a very short period of induction, but the period of induction will be lengthened by keeping the mixture in the dark for a long time."*

The latent period of the curve, due to molecular inertia, would thus appear to offer an explanation of induction. In connection with this it is interesting to note the well-known fact that a very slight preliminary exposure of the photographic plate enhances the general sensitiveness. This is no doubt due to the fact that the preliminary exposure had merely overcome the molecular inertia.

It would appear from the inspection of the curve that the general law of photo-chemical action, which regards the total photographic action as proportional to the product of the light intensity multiplied by the time of exposure, is subject to several modifying conditions. During the latent period this cannot hold good in the first part, nor can it be true after the maximum is reached. It can only hold good in the second stage, where the actions proceeds uniformly.

Effect of Intermittence in Modifying the Law of Photo-chemical Action.

But even at the second stage of uniform action there may still be deviation from the above law. If in one case the light be intermittent and in the other continuous, the effects may be quite different, though the total duration be equal. For in the former case, during the continuation of light, we may have the distortion or molecular swing proceeding in one direction, but on the stoppage of light, the swing stops too, and owing to self-recovery may even become reversed. After an interval, when the light is again allowed to act, it has not only to overcome the molecular inertia, but may have to reverse the negative swing. In the case of continuous illumination the molecular action proceeds without interruption. This is well seen in two curves I obtained, which show the difference in the extent of molecular effects produced in an AgBr cell by interrupted and continuous illuminations of the same total duration. In the case of interrupted illumination the molecular effect as measured by the galvanometer deflection was 7 divisions; with continuous illumination it was 11.5 divisions, or one and a half times as great. It is thus seen that owing to self-recovery the effect of light with interrupted illuminations is less. It is also evident that the greater the period allowed for self-recovery (during the interval of darkness) the less will be the resultant effect. In connection with this, Abney's experiments are interesting. In comparing the relative effects of continuous and interrupted illuminations, he finds that in the latter case the effect produced was always less, and that the longer the interval between the successive exposures, the smaller was the effect.

Photographic Effect Modified by the Time Rate.

It will thus be seen that the photographic effect is not solely governed by the total amount of radiation, but by the time rate also. This gives a simple explanation of the apparently anomalous result obtained by Mr. Wood ("Nature," November 30th, 1899). The photographic image of a single electric spark came out as a reversed positive, when the lens was wide open;

* This is evidently due to self-recovery.—J. C. B.

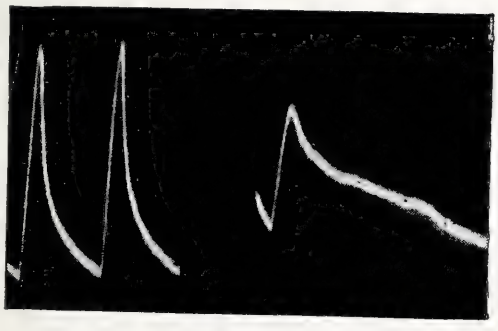
but there was no reversal with four successive sparks with the lens aperture reduced to one-fourth. The quantity of light was the same in the two cases, but the time rate of illumination was different. In the first case the rate was quicker, and gave rise to a molecular reversal (see below).

Phenomenon of Reversal.

After continuous stimulation—either mechanical or luminous—the curve of response is found to undergo reversal. Similar molecular reversal is found also under the action of continued electric radiation. The relation of this to photographic reversal is obvious.

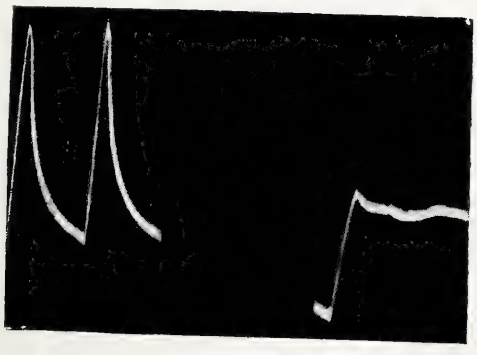
Arrestors.

We have seen that the difference between the retinal image and the photographic image is that in the former it is fugitive and in the latter persistent. We have also seen that there are theoretically two ways of making the image permanent—(1) by overstrain; (2) by the influence of certain agents which would arrest the self-recovery, the molecular strain thus becoming more or less permanent. This photographic permanence of after-effect is merely a question of degree—from numerous evanescent effects which cannot be photographically detected to a little more permanent effect in daguerreotype, and still greater permanence in photographic plates. One of the chief functions of the so-called sensitisers appears to be, not so much to impart sensitiveness—for everything is more or less sensitive—but to make the light effect developable by arresting the self-recovery.



(*a*)

Before. After.



(*b*)

Before. After.

Fig. 12.—Effect of arrestors. (*a*) Shows retarded recovery; (*b*) complete arrest.

I have been recently carrying out a series of experiments to verify the supposition that with the help of the "arrestors" it is possible to render the strain effect permanent. The following records will speak more eloquently that I can about the manner in which the molecular arrest is brought about. First you see the normal response to stimulation and the immediate recovery. I add a small quantity of the arresting re-agent. There is the response, but the recovery is very much prolonged—from the normal one minute to five minutes. You have now a case comparable to the daguerreotype image. I add a little more of the arrestor. Here is the response, but the recovery is completely arrested. The impress of the stimulus has now become fixed. (Fig. 12. Compare also in the Fig. 2 *d e*.)

Conclusion.

It is thus seen:—

(1.) That molecular strain is produced by the action of light.

(2.) That both in the artificial and real retinæ, the molecular strain produced by light gives rise to similar electric impulses.

(3.) That as the physico-chemical properties of a substance are changed by strain, it is possible to develop the latent image through the difference in the following properties between the exposed and unexposed portions, produced by light: (*a*) Difference in adhesive power, *e.g.*, development of Daguerreotype by mercury vapour; development by water vapour; (*b*) Difference in chemical stability, *e.g.*, development by reducing agents.

(4.) That molecular strain may not only be produced by visible or invisible radiation, but also by (*a*) electric, and (*b*) mechanical stress. Latent images produced by such means may be developed, *e.g.*, inductoscripts, development of pressure marks.

(5.) That nearly all substances are sensitive to radiation, but the effect cannot in all cases be rendered visible, (*a*) owing to the want of suitable chemical developers; (*b*) owing to quick self-recovery. The effect may be rendered more or less permanent by overstrain or by "arrestors."

(6.) That the molecular effect due to radiation can be demonstrated by the conductivity or E.M. variation methods.

(7.) That the latent period of overcoming inertia corresponds to the photographic induction period.

(8.) That the relapse of image is due to self-recovery.

(9.) That owing to the tendency towards self-recovery, the radiation effect does not solely depend on the total quantity of light, but depends also on the time rate of illumination. Hence the photographic effects of intermittent and continuous illumination are not the same.

(10.) That the continuous action of radiation produces recurrent reversals.

I have brought before you this evening various response phenomena in the living and non-living which at first sight appear to be distinct and unrelated to each other. But you will, I hope, have noticed an underlying unity in the experiments demonstrated before you. You will have understood how the same molecular mechanism which prints the latent image, works also the wireless telegraphic receiver and transmits the visual impulse. You may have realised—if I have been successful in the presentation of a large subject in a short time—that the responsive phenomena in the living have been foreshadowed in the non-living, and that in nature there is no abrupt break of continuity, but an uniform and continuous march of law.

Jagadis Chunder Bose, M.A., D.Sc.

London and Provincial Photographic Association.—Throughout August the Thursday evening meetings will be open to any member or visitor who has any matter of photographic interest to bring forward. Colonial and foreign visitors are always welcome at the meetings, at the White Swan Hotel, Tudor Street, Fleet Street, E.C.

THE PLATINOTYPE PROCESS.
IV.
After Treatment of the Prints.

Although the after treatment of platinum prints is fairly well known, I have thought it worth while to abstract what Hubl has to say on the subject, and add a note on those processes which he does not mention.

In the first place, it is not possible to reduce a platinotype print, platinum, even in a finely divided state, being extremely resistant against the ordinary reducing agents. They can on the other hand, be intensified and "toned" to various colours; in all cases the so called toning is more or less of an intensification process and this must not be forgotten, so that prints for these processes must not be developed quite so far as usual. The prints must be, of course, thoroughly freed from all iron salts and it is immaterial whether the prints are freshly made, though some old prints seem to be less inclined to take kindly to one or other of the processes.

Lyonel Clark suggested the use of an acid pyro-silver intensifier, but Hubl states that he has never been able to obtain satisfactory results, and that the deposit is generally coarse-grained. The formula is:

Glacial acetic acid	50-60 drops.
Pyrogallol	0.65 g.
Distilled water	360 ccm.
Silver nitrate solution, 12 p.c.	20 drops.

The silver solution must be added gradually and it is advisable to flood the print first with the acid pyro and then add the silver in successive portions to the solution as the intensification is more under control. Hydroquinone may be used instead of pyro in the above formula and the action is slower. Of course, the silver on the image can be toned with gold or platinum.

The most satisfactory method is certainly the intensification with platinum and there are three ways of doing this, the first two, however, are extremely liable to give coarse-grained prints, and there is the further disadvantage that the intensifier becomes thick and black, and this occurs so suddenly that frequently the platinum is precipitated in the paper.

Dr. E. Vogel's intensifier is:

Chloroplatinite solution	3—5 drops.
Ferrous oxalate developer	5 ccm.
Distilled water	50 ccm.

This is applied to the prints after the acid baths.

Dr. A. Miethe's process is to apply the intensifier to the print before fixation, so that the platinum salt of the paper is used:

Potassium oxalate solution (3.10)	125 ccm.
Ferrous sulphate solution (3.10)	25 ,,
Potassium bromide solution (1.10) ...	25 drops.

The print is placed face upwards in a dish and a little of the above solution poured over it and when sufficiently intensified, it should be treated with the acid baths.

The third, and the only satisfactory method, is that with sodium formate suggested by Hubl, and it is, of course, purely a physical intensification, the platinum being deposited *in statu nascendi* upon the image; the intensification is slow, taking about 15 minutes in all, and is, therefore, well under control. Two stock solutions are required, which keep well.

I.—Sodium formate	10 g.
Distilled water	100 ccm.
II.—Platinum bichloride	2 g.
Distilled water	100 ccm.

For use mix from 100 to 200 ccm. of water with 5 ccm. of No. 1 and then 5 ccm. of No. 2. It will be noted that here the chloroplatinite is not used. The solution for use must be mixed as stated, and if the two stock solutions are mixed together first and then the water added, there is a great tendency for them to turn black before sufficient intensification is obtained. The prints should be well washed after the acid bath before intensification.

Another method and one which is useful to give a better colour to somewhat rusty-looking prints, and at the same time as intensification, is Mr. A. W. Dollond's process with chloride of gold; there is, however, great tendency for the whites to turn pink. The well-washed print should be placed face-upwards on a sheet of glass and blotted off with blotting paper, and covered, by the aid of a brush, with pure glycerine, then a few drops of a 3 per cent. solution of chloride of gold should be dropped on the print and rapidly brushed over it; when the desired intensification is obtained, the print should be well washed and then sponged back and front with a metol potash developer, and again washed and dried.

In the so-called toning process, there is, as has already been mentioned, intensification and the platinum image undergoes no change in itself, but merely acts as convenient points for the deposition of the toning compound.

For uranium toning three stock solutions are required:

I.—Uranium nitrate	10 g.
Glacial acetic acid	10 ccm.
Distilled water	100 ,,
II.—Red prussiate of potash	10 g.
Distilled water	100 ccm.
III.—Ammonium sulphocyanide	50 g.
Distilled water	100 ccm.

For use add to the litre of water 10 ccm. of No. 1, and then 10 ccm. of No. 2, and finally 10 ccm. of No. 3. A 10 per cent. solution of sulphite of soda may be used instead of the sulphocyanide, and in this case 5 ccm. of each solution may be added in the same way. When the desired tone is reached the prints should be washed in acidulated water and then dried. It is important that the toning solution should keep clear, otherwise the whites of the prints will suffer.

For bluish tones the following can be used:

I.—Ammonia iron alum	10 g.
Hydrochloric acid	10 ccm.
Distilled water	100 ,,

II.—Red prussiate solution, as above.

III.—Sulphocyanide solution, as above.

For use 5 ccm. of No. 1, 2ccm. of No. 2, and 5 ccm. of No. 3 should be added in turn to the like of water.

It is hardly necessary to say that for anyone desirous of practical work in the manufacture of platinotype paper a careful study of Hubl's work is absolutely essential, for there are numerous important points which I have necessarily had to omit in this bare digest.

E. J. Wall.

Photographic Camp.—A very successful photographic camp, organised by the well-known photographer and writer, Mr. Walter D. Welford, has been located on Glover's Island during the present week. It was opened at the end of last week and terminates to-day. Ten ladies and gentlemen form the camping party, the ladies being provided with sleeping accommodation at Clerk's Hill House, and the gentlemen spending the night in tents. A luxuriously fitted marquee was erected for the use of the party who have spent a very enjoyable time. There have been excursions to Stratford, Tewkesbury, the higher reaches of the river and so on, and cricket, boating, music and so on have helped to pass the time. One of the party had an encounter with a tramp, as reported in our police news.—"The Evesham Journal and Four Shires Advertiser," Saturday, July 26th, 1902.

CELEBRITIES BEFORE THE CAMERA.

[Reprinted from "Camera Craft."]

It is doubtful if there ever was such an outcropping of cameras in this city as on the May day, a little over a year ago, when the late President William McKinley formally entered San Francisco. The edges of the sidewalks on Market and Kearny Streets and Van Ness Avenue were literally fringed with curious photographers, anxious to secure a likeness of the President, who had won the sympathy of all through the sudden severe illness of his invalid wife. I shall never forget the keen disappointment suffered by one of my friends on this occasion. Perched on a stepladder at the corner of Kearny and Sutter Streets, he sat in a cramped, uncomfortable position for an hour, awaiting the approach of the President. Finally, there was a general commotion along the line, and the photographer, by this time almost in a state of nervous prostration, rested his camera firmly on his knees, focussed so as to take in the centre of the street, and awaited the crucial moment.

As the carriage of honour neared his vantage point, President McKinley stood up, bowed graciously to the right and left, his silk hat grasped firmly in his right hand. From the upper window of one of the corner buildings a rose was thrown by an enthusiastic girl, and, strange to say, it fell into the President's hat. He immediately picked it out, raised it to his lips, and, with beaming countenance, nodded in recognition to the upper windows, from whence had come this token of goodwill and affection. It was a dramatic bit of by-play, observed by only a few of that mighty throng, but it made a picture which many an artist would have travelled miles to secure. My friend was congratulating himself on this stroke of good luck, when, just as he squeezed the bulb and the shutter of his camera clicked, several enthusiastic men, carried away by the sight of the President, cheered lustily, and waved their hats in such a manner that they covered the lens of the patient photographer's camera. In his desperation, he shouted to them to lower their hats, but before he could readjust his machine for another snap, the carriage had passed, and the golden opportunity was lost.

In his recently published posthumous volume, "Men and Memories," John Russell Young tells of the amusing attempt of an enterprising artist to photograph Abraham Lincoln when he delivered his famous Gettysburg speech. By dint of much persuasion with the crowd, the protographer managed to place his camera in front of the President. And as Lincoln began to speak he commenced his work, peeping through the lens, dodging his head to catch a favourable position, fooling with the focussing cloth and staring wistfully at the President, and waiting for the right moment to make the exposure. But the President was not a good subject. Whether conscious or not of the honour thus impending, he drove on with his speech, ever holding the paper before his face, the dismayed photographer vainly hoping for one glimpse of the face. And as the President summarily turned to sit down, he desperately uncovered the camera, but too late! The flash of light brought him nothing. There was a general ripple of laughter at his dismay, as he folded his camera and stole away.

As is well known to all who follow the papers closely, President Theodore Roosevelt has a burning dislike for the amateur photographer. A rather unpleasant incident occurred just as he was leaving Grace Reform Church, the first Sunday he spent in Washington, D.C., after he had succeeded to the Presidency. A fifteen-year-old boy, anxious to obtain a photograph of the Chief Executive, had stationed himself on the sidewalk about sixty feet from the entrance to the church. As soon as President Roosevelt reached the sidewalk, he saw the boy with his big box immediately, and, raising his hand in a signal to a bicycle policeman standing near, said, "Stop that, stop that!" The officer jumped in front of the camera and the President strode forward almost on a run. Coming up to the boy, he shook his finger menacingly at him, and declared: "You ought to be ashamed of yourself trying to take a man's picture as he leaves a house of worship. It is a disgrace. You ought to have more respect for the proprieties and the sanctity of the day than to pursue people to church for the sole purpose of snapshotting them." The policeman, manifestly agitated, was standing with his broad back close to the camera while the President spoke to the photographer, who, evidently accustomed to rebuffs of this kind, smiled blandly at the President as he walked away.

It is said that the Roosevelt children have learned their lesson well, and whenever they espy a camera, the little fellows duck their heads and move about in such a way that it is impossible to catch them. Not long ago, Archibald, who attends one of the public schools of Washington, D.C., found himself in an embarrassing position. He had mounted his bicycle and was about starting home, when a photographer appeared straight in front of him. There seemed no escape for the lad, but just then a great hay waggon came down the street. In a flash the child turned his wheel and rode directly under it, continuing between the wheels until a corner was turned and the danger passed.

Recently an Eastern weekly published a series of striking pictures showing the President taking fences on his famous charger, Bleistein. This is the story which is told of their origin: A certain New York newspaper wired to its Washington bureau to get a picture of President Roosevelt on horseback. It was an impossibility. The paper then wired instructions to "fake" such a picture. An order was given to a good photographer, who took the President's head and transferred it to the body of an equestrian. The job was so neatly done, that when the picture was sent to New York, the artists there asserted that no fake photograph could have certain characteristics shown in the picture. A message came back that the picture was not a fake, and orders were given to get the "story" and all about it. The fraud was so neatly done that someone showed it to the President, and his first words were: "Where did you take that?" A second glance, however, showed him that the horse, although very like, was not Bleistein, and the President laughingly detected the deceit. He was so pleased with the workmanship, however, that he promised, if the "fake" was not published, to give the photographer a chance to make some real pictures. This little act of kindness is characteristic of the President. He likes good work in any line. The result of his promise was a beautiful set of equestrian pictures, showing the President and his horse in all the positions of an active horseman.

At the launching of Emperor William's yacht, the Meteor, as the President and his wife and daughter were leaving the platform which had been specially erected for the distinguished guests, a little fat man worked a clever ruse on Roosevelt. He took off his hat and shouted: "Three cheers for the President and Prince Henry!" The President instantly turned around to make acknowledgment. As he did so, the little fat man flashed a camera, which caused the President to smile, but he posed for the "fiend," and the latter was happy.

Cameras proved the bane of Prince Henry's visit to America. Every move he made, from the time he landed until he departed, was faithfully recorded by the dreaded machines. When he visited Lincoln Park, in Chicago, for the purpose of laying a wreath on the Lincoln monument, he was photographed by a horde of camera workers. When he deposited a wreath at the tomb of Washington, at Mount Vernon, he strongly

protested against being photographed in the act. "It does seem to me," he said, in more of a plaintive than an angry tone, "that when a man is doing an act of reverence he might for that moment at least be spared by the photographers." But he was not spared. The click of the shutters was all about him like the fire of a skirmish line, and it kept up until he was again in his carriage and out of range.

All notable visitors to this country make the same compaint. In New York recently, the Countess de Rochambeau, who was en route to Paris, after having been present at the unveiling of the Rochambeau statue at Washington, D.C., said: "Next time I come I hope that the photographers will be busy following the Emperor of Germany, or some other high personage, so that I may go about in peace. That is a very offensive habit they have of following people and photographing them without any provocation whatever. I submitted gracefully at first, but now, whenever I see them coming, I feel as if I had committed a crime, and were about to face my executioners."

Nevertheless, in spite of these uncomplimentary remarks of the Countess, we read in the Paris papers that snapshot photography has become such an absorbing pastime in Paris society that an amateur exhibition has just been held in the Galerie des Champs Elysees, which attracted scions of almost every aristocratic family.

In England, too, the amateur photographer is met at every turn. Julian Ralph bears out this statement in his description of the funeral cortege which carried the remains of Queen Victoria from her castle on the Isle of Wight to the royal yacht en route to London. "The solemn procession," he says, "wound its way along a country lane. Following the body on the gun carriage were eleven royal women—queens and princesses—in black nunlike garb, trudging on foot in the muddy road. Waiting for them in the tree branches, on the walls, on the roofs, on the chimneys, on the gate posts, in the upper windows, were scores of men with cameras. One photographer had brought with him a ladder of extraordinary height and amazing slenderness, up which he clambered to the top with a large camera, so that he looked like a blackbird and his camera like the box nest in which he lived. The wind blew strongly and the airy ladder rocked and swayed too and fro. The princesses, walking meekly in the mud with downcast eyes, did not see the contraption or realise the danger of it falling upon them. But King Edward did. He looked up and saw the swaying, rocking figure over his head, and when he had passed it, I do not doubt, he heaved a sigh of relief. Perhaps he wondered if it would fall on any of the Court functionaries behind him, and whether they or the photographer would get the worst of it." Judging from the countless imperial groups which appear in the English and European high-class weeklies, royalty and nobility take a great delight in posing for pictures. They have only one horror, and that is being snapshotted. They want to have a chance to pose and look pleasant. In Germany, in spite of the Kaiser's love of being photographed, it is said to be a legal offence to point a camera at him or at any member of his family without having received permission.

The late Empress Elizabeth of Austria was decidedly averse to being snapped by camera fiends or even posing for professional photographers. This prejudice was one she had displayed for a good many years before her death, and the result was that, after her assassination in Switzerland, the only picture obtainable in many cases was one at least twenty-five years old. She always carried with her a large black fan or a parasol, which she used as a screen to protect herself from the omnipresent camera man. It is believed that the only time she was caught off her guard was a few months before her death. A photographer hid behind some bushes, and got a fairly good picture of the Empress walking with the Emperor at Bad Nauheim.

During his recent stay in Constantinople, William E. Curtis found it impossible to buy a photograph of Abdul Hamid at any picture store. The dealers all told him that since the Sultan's accession, none have been taken. "The portraits that frequently appear in the illustrated papers," Mr. Curtis says, "have been sketched from memory by artists who have seen the Sultan. The portraits of his sons, however, can be purchased wherever such things are sold in the Turkish capital."

Faked photographs of celebrities are not at all uncommon. M. Dollfus, in his book, "Modeles d'Artistes," says that Victor Hugo never sat for any of the popular portraits and photographs which were in great demand during the latter part of his life. Dollfus claims that they were not portraits of Hugo, but of a crayon-seller of the Latin Quarter, who bore a striking resemblance to the great author. The substitute earned a good income by posing for these portraits, and the resemblance incidentally brought him other benefits. He was largely responsible for the common rumour that it was the author's custom to ride in cheap and public conveyances, even in the coldest weather, and to permit his admirers to pay his three-cent fare. In the evening the crayon-seller frequented the cafés and accepted the "treats" from credulous persons, who boasted next day of their familiarity with the great writer. In this way the impostor satisfied his thirst for wine and fame at small expense. But, alas, Victor Hugo died, and with him his double's reflected glory. No more did photographers care to have the impostor pose.

When half-tone photographs were first introduced in the newspapers, they were welcomed as a great improvement on the miserable cuts which formerly supplemented the news of the day. Upon beholding some life-like snapshots of himself for the first time in an Eastern publication during the campaign of 1892, Senator John Sherman is said to have remarked to a friend: "Well, well, our time for criticising the newspaper men is over. They ha us to rights now. Here I am just as I am, and I'm a caricature of what I always thought I was."

So familiar have the public become with the faces of distinguished Americans, that no matter where they may go, they are sure to be recognised. It is related that some years ago, when Bishop Potter, of New York, was travelling in Minnesota, a man approached him on the railway platform and scanned his features closely. "Excuse me," he said, finally, "but haven't I seen your picture in the papers?" Potter was compelled to confess that he had. "I thought so," remarked the inquisitive one; "may I ask what you were cured of?"

It is amusing to read of the restrictions which are placed on the photographer abroad, for in the United States he is supreme. Nothing can stop him; everything is in his favour. Yet once in a while, he does get a setback. For instance, a few summers ago, a newspaper photographer attempted to take photographs of the wives of William K. Vanderbilt, jun. (formerly Miss Birdie Fair) and Hermann Oelrichs in front of the Casino at Newport. The ladies protested against being snapped, but the photographer did not heed their wishes. An hour later, Mr. Oelrichs and Mr. Vanderbilt appeared upon the scene, and much to their surprise, found the man still at the Casino entrance, shooting his camera most audaciously at Society women. The two men accosted the camera fiend and expressed their indignation. One lively word led to another, until Mr. Oelrichs raised his foot and sent the camera out of the man's hand and sailing skyward. When it came down on the hard brick walk, it broke into a dozen pieces, and the film, with the pictures of Mrs. Vanderbilt, Mrs. Oelrichs and others, were exposed to the light and destroyed. The man wept at the

loss of his camera, and left, saying that he would sue Mr. Oelrichs; but no complaint was ever made to the police. The Newport cottagers applauded Mr. Oelrichs action, for they were indignant at having to run the gauntlet of a dozen Kodaks every time they stepped off their porches or climbed into a carriage.

HORATIO F. STOLL.

THE APPLICATION OF SCIENCE TO INDUSTRY.

(Reprinted from the "Times.")

THE report of the special sub-committee of the London Technical Education Board on the application of science to industry, which was under discussion at the meeting of the London County Council last week, contains much matter of interest in the reference to the loss of business in various branches of British industry and the most feasible means of combating any further diminution. The sub-committee consisted of Mr. H. J. Powell (chairman), Mr. A. A. Allen, Mr. W. Bousfield, Mrs. Bryant, the Rev. R. S. de Courcey Laffan, Mr. W. Leaf, Sir Philip Magnus, Mr. T. A. Organ, Sir Owen Roberts, Mr. Mr. W. Verney, Mr. Graham Wallas, Mr. H. Ward, Mr. Sidney Webb, Mr. C. A. Kohn, and Dr. Garnett. The witnesses were Mr. J. W. Swan, F.R.S., Sir Bernard Samuelson, F.R.S., Sir Henry Roscoe, F.R.S., Dr. Frank Clowes, Professor James Dewar, F.R.S., Dr. J. T. Merz, Dr. W. H. Perkin, F.R.S., Professor Sir W. Ramsay, F.R.S., Mr. Thos. Tyrer, Professor Meldola, F.R.S., Mr. George Beilby, Dr. T. E. Thorpe, C.B., F.R.S., Professor W. E. Ayrton, F.R.S., Professor H. E. Armstrong, F.R.S., Mr. J. Levinstein, Mr. Alex. Siemens, Mr. Herbert Jackson, Mr. Hugh Bell, Principal Sir Arthur Rücker, F.R.S., Mr. A. G. Green, and Dr. Gordon Parker. Written reports have also been received from Professor M. J. M. Hill, F.R.S., Professor Cormack, Professor Fleming, F.R.S., Professor Lunge, and Mr. B. S. Rowntree.

Dealing first with the question of loss of business, the committee state that they were unable to resist the conclusion that various branches of industry had during the past twenty or thirty years been lost to this country owing to the competition of foreign countries, and that in many others our manufacturers had fallen seriously behind our foreign rivals; that London in particular had distinctly suffered; and that these losses were to be attributed in no small degree to the superior scientific education provided in foreign countries. They referred to the transfer from England to Germany of numerous departments of manufacturing chemistry. The best known instance of loss was that of the manufacture of aniline dyes and many other valuable products from coal tar. The total exports from Germany of coal tar products now exceeded £4,000,000 annually, of which about one-fourth came to the United Kingdom. The United Kingdom now paid annually over £3,000,000 for imported chemical dye stuffs of one kind or another. As an instance of an industry in danger at the present time, the committee point to what has always been in part a London manufacture, that of pottery, especially of the finer kinds.

Dealing next with the causes of this loss of trade, the committee observe that all witnesses agreed in considering the relative beckwardness of this country in scientific industries as due in the main to the deficiencies of our educational system. The glass industry had suffered from the inability of manufacturers to appreciate the value of science, from want of touch with scientific institutions, and especially from the want of an institution similar to the Physical Institute at Charlottenburg. The recently established National Physical Laboratory would, it was hoped, now fulfil this want. That industries were affected by education was perhaps best proved by the vitality of scientific industries in those countries in which the system of secondary education was supplemented by scientific education of university rank, for the perfecting of which no expense was spared. Summing up all the evidence, the committee are convinced that the main causes of our relative failure in the chemical, optical, and electrical industries are—(*a*) The lack of scientific training of the manufacturers, and their consequent inability to recognise the importance of scientific assistance. (*b*) The defective condition of our secondary education, and the consequent lack of sufficiently prepared recruits for advanced technological training. (*c*) The lack of a sufficient supply of young men who have been trained in scientific principles and methods, and in the application of science to particular industrial processes. (*d*) The lack of any institution providing advanced technological training, which is sufficiently endowed to enable it to give adequate attention to post-graduate or advanced work.

With regard to science training in the secondary school, the committee state that scientific industries have suffered in England, not only through defects in higher scientific training, but to an even greater extent through defects in general and secondary education. They add, "In the majority of secondary schools, the curriculum has been so hampered by the exigencies of examining authorities and of examinations that the teacher has been compelled to devote undue attention to storing the minds of the students with facts for reproduction at the expense of the time which should be devoted to stimulating their reflective powers and making them think. In after life those who enter upon industrial pursuits too often regard science with distrust, and to some extent this distrust is merited, owing to the insufficient preparation and training of those who offer themselves for responsible posts in scientific industries."

Proceeding to deal with the question of science instruction at the University, the committee state that they have been impressed with the need for providing increased opportunities for the young chemist, electrician, and engineer. Part of this provision was being made in the evening work of the Polytechnics, from which a number of students annually took the degree of B.Sc. at the University of London; but there was a consensus of opinion that the highest grade of technical education must be carried on in an institution of University rank open during the day. The existing institutions of University rank in London were hampered by deficient endowment, deficient accommodation, deficient teaching power, deficient equipment, and by the deficient preparatory training of the students. The improvement of equipment and the strengthening of the teaching staffs could be effected partly by co-ordination and partly by securing to the institutions a moderate increase in their income from a reliable source.

Dealing with the development of advanced technology in London, the committee express the opinion that the greatest need of London at the present time is the co-ordination of the provision for the highest grades of education and the development of new departments, so that professors of the highest distinction and practical training should have under their supervision, post-graduate or other advanced students carrying out research work. The committee urge that the education of a leader of a scientific industry should include (1) a good general education on the classical or modern side of a secondary school up to the age of 17 or 18; (2) three years' training for the B.Sc. degree, followed by (3) two years' "post-graduate" work in order to obtain the D.Sc.

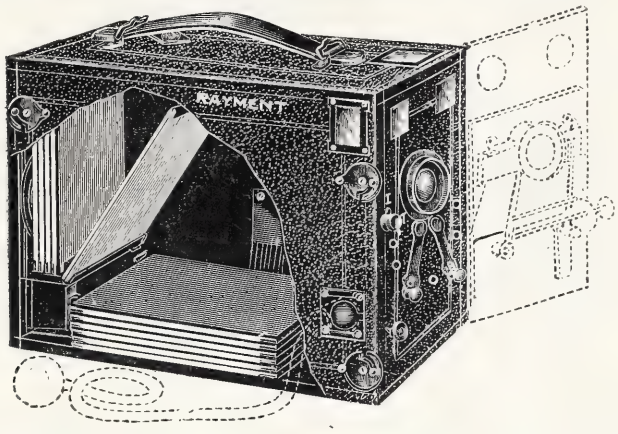
Concluding their report with a review of the work and prospects of the Technical Education Board, the committee state that the expenditure required to put London in a position to equip itself as well as, say, Berlin, is altogether beyond the range of the sums with which the County Council has entrusted the Technical Education Board, and even beyond the amount which it could legally spend on technical education. They were specially impressed by the need of higher salaries being provided for science teachers, alike in the secondary schools and University colleges, by the desirability of lowering the fees at the University colleges, and by the importance of extending the scholarship ladder in respect of exceptional students to a later age than was at present customary. They did not, however, feel able in the present financial position of the board to press any specific recommendations. The cause of the want of vitality in our scientific industries was not far to seek; it was due to defects in secondary education and the lack of adequate provision for training and research. If secondary education could be more widely extended; if general and scientific education, both in secondary schools and schools of University standing, could be made more thorough; and if further opportunities could be provided to enable post-graduate and advanced students to obtain adequate training in technological research, there was no reason to fear for the future prosperity of our scientific industries.

PRINTING should always be carried out in the shade, unless the negative is exceptionally dense, thin negatives being covered with tissue paper tightly stretched across the printing-frame. Printing is continued until the paper is slightly darker than the finished print is desired, the prints being stored in a light-tight envelope until the batch is ready for toning. Toning is an operation which many amateurs do not like to undertake, but if done with reasonable care it offers no real difficulties. The first washing should be properly carried out, or the toning-bath will not act evenly. The prints should be washed, if possible, in rain or "soft" water —very hard water tends to precipitate the free silver salts which we are trying to remove. The prints should be changed as quickly as possible, and washing continued until all opalescence has disappeared, which will take from ten to twenty minutes. After being hardened in the salt and alum bath, and again well washed, the prints are ready for toning. The formula I use is as follows:—Ammonium sulphocyanide, 20 grains, dissolved in water, 20 ounces, to which are added 2 grains of gold chloride. Some amateurs tone their prints singly, or only two or three at a time. I used to do the same thing myself until I knew better. To get uniform results, a batch of prints, proportioned in number and size to the quantity of gold in the bath, should be toned simultaneously. The prints must be kept continually on the move: if allowed to rest one on another for even a few seconds, uneven tones will appear. In warm weather the prints often seem to tone in from two to three minutes. If fixed at this stage, the "tone" will disappear leaving merely the crude yellow of the print. This tone is in reality only on the surface, and no notice should be taken of it. The tone should be judged by looking through the print. If the toning-bath has been properly made up, no signs of double toning should present themselves. Prints that are red in the shadows and blue in the high lights are always unsatisfactory, and constitute bad examples of colour photography. Sufficient gold should be used, but the quantity of sulphocyanide given in the makers' formula should never be exceeded.—P. T. S., in "Photographic Scraps."

New Apparatus, &c.

A Magazine Hand or Stand Plate Camera, to carry 12 dry plates 4¼in. by 3¼in. Sold by Arthur Rayment, 125, Earlham Grove, Forest Gate, London, E.

To amateur or professional photographers who prefer glass plates to spools of film the camera shown in the accompanying diagram will appeal. It is a complete and efficient little instrument. We will enumerate its most important features, namely: It carries twelve plates, which are successively and automatically exposed without dark slides. The number of plates exposed is mechanically recorded and is visibly indicated outside the camera. The plate-changing mechanism is simple and reliable. The camera possesses an achromatic rapid rectilinear lens,



with iris diaphragms. Supplementary lenses are arranged, which work between the combinations of the rapid rectilinear and enable quite near objects to be photographed. The shutter allows prolonged or time exposures as well as varying speeds of instantaniety. It is released by finger-pressure or by pneumatic ball, as may be preferred. Two brilliant finders are included: these give clear and distinct images, not upside down, but erect. The exterior of the camera is unobtrusive, and is covered with hard-grained leather. Altogether, the instrument may be regarded as good value at the price (50s.) for efficiency and sound workmanship.

New Books.

"La Photographie du Nu." Published by C. Klary, Paris.

Much as we desire to encourage every serious effort to promote the study of the beautiful in photography, we regret we cannot extend a welcome to this volume. Public opinion rightly objects to the lifting of the veil from nature in relation to the human figure, and the only justification which can be offered for the act is service to science or art. These studies are offered as a contribution to art, and although some may be of sufficient value to merit the attention of the art student, others are not. The absence of approach to ideality of form and errors of judgment in posing make some of the studies repulsive. We think a mistake has been made in publishing them in a popular form.

"Encyclopadie der Photographie," vol. 40. Wissenschaftliche Arbeiten auf dem Gebiete der Photographie, Dr. Luppo-Cramer. Wilhelm Knapp, Halle a/S.

Students of photography in its scientific aspects will find this volume a valuable addition to their library. A few months ago we published in these columns a translation of Dr. Luppo-Cramer's investigations concerning the latent image. They have disposed of several untenable theories, and we are glad to see in this volume a further contribution to the subject. Chapters are also devoted to optical sensitizers, the Lippmann process, and other subjects having an important bearing upon photography.

"The Principles of Simple Photography." By F. W. Sparrow, R.N. 130 p.p. Price 1s. London: Hazell, Watson, and Viney, 52, Long Acre, W.C.

One has to turn to the final chapter of Mr. Sparrow's book—the latest addition to a very long list of shilling manuals for beginners—before coming across anything that has not been written about photography times out of number. This chapter is headed "Shipboard Photography." Here the author strikes new ground, and the advice he gives seems practical, and is obviously founded on experience. Dealing with shipboard exposures, Mr. Sparrow says:—"The problem of maximum exposure becomes more complicated on board ship, as it must be remembered that blurring is produced by the relative motion of the subject and the camera. The motion of subject has been treated in a previous chapter, but now we are confronted with a more intricate problem—the motion of the camera itself during exposure. Unless the ship be absolutely stationary either in dry dock or in a still basin, there will always be sufficient roll to blurr a "time" picture taken over the side; for instance, even in the stillest weather it is not advisable to set up a stand-camera on deck for the purpose of photographing either another ship or the shore with an exposure of (say) two seconds, as the motion of your ship, and consequently of the camera, during that time will be sufficient to spoil the plate. Anything within the ship herself (provided it be not suspended) may be given a time exposure, as the camera and subject, moving together, have no relative motion. When taking another ship this relative motion must be considered; for instance, if you are steaming at 10 knots, and meeting the ship moving at the same speed, an exposure, corresponding to at least 20 knots must be given to ensure a sharp picture; whereas if she were steaming in the same direction, a considerably longer time might be allowed. If photographing from a heavily-rolling vessel, wait until she is at her maximum angle of heel, and expose at this instant, when she will be practically at rest; never expose during a roll when your ship is on an even keel, as her motion is then greatest. Care must be exercised when taking pictures over the side that near ropes or staunchions are not included, as these, although perhaps unnoticed in a view-finder, will become large blurred lines across an otherwise satisfactory photograph. Open deck scenes correspond to road views as regards exposure." The book is very well written, but as we have hinted, it is unfortunate that Mr. Sparrow's main path has been so well trodden before and. But this, it must be said, does not detract from its many excellencies, for the author has mastered his subject and quite knows how to handle it.

A New Series of Photochroms. Published by the Photochrom Company, 121, Cheapside, E.C.

For some time past the Photochrom Company, to whom great credit is due for popularising the very pleasing photomechanical reproductions that are such familiar objects in railway carriages and shop windows, have been directing their attention to experimental work with the idea of producing results of a different and indeed a higher calibre. They have sought, we understand, to adapt the process to the reproduction in facsimile of some of the pictorial masterpieces in the national and great private collections. Some early specimens are before us. These are "A River Scene," by F. R. Lee and Thomas Sidney Cooper; "The Cornfield," by Constable, and Rembrandt's portrait of himself. The specimens are strikingly beautiful and effective, and convey the idea of very close fidelity to the originals, as the colouring throughout is natural and harmonious; indeed, we should imagine that for this particular class of work the process chosen by the Photochrom Company is superior to the ordinary system of trichromatics, which unfortunately lends itself too readily to falsification of colour and defective registration. Of course, we are now speaking of what are known as long runs: some of the trichromatic specimens that have come under our observation are flawless. To revert to the charming results before us. As we wrote on the first introduction of photochroms, some eight or ten years ago, "they should speedily achieve a great popular vogue." It is only the fortunate few who can possess great paintings; but for a modest two or three shillings all but the very poorest may provide themselves with excellent colour-reproductions of them. Retailing at 2s. 6d. each, they are certainly worth framing, and undoubtedly impart great beauty to the walls of the home.

Exposure Notes. Published by the Watkins Meter Company, Hereford.

The fifth edition of this useful little book contains about twenty pages of formulæ and other data calculated to be helpful to that much written about but seldom encountered modern phenomenon, the "earnest" or "serious" worker. There are spaces also for memoranda, and two pages headed "Photographs Promised." Our own conscience pricks us at friend Watkins's reminder that even photographers may be guilty of sins of omission in the practice of their pleasant hobby. The greater part of the note-book is ruled off for recording data application to any method of exposure. It is well worth the shilling charged for it.

THE amateur photographer knows well how difficult it is to get animals to pose gracefully before the eye of his camera, or even to get the best effects which his own eye observes in still life. If this is difficult with birds and quadrupeds (as also, not infrequently with bipeds higher up the scale of animated nature), still harder must it be to obtain good photographs of insects. Dr. R. W. Shufeldt has been telling Mrs. Alice Corkran how he succeeds; and in the new number of "The Girls' Realm" that lady gives a most interesting description of "Insects Sitting for their Portraits," with illustrations of some of his best photographs. One of these is that of a Turnus butterfly posed on a lily, with his wings expanded. It took Dr. Shufeldt, we read, "a good three-quarters of an hour of patient handling to get this superb fellow to alight just where he wanted him, on one of the lower petals of the flower." It takes a long time to pose some human sitters for their photographs, but three-quarters of an hour beats the record. "Infinite," we are told, "are Dr. Shufeldt's devices and infinite the power of patient observation which they disclose." This is how he got the picture of a "Bumble Bee and the Thistle" (not the Honeysuckle and the Bee): "I simply selected a fine thistle top of flowers on one bright afternoon, that grew some several feet away from a bank of dense foliage, and, with the sun at my back, I focussed on the thistle as sharply as possible, and when a hungry bee came along for its evening sip of honey, I made an instantaneous snap of the whole, and obtained the result here shown." Dr. Shufeldt seems ambitious to get his camera into the hive in order to disclose by photography some of the hidden mysteries of the bee community.—"English Mechanic."

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

August.	Name of Society.	Subject.
13.....	North Middlesex Photograph c	Technical Meeting.
13.....	Southampton Camera Club....	Ramble—A Sea Trip (to be arranged).
13.....	Ashton-under-Lyne Photo. ...	Sale of Magazines and Papers.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JULY 31ST.—Mr. Kindon in the chair.

A discussion took place on the merits of albumenised paper and why it should have so gone out of use, especially amongst amateurs, and Mr. Henderson suggested that more should be done to endeavour to put on the market a good albumenised paper, ready-sensitised, that would keep, one of its great merits being the rapidity with which it dries. Some prints were passed round, toned in a formate bath, the tones being all that could be desired, there being no lowering of the high lights, the whites being so absolutely pure. Mr. Mackie remarked that the prints made in the old days, on albumen paper, were certainly far superior to those made at the present time on gelatine chloride.

Mr. Everitt pointed out how difficult it was to obtain, commercially, good, ready-sensitised albumen paper, as the dealers do not like stocking it, owing to its deteriorating properties, whereas P.O.P. would keep a good length of time.

Mr. Rapson thought that one reason why it had gone out of use was due to the weak class of negatives which seem to prevail now, as to get a good tone one must have a fairly plucky negative.

Mr. Drage passed round some negatives in which portions of the images were reversed, the cause of which he had found by experiments to be due to starting development with a weak developer and finishing up with a strong solution.

In regard to potassium bromide as a restrainer, Mr. Henderson said it had been used from the old collodion days, and he thought there were other agents much better, and suggested the use of cyanide of potassium, as, by using this, plates which have been so over-exposed as to render bromide of no use, can be made into quite good negatives by soaking for a few mintes in a weak solution of cyanide and then thoroughly rinsing under the tap, after which development can be quite safely proceeded with.

NORTH MIDDLESEX PHOTOGRAPHIC SOCIETY.

JULY 30TH.—Technical evening.

Mr. Beadle asked what was the cause of a falling off of illumination towards the edges of the plate which he had experienced when using a Gilvus screen. The opinion was expressed that the screen was too small for the lens used, and that seemed the only solution of the question.

Mr. Taylor showed a celluloid film which had been developed in an upright dish with a metol-quinone developer, which possessed curious markings. He attributed the markings to hypo having been introduced into the dish, but the opinion was they had not the appearance of being caused by hypo.

Mr. Lawson asked as to the keeping qualities of sodium sulphite in solution, as he had seen it stated that the quantity of sulphite was reduced by 50 per cent. in something like six days, and that the stronger the solution the more rapid the deterioration.

A member said that a solution of sodium sulphite would keep indefinitely if kept in a closely-stoppered bottle filled to the neck. A bottle half-filled deteriorates every time the bottle is opened, as the oxygen in the air contained therein is absorbed by the solution, and is replaced from the air on opening.

Commercial & Legal Intelligence

PENAL Servitude for a Photographer.—At the Middlesex Sessions on Friday last Stuart Robson, 50, a photographer, was brought up to receive sentence for obtaining £70 by false pretences from tradesmen in North London, including £64 5s. from Mr. Cornish, estate agent, of Harringay. The prisoner, who was found guilty of the charges against him at the May sessions, obtained the money by representing that his inventions, the "periphone," the "camskye," and an advertising captive balloon to float over the Alexandra Palace, were being taken up most satisfactorily, and were going to produce him a net income running well into five figures. The "periphone" was an arrangement of telephones and sandwichmen designed for use at theatres to tell the passers-by exactly what thrilling or other episode was at the moment taking place on the stage; and the "camskye" was, like its name, a combination of the camera and the cycle. No one, in fact, took up either of these "inventions" to the extent represented by the prisoner, and they were as much "in the air" as the captive balloon was to have been. For the balloon Robson represented that he had obtained a concession from the Palace trustees, but this was untrue. Sir Ralph Littler said he had looked through the statement of the prisoner, and he must go to penal servitude for six years.

RE Automatic Views (Limited).—A winding-up order having been obtained against this company, meetings of the creditors and shareholders were held at the Board of Trade Offices, Lincoln's Inn, on Friday last, before Mr. A. S. Cully, Assistant Receiver. It appeared that the company was incorporated on May 1st, 1901, with a nominal capital of £1,500, and was formed for the purpose of exhibiting photographic views in automatic machines. It was stated to have been promoted by Mr. B. J. Atterbury with the object of acquiring from him and working his invention for improved slot automatic machines, and his contract for exhibiting the same on the stations of the London and South-Western Railway. The company agreed to purchase Mr. Atterbury's interest in his invention for £1,000, payable as to £50 in cash and £950 in shares. No mention was made in the contract with the railway company. The agreement was modified in August, 1901, the consideration of £1,000 being reduced to £500 payable in cash. The £500 was handed to Mr. Atterbury, and he returned £450 to the company in payment of 450 shares. No assignment of the patent was made, and the chairman now said the directors would have to explain how it was that the assets of the company had been parted with without a proper equivalent. For the privilege of exhibiting the machines the company agreed to pay the railway company a yearly rental of 10 per cent. upon the gross taking of each machine. In order to carry out the contract with the railway, the company procured a number of machines on hire, and about 185 mutoscopes had been placed on the London and South-Western Railway stations. The chairman further reported that dissensions arose between the company and Mr. Atterbury, and he did not attend any board meeting after November 21st last. An account had been furnished, and disclosed a loss on trading of £275. The deficiency was now returned at £1,149. Some discussion followed, and it was resolved that the Official Receiver should continue to act as liquidator, a committee of inspection being also appointed.

PATENT Law Amendment Bill.—The Standing Committee of the House of Commons on Trade sat last week to consider a Bill promoted by the Board of Trade to amend the law with reference to applications for patents and compulsory licences. Lord E. Fitzmaurice presided. Clause 1 provides for an examination of previous specifications in the United Kingdom on applications for patents. One subsection, providing that the section should come into operation at such date as the Board of Trade might direct, was objected to by Sir W. Tomlinson, who proposed that the order should be laid on the table of both Houses of Parliament. Mr. Gerald Balfour, the President of the Board of Trade, accepted the amendment, which, with some other amendments of a technical character, was agreed to. On the question that the clause as amended should be added to the Bill, Mr. Briggs and Sir R. Reid took exception to subsection 4, which says that "the provisions of subsection 5 of section 9 of the principal Act, as amended by any subsequent enactment, shall apply to reports under this section." Sir R. Reid said that this method of legislating by reference was becoming a perfect nuisance. Even for a skilled lawyer it was very difficult to know what the law was, and for those not so skilled it was perfectly hopeless. Mr. Gerald Balfour, while holding that the form adopted was the easiest way of dealing with the matter, undertook to consider whether it would not be better to insert in a schedule the terms of the principal Act as amended by the subsequent Act; and the clause as amended was then agreed to. Considerable discussion took place on a clause brought up by Mr. Gerald Balfour in substitution for Clause 2, amending the law relating to compulsory licences. The clause provides inter alia that any person interested may present a petition to the Board of Trade alleging that the reasonable requirements of the public with respect to a patented invention have not been satisfied, and praying for the grant of a compulsory licence, or, in the alternative, for the revocation of the patent; and, further, that the Board of Trade shall consider the petition, and may either dismiss it or refer it to the Judicial Committee of the Privy Council. The new clause having been adopted after a general discussion, Sir W. Mather moved to amend it by inserting words to the effect that dismissal of the petition or reference of it to the Judicial Committee should be "if the parties do not come to an arrangement between themselves." Mr. Gerald Balfour entirely sympathised with the object, and thought the amendment would be a distinct improvement. At the same time, he said it was never contemplated that the Board of Trade would not endeavour to use its influence so as to bring the parties together. Sir R. Reid, in supporting the amendment, urged that the Board of Trade should consider a petition in a business way on its merits, and either dismiss it or grant it, but always subject to this—that whatever decision they came to should be passed on to the Judicial Committee, together with the report of the Board of Trade. Mr. Bousfield thought the Board of Trade should only consider whether a prima facie case had been made out, and if not that they should dismiss the case. After some further discussion, Mr. Gerald Balfour said the proposal could not be carried out without doing what he was not prepared to do—namely, to have two hearings, with all their attendant delay and expense. Even if the Board of Trade granted a compulsory licence they had no power to enforce it. The amendment of Sir W. Mather was agreed to. Sir R. Reid moved further to amend the subsection by giving the Board of Trade power to grant as well as to dismiss a petition subject to review in either case by the Judicial Committee. He strongly objected to giving a Government department power to dismiss a petition at their own ipse dixit and prevent a petitioner from going to the Privy Council. He pointed out that property of enormous value might be at stake—the case, for example, of a French or German patent not being worked in this country—and

industry might be hindered in a serious degree. Was there a case, he asked, except in certain well-defined powers of the Attorney-General, in which any public department had been permitted to stop the road of a litigant to a court of law? Mr. Gerald Balfour opposed the amendment, and intimated that, if it was carried, he should have seriously to consider whether he would not have to drop the Bill. Of course it was never intended that the Board of Trade should exercise their power to dismiss except in extreme cases. Sir R. Reid pressed the right hon. gentleman further to consider the matter before the next sitting. Mr. Gerald Balfour, while ready to do so, said he was very firm in his conviction on the point.

Lord Kelvin and the Kodak Company.—Details of the plan for the consolidation of all the Eastman Kodak enterprises of whatsoever name and nature in the world have appeared in the public prints of late. The aggregate cash value of all these enterprises is estimated at $20,000,000, and the capital stock of the consolidated corporation is $35,000,000. The corporate name of the new company is The Eastman Kodak Company. It was incorporated a few months ago under the laws of New Jersey, but none of the details of the reorganisation and consolidation have been given out until recently. The new company has been formed for the purpose, according to the prospectus sent to stockholders, of "acquiring the business and shares of the Kodak Company, Limited, of London, England, including the shares of the German Eastman Kodak Company, and the French Eastman Kodak Company, and also the outstanding shares of the New York Eastman Kodak Company owning the shares of the Canadian Kodak Company, Limited, and a controlling interest in the shares of the General Aristo Company, which latter owns the Photo Materials Company, the Nepera Chemical Company, and the New Jersey Aristotype Company, and the shares of the American Aristotype Company, and the stock or business of such other photographic concerns as the directors may from time to time consider desirable. The business of the various companies to be taken over consists principally of the manufacture and sale of photographic cameras, dry plates, films, papers and other materials, with factories at Rochester and Jamestown, N.Y.; Harrow, England, and Toronto, Canada. The new company will own and control a large number of patents and trade marks. Of the new capital stock of $35,000,000, there will be 1,000,000 shares of preferred stock, paying 6 per cent. cumulative dividend, and 250,000 shares of common stock; 46,694 shares of preferred and 149,928 shares of the common stock were issued July 1st. All of this issue is offered in the first instance to the shareholders of the Kodak, Limited, Eastman Kodak Company, of New York, and the General Aristo Company. The executive office of the new company will be in Rochester. The British holders of Eastman stock have consented to the consolidation outlined above, and now practically effected. Lord Kelvin, the eminent scientist, recently visited this country as the representative of the British stockholders. During his visit to the works of the American Aristotype Company, at Jamestown, N.Y., Lord Kelvin expressed his opinion of things as follows:—"Mr. Abbott has said that there are no scientists in Jamestown, but I have had a most charming and delightful scientific welcome to Jamestown this afternoon. I have seen applications of science of the most interesting kind, not merely the rough-and-ready applications of science which we see every day, which do not reach the depths and subtleties of science. But in the factory which I visited to-day there are applications to real scientific problems which I have considered with great interest. I received a really scientific welcome there. I knew a little about those works before. I know more about them now, and I hope to know still more hereafter. I feel that my association with Mr. Eastman in the great company which he has created has been a continued pleasure to me, and has given me more enjoyment in the application of science to the uses of mankind than almost anything I have ever been associated with. In Mr. Eastman's work science is applied with marvellous results, and wherever you go through the civilised world the results of Mr. Eastman's labours add to the enjoyment of life. I have had a day in Jamestown which I shall look back upon as a landmark in life, of which the memory will be with me as long as I live. The success of the photographic work here depended on knowledge, invention, and science, and because the founders of this industry were not satisfied with imperfect results it has become one of the most interesting and valuable applications of science that is known. The great success of the work speaks for itself. Photography as developed by these allied companies is not only an amateur pleasure, but in art it has become an institution of great value. Mechanics, engineering, scientific research of all kinds, are aided by the photographic process. The properties of the stars and their characteristics are discovered to us by photography. I mention this to show the grandeur and dignity of the work of photography as exemplified in these factories at Jamestown and Rochester. My close association with Mr. Eastman is a great gratification to me, and my connection with the Eastman Kodak Company as a director is a pleasure. I am proud to be a representative of my English colleagues here."—"Wilson's Photographic Magazine."

News and Notes.

The Structure of Comets.—Mr. E. W. Maunder continues in "Knowledge" for August his studies on "Astronomy without a Telescope." He writes:—"In a previous chapter I pointed out that the systematic observation of heliacal risings and settings offered a chance—a rare one, it is true, but still one not to be despised—of making the first discovery of a comet. Unfortunately comets, bright enough to be visible to the naked eye, have been but very scarce visitants, nor can we reasonably expect that they will be more numerous in the future. Still, when one does come, it justly attracts universal attention; and the 'astronomer without a telescope' will naturally be anxious to know if there is any work within his power to effect upon it. There is. For the shape, extent, and precise form and position of the comet's tail are better observed by the naked eye than with the telescope; since the eye can embrace a far wider field, and is the fitter instrument for dealing with great extensions of faint light. To map out, night by night, the precise position of the tail or tails with reference to the neighbouring stars, to trace its limit and to determine its exact form, are by no means unimportant tasks. It was very early noticed that the tails of comets are in general directed away from the sun, and the instance of certain comets which passed at perihelion very close to the solar surface, was sufficient to prove that we must not regard a comet's tail as forming a body coherent with the head. Thus the great comet of 1843 swept round some 180 deg. of longitude at perihelion in something like eighteen hours of time. The tail which had been seen before perihelion, pointing away from the sun in one direction, could not possibly have been composed of the same material as made up the tail, lying in the opposite direction after perihelion. But if it were supposed that the sun were capable of exercising a repulsive force upon some portion of the substance of the comet, driving it off in a continuous stream, then the general behaviour of cometary tails would be accounted for. The tail, seen at any particular time, would be the summation of particles which had left the comet at different successive instants, just as the trail of smoke from the funnel of a locomotive, as seen at any particular moment, is composed of particles that came off from it at successive instants, and is not a body coherent with the engine. . . . Prof. Bredikhine found that several of the great comets of the past century were distinguished by the possession of long straight tails which must have been composed of particles moving under an influence some twelve or fourteen times that of gravity."

Sun Pictures at the St. Louis World's Fair.—Professor Halsey C. Ives, chief of the Department of Fine Art, and Colonel John A. Ockerson, chief of the Department of Liberal Arts of the Universal Exposition, St. Louis, 1904, have been in conference with the leading photographic circles on the subject of the position of photography in relation to the painters' arts, and have decided that not only shall a full allowance of space be set aside in the Palace of the Liberal Arts for photography, but they have also agreed to give a certain amount of room to the science in the Palace of Fine Arts. The Palace of the Liberal Arts is one of the big temporary buildings in the exhibition. In style, the structure is French Renaissance, with an inner cloistered court after the Italian fashion. The building is to cost $500,000, or about £104,000, and it will cover an area of 400,000 square feet, the facade being 150 feet long. One of the groups on view there will relate to photography in all its bearings, including equipments, all manners of processes, and separate, collective, and comparative results. These include the materials and instruments, as well as the apparatus of photography, equipment of studios; negative and positive photography on glass, paper, wood, cloth and enamel; photogravure in intaglio and in relief; photocolography; photolithography; stereoscopic prints; enlarged and micrographic photographs; colour photography; direct, indirect, and photo-colour printing, with scientific and other applications of the art. The interest shown in the exhibit, our readers may desire to be informed, is a growing one. This applies not only to photographers in the district, but to the makers of sun pictures all the world over. The intention is to include in the scheme, on the architectural side, photographs of public buildings, hospitals, dwellings, with the ornamentation of grounds, parks, etc. Thus, this section will afford the photographer the opportunity of exhibiting sun pictures of some of the stately homes in the United Kingdom, also of their beautiful surroundings. And in the mechanical side of the art, machinery used in photo-mechanical printing, and the results attained, as specimens of engravings and drawings obtained by, reproduced, enlarged, or reduced by mechanical photographic processes, will be shown. Further, in the Palace of the Fine Arts—a permanent gallery that will vie in size and grandeur with the Grand Palais in Paris, the magnificent building in the Champs Elysees, in which the old and the new Salons hold their annual shows, or with the stately buildings of the Imperial Art Museums, Vienna—the space set aside for the purpose in question will be, among other subjects, for work that may be defined as "distinctive art photography," which may either deal with landscape or the figure, and also for works produced by photo-engraving processes. All works will be subject to selection by a jury now in course of formation. A grand prize, and gold, silver, and bronze medals will be awarded, and diplomas issued. Intending competitors may like to know that the offices of Mr. George F. Parker, the resident representative in the United Kingdom of the Universal Exposition, St. Louis, 1904, are at Sanctuary House, Tothill Street, Westminster, S.W.—"Communicated."

Jupiter's Great Red Spot.—"During the last quarter of a century no other planetary marking has incited so much interested attention and study from telescopic observers," says Mr. W. F. Denning in "Knowledge" for August, "as that familiarly known as 'the great red spot on Jupiter.' The size of the object, the striking aspect it exhibited in the years from 1878 to 1882, its beautifully elliptic form, and the extended duration of its visibility have all contributed to render it a feature of exceptional character. It may, indeed, be almost regarded as unique, and it has certainly served an excellent purpose in stimulating enthusiasm and directing observers to the study of the physical changes affecting the leviathan planet of our system. . . . Was the spot discovered by Hooke in 1664, and studied by Cassini in later years, identical with the feature which has enlisted such widespread interest in our own day? There is evidence strongly countenancing the supposition of identity. The latitude of Hooke-Cassini's spot was the same as that of the great red spot, and the motions of the two objects appear to have been approximately the same. But the ancient marking was a roundish object, described as one-tenth of the apparent diameter of Jupiter, while the great red spot is about one-fourth. In fact, while the old spot was about

8,000 miles in diameter, the present one, when most conspicuous, was 26,000 miles long and about 9,000 miles wide. These differences occasion doubts, without, perhaps, absolutely negativing the theory of identity. Possibly, with the lapse of time, the spot has distended its material in a longitudinal direction as a result of the swift axial rotation of the planet. . . . The red spot is a boat-shaped object (as seen from a vertical position), and it floats in a wide current situated from about 20deg. to 35deg. of south latitude. This current has always given a very equable rate of velocity, and the rotation period has been found to be 9h. 55m. 19s. Dark and white spots, and various irregularities on the belts marking this region, all participate in this velocity; but the red spot shows a singular departure from the rule, for it travels slower than the involving stream, and loses 53 seconds per day (nearly half a degree), which is equivalent to about 370 miles. The spot is, in fact, like a great barge slowly drifting eastwards in a wide current. It is probable that the rate of neither the current nor the spot coincides with the exact rotation period of the globe of Jupiter. We have learned the period of the small planet Mars to the tenth of a second, for some of the markings displayed on the ruddy Martian surface represent permanent lineaments, which are invariably visible, though the atmosphere of that planet is apt to affect their appearance in some degree. But the conditions are very dissimilar in regard to Jupiter, forming, as he does, an immense orb, probably in a very heated state, and with his real features masked by dense gaseous vapours undergoing frequent changes. Though the red spot is now very feebly visible, it may still be intact and in no danger of disappearance. The past history of the object is suggestive that we may expect a repetition of its formerly conspicuous aspect. The hollow in the belt is as strongly pronounced as ever. If it filled up and the south half of the double S. equatorial belt became continuous (without bend or break) in one and the same latitude throughout its circumference, then we should conclude that the material of the spot had really dispersed. But nothing of the kind seems imminent. The past behaviour of the features in this region indicates that when the red spot regains its former prominence the hollow and the southern half of the equatorial belt will decay and probably fade away to invisibility. Possibly the material evolved from Jupiter's heated surface is responsible for the production of the belts and spots on the planet, and the intensification of the belt north of the red spot means that the sustaining material of the latter is being diverted to the belt, whereupon the spot necessarily becomes very feeble."

Lightning Research Committee.—This committee, which has been organised by the Royal Institute of British Architects and the Surveyors' Institution, and of which Mr. John Slater, B.A., F.R.I.B.A., is the chairman, and Mr. Killingworth Hedges hon. secretary, has just issued a further report. The committee intimate that they are now in possession of a large number of firsthand reports on cases of damage to buildings from lightning-stroke. As regards the general character of the injuries to which non-protected buildings are subject from this cause the committee consider that the information already collected by observers furnishes ample material for deliberation, and that it is unnecessary further to multiply observations as to the action of lightning-stroke on non-protected buildings. Data to hand, however, respecting "protected" buildings which have been struck are few, and generally meagre and unsatisfactory, and as the object of the committee is to improve existing methods of protection they propose for the future to confine their investigations to buildings which have been struck in spite of being provided with lightning conductors. In order to determine the efficiency or otherwise of the conductor, the committee are of opinion that it is necessary to scrutinise minutely the actual conditions of the building affected. They therefore suggest that observers should first ascertain whether the building struck is provided with a conductor, and if this be the case the structure should be carefully examined at once (The committee are prepared to defray actual out-of-pocket expenses, and also a moderate charge for the photographer's services, provided that complete details of the disaster be furnished within a few days after the occurrence, and that an account of the expenses incurred be sent in with the observer's report), and a photograph taken of it before any repairs, temporary or otherwise, are effected Details additional to those indicated in the original form of questions are requisite to the more limited inquiry now contemplated. A general description should be given of the surroundings, especially of elevated buildings in the vicinity, and photographs should be taken in cases of importance; and if these elevated buildings are provided with lightning conductors, their positions and heights should be given. The following further points, drawn up for the committee by Sir Oliver Lodge, should, as far as possible, be attended to by observers in making a record of any case of damage:—(1) Any signs or indications of where the flash appears to have first struck, and an account of the damage done. (2) A specification and drawing of the metalwork of the building, paying special attention to metal of every kind which comes anywhere in the neighbourhood of the conductor, whether roof guttering, lead covering, rain-water spouts, sewer ventilators, telephone wires, bell wires, gaspipes, ornamental railings, etc., etc., carefully ascertaining whether any of these were either purposely or accidentally connected with the lightning conductor, and, if not, what their nearest distance was from it. In the drawing, all metals may be indicated in red, no matter of what kind they may be; the hypothetical path of the lightning, as appears to the observer most probable, may be sketched-in in blue, remembering that bifurcation of path is not unlikely. Places of damage may be indicated by a blue swelling or patch, the size of the patch giving a rough idea of the relative damage, and an arrow being employed when necessary to call attention to any small patches liable to be overlooked. The patches may be numbered, and the nature of the damage at each place stated in the description. Any place where fire broke out is to be specially attended to. (3) The nature and condition of the conductor, especially with reference to its continuity, its earth, and its elevation; also how fixed, and, if carried horizontally, its length as compared with the vertical height of its terminal above the ground; also note whether it made any sharp curves or loops round projections of the building, or took an indirect course. Cases of damage where there have been more than one or several conductors are specially important. In the case of church steeples, the wind-vane should receive special attention, and the mode in which its rod terminates in the steeple should be ascertained. In the case of chimneys, any internal metal flue should be carefully specified. Likewise any indication that the flash took the column of hot air in preference to the conductor should be recorded; also whether the conductor was bent or curved over the mouth of the chimney or not. In any case of importance the earth of the conductor should be carefully examined, being, if possible, dug down to for this purpose; and a complete specification of the nature of the earth, the nature of the soil, and of any metal ramifications as well as of moisture in its neighbourhood, should be made. Any signs that the discharge has entered the earth should be recorded; and if the conductor is at any point damaged or otherwise affected, this should be specified, and, when interesting, a sample of the damaged portion should be sent. If the conductor has recently been examined and tested, or otherwise reported on, the fact should be stated.—"The English Mechanic."

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

IRRITANT POISONING BY PHOTOGRAPHY.

To the Editors.

Gentlemen,—I have practised photography for about two years. A couple of months ago a most troublesome eczema broke out on my fingers. My doctor attributes it to irritant poisoning by photographic chemicals, and I should be interested to know if similar experiences have come within your knowledge. The eczema begins with violent sub-cutaneous itching, in the course of a day or two red spots appear, these develop into blisters, which finally dry and peel off, leaving the skin beneath extremely tender. What seems to be a peculiarity in any case is that a few days after peeling the itching begins again, and fresh spots and blisters come in due course. I have had the recurrence of these now four times, and it is proving a great trouble and annoyance, as I have to keep my fingers bound up with ointment. In my photographic work I use the familiar pyro-soda developer, Howard Farmer reducer, mercurial intensiner, sulpho-cyanide toning bath, and the usual platinum and bromide paper developers. Although I cannot say I never get any of these on my fingers, I am careful and cleanly in working.—I am, yours faithfully, C.

July 25th, 1902.

[Our acquaintance with skin troubles caused by solutions used in photography is, fortunately, not a first hand one. We have used the solutions detailed by our correspondent very frequently during the past twenty years, and have experienced no ill effects from them. It is, of course, well known that potassium bichromate occasionally attacks the skin, and a few years ago, when metol was added to the list of our devloping agents, cases of eczema, if we may so designate them, were common amongst photographers. We have, besides, seen at least one bad case of "platinum fingers." The medical side of the matter is, of course, outside our sphere; but in the cases that have come under our notice it has not seemed to us that satisfactory explanations have been forthcoming. However, we shall be pleased to have the experiences of others upon the subject.—Eds. B.J.P.]

THE THREE-COLOUR PROCESS FOR PORTRAITURE.

To the Editors.

Gentlemen,—I should be very much obliged if you will advise me as to the three-colour process in its application to portraiture. Your leaderette in last week's issue has attracted my attention, showing me that for business purposes, it has apparently passed the experimental stages. I must confess I have read very little on the subject, but shall be glad to read more, under your guidance, if a business application of the knowledge can be made.—Awaiting the favour of an early reply, and thanking you in anticipation of the same, and especially for the incentive referred to above, I beg to remain, yours faithfully,

Enquirer.

July 25th, 1902.

To the Editors.

Gentlemen,—Some time ago there appeared in your Journal a report of Mr. Ives' lecture at the Traill-Taylor Memorial Lectures, on "The Theoretical Basis of Three-Colour Printing," also Mr. Howard Farmer's views (Polytechnic School of Photography). Would it be troubling you

too much to ask you to kindly let me know the dates on which the above appeared? As manager to the above, I am very much interested in three-colour printing, and should like to possess the copies of your Journal, and how we can obtain the necessary materials and apparatus.—Yours respectfully, J. S. KELLAWAY.

The Chandos Press, 170, St. John Street, Clerkenwell, E.C.

To the Editors.

Gentlemen,—Will you please inform us, through the columns of the Journal, how we can obtain the necessary materials and apparatus for producing Dr. Meithe's three-colour process?—Yours faithfully,

"THREE COLOUR."

[By way of introduction to half-tone trichromatics, our correspondent could not do better than study pages 847 to 885 of our last Almanac. Here the subject is dealt with theoretically by Mr. F. E. Ives, and practically by Messrs. Howard Farmer and Guy Symmons. The latter gentlemen go very fully into the working details of the process.—EDS. B.J.P.]

THE SUN AT THE HORIZON.

To the Editors.

Gentlemen,—I beg leave to assist your readers in the solution of the "big sun" problem.

The adjustment of the iris to strong and weak light is only one phase of a very interesting and complex sympathetic adjustment, whose action extends throughout the whole organ. So far as I am able to investigate, the physiologists have not as yet told us anything of this adjustment, although I believe it is the principal one in the eye, and that that of the iris is only one of its numerous divisions. The same strong light which causes the iris to close also causes a *tentional* action of the retina, which masses the rods and cones together, and the more delicate cones are thus protected and kept from being unbearably affected by the amplitude of the impinging ray cones. This tentional adjustment of the retina seems to be assisted by the full construction of the ball, and is so vigorous that in the presence of strong light the whole ball is drawn up to a smaller size. As the iris closes, there is also caused an increased curvature of the lens sufficient to adjust the focus to the altered distance to the retina. If in weak light, then the focal distance of the eye is lengthened, an image of an object becomes larger, just as is true of two lenses of different focal length. To prove, subject one eye to the action of a strong light, having the other shielded with the hand, and then look quickly and alternately at some regularly formed object in weaker light, and it will be seen that the eye that was protected will give the larger image. Now expose the darkened eye to the light, and shield the other, and they will respond in the same way. Now, as to the sun, it is simply a question of the focal length of the eyes as determined by their intensity adjustment. In the day we obtain our impressions of the size of the sun by means of very furtive glances, which, however, are long enough to cause physical pain, and the eye responds with its machinery of protection, and the iris, retina, and the whole ball spring into an abnormal state of contraction, in which condition the focal distance of the eye is abnormally short. But in the evening, when all about us the light is of low value, the eyes are relaxed to a very great degree, and as the face of the sun when low at the horizon can be looked at with ease, we see it with eyes of correspondingly longer focus, and hence the larger image.—Yours, etc.,

FRANK M. STEADMAN.

Puebla, Mexico.

KODAK, LIMITED, AND THE TRADE.

To the Editors.

Gentlemen,—We thought you would, perhaps, like to see the enclosed letters we have had from the Kodak Company for reference in your Journal, of which we are constant readers. Having in stock a few roll film cameras of any other make than Kodak, and being in receipt of one of their rebate forms, to which they need our signatures as not having stocked other cameras, as you will see by the enclosed copy, we felt we could not conscientiously sign the same, so we claimed a rebate on the amount of films sold (not having stocked or sold any but theirs). They in return sent letter, dated July 17, to which we replied, refusing to give the guarantee required, but still claiming rebate on films, to which came letter of 18th, our reply to which you will gather from the last letter to hand—viz., July 22nd.

Surely it is time for the trade as a body to protest against and alter, if possible, this state of things.—We are, yours truly,

DAWKES AND PARTRIDGE.

Cathedral Studio, 29, High Street, Wells, Somerset.
July 23rd, 1902.

[COPIES.]

Messrs. Dawkes and Partridge,
29, High Street,
Wells, Somerset.

Gentlemen,—In reply to your favour of the 16th inst., we regret that you are unable to sign the rebate memo. on account of rival film cameras in stock. We shall be pleased, however, to allow you the rebate on your supplying us with the numbers and makes of cameras you have, and also on the undertaking that in future you intend to keep only to Kodak rollable film specialities.—Trusting this will meet with your approval, we are, yours faithfully,

KODAK, LIMITED,
By F. A. Woodman.

43, Clerkenwell Road, London, E.C.
July 17th, 1902.

Messrs. Dawkes and Partridge,
29, High Street,
Wells, Somerset.

Gentlemen,—We beg to acknowledge the receipt of your letter of the 18th inst., and in reply beg to say that we consider our request was a fair and businesslike one. If you care to sign the next rebate certificate, marking the number and makes of the rollable film cameras you have in stock not of our make, we would consider the allowing of our best terms.

We think it is only reasonable that we should know the number of the cameras you have, as it would, of course, be open to you at any other time to increase your stock whilst claiming the additional credits.—Yours faithfully,

KODAK, LIMITED,
By F. A. W.

43, Clerkenwell Road, London, E.C.
July 18th, 1902.

Messrs. Dawkes and Partridge,
29, High Street,
Wells, Somerset.

Gentlemen,—In reply to your letter of the 21st inst., we beg to say that our rebate is granted to those dealers who stock no other rollable film or rollable film cameras than those of our make. As you do not see your way clear to comply with our conditions we regret that we are unable to allow you the additional rebate. You are mistaken in saying that we are attempting to choke honest competition. We do not find honest competition. All other rollable film goods on the market are flagrant imitations got up to trade on our reputation and advertisements. We are positive that further developments of the photographic trade will prove to you that your best interests lie with us and not with the imitators of our wares.—We are, yours faithfully,

KODAK, LIMITED,
By F. A. W.

43, Clerkenwell Road, London, E.C.
July 22nd, 1902.

To KODAK, LIMITED.

I (we) hereby declare that since .....*, I (we) have not received, bought, sold, carried in stock, or disposed of, either directly or indirectly, or accepted any commission or consideration on or because of the sale of any Rollable Film Cameras, Rollable Film Holders or Rollable Fims, other than those supplied to me (us) by you; and that I (we) have sold all of your Goods in strict accordance with the Conditions of Sale set forth in your current Discount Sheet. It is understood that this is purely a claim for credits due to me. It is in no way a bond for any period beyond this date.

Signature.....

Dated..... 190...

Serial Number D9212.

*Insert correct date.

CINEMATOGRAPHS IN NATURAL COLOURS.

To the Editors.

Gentlemen,—My attention has been drawn to some letters, published in the BRITISH JOURNAL OF PHOTOGRAPHY, of the 25th July, relating to cinematography in natural colours, especially to Mr. Hepworth's able communication on the subject. I have made cinematography in natural colours a special study, and have succeeded far beyond my expectations in taking and projecting "living" pictures in colours, and, perhaps, a rough outline of my procedure might be interesting to readers of your valuable paper. My first idea (which I have now placed aside for something better), was to attach a supplementary shutter, holding colour screens—red, blue, and green (or yellow)—in different widths to equalise the exposures for the different colours, and to revolve eccentrically, to the kinematograph shutter proper. By this means negatives were taken alternately, through different colour screens, every fourth exposure being through the red screen, and so on with the succeeding colours, blue and green.

This answered fairly well, but, when the resulting colour records were projected on the screen, in conjunction with the revolving shutter containing suitable colour screens, the colours appeared to be "washed out" and lacking in vigour, owing, doubtless, to being projected on the screen in succession with intervals of darkness between each colour. To superimpose colour records (taken originally

n succession) by means of mirrors, etc , is impossible, as the moving nages are dissimilar, and occupy different portions of the film, unless ery rapid exposures are given on a very slow moving object; but iis s a very imperfect manner of getting over the difficulties, even if ery rapid exposures could be given (which is impossible at present), nd should be dismissed as impracticable, from a commercial point f view.

Now, the most perfect way to photograph and exhibit animated ictures in natural colours is to expose three negatives simultaneously t a time, in succession, through their respective colour screens, from ie same point of view, and to project the resulting colour records rough suitable colour screens simultaneously on the screen, thus iving perfect stationary colours on a moving object. I have succeeded n doing this by means of an attachment, which will fit any lens, and ives brilliant results in colours on the screen, and, I have no doubt, ith further slight improvements, I shall be able to show a 12ft. ani- ated picture on the screen in colours with a powerful light.

Regarding colour screens, I notice Mr. Hepworth says, in his tter. . . . . "We are, therefore, limited to pale tints for our colour lters, and with the abandonment of our pure screens we forfeit our laims to all but a vague suggestion of the rich colours of Nature," tc. . . . . .

With all due respect to Mr. Hepworth, I humbly beg to differ on his point, as I have found by actual and most tedious experiments hat the colour screens cannot be used lighter, they must be "pure," nd the right tint, best suited to the colour sensitive plate or film n use at the time. If the screens are too pale or too deep the results ill be false in colour.—Apologising for trespassing at such length, nd trusting the subject will be of sufficient interest to your readers, am, yours truly,

W. N. Lascelles Davidson (Captain),
(late) 4th Batt. The King's (Liverpool Regiment).

Brighton.
July 26th, 1902.

RESTORING DAGUERREOTYPES.

To the Editors.

Gentlemen,—Will you kindly allow me to supplement your excellent rticle in a recent Journal upon the restoration of daguerreotypes ith the remark that the process of restoration removes all the colour rom them? It will be advisable for anyone who receives a commission o restore, to be cognisant of this fact, as a large majority were very kilfully and beautifully coloured, which, if removed, cannot be re- tored.—Yours truly,

An Old Daguerreotypist.

THE REPAYMENT OF PREMIUMS.

To the Editors.

Gentlemen,—Some eighteen months ago I inserted an advertisement n one of the London dailies to the effect that I was anxious for em- loyment, and would give a month or so free services to anyone who ould find me suitable occupation. I received a reply from a West-End ddress, something to this effect:—"If photography, with 30s. per eek for an investment of £20, will suit, kindly write or call." I did all, and eventually agreed to start upon the above terms. Before oing so, he drew up an agreement, which was duly signed, stamped, nd witnessed, to the effect that for £20 deposit, he agreed to teach me he trade and turn me out a good average hand. I had not been there week before I received evident signs that things were not going to ork any too smoothly, and by the time a month had elapsed things ame to a crisis. I inadvertently left some half-dozen cabinet frames ut printing, when it came on to rain. But at the same time I must tate I was working gas-light paper at the time, so did not see the tate of affairs outside. The result was, the corners of these plates got amaged. After this he refused to let me touch anything, and as natters did not improve, I suggested he should return me part of my remium, and I leave. To this he would give no definite answer, but s Christmas was approaching he suggested I should take a week's oliday, and he would consider the matter meantime. I did so, but pon my return he still declined to let me resume work, and eventually uggested paying me back my premium less what I had received in ages. This I declined at first, but afterwards agreed to accept, when e coolly informed me he was not prepared to pay cash down, but would ive me 10s. or so to go on with, and this after keeping me in enforced dleness for two or three weeks, when I had my board and lodging to rovide for all the same, as I came up from the Midlands to take on he job.

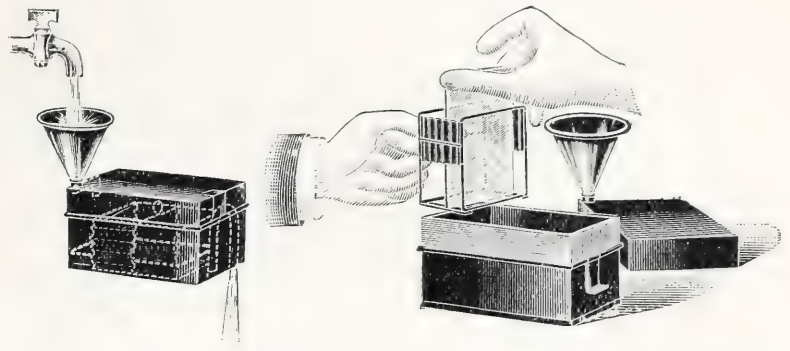
And here the matter stands to this day. Out of my premium I eceived four weeks' wages, at 30s. per week, the rest he has never efunded. I have written him several times, but he does not condescend o answer. Don't you think, Sir, I ought to be able to recover through he County Court? It is money I can ill afford to lose, and if one is to e served thus, it seems to me that agreements are not worth much. ince then I have been with a firm down here, who, if necessary, will ive me references as to character and ability.

I trust you will forgive me for troubling you at such length, but I am sure you will agree with me these sort of things should not be let pass unnoticed.—Faithfully yours, Justice.

THE "TYMA" DEVELOPING TROUGH FOR PLATES.

To the Editors.

Gentlemen, — On account of the most successful working of the "Tyma" trough for films and the very flattering reports from the Press and public alike, I have much pleasure in introducing a developing device for plates, particulars of which I herewith enclose.



This shows the same advancement in negative making, as the film trough can be used as an accessory to a dark room or for time development without one. Its chief feature, besides being a labour-saving appliance, is that it develops in total darkness, a feature in photography of the highest importance. While the camera has been improved developing appliances have practically stood still, and it is gratifying to note that at last there seems to be a move in this direction, for not only is the dark room procedure becoming unsuitable for working up-to-date make of plates, but deters many from taking up this very pleasant pastime. These are to be obtained wholesale of Messrs. G. Houghton and Son, 88 and 89, High Holborn, where I shall be pleased to demonstrate this and the film trough every Monday, Wednesday, and Friday, 1.30 to 3.30.—I am, gentlemen, yours faithfully,

Max Reichert.

11, Burgoyne Road, South Norwood, London, S.E.
July 30th, 1902.

[The illustrations show some uses of the "Tyma" plate developing trough.—Eds. B.J.P.]

Answers to Correspondents.

*** *All matters intended for the text portion of this* Journal, *including queries, must be addressed to* "The Editors, The British Journal of Photography, 24, *Wellington-street, Strand, London, W.C.*" *Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* Messrs. Henry Greenwood & Co., 24, *Wellington-street, Strand, London, W.C.*

Photographs Registered:—

W. Fisher and Sons, Rutland Street. Filey. *Photograph of Mrs. W. H. Cranswick.*
W. Bashnell, Bank Street, Great Malvern. *Photograph of Earl and Countess Beauchamp passing through Malvern Link.*
A. F. Dawkins, 7, West Cliff Arcade, Ramsgate. *Photograph of group of Pierrots.*
W. E. Hill, 15, Havelock Street, Blackpool. *Photograph of Blackpool Tower inside Great Wheel.*

Marked Negatives.—R. C. W.—The mottled markings on the negatives sent are due to the plate not being rocked during the time it was developing. The remedy, in the future, is obvious. The marking cannot be got rid of now.

B. Fryett.—Your inquiry is not so intelligible as it might be; we take it, however, that an amateur is quite within his rights in having trade cards printed, headed "Photography." This is still—in some things, but not all—a free country.

Development Query.—J. T. Davis asks: "Will 'Glycin' used as a stand developer produce a perfect negative with a properly-exposed plate, or is normal developer (say Pyro) preferable under the circumstances?" In reply: We should prefer to employ a normal developer, and thus save time.

Choice of Camera.—T. Brigs.—All we can recommend is that you get the price lists of the principal dealers and select from them the camera that best suits your requirements and your pocket. From all the principal dealers you may rely upon getting full value for your money. It is against our rule to recommend any particular maker's goods.

DAGUERREOTYPE PLATES.—T. WARDELL asks: "Can you tell me where I can get some daguerreotype plates that I want for experimental purposes?"—In reply: We regret we cannot. We have been asked this question many times during the last few years, but have always had to give the same reply. The plates were made specially for the process, and that ceased to be practiced more than thirty years ago.

CARBON PRINTING.—T. OSWALD says: "In sensitising carbon tissue, is it necessary to use a fresh solution, or may the same be used indefinitely. I have been told that it can. Is that so?"—In reply: It is not necessary to use a new solution each time, for it may be used many times. But it is not advisable to employ it after it has assumed a decided brown tint. Some workers prefer a bath that has been used a few times to one that is quite new.

CINEMATOGRAPH TROUBLE.—"CINEMA" writes: "I have bought a second-hand cinematograph, but I cannot get the pictures sharp, as you will see by the enclosed piece of film. You will notice that the edges and cornersof the film are tolerably sharp, but the centre is all out. Why is it so?"—In reply: The lens is not properly in focus for the centre of the picture, though it is fairly so for the margins. The remedy is obvious: adjust the focus for the centre, and no doubt the margin will also be sharp.

SPOTS ON PRINTS.—W. C. writes: "Can you tell me the cause of spots on the prints which appear in the toning bath (latter is always carefully prepared)? I enclose a specimen with spots. Water I use is pump water."—In reply: The spots look very much as if they were caused by impurities in the water. Try filtering it through a couple of thicknesses of flannel. If the water is not the cause, the spots are due to particles of pernicious matter settling on the prints while they are wet.

PHOTOGRAPHY FOR THE PRESS.—"PRESS PHOTOGRAPHY" writes: "Your advice on the following matter will greatly oblige. Some twelve months ago, we sent a number of valuable photographs to a leading magazine ("Country Life"), out of which some were chosen for future publication. We have made repeated application for payment of the usual fees, but the only reply we can get is that the views have not been published yet, and that the prints are lost. What would you advise us to do?"—In reply: Make a charge for the pictures, if they are not returned on demand.

DOCTORING NEGATIVES.—"GARFIELD" writes: "Could you kindly give me a recipe for a kind of putty which would enable me to produce broad effects on the backs of negatives by dabbing them with the preparation? I have been using glaziers' putty worked up with colouring matter, but have not succeeded in getting the effects I desire, as I cannot get the colour off enough to make much impression on the final result."—In reply: We know of no putty, except such as is used by glaziers. We should have thought that colour added to it would be unnecessary for doctoring negatives; it is opaque enough by itself.

MOUNTING P.O.P.—"G." writes: "I have recently mounted some P.O.P. prints with paste made from fine wheat flour, to which was added a little oil of cloves. Will the paste damage the photographs, and, if so, in what way, and how soon?"—In reply: If the paste was used freshly made, we see no reason why it should affect the picture, unless it is kept in a damp place. We prefer starch to flour paste ourselves. The only way the paste would act injuriously would be to cause yellowness or fading, and the time it would require to do that would depend upon the care bestowed on the picture in its production, and the conditions under which it is kept.

GELATINE MOUNTANT.—C. OSBORNE writes: "On compounding the gelatine solution for mounting prints without cockling, as given on page 1,092 of the Almanac, I found, on addition of the alcohol, that all the gelatine went down in a clot, and could not be got into solution again, though the vessel was put into boiling water. The formula was kept strictly to, except that as I could not get Nelson's gelatine I used Coignet's Gold Medal. Why my failure?"—In reply: Simply because the gelatine mentioned was not used: that employed was of too strong a character, and would not carry the amount of alcohol without participation. A weaker kind is necessary. Use the gelatine named, and add the spirit, a little at a time, with constant stirring, and all will go well.

AVOIDING REFLECTIONS.—"TRYER" writes: "Please be good enough to give me your advice in the following matter. I am offered a large amount of work if I manage to do it properly. In photographing boots and shoes I have great difficulty in avoiding very bad reflections. I have tried to do it by covering both sides and top with cambric to diffuse the light, but even then the shadows are bad. I enclose rough print of my own first attempt, and also one from a trade journal, to show the difference."—In reply: The only advice we can give is that you light the boots in the same manner as the specimen sent. Your photograph has no strong lights at all, it is one even tint. It is all a question of illumination. Use a stronger side top light.

VARIOUS QUERIES.—"ORTHO" writes: "(1) What is the most effective course to adopt to photograph black velvet? I find that by using all available light, and obviously over-exposing as far as face is concerned, very little impression seems to be produced on the black velvet. (2) Is there any recognised syllabus published as a guide to teachers of photography at schools? (3) Where could I obtain all information relative to the production of colour photography?" In reply: (1) Light the figure so as to get the velvet illumined as strongly as possible. There should not be too much detail in black velvet, or it will not look like what it is. (2) Not that we are aware of. (3) Write to Messrs. Sanger Shepherd and Co. for their pamphlet on the subject; that will give you much useful information. Their address is Gray's Inn Passage, W.C.

COLLOTYPE.—R. S. writes: "Some six or seven years ago, you published in your valuable journal, or almanac, or both, an article on how to treat a mixture of gelatine and glycerine, sensitizing same with bichromate of potash, etc., to enable you to take a large number of prints on any class of paper by means of a copying press. I am now photographer in a large works, and am asked to produce a quantity of prints by some such process. Will you kindly inform me what I want, and refer me to some book on the subject, or let me know how I can best ascertain what I require?"—In reply: We have no recollection of the article referred to, and "six or seven years ago" is too indefinite, without its title, for us to make search for it. Better get Wilkinson's book on the photo-mechanical processes.

THE SWELLED GELATINE PROCESS.—W. T. B. writes: "Will you be kind enough to advise me, for I am on the point of despair? For some months I have been trying to make some plates for the swelled gelatine process. I am sorry to say my knowledge of the process is not at all great. I have been advised to use a mixture of agar-agar and gelatine, but when I get the emulsion dried on the plate it is all rough and full of pinholes. (1) Can I get an up-to-date book on the subject? If so, where? (2) Are there any plates on the market suitable for the process? If not, will you kindly give me the formulæ for making some?"—In reply: (1) It would seem that you have been using an unsuitable gelatine, that is, if you do not get a sufficiently high relief. Wilkinson's work on the photo-mechanical processes will give you information on the subject. (2) There are no such plates on the market.

RIGHT TO SHOW AND SELL.—A. F. D. writes: "I should be much obliged if you could assist me in the following:—At a certain seaside resort there are performing a troupe of pierrots, nine in number. The question was put to their leader whether they would be agreeable to sit for a photograph to be taken, provided I presented each member with a finished copy. This they did agree to, and I exposed a half-plate on them and gave nine copies to their leader, telling him it was a copy for each one. Now, what I want to know is this. Having done what I promised, can I be acting wrongly or illegally in selling copies in a reduced size, say midget? Of course, I was not ordered to do the work. I took it on so as to get a little out of it in the shape of penny-in-the-slot business, and I take it that I am right in using the negative in any way I please."—In reply: Yes; the copyright is yours, and you may dispose of prints from the negative.

EXHIBITING PHOTOGRAPHS.—J. F. NOBLE writes: "Can you give me advice on the following matter? Some two years ago, my employer, a photographer in this borough, gave some photos to a stationer (a friend of his) to show his frames off to the best advantage. One of the number so given was a cabinet of myself. I had no objection to it being used in a proper manner. Since that time they have had a business difference, which caused a keen rivalry to spring up between them. He has singled out my photograph as a means of annoying me. The picture in question is placed in a frame valued at about a penny, and placed in the doorway, marked in bold letters "Clearing out 2d." I went in and requested him to remove it, but they have taken no notice. It is causing me to be made a laughing stock of, as I am well known in this town. I am going to have it removed, whatever it cost me. Query, Where is the remedy?"—In reply: The best remedy we can suggest is that you, or one of your friends, purchase the picture, as it will only cost you the small sum of twopence. You could not get any legal remedy for anything like that amount.

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*** *The Editor can only be seen by appointment.*

*** *We do not undertake to answer letters by post.*

EX CATHEDRA.

Explosive Flashlight Compounds.

Another death must be added to the list of accidents, if such they may be called, brought about by the dangerous mixture of compounds used for flashlight photography. This fatality occurred at the factory of Dr. Krebs, at Offenbach, whose goods bear the trade-mark, "Helios." The explosion occurred in a two-roomed wooden building used exclusively for the manufacture of flash-light powders and time-exposure cartridges. The workman who lost his life was in the act of mixing a large quantity of powder containing chlorate of potash. An unaccountable explosion occurred, blowing off part of the man's skull. After the many accidents of the kind which have occurred with chlorate of potash, we think the expression "unaccountable" is far from appropriate. The writer who sends the account to the "Photographisches Wochenblatt" draws attention to the fact that in August, 1901 another explosion happened at the same factory. The laboratory was then destroyed, but fortunately no one was in the building at the time, and there was no loss of life. These explosions are sufficient to shake confidence in the non-explosive character of the Helios flash-light powders, and they indicate that the greatest care should be exercised in their use.

* * *

Light and Malaria.

The wonderful account of the way in which malaria infection has been traced to a certain species of mosquito, and the plucky manner in which this theory was put to practical proof by a few earnest students, is one of those pleasant fairy tales of science which bring the better part of human nature into prominence. It is not too much to hope that when efficient means have been found of killing the mosquitoes in a malarial district—and it has already been done in several places —countries hitherto considered almost in the light of plague spots will become healthy as those of more temperate climes. Dr. A. F. A. King, of New York, has lately put forth the theory that there are still some hitherto unexplained facts with regard to malaria which seem to point to the action of the sun in influencing to some extent the spread of malaria. He does not ascribe the action to the sun's heat, but rather to its light, and believes that the relative immunity of the negro, as compared with the white man, is due to the greater opacity of the former's pigmented skin. It has been shown by certain Italian observers that malarial fever in that country is not most prevalent in the hottest weather, but in the months of greatest sunshine. The case of a camp in Jamaica is also quoted, which fared best when a fog hung round it, and where the beneficent effects of many rainy days had often been noted. He advises the keeping of malarial patients in a dark room, and, where this is impracticable, the clothing of them in garments impervious to light.

* * *

German Exports of Optical Instruments.

The commotion which the projected new Customs Tariff is creating in Germany brings to light a number of interesting statistics. The German Mechanical and Optical Association has sent two petitions to the Reichstag, and they draw attention to the fact that the value of the exports of astronomical, optical, mathematical, chemical, and physical instruments amounts to only £600,000, according to the Statistical Year Book. The association complains that the official statistics are grossly under-estimated. According to the Government, the exports to England of astronomical and other instruments in the year 1900 amounted to £39,100, but it is said that the firm of Carl Zeiss alone exported to this country £31,650 worth. It is also said that, apart from some thirty smaller firms, C. P. Goerz, E. Leitz, and Voigtländer & Son likewise exported to this country about £50,000 worth, and that the total exports to England must amount to £150,000 or £200,000. This is about five times as much as the official estimate. The petitioners declare that the figures for the exports to other countries are also much below the mark, and that the total production of Germany in these industries amounts to about £2,100,000, two-thirds to three-fourths of which is for exports. The "Central Zeitung für Optik und Mechanik" thinks an explanation of the discrepancy on the part of the

Government would be very desirable. We think the Government statistics are more probably correct, as our Teutonic friends of recent years have suffered very much from inflation. Perhaps part of the difference may be due to the gross prices being taken by the trade and the nett prices by the Government.

* * *

Trichromatic Portraiture. In our last issue we published letters from two correspondents inquiring for further particulars concerning Dr. Miethe's process for trichromatic portraiture. We first drew attention to the subject on April 11, this year, and gave all the particulars we could gather concerning Dr. Miethe's process. It depends primarily on the plates, the colour screens, and the printing inks which are used. The plates are prepared according to a special formula worked out by Dr. Miethe, and they are manufactured and sold by Perutz, of Munich. We believe they are called the Perorto plate. The light filters, or screens, which are used with the lens in making the three negatives for the three primary colours, are specially prepared by Dr. Miethe. Those who wish to prepare them for themselves may do so from the particulars of the regions of the spectrum selected by Dr. Miethe, which are given in our issue of April 11; but we do not know what dyes or stains Dr. Miethe has used in the preparation of his light filters. Concerning the camera, there should be little difficulty, the only necessary adjuncts being a rapid lens of modern type and a suitable dark slide for making the three exposures in rapid succession. Process plates should be prepared from the three negatives and from these the prints should be made with suitable inks which correspond as nearly as possible to the three primary colours selected for the negatives. Or, as Dr. Miethe has said, collotype might be used for making the prints, unless a considerable number are required. Judging by the beauty of Dr. Miethe's results and the short exposures which were given, we believe that three-colour portraiture is within the reach of the man who has the ability to work the three-colour process. But it must be remembered that the portrait by Dr. Miethe, to which we have specially referred, was taken in the open on a bright day. It is, consequently, necessary that the very best conditions of light should be secured in the studio.

* * *

Fixing Lippmann Photographs. Dr. Lüppo-Cramer, in his work, "Wissenschaftliche Arbeiten auf dem Gebiete der Photographie," raises the question of fixing Lippmann colour photographs, and comes to the conclusion that the process is superfluous. If an unfixed Lippmann colour photograph be partly covered with black paper and exposed for some time to sunlight, a certain amount of discoloration is perceptible when the plate is laid upon a sheet of white paper, but the maximum of discoloration is soon reached, and it does not interfere to the slightest extent with the brightness of the reflected image. In making these experiments, Dr. Lüppo-Cramer photographed a very broad spectrum band, and cut the plate through the band, lengthwise. It was thus possible to retain a check plate of identically the same character as the one exposed to daylight. But, although it makes little difference whether the plate be fixed or not, Dr. Lüppo-Cramer pertinently asks why cyanide of potassium, a most dangerous substance, should be used as the fixing agent. He was unable to discover any real superiority in it, when compared with the ordinary hypo fixing bath. Cyanide of potassium will remove fog, but it also attacks the image very quickly, and it is certainly preferable to dry the film and remove what fog there may be, with Farmer's solution, reduced considerably in strength. Absolutely no difference in the brilliance or clearness of the image can be seen, whether the plates be fixed with cyanide of potassium or hyposulphite of soda. Neuhauss has stated that Lippmann colour photographs are easily dissolved with hyposulphite of soda, and points out that by such means the grainless variety of silver bromide may be distinguished from the ordinary. Although this may be correct, it is not a special characteristic of the Lippmann photograph, as ordinary P.O.P. prints and chloride transparency plates are soon affected by a solution of hyposulphite of soda.

* * *

Lightning Problems. The lightning research committee which was organised by the Royal Institute of British Architects and the Surveyors' Institute have just issued a further report as to their labours, and, as it will presently be seen, photographers have a direct interest in the matter. The committee consider that they have now collected ample material for deliberation upon lightning damage to non-protected buildings, by which is meant buildings which are not furnished with a lightning-rod, or rods. But as yet they have obtained very little information with regard to "protected" buildings which have been struck. This is as it should be, for, of course, theoretically, buildings with lightning rods attached to them should be quite free from attack, by what newspaper men are so fond of calling "the electrical fluid." But such buildings are struck, and as the committee have as their prime object the improvement of means of protection they are wishful to obtain all the detailed information they can with regard to such occurrences. Many persons throughout the country are working in harmony with them, just as the meteorological authorities have been able to enlist a number of willing volunteers who record the rainfall in different localities. And the committee are anxious to impress upon such workers the need, not only of examining a building as soon as possible after it has been struck, but they suggest that photographs should be taken of it before any repairs, temporary or otherwise, are effected. And the observer, let it be noted, is not expected to do this at his own expense, for the committee are prepared to refund all out-of-pocket expenses, and a moderate charge for the services of a photographer, provided that details of the occurrence be sent to them a few days after its happening, and that an account of monies expended be sent in with the report of the observer. Photographers would do well, therefore, to be on the look-out for lightning-struck houses, in order that they may obtain the work of picturing them. And it will be useful for them to be aware of the points upon which the research committee lay especial stress. Attention should be particularly directed to all metal work about the building, and note should be taken whether any of these parts were purposely or accidentally connected with the lightning rod. If drawings are sent in by the observer, all metals should be indicated in red, while the hypothetical path of the lightning should be shown in blue. We presume that the same markings made on a photograph would answer the purpose as well, and possibly better. The nature of the conductor, how fixed, and how connected with earth, is also an important matter, and in the case of a church, the wind-vane should have special attention. It is not stated how the observer, and the photographer, are to get up to the weather-cock; but this is, of course, a matter of detail which can be left to their ingenuity. The photographer would probably solve the difficulty by using a telephoto lens.

Photography and Palmistry. Fortune-telling by the lines of the palm, which used to be the monopoly of the red-cloaked gipsy, has of late years taken a higher position, possibly because the palmists of to-day call themselves professors, and have addresses at some of the most fashionable streets of West End London. Where the gipsy woman was content to have the palm crossed with a small piece of silver, her modern representative asks for gold, and generally gold and silver mixed, for her fee is often one guinea. It is to be presumed that the craze for palmistry is not quite so rife as it was a year or two back, for a few of its professors have been prosecuted, and the more cautious among them have probably realised that the game, profitable as it is, is hardly worth the candle. Many persons, if they do not credit all that these modern soothsayers tell them, believe that "there is something in it," and as a proof of their belief, adduce the fact that two or more professors of the art whom they have consulted agree in their diagnosis of character, ability, and so forth. And, let it be added, as a material point, that the story is generally one which highly flatters the recipient. These credulous persons do not seem to see that, in this so-called science of palmistry, certain lines in the hand are understood to have definite meanings. Thus, if a "line of life" stretch across the palm to wrist, its owner will live beyond the allotted span. It is, therefore, not remarkable that glib exponents of the system, who have learnt the commonly accepted meanings of these lines as part of their professional stock-in-trade, should agree in their estimate of any particular hand. It is certain that these professors are many of them skilful readers of character, and rely to a great extent upon information unwittingly given by their clients. A photographic friend recently showed us a series of pictures he had taken of a pair of hands, which he had placed, by way of experiment, before various palmists, while he had taken notes of what each said with regard to the pictures. Some thought they were male hands, whilst others took them for being those of a woman; but on this, as on other points, our friend would vouchsafe no information. The palmists were in agreement, as might have been expected, with regard to what we may call the "trunk lines," but when they got to the branches they were hopelessly at sea. To give an instance. One palmist declared that the owner of those hands possessed such uncommon musical talent, that "he" would have become, if trained, a notable composer. Another volunteered the information that "she" was so destitute of musical feeling, that "she" could not distinguish one tune from another. That a man's character is indicated to some extent by the shape of his hands, just as his abilities may be guaged by the height and breadth of his brow, is beyond question; but as to the lines—which, by the way, are far more strongly marked in the anthropoid apes than they are in the human subject—we must regard them only as part of the necessary apparatus involved in opening and closing the fist.

* * *

Sculptured Likenesses. The presentment of any human being in marble, stone, or bronze, differs from a photograph in the circumstance that the latter preserves his likeness whilst he is still living, and the former perpetuates his memory after he has returned to dust. Perhaps it is well for the sculptors of certain of our London statues, that they waited until their victims were safely underground before they libelled them. There are, however, some exceptions to the general rule. For example, the Marquis of Lansdowne has a statue at Calcutta, as a memorial of his rule in India. And there are some very curious architectural reminiscences of certain of our statesmen, at St. Giles's Church, Camberwell, which were erected during the lifetime of the originals. These, by the way, are well worth the attention of the itinerant photographer as curiosities of sculpture. They take the form of gargoyles—those strange inventions of the mediæval sculptors—half demon, and half human, relics of the time when people believed in dragons, satyrs, the phœnix, and many other uncanny monsters. It has long been the custom to adorn our public buildings with stone medallions of those who have been foremost in the arts, but not often have they served as these guardians of the rainwater pipes which are called gargoyles. The original gargoyles, as Sir Gilbert Scott designed the church of St. Giles', were of the usual ecclesiastical type, but when it became necessary to restore the church, it occurred to the mason employed to give the new gargoyles a political touch. Here can be seen Mr. Gladstone—and this is, perhaps, the only portrait of that eminent statesman which, for obvious reasons, has not a monstrous shirt collar. Mr. Chamberlain is here, too, minus his eyeglass; but the omission is compensated for by the addition of a pair of horns. The Marquis of Salisbury appears on St. Giles' Church with remarkably fine ears, and Lord Randolph Churchill has a pair of wings which would delight the Aëronautical Society. John Bright and some other worthies are here looking down helplessly from the gutter of St. Giles's Church. There may also be seen on the gateway of Magdalen College, Oxford, the likeness of the G.O.M., and at Chester Cathedral Lord Beaconsfield figures as a gargoyle. In like manner Lord Grimthorpe, who devoted so much loving care to the restoration of St. Albans Abbey, appears on that ancient fane as a winged and whiskered angel. Of course, our cathedrals are covered with the sculptured images of the kings and queens of England, but these do not profess to be portrait studies. They are mostly of one uniform pattern, and differ little from the ordinary sculptured saint, save that they have a conventional crown, and generally a sceptre. The gargoyle is after all the most convenient form in which to present a stone likeness, for if the original is orthodox you can give him wings, and if he is someone else's 'doxy, you can furnish him with horns, hoofs, and a tail.

"DOING THE REST."

When in a recent article on the doings of the dealer amateur we remarked upon this gentleman's excursions into the regions of photographic art, we said that "The dealer rarely does much in the region of professional photography in places where the local professionals themselves are fully alive to what is going on around them; this applies not alone to the photographing of objects of interest, etc., but to such work as may be done for the amateur in the way of developing, printing, re-touching, and the rest." Two episodes of recent occurrence throw some light upon the idea evidently prevalent in the minds of some dealers as to the meaning of the term "doing the rest." The first case is that of a busy medical practitioner. This gentleman, after several years' waiting, finds himself able to take a long-deserved holiday in Switzerland, he took two cameras, and exposed a number of plates, being at the time, it must be mentioned, *no novice* in the art of exposing a photographic plate. Arrived home, he finds, as usually happens, arrears of work taking every spare hour for some few weeks. Anxious, however, to see the results of his work abroad, he entrusted three dozen or so of his exposures to a dealer to be developed and prints supplied in the ordinary course. Our medical friend was greatly

disappointed at the small proportion of results shown him and the quality of the work done. Happily, there were several dozens of exposures still to be taken in hand, and our amateur determined at any cost to do these himself. We have been permitted to see the results in both cases, and there can be no possible doubt that the dealer's work was most carelessly done, no attempt apparently having been made to make the best of a single negative. It is impossible that an amateur of this class could deliberately choose and pick out a faulty batch of exposures for the dealer to tackle, and it is not pretended that all those done by the amateur himself were of equal quality and class, but the proportion of *printable* negatives was considerably higher in those finished off in the usual way at home. The next case was that of a lady visiting some of the lovely country round Warwick and Kenilworth. The lady, it may be said, is a Coronation visitor. Our fair visitor has been extremely busy with her camera amid all the historical and picturesque country in and adjacent to the places referred to. Her exposures were from time to time placed in the hands of a local dealer, who, it must be presumed, in the intervals of his other work, did possibly the best he could under such circumstances; but they were hardly such as to give satisfaction to our fair correspondent. We were able to make a recommendation which has resulted in the lady having now a very pretty and well-selected assortment of views to show her friends in Canada on her return. It must be perfectly clear that many dealers essay the work of doing the rest for amateurs, who have not the facilities, or the time—perhaps not the ability. A chemist dealer, for instance, clearly has not the time which ought to be given to such work. Some results indicate development by wholesale, with no attempt to differentiate between a possible over or under-exposure. Add to this light and chemical fog and dirt, and it will be seen how deplorable, in the absence of system and routine, the results of doing the rest may become.

Well, now, pondering over this very matter one morning on the way to business, we suddenly came face to face with a photographer's show-case, in which were some very fair specimens; indeed, as a matter of fact, technically very good. There was pinned up amidst them, in a prominent position, a notice to the effect that for a certain number of specified weeks "One cabinet photograph will be taken and supplied for the sum of one shilling." Meeting shortly afterwards an old photographer, a man gifted with a good deal of dry humour, we put it to him, as a man of experience, how could this be done. Said our friend, "Well, if he runs an account for plates and paper, which he afterwards fails to settle, allows himself to be sued for wages and rent, as he has been, it is possible he may do it. for a time." We are afraid this often explains the position. Now, why should not a professional, before lowering himself to the one-shilling level, endeavour to use his abilities and experience, which are often considerable, in a more legitimate direction, such as that which gives a title to the present article? Our old photographer is ready with an answer; he says such a man doesn't want the work; he would rather be "backing his fancy" on the nearest race-course. This, we suppose, really does fit the case at times, but, surely our less flourishing brethren are made of tougher moral fibre than this.

It is possible that this disinclination to do the work and take the pay of the amateur, which is often characteristic of a professional, arises from a feeling that it would be beneath one's dignity to do so. Dignity is all very fine, but when it interferes with the honourable acquisition of one's dinner is apt to become tiresome. In our pre-journalistic days we once got into dire disgrace over a similar matter. It was the case of a very companionable photographer, who posed as an artist. He was an artist first and a photographer afterwards. He regularly contributed to the Academy, and as regularly failed to get "hung," and as a matter of fact was as nearly a failure as such a man could be. We had often to dissemble in those days, for we liked *the man* vastly better than his pictures, and we suggested to him one day that he should do something in the way of colouring *photographs*. He had, by the way, a very good notion of colour, and we thought (innocently) that he might do very well in the style *à la* Payne Jennings; and there was at the time a very good sale for such work. We must draw a veil over the sequel; enough to say there was very nearly another shipwrecked friendship. It appears to be little short of an atrocity to suggest to an artist—and the lower in the scale the greater the offence—that he or she should colour photographs. One could make out a *primâ-facie* case, and the idea seems a reasonable one; but there it is. Upon similar impossible grounds, it may be that many of our professional men object to the notion of doing the work of developing and printing for the amateur. It seems to be a mistaken idea, and we know of more than one high-class studio where such work is done for amateurs, who are by no means the least important of their clients—important in the sense that they are willing to pay the best prices for other work in the direction of portraiture and enlargements. Neither does it always interfere with the sale of one's own work. Our amateurs are mostly alike in one respect: visiting a new district, they like to inspect the shop windows and see the favourite views before starting out with their cameras. Our cousins from the Colonies and America do the same, but buy largely, notwithstanding; and any loss of trade by reason of the public taking some of their own photographs can surely be made up by persuading them to entrust one with the finishing off of their exposures. The work is done—and done very badly, too, sometimes, by the small dealer, who makes of the sale of *apparatus* merely an insignificant department in the performance of his multifarious duties. He, the small dealer, certainly cannot undertake to "do the rest" with reasonable prospect of satisfaction to the parties concerned; it would be very much better done by those who make a profession of photography, and who have the room, the time, and the skill necessary for the purpose.

HANDLING AND COPYING DAGUERREOTYPES.

At the conclusion of the article on the restoration of Daguerreotypes (see page 584 ante) we remarked that these pictures are very easy to copy, and that good ones would yield better copies than can be obtained from paper prints. In copying Daguerreotypes, or glass positives, there is no grain, as there is with paper pictures, to contend with, for, however skilfully the latter may be lighted, in the copy a certain amount of granularity will be manifest, which at once stamps it as being a reproduction, and not from the original negative. Not so with a good Daguerreotype, for if the work be skilfully done the copy will have all the appearance, except in the eyes of experts, of being an original, and not a copy at all. Of course, it is to be understood that all Daguerreotypes will not yield results that cannot be distinguished from originals, because there are many inferior examples of the process in existence, and from those it is not possible to get first-class results. But, however bad the original may be, it often has to be reproduced, and sometimes as

n expensive picture, and the question with many is how re the best results possible to be obtained.

Some look upon the copying of a Daguerreotype as being n exceedingly difficult thing, and we are frequently consulted on the subject, but it is nothing of the kind, if ne knows how to go to work. This is how to proceed. s we mentioned in the previous article, the Daguerreoype image is of a most delicate nature mechanically—nd that the slightest rub with the finger, or anything lse, will remove the image, and when once that is done cannot be restored, as many have found to their cost. Hence the greatest care is essential in handling these ictures when the protecting glass is removed. If the icture is in its pristine state and is well secured to the lass, we should recommend the novice to copy it as t is, for if care is taken in the lighting very good results nay be obtained without its removal; not so good, it is rue, as may be got when it is taken off, but all risk of njury in inexperienced hands will be avoided.

We shall, however, assume that the picture has been aken out of its case and the glass separated. From his point the picture must only be held by its edges—he surface must not be touched, or marks will be left. All the paper with which it was cemented to the glass must e carefully removed both from the edges and the back f the plate. The next thing is to remove any particles f dust that may be on the surface of the plate. If the picture was well secured in its case in the first instance, nd has not been taken out since, there will be no dust o remove. If, however, there is, it is best removed by lowing off with a bellows; if blown off with the mouth here is a risk of particles of saliva and moisture from he breath. It is sometimes recommended to remove any dust with a camel hair brush, but this is somewhat risky, unless the brush be very soft and is perfectly dry, as also is the plate itself. If the brush be used it is well to slightly warm the plate beforehand in order to get rid of any trace of moisture that may have condensed upon it, or the plate may be marked by the brush. If the picture has been coloured the brush should on no account be used, as the colouring, like the image itself, is of a very delicate nature. It is simply dry colour applied as a fine powder, and is in no way cemented, therefore it is liable to be disturbed even with the most careful brushing.

All the dust being removed, the picture is ready for copying, and the result is entirely dependent upon the illumination of the picture. It should be secured to the copying board by drawing pins. But before this is done, if it be closely examined, it will be found that it looks better in one position than it does in others. In some it will often show minute lines left in the final "buffing," or polishing of the plate. When this is the case the picture should be so affixed that the light used falls in the same direction as the lines, for if it falls at right angles to them they will be manifest in the reproduction, as well as interfering with the purity and depth of the blacks.

Now for the illumination, upon which all depends. This should be with a strong direct side light, and never with a front one. All the front light should be carefully stopped off, and for this reason. The angle of reflection always equals the angle of incidence, and it therefore follows that if the picture be lighted with a direct, or partially direct, front light the reflections from the polished surface of the plate will be in the direction of the lens, and if, under these conditions, the image be examined on the focussing screen it will be found that it is weak, flat, and with no depth in the shadows. But if it be lighted at an angle, say, of 45 deg., the reflections will be from a similar angle, and quite away from the lens, and then the blacks of the image will appear deep and pure. The best conditions are, perhaps, obtained when the picture is copied in an ordinary room, placing it at the side of the window, and close to it, with the blinds pulled about half-way down. The picture will then be strongly illuminated by a direct side light, while the camera is in a shaded position. If the picture be copied in the studio similar conditions of lighting should be followed. We have produced very brilliant copies of Daguerreotypes by copying them in strong direct sunlight, and arranging them so that the rays fall at a very great angle on the picture. Success or failure in copying Daguerreotypes depends entirely upon the lighting of them, and that is a very simple matter, if we bear in mind that, in all cases, the angle of reflection equals the angle of incidence, whatever that may be.

As to the plates to be used, they should not be of the ultra sensitive kind; slow plates are the best for the purpose, and over-exposure should be avoided, or flat results will follow. It is always better to err on the side of under rather than over-exposure. A satisfactory negative having been secured, the next thing is to, at once, carefully restore the picture to its case, taking special care to secure it, the matt and the glass together with paper, as described in the previous article. This is a point that is too often neglected by some photographers who have valuable Daguerreotypes brought them to copy, with the result that they afterwards quickly deteriorate, though they may have, previously, remained unchanged, perhaps, for fifty years. This neglect is highly discreditable to those who have highly-prized pictures entrusted to them by their customers.

THE SELECTION OF LENSES FOR STUDIO WORK.

In our issue for the 18th ult. we treated this subject from a general standpoint, giving indications of the characteristics of different types of lens that would probably be chosen to select from. From most points of view the probabilities were in favour of a portrait or Petzval type of lens, and we would take the present opportunity of giving further particulars regarding its properties. We refer to the fact that, unlike the most modern type of lens, the field of sharp definition with a portrait lens is curved. It is impossible to get freedom from astigmatism if the field is greatly flattened. For this reason it is that when, say, a full-length cabinet picture of a standing figure is taken with full aperture, if the head and the feet are in sharp focus, the hands, if in front, will not be equally sharp, and "stopping down" will be needed. The more modern portrait lenses give this effect, but not so strongly as those of earlier construction.

As we pointed out, it should ever be remembered that the size of the picture of a given object at a given distance from the lens is governed entirely by the equivalent focus of the lens, so that in deciding upon the lens to choose no regard whatever must be paid to any talk about wide angle, narrow angle, etc., the equivalent focus only must be considered. And let it be remembered, too, that equivalent focus is not the same thing as back focus, a caution quite necessary, as, in persuance of an old system, when cameras were not as they are, it is still the custom with some makers to give the back focus

when listing portrait lenses, though it is not done with other kinds. This is very singular, as it is so apt to mislead, but the fact remains as we state.

With these remarks by way of preamble, we may set ourselves to consider the further factors to enable the purchaser to make a final decision. It may be taken for granted that the chief consideration will be to choose a lens that will be suitable for cabinet pictures. Here the makers save trouble by putting in their lists the distance that any particular lens must be from the sitter to take a full-length cabinet picture. But here a little thought is necessary. Say that 18ft. is the given distance, that does not mean that a studio 18ft. long will be suitable. First, there must be added to that distance at the very least half a yard behind the sitter to allow for the placing of the background, and the use or introduction of any accessory employed. Next there must be added the distance between lens and dark slide, and space for the operator behind it—another 2ft. at least. Hence, with such a lens as we have taken as an example, the studio would need to be 18ft. and 4½ft., say, 23ft. in length. It may be said at once that if a studio be shorter than that a shorter focus lens may be employed (here again the makers' lists give data), and still full lengths be taken; but the shorter the distance between lens and sitter the more exaggerated does the perspective of the floor become. The floor seems to be on a slant, as if the sitter would slide off it.

Then comes the question, "Will the same lens do for cartes and midgets?" It will answer admirably for taking this class of photograph at full aperture, but the lens will have to be taken a greater distance away. "How far away?" Well, just in inverse proportion to the amount of diminution in size. If a midget full length have to be taken, say, half the length of a cabinet, the lens will have to be retired double the distance—that would mean, with the lens we have discussed, 36ft. between sitter and lens. The majority of studios are not of this length, so that with a short studio either a shorter focus cabinet lens must be employed, or a second lens must be purchased; there is no other practical way out of the difficulty.

This consideration will show the answer to such a query as that of a correspondent who asked some time ago whether he could have one lens to do for panel pictures, cabinets, and cartes. Taking a panel as being 11in. and a carte as 2¾in., the lens would need to be retired four times the distance suitable for a panel. If we took 14ft. as the very shortest permissible distance for a full length, and that the panel lens would act properly at that distance, a carte would need 5ft.! The question answers itself.

It may be said that advice is needful when the governing factors cannot be altered, e.g., the length of the studio. Consider first the case of a cabinet where a sitter, say, 5ft. 8in. high, is to be taken 4¼in., that is to say, one-sixteenth the size. Then taking from the length of the studio, the 4½ft. found as before explained, the remainder must be divided by sixteen (or whatever other proportion had been found), increased by one (always by one), i.e., seventeen. For example, a studio is 18ft. long, then 18ft. less 4½in. is 13½ft., or 162in., which, divided by 17, gives 9 9-17in. (very nearly 9½in.), as the longest focus permissible under the conditions. This rule is applicable to all lengths, of course. We trust we have now given sufficient data with simple calculations to enable anyone to ascertain for himself the focus of the lens his studio will allow for class of subject or any size, the only data needful being the length of studio and the scale of reduction, or, in other words, the size the sitter is to be represented on the negative.

CAMERAS AT THE CORONATION.

Like most people who live within touch of the Metropolis, we went Coronating on Saturday, and although we cannot boast of the prescience of that "peer's daughter" who wrote a full account of the ceremony which did not come off, and cannot describe, as she did, the appearance of the interior of the Abbey—we had not the privilege of a seat in the sacred edifice—we can tell of what we did experience, and we promise that it shall be free from the charge of mendacity.

To begin with, we saw any number of cameras. At the suburban railway station from which we started at the unearthly hour of six a.m., there were many hand cameras, but what their owners expected to do with them, wedged up, as the majority must have found themselves, in a swaying crowd, goodness only knows. Camera bearers became more in evidence when we reached the West End, and some of them were of portentous size. By the courtesy of a friend at Court, literally at Court, we had been assigned a seat hard by Whitehall, and had been told that to make sure of getting there we must start at the uncomfortable hour already mentioned. Seven o'clock found us ensconced on the particular square of crimson cloth which had been assigned to us, and the task which confronted us was that of finding occupation for the four hours that must elapse before the first procession came into view. There were cameras to left of us, cameras to right of us, and—for further information, *vide* "Charge of Balaclava." Some were "animated cameras," others were of the tame variety. One monstrous machine crowned an angle of the Horse Guards' building. Opposite that historic pile were half-a-dozen more, peeping beneath the woodwork, which formed the basis of the seats erected there. A cinematograph was a conspicuous object in front of that banqueting hall where a king dropped his crown, and his head at the same time, a few years back. Even the Canadian Arch was infested with cameras, the lenses pointing out through loopholes like the guns aboard a battleship. We wondered, among these multitudes of picture-making machines, how many were fitted with screens for taking photographs "in natural colours." Of course, our correspondents who have recently told us of their successful experiments in this direction were there, and we shall hope to see at the music halls the results of their achievements, if the pictures are not shown before these words appear in print. We trust that one of our correspondents, at least, will not suffer us long to "wallow in ignorance" as to the result of his handiwork.

By eight o'clock the crowd gathered on the pavement in front of us is twelve deep, and they are so closely packed together that they sway to and fro, as if they were one homogeneous mass. And what a good-natured, respectable crowd it is. All intent on seeing everything that there is to be seen, and content to wait patiently, pressed together like sardines in a box, until the procession goes by. There are military bands which play at intervals, and between times six Highlanders march up and down between the Horse Guards and the Canadian Arch, playing on their national instruments. It was extremely funny when the crowd took it into their heads to join the bagpipes in a kind of chorus at the end of each verse, or stanza (we don't talk Gaelic, and don't exactly know what the right term is). But what we mean is, that the crowd quickly discovered a reiterated musical phrase, and each time they were ready for it, and howled out this chorus with a zest which was most diverting.

A motor car seems somewhat out of place here, but one passes and repasses without let or hindrance; it has the Duke of Connaught and General Trotter on board, and these gentlemen have done wisely in adopting such a quick and ready means of getting about, and seeing that the route is all clear.

Then come the sand distributors, which are machines new to the London streets. They soon cover the road with a red carpet, which is both pleasant to look upon and good for the horses' hoofs.

A contingent of bluejackets, marching with that splendid swing peculiar to them, brings the first hearty cheer from thousands of throats. And then several notabilities, some of them in splendid equipages, make their way towards the Abbey. A cheer goes up as the King's nurses pass in one of the Royal carriages, and this becomes a big shout when the two little sailor lads, sons of the Prince of Wales, presently go by.

Red Cross ambulances and stretchers now make their appearance, and as if by way of encouragement, people begin to faint. One or two soldiers lead the way, and every now and then there is a little commotion in the crowd, and a woman is carried off, to be received by nurses in attendance at the Horse Guards. One of these sufferers is not quite so bad as she appears, for at the moment when she is laid upon a stretcher, the Prince of Wales's procession comes into view, and she sits up very quickly, in order not to miss the sight. Some unkind people near expressed the opinion that her faint was spelt with an "e," and had a motive in the exchange of a back seat for a front one.

At first sight, it would seem that those who were privileged to find seats on the Canadian Arch were in a very advantageous position for seeing and photographing all that took place. They had a clear view right up Whitehall, and their first glimpse of the procession would be as the Lifeguards emerged from the gates opposite Whitehall Palace. But it must be remembered that the carriages of the notabilities were closed ones, a precaution rendered necessary by the coldness of the morning, as well as by the fact that the dress ordained for ladies at Court ceremonials is practically evening dress, and one who would avoid chest troubles will be wise not to drive in an open carriage. Besides, the State coach and other gorgeous equipages which formed such a fine feature of the show, were built that way. So that anyone viewing the procession from such a vantage point as the Canadian Arch would get it end on, so to speak. The horsemen and the coachmen, and the gorgeous beings standing at the backs of the carriages, would be seen to perfection; but the occupants of the vehicles would be quite invisible. From our side position, on the other hand, we were able to see right into the carriages, as well as outside them, and we did not, therefore, envy the sightseers on the Arch. Nor did we yearn after those positions which some of the big cameras had secured, among the adjacent chimney pots, for we think that a bird's-eye view must rob such a function as this of much of its beauty.

The King and Queen's procession was a marvel of colour and glitter, and a splendid contrast was afforded by the presence of the Indian and Colonial contingents. The Indian celebrities, in their picturesque costumes, sat well in their saddles, and gave a kind of barbaric splendour to the procession, which otherwise it would have lacked. In this part of the pageant were Lords Roberts and Kitchener—who were loudly cheered and addressed by the crowd as "Bobs" and "K." The former touched his cocked hat, and acknowledged the salutations of the crowd. But "K," "the man of iron," passed through the hails of his fellow countrymen without moving a muscle of his features, or indicating in any way that he was aware that there were a few people about the streets to-day.

The State coach, with its famous cream-coloured steeds is a splendid thing to see, especially with a King and Queen within it; but it cannot fail to arouse childish memories of Cinderella's coach, and one would not be surprised if the coachmen and footmen had the characteristics of rats and mice.

After the King and Queen had passed on their way to the Abbey, there was a long wait of close upon three hours before they returned. But during their absence there was at least one episode which it was worth travelling many miles to see and hear. When the park guns fired to signify the moment when the crown was placed upon the King's head, a shout of joy went up from this mighty crowd, and with one accord, and with heads uncovered, they sang

GOD SAVE THE KING!

THE ASTROGRAPHIC CHART.

[Reprinted from "Nature."]

It is probably well known, even to those who are not astronomers, that an astronomical enterprise of considerable magnitude was initiated fifteen years ago, and is steadily, although somewhat slowly, progressing towards completion. In the year 1887 a conference of astronomers met at Paris to consider the best means of co-operating to make a complete map of the heavens on a large scale, and with all possible attention to accuracy, by photography. As the outcome of this conference, eighteen observatories of various nationalities undertook the work, the whole sky being divided up into eighteen zones; a zone assigned to each observatory with due regard to its geographical position. A standard pattern of photographic telescope was chosen, and all the eighteen observatories obtained instruments of the required type, and set to work. The enterprise being in several respects entirely new, it has been necessary to guide the procedure in the light of experience acquired; and conferences assembled at Paris in the years 1889, 1891, 1896, and 1900 to report progress and compare notes. At the last of these conferences a second enterprise was undertaken. The small planet Eros, discovered in 1898, was to make a particularly close approach to the earth in the winter of 1900-1, thus affording an opportunity, the like of which would not recur for thirty years, of determining the solar parallax; it was felt that, although the main object of the association of observatories (viz., the formation of the astrographic chart) was not yet attained, still the advantages to astronomy which would result from utilising this exceptional opportunity were too great to be neglected, and it was resolved that the co-operating observatories should add to their programme the photographic observation of the little planet during the months October, 1900, to February or March, 1901. In connection with this second enterprise, it has been found necessary to circulate a large amount of statistical material, such as approximate positions of the planet on different dates, and of all the well-known stars lying near his path in the heavens, lists of the observations made at the different observatories, so that one might know how to match plates with another, and so on. The energy of the director of the Paris Observatory (who has from the first acted as director of the whole work) in printing and circulating this material has been most noteworthy. We have recently received the ninth circular relating to Eros, which is itself a pamphlet of 200 pages quarto, and represents a vast amount of work. In the first place, M. Lœwy discusses, in two long memoirs (supplementing a former one already published), what accuracy is obtainable from measures of photographic plates and what precautions are necessary to obtain that accuracy. The discussion is concerned with a number of minute details, and involves the adjustment of conflicting advantages, so that there is room for difference of opinion in the conclusions; but there can be but one opinion of the value of the material patiently collected and tabulated by M. Lœwy, which can be examined in the light of any hypothesis preferred. The second part of the ninth circular gives, among

other useful information, ephemerides of the planet Eros and of the sun, calculated to eight significant figures for every six hours—almost a new departure in such work, the only precedent being afforded by the investigations of Sir David Gill on the planets Victoria, Iris, and Sappho, whereby he clearly showed that eight figures were necessary to represent the accuracy of heliometer measures. To advance one decimal place is of course a step of the gravest importance, and to Mr. Hinks, of the Cambridge Observatory, belongs the credit of being the first to show that an accuracy can be obtained from photographic measures of the Eros plates of the same order as that which led Sir David Gill to ask for an eight-figure ephemeris.

The appearance of so much important literature in connection with this second enterprise, the photographic observation of the planet Eros, naturally suggests a glance at the state of affairs with regard to the main work, the astrographic chart itself. It is, as remarked in the first sentence of this article, some fifteen years since the work was initiated, and it should by this time be possible to form an estimate of the probable outcome and the approximate date of completion. It must be confessed that the original estimate of the time required has already been seriously exceeded. In the letter which summoned the conference of 1887, it is stated that:—"Ce grand travail . . . pourrait être facilement exécuté en quelques années si dix ou douze observatoires bein répartis sur le globe pouvaient se partager convenablement la tâche."

The phrase "quelques années" is somewhat indefinite, but it may be assumed that those who assembled in 1887 would have been shocked to learn that after a lapse of a dozen years scarcely one-fifth of the work projected had been accomplished. Indeed, many who are tolerably familiar with the general course of events may be startled to hear this statement made; and yet a glance at the last comprehensive report available (see R.A.S. "Monthly Notices," vol. lxi., p. 280) shows it to be only too true. It was decided to work on such a scale that 11,000 plates would be required to cover the sky, and this number was to be repeated four times, twice with short exposures (of six minutes, three minutes and twenty seconds), and twice with long exposures (40 minutes). The plates of the first series (catalogue plates) were to be measured, and the measures printed and published; those of the second series (chart plates proper) to be reproduced in facsimile. In June, 1900, the state of affairs was as follows:—15,000 of the 22,000 catalogue plates had been taken, but only 4,000 had been measured; and the measurement is of course by far the most serious part of the work. Of the 22,000 chart plates required, less than 4,000 had been taken, and only a small portion of these had been reproduced and published. So that the fraction of the whole programme accomplished in a dozen years can certainly not be put higher than one-fifth.

Does this mean, then, that it will take sixty years to finish the whole? It is earnestly to be hoped that this would not be a legitimate inference, and fortunately there are good sound reasons why it should not be. The years immediately succeeding 1887 were naturally devoted to experimental work, of which a large amount has been necessary. This was foreseen at the outset; witness, for instance, the words of the veteran Otto Struve in his opening address:—"En effet, l'astronomie pratique possède aujourd'hui, dans la photographie, un instrument de la plus haute valeur et qui, probablement avec le temps, facilitera énormément nos études épineuses. Mais restons sobres dans nos prévisions. Pour le moment, nous ne devons regarder la photographie que comme un instrument très précieux, mais dont l'étude reste encore à compléter." But it will probably be agreed that the amount of work necessary "to complete the study" has exceeded expectation.

Beyond the preliminary experiments which might have been foreseen by an individual worker, much time has been spent in a well-meant endeavour to secure uniformity in the work which has, after all, not been very successful. Thus a large part of one year was lost in attempts to devise an obscuring screen which should diminish the light received from the stars in a known ratio, and ultimately secure uniformity in the limiting brightness (or rather faintness) of the stars charted; but this attempt was at last abandoned in favour of the simpler method of fixing a definite time of exposure, which might have been adopted from the first. Or going further back in the history, it must be remembered that although a standard pattern of telescope was adopted in 1887, it took a considerable time, not only to make the eighteen instruments required, but for the makers to find out how to make them. Thus it would be fair to estimate that in 1900 the work had been in actual progress, not for a dozen years, but for less than half that period; so we need not fear that the completion of the work is still half a century off. Nevertheless, he would be sanguine who should reduce this prospective limit below twenty years, unless some very drastic measure is adopted in the near future. Some of the co-operating observatories are well advanced with their work, but others are far behind. In 1900 there were actually three which had not started at all, and these have been struck off the list and replaced by three new ones. We have good reason for anticipating energetic action from these new comers, but it must be remembered that they start a dozen years at least behind their colleagues.

This great delay in the execution of the work has been prominently mentioned, because it demands most serious attention if the original scheme is to be carried out in any real manner. Even without the addition of the Eros work, there was sufficient cause for anxiety; with that important and unforeseen addition there is reason for alarm. It is to be hoped that the dangers may be realised and obviated within the next few years.

But when we turn to the contemplation of what has been accomplished, there is good reason for satisfaction. To take first the series of catalogue plates, with short exposures of a few minutes only. Each observatory has to take about 1,200 of these, and the area of the sky covered by each is a square of two degrees in the side, so that sixteen full moons arranged in solid square formation would just about cover this area. On each plate there are some 300 or 400 star-images on the average; but this is an average from which the deviations are large. A plate exposed near the Milky Way, even for a few minutes only, shows thousands of stars, whereas if the telescope be pointed to a region distant from the Milky Way, the number may fall below 100. Taking the average as 350, there are on the 1,200 plates which form the share of one observatory some 400,000 star images; and it is the business of that observatory, after taking the plates, to measure carefully the relative positions of all these images and publish the results. Moreover, it has been found advisable to make these measures at least twice over, so that we may put the total number at something like a million. It will readily be conceded that this is a gigantic piece of work for a single observatory to carry out, and it is a great thing to be able to say that some of the observatories are already in sight of its accomplishment. Others, as has been admitted, have not yet commenced the work, but they will enter upon it with all the advantages of following an example already set, and we may consider that the greatest difficulties have been overcome.

This portion of the work affords another reason for satisfaction. Mention has been made of some preliminary experimental work which produced no positive result, but other such investigations have had more fortunate issues, especially the

research on the best method of measuring the plates. In 1887 there were at least three different methods which might be adopted, and corresponding to each of these there was a choice of patterns for the instrument to carry it out. The proper method for measuring stellar photographs has now been practically settled, and though there is diversity of opinion as to the best actual instrument, the relative advantages of the different forms are becoming tolerably well known. It will be realised how definite an advance has here been made when it is remembered that an eminent astronomer, in reviewing the possibilities in 1887, dismissed the method which has since been universally adopted as obviously inferior to the others, and not worthy of consideration. The test of experience had, in fact, not been applied, and the result of its application may be regarded as a valuable scientific asset.

Let us turn now to the other set of plates, the chart plates as they are called, similar in every way to the catalogue plates, except that they are exposed to the sky for a much longer time (forty minutes at least, instead of three or six), and hence contain thousands of stars instead of hundreds. It is proposed that these plates shall be reproduced on paper by some process which depends on the automatic action of light only, and is thus free from the imperfections incidental to human agency. The exact process has not been formally specified, and it is open to any observatory to circulate ordinary contact prints, for instance, if such can be made without losing too many of the fainter star-images. Up to the present time, however, the only reproductions of chart plates which have been published are in heliogravure. The French observatories (Paris, Algiers, Toulouse, Bordeaux) and the Observatory of San Fernando, in Spain, have produced and circulated most beautiful enlargements (twice the linear dimensions) of some of their chart plates made by heliogravure, and there are many reasons why we may hope that their example will be universally followed. To begin with, the charts are really beautiful to look at—as might be expected from the French, they have produced something æsthetically satisfactory. Secondly—a matter of infinitely more importance astronomically—the charts are wonderfully accurate. It has been shown that the places of stars can be measured from them with an accuracy almost equal to that obtainable from the original glass negatives. Finally, they are presumably permanent—far more so than the glass negatives, unless the toning process recently suggested by Sir Willian Crookes is adopted and found as successful as is expected. Against these manifest advantages is, unfortunately, to be set the costliness of the process. It is estimated that to reproduce its 1,200 plates in this way each observatory must have a sum of about £10,000 at command, independently of the actual time spent in the work. This sum is large, but not prohibitive. Five observatories are apparently already provided with it; in the interests of uniformity in a magnificent piece of work, may it be hoped that in some way or other the remaining shares will be taken up? If the paper reproductions were (as it was at one time supposed they would be) mere playthings of no scientific value, such expenditure might have been deprecated. But it has been demonstrated that they are accurate beyond expectation, that, in fact, an observatory provided with copies of this kind for the whole sky could in a few minutes obtain the place of any star down to the fourteenth magnitude with an accuracy equal to that with which the best meridian observations can be made. It seems probable that the outlay is as good a one as can be made with out present imperfect knowledge of the requirements of the future.

The consideration of what this means in actual weight of paper brings home to us in a striking manner the magnitude of the whole enterprise. If the 22,000 maps are completed in the style adopted by the French, the sheets when piled one on the other would form a column thirty feet high and weighing nearly two tons! The most elaborate star atlas which has been produced up to the present time can be bound as a single, though rather large, volume, which could be added to any library without sensible disturbance. But not so with a copy of the astrographic chart; it is a matter for the serious consideration of each fortunate possessor where and how he shall store the sheets and ensure their preservation. There is not likely, of course, to be any real difficulty in doing this, the point is only mentioned here to illustrate the novelty of the departure rendered possible by photography.

As there is an obvious danger of not being able to carry out this vast programme (for which, it will be remarked, not only scientific labour, but much hard cash is required, and the latter may not be easy to extract from reluctant governments), it is reassuring to know that there is at least one good alternative. We might carry out the work much more economically with a different type of instrument, though at the cost of some obvious advantages. The type selected in 1887, a refracting telescope, 11½ft. focal length, allows us to photograph an area of the sky at one exposure limited to two degrees square, and 11,000 plates are required to cover the whole sky. Two other types were considered and rejected. The first was the reflecting telescope, with a concave mirror in place of a lens. The area satisfactorily photographed at one exposure with a reflector is even smaller, and the number of plates required for the whole sky consequently greater. Though the reflector has distinct advantages in cheapness and in light-grasping power which have recommended it for other classes of work, there is no doubt that it was rightly rejected for the astrographic chart; all our experience subsequent to 1887 has tended to confirm this view. The third possibility open to the conference of 1887 was the use of a doublet lens, such as is familiar in an ordinary camera. The lens of a camera is made up of two lenses (each of which is itself double) separated by a definite interval, where a "stop" may be inserted. A photograph could be taken with one of these lenses alone, but only a comparatively small portion of the picture near the centre would be in good focus; the combination is made to give a larger "field." If such a doublet lens is used to photograph the sky, we get a much larger field at one exposure, and can cover the sky with fewer plates. The claim has recently been made that twenty or thirty plates would suffice to cover the sky instead of 11,000! Of course the results would be on a correspondingly smaller scale, and this extreme procedure is not to be contemplated as an alternative to the large and accurate charts with which a start has already been made. But if we could reduce the £10,000 required to (say) £1,000, we are in the region of the possible or even the probable, and this only means reducing the number of plates required in the ratio of one to ten, or increasing the area covered by each in the same ratio. We may take it as fairly well established that a doublet will satisfactorily cover a field at least ten times as large, in area of the sky, at the single lenses at present in use for the work of the chart.

The question naturally arises whether these facts were realised in 1887, and if so, how the single lens came to be preferred to the doublet. The discussion on the type of instrument to select took place on April 18th, 1887, and the procès-verbaux are given on pp. 36-43 of the official account of the conference. Twenty-six distinguished astronomers were present, and eighteen of them took part in the debate. The photographic doublet was not even mentioned. At the present time this circumstance is almost bewildering. At the end of the volume a letter is printed from Prof. E. C. Pickering (who most unfortunately was not able to attend the conference), advocating

the use of the doublet, and giving detailed suggestions for the whole work which commend themselves, in the light of subsequent experience, as admirable. But his views received no attention; the debate was confined almost entirely to the relative advantages of reflectors and refractors, and the proper size to be adopted for the later, and it must be confessed that an opportunity was lost. Since that time Prof. Pickering, using doublets, has charted the whole sky himself many times over, while the associated observatories have not yet accomplished a third of their programme. It must not be forgotten that their programme includes much more than the mere charting of the sky, viz., the measurement of some plates and the reproduction of others; but even making this allowance, the discrepancy between what he has done single-handed and what has been done on the plan preferred at Paris in 1887 is sufficiently serious.

The fact is that astronomers generally were afraid of the doublet in 1887, and some of them have not yet lost their mistrust. They were afraid that so fair a promise was too specious; that, in fact, the gain in extent of field over the refractor must be accompanied by a corresponding loss in accuracy. At the time no definite information was forthcoming on this point, and it must be admitted that even now our knowledge is far from complete. It is not so easy as it might seem to test pictures of the stars for the minute accuracy necessary to an astronomer, and it may still be proved that the choice of the refractor in 1887 was, from the point of view of getting the greatest attainable accuracy, a wise one. But, on the other hand, it has been shown that the mistrust of the doublet was largely unjustifiable; its accuracy is of a high, if not of the very highest, order. It is not even now too late to follow the excellent advice which was offered in 1887, only to be ignored. By adopting the doublet the chart plates might be completed in a reasonable time and at a reasonable cost, though on a smaller scale.

PROFESSOR H. H. TURNER., F.R.S.

SCREENS AND DIAPHRAGMS FOR HALF-TONE AND THREE-COLOUR WORK.

[A Paper read before the Camera Club and reprinted from its "Journal."]

I.

IT may be within the recollection of some who are here to-night that just over eight years ago, namely, on March 8th, 1894, Mr. F. E. Ives read a paper before this Club—I am not sure whether actually in this room—on a similar subject to that which I propose to deal with to-night. That paper I look upon as possessing quite historical interest, because it was the very earliest publication of the principles underlying the modern half-tone and three-colour processes, which in these eight years that have elapsed have made such enormous strides, and reached such a high stage of development, besides giving evidence of such immensely greater possibilities in the not distant future. It is worthy of note that in this paper Mr. Ives referred to his use of the cross-line screen so early as 1886, whereas at the time of reading the paper the screen had hardly been introduced into this country. He also pointed out that the function of a cross-line screen was to produce pin-hole images of the aperture of the lens diaphragm, that there was a correct distance for the screen from the sensitive plate, and that the shape of the dot image could be regulated at will by changes in the size and shape of the diaphragm aperture. Whilst further he set forth in the most explicit manner the necessary conditions for working the three-colour process and the making of the screens for it. In fact, it must be admitted, in spite of all that has been done during the past eight years, that there is little to add to the principles that he then laid down, and my paper to-night must cover pretty much the same ground, though, of course, I have much to say of improvements in detail, and of novel modifications of his methods. The point I wish to emphasise is that the fullest credit is due to Mr. Ives for his prescience and the knowledge he so early displayed and imparted to the world at a time when these processes were only imperfectly understood. At the same time there is some credit due to your Club for so early discovering Mr. Ives, and extracting a most interesting paper from him. With this little reminiscence I propose to leave the historical treatment of the half-tone process, and proceed to describe to you, and I hope interest you in, some of the technical and scientific features of the application of the half-tone and tri-chromatic principles.

In the first place, let us look at the half-tone screen. The Levy screen is the standard article almost universally used. It is manufactured by a neighbour and friend of Mr. Ives, in Philadelphia, Max Levy, who has often frankly acknowledged the assistance Mr. Ives has rendered him. Max Levy is a man of great inventiveness and resourcefulness, besides having infinite patience and determination, and these gifts have carried him through the enormous mechanical difficulties incidental to the delicate operation of ruling these screens. He has designed and constructed his own machines, grinds his own diamond points, polishes his glass by novel machinery, and now expresses his intention—probably half carried out by this time—of making his own glass, owing to the difficulty of getting it in the market free from bubbles and other imperfections. The glass at present used is a beautifully white crystal patent plate, imported from France, about one-eighth inch thick, which is thinned down to about three-thirtyseconds inch thickness in the necessary grinding and polishing. So far as we know of Levy's method, from the description he has allowed to be published, the routine of manufacture is as follows:—The glass is coated with an etching ground which is resistive of hydrofluoric acid, and is at the same time capable of being cut through in lines by a diamond ruling point, ground to a U shape. The glass is fixed to the bed of the machine, and the diamond point is fixed in an arm which traverses it, very much like the ram of a shaping machine. The plate is ruled at an angle of 45 deg. to its sides, and an ingenious feature of the ruling mechanism is that the arm carrying the tool automatically adjusts its stroke to the length of line it has to cut, starting with a stroke of about two inches, and increasing the length of every stroke until it reaches the central diagonal line, after which it gradually diminishes to two inches at the opposite corner. The time as well as the length of stroke is altered, as uniform ruling requires uniform speed. The machine is started and runs on automatically day and night until the plate is finished. It would be fatal to the evenness of the ruling to stop the machine.

I do not know the time required for ruling a plate, but the cycle of operations necessary for the stroke and return of the point and the spacing for the next line must necessarily be slow on a machine of this character, especially as the diamond point must be drawn very slowly over the glass plate. If we take the largest plate Mr. Levy can rule, viz., 48 inches square, which would give a diagonal of about 68 inches, the interesting calculation can be made that a screen of 100 lines per inch would require about sixty-six hours for each of the two plates required to form the cross-line result. For the four-line screen which I shall presently describe, the lines are crossed on the one plate, and the adjustments of the machine have such a degree of accuracy that the plate can be removed after the first ruling to its position for the second with such precision that the corner of a 24-inch square plate wil not be more than the 200.000th of an inch out of the position it should occupy to make the

lines cross at a right angle. Mr. Levy has said: "We can set the machine with all care, watch it and tend it, perhaps for a week, and at the end of that time the result may be success or it may be failure." When the ruling is finished, the lines are etched with acid, the resist is polished away, and the furrows formed by the etching are filled with a black made up, something like a printing ink, from the finest possible vine-carbon. Some time ago Levy experienced great difficulty with his black filling, all the blacks he could get having an oily constituent which was dissolved out by the balsam used for sealing, and rendered the transparent spaces of the screen somewhat yellow. This led him to abandon the carbon filling, and use a dark-red substance, but it was strongly objected to by the process operators, who had become accustomed to the black lines, and imagined that their troubles in the making of the negative were due to the new filling. It was stated that the latter increased the exposure, although Levy himself put it forth as an advantage that it really decreased the time. However, he had finally to yield to prejudice and return to the black filling, having evidently found ways of overcoming his earlier troubles. The difficulty of obtaining good balsam for sealing the screens together is another which Levy has experienced, so much so, that when he finds a good sample of balsam he will buy up the whole of the same kind on the market. Mr. Ives has also referred to the same difficulty in regard to the balsam required for making colour screens. Canada balsam is the kind used, but it must be in the liquid form as it oozes from the tree, and is used after simple filtering through muslin. The balsam found on the English market has been dried and the lumps re-dissolved in turpentine. The baking of the screen to dry the balsam after sealing is an important operation, which is done, I believe, with the screen under pressure, the heat being applied by a steam chest underneath.

The largest effective size of screen Levy can produce is, I believe, 42 inches by 32 inches, and one of this size is in use at the Ordnance Office, Southampton, where it is stated to be kept under lock and key, and the door probably guarded by a sentry. I suppose it is quite an interesting ceremony when the screen has to be given out for use, and one can imagine that it requires no end of permits, if not, indeed, the presence of the commanding officer. As the screen is worth something like £250, it would be a serious matter if it were broken. It is, as you may imagine, no joke to break even a small Levy screen, though it is a not infrequent occurrence in some of the process studios. I have heard of one unfortunate operator who is "doing time" for such a mishap—I don't mean in a gaol, but simply that, being a conscientious man, he offered that he would work so many hours a week overtime until the damage was compensated for. His penance has already gone on for two years, and I don't know when it will cease. In another case, a well-known firm bought a four-line screen, and it was dropped on the floor before it had been in the camera at all, whilst the operator was examining its peculiarities. I suppose, in that case, something like £25 went "bang" with as much expedition as the Scotchman's proverbial "saxpence." Screens which are scratched, chipped, and otherwise partially damaged can be sent back to the maker for repairs, and come back equal to new. Levy used to have the distinction of being the only man in the world who could make half-tone screens; but that is not so now. Wolfe, a competitor who used to make collodion copies of rulings, now supplies original engraved screens which closely resemble Levy's. In this country, Johnson, in Leicester, makes screens, which seem to give satisfaction to some operators. Similar screens are also made in Germany, by Haas, of Frankfurt. France has no manufacturer of screens, and the Academy of Sciences offered a prize some years ago to any manufacturer who could successfully start such an industry in France. Passing from these generalities about screens, let us examine the nature of the screen-ruling more particularly.

In the first place, I daresay you are all aware that screens are made in varying degrees of fineness, which means that they are ruled with a greater or less number of lines per inch. Screens can be ruled with any number of lines per inch, from 50 to 400. Until quite recently, 240 lines was regarded as the limit of fineness, and seldom more than 200 lines per inch was used in the regular commercial practice. But now Levy has ruled 400 lines per inch, and I am able to show you a piece of such a screen here to-night, which is, in fact, the only piece at present in this country. The lines are invisible to the naked eye, and it looks just like a piece of smoked glass. The ruling is very perfect, and, under the microscope, I find that the black lines are thicker than the transparent spaces, whether intentionally so or not I do not know. This 400-line screen is not merely a curiosity in rulings, but has been actually used, and yields blocks which are almost as easy to print from as much coarser ones. The tones of the pictures are practically continuous to the naked eye, and the result closely resembles collotype. These exceptionally fine rulings make excellent photogravure plates for intaglio printing, and they are exceedingly useful for the reproduction of microscopic subjects, where the finest detail must be held. Coarse screens give bold contrast, with a lack of detail, whilst fine screens give detail, but with some flatness. The coarse screens make very good poster pictures, but, as a rule, screens actually ruled coarse are not used for this purpose, for one reason, because of the large size which would be required, and consequent expense. The usual plan is to make a small negative with a screen of some ordinary ruling, and an enlarged negative from it. Recently a method has been patented called gigantography, by which a screen of ordinary degree of fineness is placed in an enlarging lantern at a properly determined distance from a positive picture, and the latter is projected together with the screen effect on to a sensitive plate of any desired size within the usual limits. The coarseness is in this case simply governed by the conjugate distances of the projection apparatus, so that one screen will do for all cases. Not only does the number of lines per inch vary, but also the relation of the black line to the transparent spacing. In the screens now most commonly used the relation of black to white is 1:1, and consequently the width of the transparent opening will be a fraction whose denominator is double that of the number of the lines per inch. For instance, 100-line screen one-twohundredth inch opening. But in some screens the relation will be found to be perhaps 5:4 or 4:3. Rarely is it in the reverse proportion. This relative thickness of line has a great influence on the working and the character of the results. In the extremely rare case where a screen has been ruled accidentally or intentionally with the lines on one plate thicker than the other, an oblong opening is formed which produces on the negative elliptically-shaped dots. Apart from such abnormal results, you can readily see that the thickness of the ruling will have an influence on the exposure and on the gradations of the negative. In the case of a 1:1 ruling, three-quarters of the area of the sensitive plate is screened. Consequently the exposure must be at least four times what it would be if the screen was not there. As a matter of fact, the exposure with the half-tone screen is generally put at five times ordinary, the time over and above that due to opacity ratio being probably accounted for by reflection from the surface of the screen—which in the case of lenses is something like eight per cent.—and to loss by refraction in the glass, as well as by absorption in the

balsam. The fact, too, that the plate is so heavily screened, and the stops used comparatively small, probably affects the inertia constant of the plate.

It has been suggested that a screen with its opacity arranged in chess-board form would be better than a cross-line pattern, as the former would only screen half the area instead of three-quarters, as in the latter case. Such a chess-board screen can be produced in various ways. For instance:—(1) A plate of glass can be covered with an opaque ground, and ruled through so that isolated squares of opacity are left. Another exactly similar plate is superposed with its squares displaced the space of one square in a vertical direction and the space of one square in a horizontal direction. Another way, patented by Levy, is to take two cross-line screens, one ruled diagonally and the other parallel to the sides, and so fit them together that the one cuts off the corners of the openings in the other, and gives a chess-board pattern. (2) An easy way of photographically making a chess-board is to make a half-tone negative from a sheet of white paper, taking pains to get sharp square dots on the negative, arranged in chess-board form, which, as I shall presently show, can be done by means of a suitable stop in the lens. It is surprising what perfectly sharp and clear chess-board effects are got in the best wet plate negatives by careful manipulation. (3) A more ingenious way than any for making a chess-board screen was devised by Mr. Deville, the Surveyor-General of Canada, who some years ago made some most extensive and interesting researches into the theory of the screen working. His method consisted in placing a cross-line screen in front of the sensitive plate at a suitable distance and in place of the lens having a diaphragm, perforated by a pinhole. An electric arc light is directed by a condensing lens to this pinhole, and the result is a series of sharp-edged isolated squares on the sensitive plate. Another pinhole is then uncovered, its distance from the first being such that an additional set of squares is printed so as to exactly fit between the set first printed, and form a pattern like a chess-board. The plate is developed and fixed, and then forms the screen. It is an interesting fact that a chess-board screen can be made into a cross-line screen by closing up alternate holes diagonally. We have then added one quarter more opacity, whilst also covering up squares which would have given double the number of dots, and consequently we must have lost in value of tone rendering. Deville says the aperture of the diaphragm with the cross-line screen should be twice as large as with the chess-board screen, but the exposure is the same for both, because there is never more than one-half of the aperture visible from the plate through the cross-line screen. That is to say, the diaphragm aperture is placed with its sides at forty-five degrees to the lines of the screen, whilst in the case of the chess-board screen the aperture is symmetrical to the openings of the screen. This rather disposes of the idea that the chess-board screen will reduce the exposure. Deville further says that in order to produce with a cross-line screen as good a result as the chess-board screen, the adjustments of the screen, plate, and diaphragm would have to be three times more accurate and the screen itself three times more perfect. The same authority strongly recommends vignetted screens, which he defines as a screen that is "semi-opaque over its whole surface, and divided into minute zones of varying degrees of opacity." That is not a very lucid definition, and requires a little elucidation.

The screens I have so far brought under your notice have what may be termed sharp-edged opacity. They are simply black lines or squares with transparent spaces. But consider a case in which the lines or squares have no sharply defined outline, but graduate from perfect opacity to perfect transparency. The chess-board dot would be a pyramid of density, and only the very centre of the space between would be clear glass. Such screens were in use in the early days of the half-tone process. Mr. Ives used a line screen of this nature, and Dr. E. Albert, of Munich, made the idea the basis of a patent. Yet I know of no one who is using such a screen to-day, so that it is reasonable to assume that they possessed no special advantages over the present opaque line screens. It is singular, therefore, that Mr. Deville should so strongly advocate them. He says:—"In theory, the vignetted screen is the most perfect one for the photo-mechanical process, because correct prints may be obtained from thin or intense transparencies by using thin or intense screens, while in copying from a negative through a chess-board screen the negative must be of the right density to give a correct print." A vignetted screen must be placed in contact with the sensitive plate, and therefore only dry plates can be used for it. The screen cannot have a glass cover, so that it is easily damaged. One advantage is that the shape and size of the diaphragm is immaterial, and so is its size provided it is not too large. A transparency may be copied in a printing frame without using a camera at all. In this case the frame must be exposed to a point of light, such as an electric arc, and the frame must be kept in the same position during the whole exposure. This process reminds me that my friend, Mr. J. A. C. Branfill, worked some years ago with considerable success a half-tone process in the printing frame, but used the cross-line Levy screen, which he placed in the printing frame, the screen being placed in front of the positive transparency with a certain separation between dependent on the usual conditions of screen distancing. The source of light was an enlarging lantern with a square stop in the objective. Dr. E. Albert, of Munich, has also introduced a process of this kind for producing a fourth negative for colour work. The only difference between his method and that of Deville's and Branfill's, which I have just described, is that, instead of using one-light point, he uses several—in fact, a number of incandescent lamps. The only effect of this that I can conceive would be to reduce the exposure, the principle being the same as using diaphragms with multiple apertures, about which I shall have something to say presently. The important reason why Albert desires to reduce his exposures is that he is making an actual print on to the bichromatic sensitised zinc plate by this method.

There is another form of ruled screen which deserves a reference, viz., Levy's four-line screen, although it is now practically withdrawn from the market on account of the very great difficulties atending its commercial production. I have here a piece of such a screen, and I will project on the lantern sheet an enlargement of it, from which you will see its peculiar pattern. Actually it consists of two glasses, on each of which a cross-line screen is ruled, one being at forty-five degrees to the sides, and the other parallel to the sides. The lines on each screen are not equal in width, nor are the spaces anything like the 1:1 relation. I estimate the opacity of this screen to be equivalent to 0.65 of the area, which results in its passing about ten per cent. more light than the ordinary 1:1 cross-line ruling. The advantage claimed for this screen is that it admits of greater variety of texture in the half-tone black, that it holds more detail, and the full values of light and shade are better rendered. An interesting optical peculiarity about the results from it is that, where a sharp straight line, such as the rigging lines of a ship, would be rendered with a saw-tooth edge by the ordinary cross-line screen, the four-line screen will render them with a straight opaque edge. That seems to corroborate the statement that the screen does not chop up the detail so much. The dot effect produced on the negatives is very peculiar, as you will see by the slide I project herewith, and by comparison with the subsequent slide from an ordinary half-tone negative.

Screens of circular dots have been tried, but have not been found to possess any advantages. The use of "bolting cloth" can hardly be treated as a practical alternative to the screen, though it was common in the days before ruled screens were as good as they now are, and probably if we had known as much about the principles of screen working as we do now, greater success might have been attained with this material. It might be worth trying again in the light of present knowledge for the production of novel effects—perhaps it would suit very well for reproducing some of the work of the impressionistic school of photography. I wonder some of that school do not study the half-tone process. They might produce some truly remarkable results by utilising the screens and diaphragms we make use of in this business, and the interesting feature of the results would be that it is highly improbable anyone would find out how they were done. The effect produced by the use of "bolting cloth" can be very much improved by giving it a slight angular displacement during the exposure. This was suggested to me by Mr. Branfill, and he showed me some very pleasing results in half-tone, produced in this way something like fourteen years ago.

I may here say a few words about an interesting method of making half-tone blocks which does not involve the use of the screen at all, and may eventually supersede it. I refer to the Amstutz Acrograph process. Briefly this consists of making from an ordinary negative a carbon print which should have a fair amount of relief. Such a print I have here. A piece of thin celluloid is laid over it, and the two strained over the cylinder of a little machine, which at first sight is very much like a type-writing machine. The cylinder revolves continuously, whilst a V-shaped cutting tool is pressed against the celluloid and cuts the equivalent of a screen thread on it, with this important difference, that the thread varies in depth, and at the same time the cut space varies in width. This is due to the tool's rising and falling as it passes over the carbon relief which backs the celluloid. There is a tiny sapphire point continually pressing down the celluloid in front of the point. The result of this action is that the photographic tones represented by the varying relief of the carbon are faithfully reproduced in the engraved lines. The result is as you see on the slide I now project. The celluloid can be printed from right away, or it can be electrotyped, stereotyped, or transferred to zinc and etched. The process is very rapid, the actual cutting only taking about two minutes, whilst the whole of the operations, including the making of a negative and a carbon relief can be done within an hour. The process seems likely to be very good for daily newspaper illustration, especially as the blocks are cut deep and print well. The average depth of a 125-line half-tone in high lights has been found to be .0015 inch, whilst an acrotone is .002.

Let us now consider briefly the matter of irregular-grain screens such as are now becoming popular. The very earliest experimenters in process work down to the very latest have believed that the ideal breaking-up method would be one of irregular grain, yet the productions resulting from carrying out this idea have not so demonstrated its superiority, except for certain classes of work eminently suited for such screens, viz., for broad effects in painting, drawing, and photography. When it comes to rendering fine detail and delicate light and shade with crispness and clearness, the irregular-grain screen is quite out of it in competition with the cross-line screen.

Mr. Sanger Shepherd was one of the earliest on the market with irregular-grained screens, and his plates were apparently all that could be desired in this way. But the results from the screens were not popular. Whether it was that the half-tone men did not handle the screens rightly or that the printer made a mess of the blocks, I don't know, but the fact remains that Mr. Sanger Shepherd finds colour-photography a more profitable line to pursue. The late E. Gaillard, of Berlin, also produced some good grain screens, and the Haas irregular-grain screen is another well-known make. So far all these screens consisted of opaque grain, produced apparently in a very similar manner to laying the asphaltum dust ground on a photogravure plate, and the grain was practically the same as is got on a photogravure plate. There can be no doubt that the photogravure grain is a very perfect one for tone reproduction, but it owes much of its success to the method of intaglio printing which is invariably used in conjunction with it. Use the same grain in a screen, or for a relief block without a screen, and the result is flat and dirty. The same objection applies to the use of the collotype grain. Here is an enlargement, 100 diameters of the collotype grain, prepared for me by Mr. W. T. Wilkinson. No grain could be more charming than this in the collotype, printed in the collotype way, but it is generally a smudge when used to produce relief blocks. The fact is, that you must suit the printing process to the grain. That is why the half-tone process only yields its best results when printed on the glossiest paper with very opaque ink, and the most precisely sharp impression. There is one kind of irregular-grained screen now coming into vogue in which I have the greatest faith, viz., the Metzograph screen, invented by Mr. James Wheeler, of Bushey. The previously mentioned irregular-grained screens have probably from a quarter to half their area opaque, but the Metzograph screen has no apocity whatever. It looks like a piece of clear glass, but when examined more closely it will be found to have an embossed grain on one side. This is produced in a peculiar way. Mr. Wheeler is a maker of a pharmaceutical product known as pyro-betulin, which is obtained from birch-bark, and when sublimed it is found to deposit itself on a glass plate in a reticulated grain of any desired fineness. This grain being of an acid-resisting nature, the spaces between can be etched by means of hydrofluoric acid, so that apermanently embossed granulation is imparted to the glass. When a screen prepared in this way is placed in front and close to the sensitive plate, each of the grain points acts as a tiny lens or prism, deflecting or transmitting the light so as to produce alternate light and dark places. This action can be readily understood by noting the effect of light and shade in the embossed glass used in doors, partitions, and windows. Whatever the precise theory of its action may be, the fact is there that it produces a beautifully grained negative, which yet certain classes of subjects has a very good effect, as the results I pass round will show. This screen obstructs very little light, but as it is necessary to use a very small stop to produce the the crispness of grain necessary for the relief block making, the exposure is quite as long as for the cross-line screen. It can be also used in general photography with ordinary stops to subdue detail, and it saves the necessity of a good deal of retouching in portrait work. The screen can be made also to yield an orthochromatic effect by coating it with coloured collodion. It has been suggested that by its use the half-tone and colour screen could be combined in the one exposure. This has also been suggested as an application to cross-line screens, and a patent taken out for it. The colour film, it was proposed, should be between the glasses.

I must now turn to the question of diaphragms for the half-tone process. I think it must be pretty well known to all here, that the half-tone workers use square and other shapes of diaphragm apertures other than round ones. A round diaphragm can be used, but is not so effective for forming the

screen dot. To understand why that is so, we must fully grasp the fundamental principle of half-tone work, viz., that every aperture of the screens acts as a pinhole lens, and photographs the brightly illuminated diaphragm aperture. Consequently, whatever the shape of the diaphragm aperture, that will be the shape of the dot images on the sensitive plate. Thus a round aperture gives a round dot, and a square aperture a square one. Now let us see which will give the best result. Here is a diagram which shows the range of gradation from high light to shadow in a theoretically perfect half-tone negative. You have three distinct kinds of dots:—

(1) Dots which have overlapped each other in the high lights and formed transparent openings.

(2) Dots which are isolated, but varying in size in the middle tones.

(3) Fine isolated dots in the shadows.

Of course, the print will be the reverse of this, and will give:—

(1) Small isolated dots in the high lights.

(2) Fairly large white dots in the middle tones.

(3) Small white dots in the shadows, becoming invisibly small or covered in altogether in the deepest shadows.

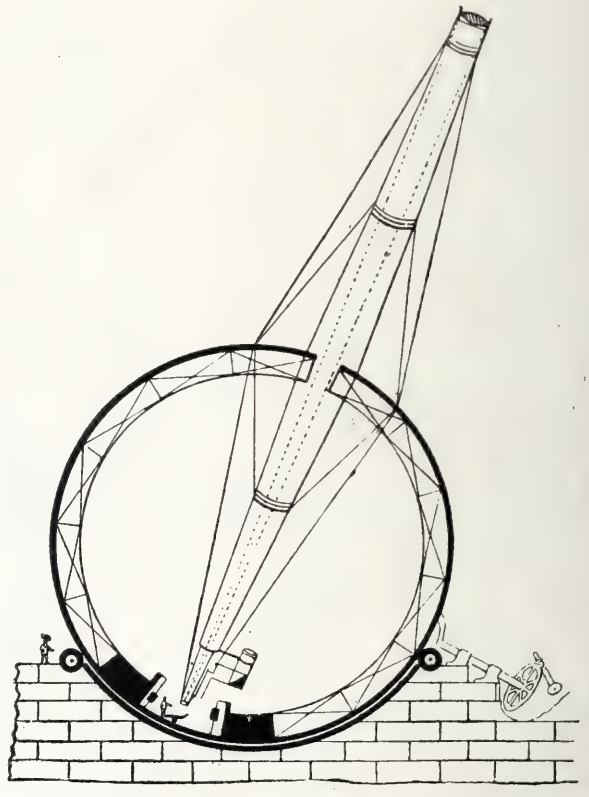
The crux of half-tone negative making is to get all these kinds of dots on the negative at the same time. The first difficulty is to get the joining up of the high light dots, and the difficulty is intensified if you use a round stop. At first, perhaps, it is not joined up enough, and the next time it is joined up too much. You can see it is difficult to get four circular dots to approach each other and let no light between where they touch. The point of contact is so very small. If you make them overlap, you get a very small area of transparency in the space between any four dots. The result is, a very small dot is printed in the high lights, and it is too weak to stand the etching. Now look at the four squares joined up to each other with their corners overlapping. You get quite a large opening, and consequently a good fat dot on the metal to resist the etching. A big dot can always be etched down smaller, and that is why the half-tone negative maker aims to get big openings in the high lights of his negative. To promote this joining up in the high lights, various forms of diaphragms have been used; such as those you see here with extended corners. You can quite understand that the function of their extensions is to make the overlapping more perfect.

WILLIAM GAMBLE.

PLANS FOR A GREAT TELESCOPE.

[Reprinted from "The Scientific American."]

PROF. TODD, of Amherst College Observatory, has devised an ingenious plan for constructing a telescope, on the model of a gigantic eye, 100 feet in diameter, with a pupil represented by an object-glass five feet wide. A tube 200 feet in length, occupying the position shown in the illustration, is designed to extend 100 feet beyond the exterior of the sphere. The focus of the telescope falls on the interior of the sphere, at the point where the retina of the eye is located, and here the eye-pieces, spectroscopes, and photographic cameras are to be placed under the control of the observer. The entire sphere is to be floated in a zonal basin constructed within brick or stone masonry, about twenty-five feet in depth and from 100 to 120 feet square. By this means the utmost ease of motion may be acquired in directing the sphere. In order that the observer may enter the sphere, the tube must be placed in a nearly horizontal position, the observer entering through a door in the tube, at a point close to the sphere itself. He then walks along a pathway leading to the adjustable platform, where the eye-pieces and other accessories are stationed. This platform is delicately poised by means of weights which are so adjusted, that if additional observers are admitted on the platform, their equivalent weight must first be removed before observations begin. This swinging platform may be compared to the glass crystal of a ship's chronometer, being mounted in the same way, always maintaining a horizontal position, no matter in what direction the axis of the telescope is pointed. From this platform, and extending through an opening in the sphere, is an electrical cable controlling an exterior automatic apparatus, by means of which the telescope may be pointed in the necessary direction for altitude, azimuth, in declination or right ascension. These specified motions may be obtained by means of a series of rubber-faced wheels, mounted on oscillating forks or levers, three wheels being necessary for each



PROF. TODD'S PLAN FOR A TELESCOPE.

co-ordinate, and the required speed being controlled by electric motors. The cable connection inside the platform enables the observer to use any set of co-ordinates he may need, it being possible, of course, only to use one set at a time. Following the design of the antique armillary sphere, a series of automatic-setting devices for the horizon and equinoctial system of co-ordinates is advisable, these setting-systems being gimbal-mounted and controlled by means of a pendulum. In order that the eye-piece of the finder of the telescope may be as close to the eye-piece of the great tube as possible, Prof. Todd considers a finder with a duplex Coudé tube essential.

With regard to the clockwork required for controlling the moving parts of the telescope, such as the dome and the observing platform, exceptional power is needed. Prof. Todd suggests that the mechanism should consist of electric motors

controlled by the observer from his chair, thus making a change of level in the floor or the observer's chair unnecessary. In the present style of mounting, the dome is separate from the rest of the structure, and means must be provided for rotating it in the required direction, while Prof. Todd's suggested form of mounting a telescope, either refractor or reflector, is one in which the telescope, observing-floor and dome are all combined in one. When not in use the exterior tube of the telescope is lowered nearly level with the ground, and the objective is sheltered beneath a movable roof, like that of a transit-room. In this way, the objective is accessible at any time for the purpose of adjustment or repairs. If such a telescope were placed on a high mountain, it would be possible to keep the interior of the sphere at a comfortable temperature by means of electric heaters, and within a compartment of the sphere, a barometric pressure might be maintained by artificial means.

Prof. Todd estimates the price of such a telescope as follows:

	Dollars.
Sphere	175,000
Five-foot objective	75,000
Masonry and cement basin	5,000
Clockwork and motion...	10,000
Tubes and eye-piece accessories	10,000
Total	275,000

MARY PROCTOR.

New Apparatus, &c.

The "Dalo" Hand Camera. Sold by George Houghton and Son, 88 and 89, High Holborn, London, W.C.

The distinctive feature of this camera, the latest introduction of Messrs. Houghton, is the application of the system of what is known as daylight loading and changing to cut films. In the back of the camera is fitted a movable spool holder, to which the spool of flat films is easily attached. Then, by an ingenious movement the black paper is secured to a winding-reel, and as the paper is unwound a cut film is successively brought into the focal plane, and, after exposure, deposited in a receiving-box in the base of the camera. In other words, one gets the peculiar advantages of a roll-film camera utilised in a system expressly designed to afford those photographers who have a "penchant" for the use of cut films the opportunity of gratifying their tastes. In our practical trials of the system we found it easy of application. It is fully explained for the benefit of



beginners and others in the "Dalo" booklet, copies of which may be had of Messrs. Houghton. The other features of the camera are:—Two brilliant finders and a rotating diaphragm, and a time and instantaneous shutter, both actuated from the front of the camera. The release is at the side. The milled head shown at the back of the camera controls the winding-key for the black paper. The large key turns the spool, which revolves in the body of the instrument. A little catch at the top of the camera allows of the front being extended, and when that catch is released the front springs back into position and performs the peculiar office of pressing against the film in the focal plane, thus holding it flat and in register. The "Dalo" certainly embodies several novel ideas, and may be commended to the attention of those photographers who are ever on the alert for the *dernier cri* in camera construction.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

August.	Name of Society.	Subject.
16	Camera Club.....	Ramble—Swimbridge and Landkey. 2.45.
16.....	Woolwich Photographic	1. Lambeth Palace. Leaders, W. H. Dawson and J. B. Panting, F.R.P.S; or, 2. Palmers Green. Leader, Alex. Lees.
16.....	West London Photographic ...	West Drayton.
18	Southampton Camera Club.....	
20.....	North Middlesex Photographic	*A few Notes on Photographing Natural History Subjects in the Field.* Mr. T. B. Bayne.
20.....	Birmingham Photographic	Excursion to Dodderhill Common. Leader, Mr. Lewis Lloyd.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

AUGUST 7TH.—Mr. F. C. Kellow in the chair.

Mr. W. G. Barker passed round a reversed negative. This had received a snapshot exposure in a rather badly lighted place, and after leaving in the developer for half-an-hour, no image whatever appeared. A large quantity of water was then added, and the plate was shut away for forty-eight hours, the result being a decided positive. Edinol was the developer used. Mr. H. C. Rapson asked whether dry plates now in the market contain a quantity of free silver, as he had always understood that this was fatal in a dry plate. Mr. A. L. Henderson remarked that, if this is so, one would have to use a large amount of bromide in the developer, as pyro and free silver would mean fog. Mr. Rapson said his reason for asking this question was because he cannot conceive what the deposit is which he finds in his porcelain developing dishes. This deposit cannot be removed with acid, but after using acid and then flooding the dish with ferricyanide and hypo it is removed.

Mr. A. Mackie said that he had noticed, after using some of the newer developers, a curious stain was left in the dish, but did not think it was free silver.

Mr. A. L. Henderson, referring to the speed of plates, remarked how he used to put in a certain amount of bromide potass and nitrate of potass when making up his emulsion, which was boiled up longer than usual, and had the effect of increasing the speed more than twice, and gave three times the density, the extra amount of nitrate preventing fog. Mr. Henderson said that the plates at the present time, in his opinion, are not so rapid as they were eighteen or twenty years ago. In proof of this, four different makes of plates had been obtained, all of the highest speed made. Some of each had been carefully tested with a Warnerke's sensitometer, and some with a drop shutter. These were all developed with the developers recommended by each maker, and not one gave 20 on the sensitometer; whereas, plates eighteen years ago gave 25 strong.

Mr. Mackie suggested that Mr. Henderson had made his tests with the old luminous screen, which has now been altered.

A general discussion followed on the use of actinometers, Mr. Henderson being rather opposed to such instruments; but it was the general opinion that to the novice and ordinary amateur they were, no doubt, a very useful guide in estimating an exposure.

PHOTOGRAPHING PLATE CULTIVATIONS.—W. A. Mitchell finds that, in photographing plate cultivations which have been made in scratched dishes, the scratches which are sometimes only too faithfully reproduced and interfere very much with the photographic detail of the cultivation, can be avoided by putting a drop of cedarwood oil thinned with xylol on the bottom of the dish, after it has been thoroughly cleansed with swabs of wool soaked, first, in hydrochloric acid, and then in water. The oil is well rubbed in with the finger-tips. It is important that the oil should not be too thick, and that it should be well rubbed in so that no scratches are visible. The best result is obtained when the oiling is done twenty minutes or so before the photograph is taken. Every bacteriologist knows how easily cultivation dishes are scratched, and in research with mixed cultures it is impossible, as Mr. Mitchell points out, to duplicate a plate should it be scratched and a photograph of it be desired. The editor of the "Lancet" has received for inspection (1) a photograph of a gelatin culture in a dish which was purposely badly scratched, and then thoroughly cleansed in the way indicated; and (2) a photograph of the same dish taken with the same lens, with the same stop exposures and lighting arrangement, but with one-half of the dish oiled. It is stated that the advantage of this simple method is obvious from the latter photograph, the scratches being quite eliminated.—"The Pharmaceutical Journal."

LONDON and Provincial Photographic Association.—Throughout August the Thursday evening meetings will be open to any member or visitor who has any matter of photographic interest to bring forward. Colonial and Continental visitors are always welcome at the meetings, at the White Swan Hotel, Tudor Street, Fleet Street, E.C.

Commercial & Legal Intelligence

Messrs. Marion and Co., Ltd., of 22 and 23, Soho Square, London, W., announce that a most successful series of nineteen photographs of the King's Coronation Procession will be published immediately (size, 11in. by 9in.), trade price, 8s. per dozen or 12s. the set); also a set of twelve full-size postcards (price, 1s. 4d. per dozen or 15s. per gross).

On Saturday last, August 9th, the works staff of Messrs. J. H. Dallmeyer, Ltd., held their annual excursion to Southend-on-Sea. The chair at the dinner was taken by Mr. Thomas R. Dallmeyer, F.R.A.S., managing director of the company, and he was supported by Mr. St. L. Carson and Mr. Thomas Bedding, F.R.P.S., Editor of the British Journal of Photography. The toast of "The Company" was given in appreciative terms by Mr. Frampton. Mr. Dallmeyer, in response, dwelt upon the good feeling that existed between the company and its staff, and took pride in the knowledge that so many veteran workers still stuck to the old shop. Amongst the other speakers were Mr. Carson and Mr. Bedding. The dinner was followed by an entertaining musical programme, and the day's outing was very successful and enjoyable.

A Photo Canvasser's Frauds.—At Atherstone, on Thursday last, James Johnston, described as a photographer, of no fixed abode, was charged with obtaining 6s. by false pretences from John Moore, platelayer, Amington, on October 30th and November 10th, 1901. Prisoner met Moore, represented himself as a canvasser in the employ of Mr. Whitehouse, photographer, Vauxhall Road, Birmingham, and said he had been requested by Moore's sweetheart to wait upon him with respect to their photographs being taken. It was arranged that the young man and sweetheart should sit, and Moore paid 1s. as a deposit. On Sunday, November 10th, prisoner and another man visited Moore's house, and Johnston's companion took a photograph of the couple. Prisoner then received 5s. from Moore, the former making out a receipt on the back of a handbill advertising Whitehouse's photographs, and which was handed to Moore before he gave the order to Johnston. A proof of the photograph was promised the following Tuesday, but, nothing coming to hand, Moore communicated with Mr. Whitehouse. He wrote in reply that he knew nothing of the matter, and that Johnston must be getting money by false pretences. Charles Whitehouse, the Birmingham photographer referred to, failed to recognise prisoner, but said he resembled a man named McCarr who once called upon him. Witness was not in the habit of employing agents. The handbill which prisoner handed to Moore was one of a number issued by him (Whitehouse): there was a pile of them on the counter in witness's shop, and anyone could take one. Prisoner, on oath, alleged that Mr. Whitehouse appointed him to canvass for orders, and that he did extensive business among railway employees in Birmingham. He pleaded not guilty. Sergeant Harrison said Johnston had recently undergone imprisonment for embezzlement at Burton-on-Trent. Witness had received complaints from no less than thirty persons residing around Tamworth of prisoner soliciting orders and not supplying the goods. The Bench sentenced him to two months' hard labour.

Re Frederick Walker Smith and Philip William Taylor, trading as "F. W. Smith and Co.," carrying on business as photograph frame back manufacturers, at Stanley Works, Leopold Street, Birmingham. The above-named debtors appeared for their public examination at the Birmingham County Court, on Wednesday last, before Mr. Registrar Whitelock. The statement of affairs filed by the debtors disclosed liabilities amounting to £2,815 19s. 2d., and assets estimated to produce £725 6s. 9d. The separate estate of Frederick Smith showed no assets, but a deficiency of £66 7s. 11d. Philip William Taylor's estate showed a balance on the right side of £44 17s. 2d. Under examination by the Deputy Official Receiver (Mr. Woollett), Frederick W. Smith, who lodges at 110, Avondale Road, Sparkhill, stated that he commenced business in 1895 as a paper box maker, with £100 capital given him by his father. In 1896 he began to make photo-frame backs. A balance-sheet prepared on July, 1900, showed liabilities £844 and assets £934 4s. 4d. There was also £1,000 due to his father, but it was arranged that no claim would be made for ten years for repayment of the principle if interest was paid in the meantime. If this had been included in the balance-sheet it would have been evident that he was insolvent. On April 26th, 1901, he was joined in partnership by Philip William Taylor, who introduced £500 lent him by his wife. A rough balance-sheet was prepared, showing that, excluding the liability of £1,000, he was solvent, but that document had been mislaid. It has not been destroyed intentionally. Since then the business had been carried on at a loss. In twelve months they lost £478 6s. 10d., and drew £558 7s. 8d., making a total of £1,036 14s. 6d. For some time they lost £3 a week. Asked to explain why they went on trading at a loss, he said he knew they had to cut down the profit to vanishing-point in order to get a connection, but he did not know they had made such a loss till the books were audited. Mr. Woollett: So long as you could draw £5 or £6 a week, and your creditors did not press, you were content; in fact, you were living on your creditors?—So it appears now.—Mr. Jacques, on behalf of the trustees questioned the bankrupt as to why he sent his furniture back to the dealers a week before filing his petition although there was only £4 owing on it. He explained that he had to give up his house, and he could not raise the money to complete the purchase. He denied that he asked the furniture dealers to store the furniture for him. It was his wife's furniture that he asked them to fetch. The Registrar: What do you propose to do in the future? Bankrupt: I don't know. The Registrar: How are you living? Bankrupt: Friends are helping me. The Registrar: That is a miserable state of things after drawing £5 or £6 a week at the expense of your creditors. Philip W. Taylor, of 41, Castleford Road, Sparkhill, was also examined, and gave similar answers. The examination was concluded.

News and Notes.

Sir Benjamin Stone has greatly enriched his historical collection of photographs during the present Session. The visits to the Houses of Parliament of native soldiers from far-off lands, of Colonial soldiers, Indian rajahs, Asiatic Sultans, powerful princes, and renowned citizens who represent the wealth, power and importance of the British Empire, have afforded opportunities, of which Sir Benjamin Stone has taken full advantage, for obtaining unique pictures on the terrace, besides which his camera has been freely utilised for securing pictorial records of recent events, such as the changeful aspects of Westminster Abbey, the appearing and disappearing street decorations, the throngs of sightseers, the varying dress of the Canadian Arch, and so on. For reasons which will be understood, most of these Coronation pictures cannot be exhibited or even seen until after the actual ceremonial has taken place; but it is hoped that, with the approval of the King, some arrangement may be made for exhibiting them later in the year, possibly during the autumn sittings of Parliament.—"The Times."

Better Paper Wanted.—New alarm has been caused by fresh evidences of the utter unreliability of modern paper and ink, so far as lasting is concerned A British Government Commission is now investigating this important subject. It is found, on examination, that some public records not more than thirty or forty years old are so faded as to be illegible, and the paper greatly deteriorated. In the United States the matter is brought home by the fact that the precious original Declaration of Independence, preserved in the State Department, Washington, is all but gone to pieces, and the writing on it almost undecipherable. The Pope some years ago called a conference of librarians and chemists from all parts of Europe to meet at the great monastery of Einsiedelen, in Switzerland, to consider the question of better paper and ink, and the subject was thoroughly discussed at that time. There are plenty of ancient manuscripts in existence which are as legible as the day they were written, but most of the paper and ink used for manuscripts in these days will not last many years. The most enduring writing material is the original papyrus of Egypt. This became extinct as an article of commerce during the period of the Arab occupation of that country. Then parchment, made of sheepskin, came into general use; but the demand for writing material was greater than the supply from this source. Henry I. of England was unable to procure enough parchment for a single large illuminated edition of the Bible he proposed. It was not till about the 14th century that paper made of linen or cotton was produced in Europe, though the Orientals had used it several hundred years. But in time even this material became inadequate to the demand, and paper made from wood pulp came into use. Virtually all book papers and the great bulk of writing papers are now made from wood, and it is certain that the life of this material is very short. Most of the work done on typewriters will probably not be legible to the next generation, owing to the non-permanent nature of the aniline inks used.—"Invention."

The late J. R. Mann.—It is with great regret that we ("Sharland's New Zealand Photographer") have to announce the sudden death of Mr. J. R. Mann, whose photographs of native life and New Zealand scenery have just gained the prizes offered by Sharland and Co. Mr. Mann was an experienced outdoor photographer, and for several years past had devoted himself specially to press-work. He seemed to know just what class of subject would take best with the public, and how to develope his negatives so as to make the best prints for reproduction. He was quite a master of the craft, and his pictures have always been readily accepted for publication in newspapers and magazines. We reprint a paragraph from the "New Zealand Herald," giving full particulars of the circumstances attending his death:—"A photographer named J. Randell Mann died very suddenly at half-past twelve on the afternoon of May 26th, whilst engaged in his profession, at Wirth Brothers' Circus, Freeman's Bay. Mr. Mann, accompanied by Mr. Alf. Jones, went to the circus shortly after noon for the purpose of taking a photograph of the tigers belonging to the combination. A feature was to be made of the picture by the presence in the cage with the wild beasts of a young lady (Miss Purcell by name) who had undertaken to stand inside the cage whilst the photograph was being taken. The details were carried out, and Mr. Mann took the photograph. Immediately afterwards he remarked, "That will do, gentlemen," turned away, and dropped down dead. The cause of death was apparently heart disease, accelerated, no doubt, by excitement occasioned by what was going forward. Mr. Mann was formerly in business as a photographer in Melbourne, where he acted for several papers, including the "Leader," being well-known as a press photographer in Australia for many years. He came over to New Zealand and photographed incidents connected with the Royal visit throughout the colony, for several papers, afterwards settling down in Auckland, where he has been living ever since. During

he last twelve months deceased did a considerable amount of work for he "Auckland Weekly News," and other papers, besides acting as agent or Australian journals, including the "Sydney Mail." Deceased was a lever outdoor photographer, and his pictures were frequently accepted nd reproduced by the English newspapers.

The "Monthly Notices" of the Royal Astronomical Society.—Fellows f the Royal Astronomical Society should study the number of the Monthly Notices" (only just issued) for June, if they wish to learn how ts funds are expended in printing. I have very little hesitation in say- ng that not 10 per cent. of the fellows will ever cut thirty-six of the ages of the part lying before me, and assuredly not 2 per cent. will ver dream of wading through them. They are the work of men who pparently wish to air their mathematical knowledge at the cost of the ociety. The first paper is by Mr. Plummer, and takes the form of a Note on the Principle of the Arithmetic Mean," and fills six pages, argely with formulæ (as the advertisements say) "of no use to anybody ut the owner." Then Mr. Hinks occupies ten pages with a paper on he "Reduction of Photographs of Eros," which he entitles, "Combination f Results from Mount Hamilton, Minneapolis, and Cambridge"; but I seek in vain for those results themselves. What the paper really seems meant for is to glorify Mr. Hinks's method of reduction, and to show hat, as they say onthe boxes of pills, "all others are counterfeits." If, however, Messrs. Plummer and Hinks chastise the ordinary average reader of the "Monthly Notices" with whips, Mr. Filon chastises them with scorpions, for he actually fills twenty pages (!) with "Reduction of Photographs of Swift's Comet (a 1899) taken at the Cambridge Obser- vatory with a Portrait Lens." As a specimen of unutterable dreariness and practical uselessness this paper would be hard to beat. Page after page of formulæ, which not 1 per cent. of the Fellows will ever look at, and the old *crambe repetita, re* the co-ordinates of objects to be measured, form Mr. Filon's contribution to those essays by the little mutaul admira- tion association (limited) whose objects seems to show that they, and they alone, are to be trusted in determining the position of a star on a photograph. I am not concerned to dispute that parts of these papers might interest the members of the Mathematical Society; but, of course, I am ignorant whether they have ever been presented to, and rejected by, that Society or not. There are other papers in the number which are of very much greater astronomical interest, by Mr. Thackeray, Dr. Downing, Mr. Cooke, of Perth (Australia), one on Mr. Gledhill's Obser- vations of Jupiter in July, August, and September, 1901, and a series of observations of the Nova Persei, by Dr. Rambaut, Mr. Backhouse, and Mr. Stanley Williams, together with Mr. Crommelin's invaluable ephe- meris for Physical Observations of Mars.—F. R. A. S. in "The English Mechanic."

The Forthcoming Meeting of the British Association at Belfast.—Our contemporary, "Nature," last week gave a preliminary statement of some of the subjects to be brought before the Belfast meeting of the British Association. In Section A (Physics) there is to be a department in astro- nomy and cosmical physics, to be presided over by Professor Schuster. To this department papers on the work on Eros, on the Moon, and on Nova Persei will be presented, and some discussion on points connected with the nebular theory will, it is hoped, take place. Photographs from Yerkes Observatory will probably be shown, and several seismological communications will be made. In the section itself, Lord Rayleigh will probably raise the question of the conservation of weight in chemical reactions; Professor Trouton will describe his experiments to detect the rotation of the ether with the earth, and Dr. Larmor will have something to say on the temperature of radiant energy. Belfast will be repre- sented in the programme, Professors Everett, Morton, and Dixon having several communications to make. The president of the Engineering Section is Professor John Perry, F.R.S., whose presidential address is looked forward to with interest. In this section it is expected that an important report will be presented by the Committee on Road Traction. The committee, the secretary of which is Professor H. S. Hele Shaw, was appointed two years ago to investigate certain questions connected with the propulsion of vehicles on roads. The introduction of motor-cars has made these problems of great importance, and one easily realises that much has to be done, remembering that scientific engineering was born long after the railways had absorbed all important traffic from the roads. The Screw Gauge Committee reported last year that it was transferring its work to the National Physical Laboratory, and the pro- gress of this will probably be reported this year. Among the papers to be read are several on Irish water questions, on problems connected with steam raising, on electrical and surveying apparatus, and on some subjects of mechanical detail. The president of Section L (Educational Science), Professor Henry E. Armstrong, F.R.S., will deliver an address on the morning of Thursday, September 11th. The subjects to be brought forward in papers, addresses, or reports with a view to dis- cussion are:—"Recent Reforms in Irish Education, Primary and Secon- dary, with a view to their Co-ordination," by Dr. W. J. M. Starkie; "Re- port on the Teaching of Mathematics"; Irish Educational Work: (1) "In- termediate Education in Ireland," by R. M. Jones; (2) "The Introduc- tion of Practical Instruction into Irish National Schools," by Mr. W. Mayhowe Heller; "Technical Instruction in Relation to Industrial De- velopment in Ireland," by the Right Hon. Horace Plunket; "Report on Teaching of Science in Elementary Schools"; "The Training of Teachers," by Professor Withers, Miss Walter, and others; "Report on the Con- ditions of Health essential to the carrying on of the Work of Instruction in Schools"; "The Subjects to be Taught as 'Science' in Schools and the Order in which they should be Taken," by Dr. C. W. Kimmins; papers on "Educational Experiments"; "The Teaching of English," by Mr. P. J. Hartog, Canon Lyttelton, and others; joint discussion with Section G on "The Training of Engineers"; and "Interim Report on Examinations."

At the Nature Study Conference last week Professor Bickmore gave a brief account of the system of "Visual Instruction," carried on under the auspices of the State Superintendent of Public Instruction, from his institution throughout the State of New York. He explained that at first he tried the experiment of describing the countries from which speci- mens for nature-study were taken, and it occurred to him that this could be done, to some extent, by photographic representations. His first audience numbered about twenty-five teachers and three officers of the Board of Education. Their work went on until last winter, when his aggregate attendance was 26,910. His lectures were recorded, and copies with illustrations were supplied to eighty-five cities and villages in the State of New York, whence they were "loaned" to the surrounding towns. The instruction was repeated in twelve other States of the Union, and it had spread into Canada, where the attendance last year was 8,400, and this year over 27,000. The exhibition, he said, was the first of its kind that he had had the privilege of visiting in Great Britain, and he had some to see our method, and, in some cases, copy them. In order to illustrate his system in detail Professor Bickmore afterwards dis- played a series of views in actual use in the schools of New York City, beginning with a number of slides representing a teacher of a kinder- garten school and her class going from New York City to the adjoining country. The slides depicted a garden of flowers, where the life history of a lotus flower was displayed in all its natural and brilliant hues. He then exhibited some views to illustrate teaching in the grammar schools. These views portrayed a journey from the Atlantic to the Pacific coast. Later in the week Professor Bickmore continued his address on "Visual Instruction" as carried out in the United States, and dealt chiefly with volcanic eruptions. His opening remarks were devoted to a description of the islands of St. Thomas, Santa Cruz, and St. Christopher (St. Kitts), which, he said, were very fertile. As they came further south in this group of islands, the Lesser Antilles, the volcanic region was entered. A lantern-slide view of St. Pierre was shown, illustrating the high degree of cultivation which existed before the eruption, as well as a picture showing the manner in which the ships formed part of the town. Slides depicting St. Pierre during the eruption were thrown on the screen, giv- ing an excellent idea of the situation, with streams of mud flowing from the mountain and the thick clouds of smoke overhanging the country The lecturer remarked that as the flood poured down there was a burst of light, accompanied by a sheet of flame. From this they had discovered a new fact in regard to volcanic eruptions, that gases from the interior of the earth, when united with the oxygen in the air, burst into flame, so that the atmosphere was actually ablaze. The slides also showed a pillar-like mass of cloud, thrown to a height of some thousands of feet by the explosion, which, on rolling down the side of the volcano, swept away 26,000 persons in a few seconds. Other pictures illustrated the manner in which the country was scored with deep channels after the explosion. These channels, Professor Bickmore observed, had been formed by torrents of rain, which were caused by the condensation of large clouds of smoke rising to a very high altitude. These torrents, on their way down, became rivers of black mud. Professor Bickmore went on to give a description of a visit he had paid to the Hawaiian Islands, where all the rock was volcanic. Pictures were shown of rivers of fluid rock in the islands, and at Mauna Loa two photographers were taken solely by the light of the fluid rock.

Going to Nature.—Among mechanisms a great deal is heard about learning things from Nature, and many mechanics are fond of tracing analogies between Nature's structures or ways and the things done by men. An original view of this matter is taken by an editorial writer in the "Journal," of New York. Speaking of Professor Langley's experi- ments in mechanical flight, he says:—"On two high towers Professor Langley places his cameras. As the birds pass they are photographed from two positions at once; the direction and force of the wind are recorded at the same time. Buzzards and other high-soaring birds are studied especially, and Professor Langley thinks the photographs will help him to solve the problem of human flight. Any kind of concen- trated observation is useful. Probably Professor Langley will be led to useful thinking and experimenting by his watching of birds. But he will not learn from birds the secret of human flight. That secret, like all other great secrets affecting humanity, will be found in the human brain. Nature—so much praised and for ever put before us as an example—does things really in a primitive, wasteful way. Her forces work regardless of economy, and puny man, mentally developed only one- thousandth part, can already teach Nature more than she can teach him. Man could not learn the secret of swift locomotion by watching the antelope. He could not solve the problem of transcontinental freight- carrying by photographing the powerful elephant or whale. He had to use his brain. Through his own genius he learned to take a sphere, cut a slice out of it, and make a wheel. Two of these wheels he attached to an axle. He had his cart—a rough concern first. He has now his ball bearing sulky, and his lightning express train. He will have swifter and more marvellous conveyances later; but they will come out of his brain—not from Nature. There is no hint in Nature of the railroad, nor of any great and indispensable human machine. Nature carries birds through the air by means of exaggerated fins, acting on the atmosphere as fins of fishes act on water. She sends animals speeding through the forest on four levers, which strike the ground and propel the beasts in various awkward ways; but a little girl on a bicycle could run any deer to death in a forenoon, and in the future that same girl will be able to outfly the condor and make the albatross feel like an aërial stage coach

of days gone by. The one powerful thing in this world is an idea. One simple idea made the sewing machine—it could not have been inspired by the 'darning-needle" flying over the pond, nor by the Baltimore oriole weaving its nest. One idea will solve the problem of human flight, and all our other problems will be solved similarly, by the one necessary idea. Archimedes was thinking in his bathtub—and the one idea that came to him solved a great world problem. He would have wasted his time had he taken a fish with him into the bathtub and studied that fish. The great problem of social organisation will be solved by the force of one idea—that of "Industrial Attraction," to which the immortal Fourier gave birth. The real force on earth is man, and not Nature. Nature received and cared for us at first—in true stepmother fashion. She gave us cold stone caves, cheerless, long-haired mammoths, and inhospitable cave bears for food and for neighbours. All the rest we had to do ourselves. We had to change iron ore into swords and guns and kill off the reptiles and other monsters. We had to drain the swamps and cut out the forests that nature lavished in every direction. We have still to water Nature's deserts—spots of eczema on the earth's surface. We have ahead of us the perfecting of our own social life, the amelioration and control of climate and rainfall. All of this work will be done inside of our brains. Watching the buzzard will teach nothing about flying, nor will watching fish teach anything about the perfect ship. As well watch the mole an dask him for hints on building the Mount St. Gothard Tunnel. In the curious oily, grey mass inside the human head lies the solutions of all earth's problems. The force at work in the brain is able to do whatever it will through hard work. And that is what makes life interesting and worth while.—From "The English Mechanic."

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

KODAK NOVELTIES.

To the Editors.

Gentlemen,—We beg to advise you that we have recently introduced the following novelties:—

Kodak Intensifier Cartridges.—A new and valuable intensifier, put up in our well-known and handy cartridge form. This new intensifier will, doubtless, be welcomed by the amateur, for it is alike simple in use and certain in action, the absolute elimination of hypo not being an essential factor of success. The negative to be intensified is, after a preliminary soaking, left in the intensifying solution until the required amount of density is reached, then washed for a short time and dried.

The intensified image is permanent, and will neither fade nor discolour. The Kodak Intensifier Cartridges are sold in boxes containing half a dozen at 1s. 9d. per box.

Kodak Reducing Solution.—At the same time we have introduced our Kodak Reducing Solution, which is put up by us in 1s. bottles. The negative to be reduced is first well soaked and is then placed in the solution until sufficient reduction has taken place. It is then washed and dried in the usual manner. The Reducing Solution can be used over and over again.

New Model No.4 Special Bullet Kodak.—We have made a radical change in the construction of our No. 4 Special Bullet Kodak, practically constituting a new camera. The Model C. No. 4 Special Bullet is smaller than the former instrument, and it dispenses with the detachable cartridge roll-holder, having its roll-holder arrangement as part of the body of the camera. It takes the ordinary No. 4 bull's-eye spool, of either double-two, six, or twelve exposures. The Model C. No. 4 Special Bullet Kodak is a camera of the ever-ready box pattern type, taking either glass plates (in double plate holders) or daylight changing rollable film. It is fitted with a rapid rectilinear lens of best quality and a triple action shutter with iris diphragm, working between the lenses. The shutter can be manipulated by trigger or pneumatic release, the bulb and tube being readily attached or detached from the camera. The camera is fitted with brilliant finders and tripod screw socket for both horizontal and vertical pictures. The price of the Model C. No. 4 Special Bullet Kodak, including focussing screen and double plate-holder, is £5 15s.

The Flexo Tripod.—Folds into two sections and has adjustable sliding legs. The head and tripod screw are non-detachable, and therefore cannot be mislaid or lost. The Flexo tripod is marvellous value at its price, 4s. 6d.

Glass Plate Adapter for the No. 3 Folding Pocket Kodak.—The adapter consists of an extra aluminium back for the Kodak, which takes the place of the ordinary back when it is desired to make glass plate exposures. The change from a film camera to a glass plate instrument is thus instantly effected. The back is arranged with a ground glass focussing screen fitted with a spring focussing hood. Single aluminium plate holders weighing only 1½oz. each are used with this adapter. The No. 3 Folding Pocket Kodak Glass Plate Adapter and One Plate Holder are supplied at 12s. 6d., extra plate holders at 2s. 3d. each.

The No. 3 Folding Pocket Kodak fitted with the "Automatic" Shutter.—We are now, further, prepared to supply the No. 3 F.P.K. fitted with the Bausch and Lomb improved "automatic" shutter adapted to the existing rapid rectilinear lens, making the camera as efficient and convenient as if equipped with the most expensive optical arrangement. The shutter is adapted for snap-shot speeds ranging up to 100th of a second as well as for time and "bulb" exposures. In addition, it has an automatic self-setting action which will be found invaluable for hand camera work. The price of the No. 3 F.P.K. fitted with Bausch and Lomb automatic self-setting shutter is £4 17s. 6d.

Eastman Embossing Boards.—With the aid of this new device photographers can readily plate-mark their photographs. Bromide prints look wonderfully effective when printed with a wide white margin and plate-marked in the Eastman embossing boards, and prints treated in this manner do not require to be mounted. The apparatus is extremely simple in use. All that is necessary is to place the board on a table, turn back the top flap, and insert the print under the paper guide mask. Having centred the print, shut the apparatus and emboss the print by burnishing all round the edges of the die, using any smooth, hard substance such as the handle of a knife. Prices range from 6d. to 9d., according to size.

We shall send you shortly full particulars of our Kodak Daylight Developing Machine, a really high-class apparatus, elegant in appearance, permanent in construction, and efficient in use.

The No. 0 Folding Pocket Kodak.—A new bijou folding pocket Kodak richly and daintily finished. An ideal camera for ladies' use.

Kodak Print Trimming Boards.—A really well-made guillotine trimming and cutting board which will retail at 2s. 6d. and 3s.—With compliments, we are, yours faithfully,

KODAK, LIMITED,
By T. R.

43, Clerkenwell Road, London, E.C.
August 8th, 1902.

A CURIOUS PHENOMENON.

To the Editors.

Gentlemen,—Since writing to you last week respecting an unaccountable effect on a negative, it occurred to me to remoisten the film to see if the image that had practically disappeared would be in any degree restored. I did so with a certain amount of success. I then intensified it, which, although not producing a printable image, made a distinctly visible one, both by transmitted and reflected light. I forward the negative to you as a puzzle requiring solution. Bear in mind that when it was first developed the abnormal image was of good printable value, and by far the densest part of the negative. I hope you will receive it safely.—Yours faithfully,

E. DUNMORE.

Imperial Pharmacy, Westcliff-on-Sea.
August 1st, 1902.

[The negative sent by Mr. Dunmore shows the markings he refers to by both transmitted and reflected light. From a pit-like nucleus in the sky part of the negative a series of well-defined lines radiates. The regularity of the design is very curious, but we are unable to offer any explanation as to the cause of it.—EDS. B.J.P.]

IRRITANT POISONING BY PHOTOGRAPHY.

To the Editors.

Gentlemen,—I write to advise your correspondent "C." in reference to the irritation he has suffered. At the present moment I am going about with my hand in a sling from the same cause. The cause is undoubtedly metol or metol compounds. My present very bad attack of dermatitis is due to iodide of methyl. I accidentally allowed a few drops to run down my finger. I immediately plunged my hand in cold water and took no further notice of the matter. In twenty-four hours my little finger began to swell, and purpuric patches appeared, followed by intense irritation and vesication. Except from previous experience I should not have attributed the effect to its proper cause. A previous attack was caused by accidentally pushing my hand into a weak metol solution in developing enlargements. The irritation, etc., then lasted for three weeks. The peculiarity is that the inflammation of the skin does not come on until some twenty-four hours after con-

act with the metol or methyl compound. I have found the best reatment lead lotion and the wearing of a rubber glove. As your correspondent remarks, the contact with this poisonous matter sets up a recurring irritation of the skin which may last for weeks. After the primary irritation subsides a recurrence is avoided by dipping the fingers in weak solution of prussic acid and keeping the fingers anointed with vaseline. For some individuals it is fatal to allow the least trace of metol to touch the fingers. Pyro has no prejudicial influence on the skin beyond staining. Trusting my experience may be of some help.—I am, yours faithfully,

EDWARD F. GRÜN, M.R.C.S., F.R.C.P. (Lond.).

Camera Club, Charing Cross Road, W.C., August 9th, 1902.

To the Editors.

Gentlemen,—Your correspondent "C" should try an ointment made by M. Sorbé-Buele, pharmacien, at Argeles-Gozost, Hautes Pyrénées; it is called Baume de Bigorre, and is sold in tubes, price, 2s. I have found it most efficacious in poisoning by developing with amidol, but if the poison has taken a firm hold a course of arsenic will be necessary. I found relief also in bathing my hands in nearly scalding water, but this requires resolution. Having suffered intensely from amidol, I can feel with others in similar troubles.—Yours truly,

WILLIAMS KENNAN.

Arcachon, France.
August 9th, 1902.

To the Editors.

Gentlemen,—I am particularly interested in the letter of your correspondent "C," hose description of the skin affection from which he is suffering is identical with my own. I, perhaps, have suffered longer; and in winter, when the affected parts were cracked with fissures deeply penetrating the flesh. In addition, my fingers swell where the eruption exists.

I have not sought medical advice, my modest position as an assistant will not admit of coddling, so I perforce have had to "grin and bear it." Nevertheless, I should be grateful for any practical advice, as it is possible that I may be obliged to change my occupation, a very serious matter indeed to me—so serious that I dread its contemplation.—Faithfully yours,

PRINTER.

A PHOTOGRAPHIC SURVEY OF WOOLWICH.

To the Editors.

Gentlemen,—The Borough Council having approached the Woolwich Photographic Society with the request for a photographic survey of the district, our members are responding to the call with earnestness and energy. A special committee has been appointed to conduct the work, which is to take the form of an album for presentation to the Free Library.

The enclosed circular has been generally issued to those interested in the scheme, which is warmly supported by the local Press.

As we are wishful to make this a success, I should like, with your kind assistance, to invite any workers, who have been associated with the neighbourhood, and who may possess negatives of places of local interest which have passed away, to help us in perfecting our collection.

We propose to make the records in black platinum, and any prints, from a quarter to whole plate, will be most gratefully received and acknowledged by either our honorary secretary, Mr. W. H. Nichols, 30, Heavitree Road, Plumstead, or yours sincerely,

C. CHURCHILL, President.

August 8th, 1902.

WOOLWICH PHOTOGRAPHIC SOCIETY.

Affiliated to the Royal Photographic Society of Great Britain.

President: Chas. Churchill, Esq., F.R.P.S.,
5, Annandale Road, East Greenwich.

Hon. Secretary and Treasurer: William H. Nichols,
30, Heavitree Road, Plumstead Common.

Hon. Assistant Secretary: H. G. Weekes,
6, Delafield Road, Old Charlton, S.E.

May 20th, 1902.

PHOTOGRAPHIC RECORDS OF WOOLWICH AND DISTRICT.

Object.—The members are doubtless aware of the special effort which is being made this year on behalf of the Society, to prepare a collection of views of local and antiquarian interest for eventual presentation of the same in album form to the Borough's Free Library.

Much could be urged in support of the project, but in a circular such as this it is not possible to enlarge upon the importance of the duty which all the members should feel their own. The subject is fully dealt with in an article which appeared in the "Kentish Independent" of last Friday, the 16th inst.

Assistance asked for.—The honorary secretaries will be glad to receive, at an early date, the names of all who will undertake a share of the work, as it may be found necessary to call independent meetings of an informal character to discuss plans and methods of work, etc., from time to time.

Technical Points.—It has been decided by the sub-committee, of which the President and Messrs. W. H. Dawson and J. Borthwick Panting are the members, that all the prints should be finished in platinum, and which it is hoped will be generously given on that kind of printing paper, the most suitable sizes being from quarter to whole plate. Minor defects, such as "spotting," should be left for treatment after mounting, and it may be stated to those who have had no experience in platinum printing that no difficulty will be found in adopting that process, if the usual precautions and formulæ be adhered to.

Old Negatives Wanted.—It is known that many negatives are preserved of buildings and places which have been swept away, and it will be regarded as a favour if the owners will intimate their willingness to lend them to the hon. secretaries or to the Survey Committee.

Saturday Outings.—The nucleus of the collection will be formed from the special outings which are fixed as follows:—

June 7th.—Old Plumstead, including the Church and Lessness Abbey.
July 5th.—Woolwich Common, Barracks, etc.
August 9th.—North Woolwich and the Docks.
September 6th.—Shooter's Hill District.
September 27th.—Old Charlton.

Other Places of Interest.—It is pointed out, however, that an immense amount of work would be best undertaken by independent effort, and volunteers are asked for who will photograph completely or in part any of the following places, or such others as come within their opportunities:—The Royal Arsenal, Barracks, Dockyard, various riverside premises, Borough Council Chamber, exterior and interior views of places of worship, the Arsenal Railway Station, Woolwich Market, Arsenal Gates, etc., views of crowds buying, and of men going from or returning to work; incidents at the Royal Albert Docks, views of the river banks, the Free Ferry and approaches, back streets and alleys of the town, Warren Lane district, Royal Military Academy, various streets, such as Church Street, High Street, Rectory Place, Artillery Place, etc., Eltham Village.

Preliminary Announcement.—As a matter of prospective interest it is pointed out that it is intended to include a section for local survey pictures at the next annual exhibition of the Society, and the formation of a set of lantern slides of a like character is contemplated as another result of the movement.

THE SUN AT THE HORIZON.

To the Editors.

Gentlemen,—Reading Mr. F. M. Steadman's letter in regard to "The Sun at the Horizon," I think his explanation, however, very finely drawn, not entirely fireproof. If light when intense, as in midday, makes the sun seem smaller than when it sets or rises, there are occasions when it can be looked at without pain to the eyes. First, it can be looked at through smoked glass or coloured glass. Second, in London specially, it can be seen often at noon without trouble during a fog, and in both cases it does not look as large as at the horizon. The eye may correct, if it is not habit or imagination, some of the perspective, but it would be entirely wrong, I think at least, to say that the further the object the larger it gets to vision. A balloon would therefore look bigger when seen horizontally five miles away than five miles in the air. This may, however, be the case, but I think the fault would be in the air and not in the eye. Now, given the thickness of the atmosphere around the globe, it is certain that there is less of it when you look at the sun at noon than when you look at it sideways when the sun sets, and your sight has to cross a great deal more atmosphere then, and of the most dense part of it, and this may be the reason why it looks larger. The sun has been photographed, and it could be easily done again, once at noon and once at sunset, and then measured carefully, and, as the dry plate has no preference for more or less light except as to exposure, the proof can easily be made. I cannot do it, having no instruments for such fine measurements as would be necessary for such experiments.—Yours very truly,

A. LEVY.

Asnières (Seine).
August 9th, 1902.

INTENSIFICATION.

To the Editors.

Gentlemen,—Anent your note in the last impression about intensification. For some years now I have used mercuric chloride in a for-

mula of my own, which gives all and more intensity than any need. I never have a stain. It does not require the washing the usual formula requires, and, although there is nothing, or little, new in the constituents, I believe the advantage is in the way of making them up. It can be used over and over again until exhausted, an occasional filter being all that is required to keep it bright.

Mercuric chloride, 200 grains; water, 20oz. Dissolve, then precipitate with potass hydrate, 20 grains (about); re-dissolve with hydrochloric acid, 20minims (about). As it begins to clear, add drop by drop until quite clear with very slight acid reaction. It coats the negative with a very fine deposit; then, when washed (and not so much of that is required as usual), re-act with ammonia, .880, about 4 minims to the ounce of water. Result: No stains and an intensification "as black as your hat," if you desire it.

W. T. F. M. INGALL.

13, Pinfold Road, Streatham, Surrey.

DISHONEST PHOTOGRAPHERS.

To the Editors.

Gentlemen,—I have recently been reading in the BRITISH JOURNAL OF PHOTOGRAPHY, of July 25th, that amusing article, "In Wet Plate Days." I am sorry to say that, at all events in the South of England, the dishonest "Jem Barnes" still exists, and I have repeatedly come in the track of photographers (?) who have taken groups (and the money as well) and disappeared. This thing goes on apparently unchecked, and, of course, when the genuine man comes along, the prospects of him doing anything are small indeed. Cannot something be done to stop this unwarrantable state of affairs? Cannot the P.P.A. do something in this respect, so that the honest country worker may make enough to exist on, if not to live? Things are bad enough without swindlers making them worse.—Hoping this will find room in your valuable paper, I am, gentlemen,

AN AGGRIEVED PROFESSIONAL.

August 5th, 1902.

[Is our correspondent a member of the P.P.A.? If so, what is there to prevent him from bringing this matter before that body?—EDS. B.J.P.]

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY, 24, *Wellington-street, Strand, London, W.C.*" *Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

PHOTOGRAPHS REGISTERED:—

Robert James Wood, 272, Brockley Road, S.E. *Photograph of "King's Guests" at Brockley Road Board School. (Interior.) Photograph of "King's Helpers" at Brockley Road Board School. (Interior.) Photograph of "King's Dinner Decorations" in Brockley Road Board School. (Interior.)*

Mrs. M. M. Johnson, 243, Sauchiehall Street, Glasgow. *Photograph of Group containing Colonial Premiers.*

Henry George Brabazon, 44, Trafalgar Road, Peckham, S.E. *Two photographs of the Bishop of London, taken at Cove Hill, Aldershot. (1) Three-quarter length. (2) Full length.*

Alfred Wildman, The Maybury Studio, Maybury Road, Woking, Surrey. *Photograph containing Four Bird's-eye Views of Woking.*

PHOTOGRAPHIC PAPER.—T. C. J. asks where very thin Rives Photographic Paper, of the same kind that is used for albumenising, but thinner, is to be had.—In reply: No doubt it can be obtained at Marion's. The "8 Kilos" is, we think, the thinnest made by the Rives firm.

ADDRESSES WANTED.—"ANXIOUS" writes: "Will you please inform me where I could obtain a list of all photographers (professional only) in business about the Midlands, or throughout England?"—In reply: Consult the "Chemist's Directory," published by Kelly and Co., Holborn, London.

LACQUERING.—G. SIMMONS says: "I want to relacquer the brasswork of some of my apparatus—lenses, etc. I am told there is a lacquer sold that can be applied without the metal having to be heated. If I could get some, it would be a great convenience to me. Can you tell me where it is to be had?"—In reply: The F. Crane Chemical Company, Birmingham, sell a lacquer that can be applied cold.

COPYRIGHT.—H. BIGGIN writes: "I enclose postcard, from which a friend of mine has made a copy for reproduction in a pamphlet. Could you kindly tell me if there is any fear of him being sued by the publishers, as it does not state whether the photograph is copyright?"—In reply: In all probability the original photograph is copyright, so that your friend is running very serious risks of an action for infringement.

COPYING MEDALS.—T. BALE writes: "Some time ago I saw some very fine copies of coins in a numismatic journal that were excellent. I have some prize medals to photograph, but I cannot get anything approaching those I allude to. Can you assist me to get something good?"—In reply: The copies referred to were probably not made direct from the coins, but from plaster casts of them: that is the usual way. Reproduce the medals in plaster of Paris, slightly tinted with umber, and then copy them with suitable illumination.

ADDRESS WANTED.—J. MENHINICK writes: "I hope you will pardon the liberty I take of addressing you. I am desirous of knowing the German maker (or his agent in England, if any), of a mount registered No. 34, entered at Stationers' Hall, Copyright No. 3,806. I have endeavoured to procure it through several English houses, but have failed. If you can give me the information I shall be very grateful."—In reply: We are sorry we cannot answer this question. Some reader may be able to oblige our correspondent. We do not answer letters through the post.

STAINED PRINTS.—E. VOWLES writes: "Could you tell me what is the cause of the stains on the enclosed prints. The paper is ——'s C.C. The stains appear the moment the prints begin to tone in the platinum. They are continually occurring. At the same time there is a good percentage of perfect prints. I may say I have used the utmost care in manipulation."—In reply: The stains are probably caused through the prints not being sufficiently washed between the different operations. As you say there is a good percentage of perfect prints, it is clear the paper is not at fault; therefore, the stains must be due to faulty manipulation.

OPINION WANTED.—"JOURNAL READER" writes: "I have enclosed a few prints as specimens of my retouching. I should be greatly obliged with your opinion of the work, also the salary I might obtain as a retoucher. I should be grateful for any suggestion for improvement in the work which you might think necessary. The prints are taken from waste negatives, which I have for practice."—In reply: The work is fairly good, but is capable of improvement. We should suggest that you either take a few lessons from a skilful retoucher or obtain a good book on retouching, such as Johnson's "Art of Retouching Negatives." We do not think you could command much salary at present.

PYRO-AMMONIA STAINS.—R. H. K. M. writes: "Kindly inform me the best way to remove stains caused by pyro-ammonia developer. I, having badly stained my clothes, am desirous of removing same in the best possible way. Have been recommended to use a strong solution of ammonium persulphate or benzine. Do you think either of them recommendable?"—In reply: We have had no experience in removing pyro-ammonia stains from clothes, but we should suspect that anything that would take out the stains would also take out the colour—or alter it—of the fabric. Why not try what you have been recommended, though we do not think benzine will be of any avail.

*** NOTICE TO THE TRADE, WHOLESALE AGENTS AND BOOKSELLERS.—*A Contents Bill is issued with each number of the* JOURNAL, *and copies may be had on application to the Publishers.*

*** NOTICE TO ADVERTISERS.—*A Revised Tariff for advertisements in the* JOURNAL *is now in force. Blocks and copy are received subject to the approval of the Publishers, and advertisements are inserted absolutely without condition, expressed or implied as to what appears in the text portion of the paper.*

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THE BRITISH

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*** *The Editor can only be seen by appointment.*

*** *We do not undertake to answer letters by post.*

EX CATHEDRA.

Negatives by Contact with Metallic Radiations. It has been shown, points out M. P. Vignon in "Comptes Rendus," that vapours emitted from zinc are capable of acting on a photographic plate. M. Vignon obtained images of medals, etc., powdered over with zinc dust by mere contact with the photographic plate. Although such images are not perfectly sharp, presenting the appearance of being pressed through a gauze screen, yet they are vigorous. Negatives have also been obtained by the action of ammoniacal vapours on a linen treated with a mixture of powdered aloes and olive oil. A gloved plaster hand moistened with ammonium carbonate leaves on this account a photographic imprint on such linen.

* * *

A New Lantern Illuminator. The "Scientific American" a little while ago described a new method of producing a brilliant lantern light, which it stated had been introduced by a Philadelphian firm. The principle of the light is the burning of a mixture of airs and kerosene oil vapourised under pressure in minute quantities and then heating a Welsbach mantle to incandescence. It is stated that the apparatus is quite light, easily set up, and readily put into operation. The kerosene is stored in a small cylinder, and the pressure is brought up to 50 pounds to the inch, and kept up when necessary by a bicycle pump. The vapour is then conveyed to a concentive Bünsen burner, and, after being first heated, mixes with the air, and is ignited. The vapourising tubes have to be, as we state, heated first, and this is done by igniting a small quantity of methylated spirit placed beneath the tube in a supplemental reservoir.

* * *

Explosive Ether. A possible explanation of explosions in connection with ether saturators, which it has been assumed arose through careless or improper use, is to be found in a paper by Herr E. Von Neander published in a foreign chemical periodical. Herr Neander found occasionally that upon evaporating the ethereal solution of a fat an explosion took place during the drying. Investigating the matter, he discovered that ether kept for some months gradually proved to contain a quantity of active oxygen equivalent in amount to 0.24 per cent. of hydrogen peroxide. Sometimes the oxygen was in the form of ethel peroxide. When the ether alone was experimented no explosion took place; the presence of a fat was necessary. Now it is a singular thing that some of the early explosions with compressed oxygen, which at the time were set down to the unexplained admixture of hydrogen, proved to be due to the presence of oil or fat in the valves; hence it is permissible to surmise that some ether explosions may be explained also by the presence of fat, though how introduced we are not prepared to explain.

* * *

Skiagraphs of Internal Organs. Despite the achieved wonders of photographs with Röntgen rays and the variation of effects obtainable by altering their character of penetration, it would scarcely have been anticipated that an internal organ of the living body could be skiagraphed while performing a definite functional movement. Yet that is what Dr. P. H. Eykman, of Amsterdam, has achieved. He applied his method to the investigation of the motion of the tongue, pharynx and larynx in swallowing. According to "Nature," he fixes a contact on the "Adam's apple," the motion of which closes the current which feeds the Röntgen tube at a perfectly definite moment during the motion. The motion has to be repeated 120 to 130 times with the contact in exactly the same position, in order to obtain a distinct photograph. Other photographs of different phases of the motion are obtained by altering the position of the contact. The photographs are good, considering the difficulties of the experiment, and throw a welcome light upon the position of the epiglottis and on the condition of the upper opening of the larynx during the act of deglutition.

* * *

Meteorological Hints. There are cynics who scoff at meteorological predictions. We have heard of the old lady who took her aneroid out to show the rain

coming down when the "glass" said "set fair," forgetful of the fact that if the aneroid was to be a prophet it would be foolish to expect it to act as a present indicator also, and equally reasonable are some of the sins placed to the credit of meteorology. Yet photographers of all men should treat the science with respect, availing itself, as it does, of photographic intervention at numerous points. Some of the most interesting diagrams, if we may so term them, that are to be found in meteorological treatises owe their existence to photography. The sunshine recorders that now find favour owe their indications to a modified photographic process, and there are photographic recorders for almost all meteorological data that are needed to be tabulated. Those who wish to take up meteorological recording cannot do better than obtain the little brochure now in its fifth edition, issued by the Royal Meteorological Society. It only contains sixty pages, of which twenty are tables of reduction, containing all that is really necessary, but nothing unnecessary. A glossary of meteorological terms has been added as a first step towards the realisation of the suggestion of the Meteorological Congress held in Rome so long as thirty years ago.

* * *

German Dry-Plates. We see from a note in the "Allgemeine Photographen Zeitung" that the rate of duty upon photographic dry plates has been fixed at M.24 per 100 kilos. We raise our hat to Germany for this compliment to English dry-plate manufacturers. Notwithstanding cheap labour, cheap chemicals, technical education, and what not, the German Government finds it necessary to tax the photographer, through the medium of the dry-plate, to protect the interests of the German dry-plate manufacturer against the rivalry of British manufacturers. If we take the Continental size 9 by 12c., we find that the retail price of the Westendorp and Wehner Co. for these is one shilling and ten pence per dozen. The same size may be bought of almost any British maker for one shilling and four pence. It is also remarkable that the profits of German plate manufacturers appear to be less than those of their English competitors. We find that the shares of the German dry-plate factories earn a dividend of 10 per cent., whereas Ilford, Limited, pays a $12\frac{1}{2}$ per cent. dividend. The plates we have quoted are not the most expensive. We recently referred to the orthochromatic plates for three-colour photography prepared by Perantz, of Munich, according to Dr. Miethe's formula. This plate costs two shillings and sixpence per dozen for the same size. The new Perxanto plate, however, costs three shillings per dozen, for 9 by 12c. size. This is an extra rapid orthochromatic plate, giving correct colour values without the use of a yellow screen.

* * *

At Kew. Those who have permission to carry a camera into Kew Gardens—and the privilege is by no means grudgingly granted—have just now an opportunity of taking a picture of an unusual kind, so far as this country is concerned. For the first time on record the storks which have inhabited the gardens for the past three or four years have built a nest and have reared a small family. In Germany storks breed freely in a state of captivity, but, as we have already said, it is a unique occurrence over here. It cannot be said that this first effort of the parent storks has been altogether successful, for, out of five eggs laid, two were unfertile, and of the three birds hatched, only one survives. There are other birds in Kew Gardens which are also worthy of the attention of photographers—we mean the pelicans. As far as we are aware, no photograph has yet been taken of one of these birds capturing a fish. The task would no doubt require a good deal of patience, but we do n see why it should not be done by a persevering hand. could certainly be done under favourable circumstances the Kew pond, for the edge of the basin is much above t water, and at once gives the operator a commanding po tion; besides which, the birds there spend much of the spare time in fishing. It is most amusing to watch t way in which one of these creatures captures his pre He swims quietly along until he spots a likely victim; h then puts his head on one side in a most ludicrou manner, darts his long beak under water, and immediatel brings it out with a silver fish pinched in its embrace Then, with a quick motion, the fish is jerked into his bagg double chin, and in another moment, with a gulp, it goe down the bird's capacious throat. Then he goes a-fishin again, and in less than a minute another unfortunat finds its way down the red lane. If human piscators coul have such sport as this, and so few waits between th acts, what a different kind of pastime fishing would be!

* * *

A Photograph of Pizarro. When children took more interest in the drama than they seem to do now, and when that interest took the form of the model theatre, with printed characters and scenes published by one "Skelt," at the price of a penny plain and two pence coloured, the play of "Pizarro" was a favourite one to mount in this manner. And it is doubtful if any of us in our younger days would have heard of the redoubtable conqueror of Peru, had it not been for this introduction. Anyhow, Pizarro, with Robinson Crusoe, Alonzo the brave, Mazeppa, and a few other worthies, real or mythical, used to be the heroes of the nursery. We seemed to renew a very old acquaintance when, the other day, we came upon a photograph of Pizarro, not a photograph when he was in the flesh, for he was killed some years before photographic portraiture became possible. To be strictly accurate, he died on June 26, 1541. But this photograph, which is reproduced in the "Scientific American," represents him when most of the flesh had perished from the bony framework, and just as he lies, in a marble coffin with glass panels, in the Cathedral at Lima. It is a most interesting picture, not only because it shows us the relics of a great personality, but also because this method of sepulture is most rare, if not unique. The marble coffin lies in a vault of the Cathedral, and the photograph was taken—after permission had been granted with great difficulty, and only through the good offices of friends at Court—by Mr. E. C. Frost. This gentleman informs us in the description which accompanies the picture that the vault was very dark indeed, and that in the first place he viewed the remains by candle-light, no other means of illumination being available. Then he subsequently says: "Owing to the poor light in the vault, I was obliged to give the plate $2\frac{1}{2}$ hours' exposure"; but whether this was by candle-light or no, he does not explain. Pizarro appears to have been a man of quite exceptional energy and resource, who won a good position, in spite of the fact that he was quite uneducated; indeed, some assert that he could neither read nor write. He was brave to a degree, but his memory is stained by an act of treachery which it is impossible to palliate.

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Foreign Copyright. An important point with regard to English copyright in Canada was recently decided in the Supreme Court of Appeal of Ontario, before four judges, who held that a British copyright has no protection in the Dominion of Canada. It is pretty well known that it has in many foreign countries; France, Germany, Italy, Japan, and even Hayti, to wit. It seems

at, while Great Britain gives protection to Canadian rks, Canada gives no protection to British ones. This ems anomalous. Recently an influential society of ists, fine art publishers, engravers, etc., has been formed, th Sir Edward Poynter, Bart., President of the Royal ademy, as President, and a deputation of it, amongst om were Messrs. J. F. E. Grundy (the Secretary), Walter owerbank, J. B. Pratt, J. J. Elliott, recently waited Sir Wilfred Laurier, the Canadian Premier, on the estion, pointing out the anomaly that existed at present, d at the same time presenting a petition signed by most the Royal Academicians and others interested in fine art pyright. Sir Wilfred gave the deputation a most cordial ception, whilst carefully guarding himself from any pression of opinion likely to commit his Ministry, and omised to give this important question his full and ost sympathetic consideration on his return to Canada. urther than that, he promised to at once forward the tition to the responsible Minister of the Dominion. ence, it is to be hoped that the state of the law on is point will be altered in the Dominion, for it is, as we ve just said, anomalous that many foreign States give otection to British copyright, and one of our most triotic Colonies does not. While on this subject, we ay mention that, according to a Reuter telegram a w days ago from Copenhagen, M. Christensen, the anish Minister for Education, intends at the beginning of e coming Session of the Rigsdag, to introduce a Bill abling Denmark to join the Berne Convention regarding thors' and artists' rights. If this Bill is passed, Denmark ill be another country added to the list of those in which ritish copyright will be protected.

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Automatic Sabbath Breaking.

Can an automatic machine break the Sabbath? A question of this kind has had to be decided in the German law courts, and it is surprising what an amount of legal casuistry has been employed to bring the owner of the machine within the four corners of the Statute book. What with lèse majesté and Sabbatarian legislation, Germany is endeavouring to show that she is, politically, about a century behind the power she is frantically striving to outstrip as a leader of the nations of the world. It is decades since our old friend Mr. A. L. Henderson used to make enforced weekly visits to the police-court and ask for change in payment of the fine imposed upon him for resisting the fanaticism of the law. The proceedings were an effective advertisement for the astute photographer of King William Street. Since those days, however, photographic portraiture has been reduced to an automatic art, a fact which sorely tempts us to throw a stone at the painter-photographers *en passant*. It appears that a photographic automaton was placed in a restaurant, and the owner was fined for permitting its use on a Sunday. It had to be decided whether this was a sale or a service. If a sale, it was a violation of the law, but if an act of service, or contract to work, there was no offence. The Court of Appeal at Dresden has decided that the taking of a portrait automatically by a machine on Sunday is merely a sale, and the conviction was upheld. If the observance of the Sabbath is to be enforced by law, we fail to see why both parties to a contract should not be punished, the buyer as well as the seller. Both do a similar act—the exchange of one commodity for another. In the case of an automatic machine, it is one step further removed. The owner may fill the machine on Saturday, yet because the purchaser performs his part of the contract on Sunday, the seller is punished for that which he did the day before quite legally. The possibility suggests itself that the owner of the machine should have prevented the offence by closing the machine on Sundays, but in that case we must be liable for the offences of others, if we fail to adopt means for their prevention. The householder, for instance, should be punished for theft if he leaves his door unfastened, and the thief should not be punished.

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The Earliest Photographic Studio in Vienna.

The "Photographische Chronik" gives the following account of the establishment of the first studio in Vienna, which was opened by Gerothwohl and Tanner. Gerothwohl says that he was a portrait painter at Frankfort-on-Maine in 1840 Mumm, the mayor of the town, visited him one day at his studio and showed him a photograph on paper. Gerothwohl had dabbled a little in Daguerreotype, and was astonished at the picture. The mayor informed him that the photograph had been made by an Englishman, who wished to sell the invention. An interview between Gerothwohl and Tanner was arranged for the next morning. "Professor Tanner, of London," a man of pronounced English type with red hair, rather awkward, but deliberate and confident, was introduced. "Did you make this picture?" "Yes, certainly." "Can you make similar pictures of other people, and as good as this one?" "Doubtless." "Are you the inventor, the sole inventor of the process?" "Yes." "Have you already sold your invention to other people?" "Yes, to a Frenchman, but the process is only to be used in France.' "And you also wish to sell the secret to me?" "I shall be glad to." "How much do you want?" "Two hundred guldens." "But that is absurd. You would not sell such an invention for that price if it were really your own." "If you do not believe me, I have nothing more to say. Good morning." "But, listen! You offer me an invention for two hundred guldens, and it may be worth half a million. At least explain that." "It is very easy. I have to pay my hotel bill and return to England, and I have no money." "I cannot believe it. Your invention is worth more money than I have got. Let me make a proposal. I have sufficient money to start the business. Let us work together. I am sure we shall do a good business." "Impossible. I am not for men, and men are not made for me." Gerothwohl was persistent, and Tanner at last consented. A studio was first built at Frankfort, but afterwards they migrated to Vienna. Georg Koberwein, the son of the actress Sophie Koberwein, subsequently bought the business in its prime for 28,000 guldens. Gerothwohl and Tanner travelled about for a time, but gave up photography and returned to painting. Gerothwohl lost all his money in the Bontoux crash, and committed suicide in Copenhagen. Tanner lived for a time at Interlaken as a landscape painter, but, after great suffering, died in the hospital at Cannes.

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Fire.

A very fine example of tri-colour printing forms the frontispiece to a pamphlet which has reached us from Frankfort. This booklet contains a description of Schapler's pneumatic fire escape and tower, and the picture in question represents a conflagration at night, with the fire apparatus in position and the red glow of the flames thrown on the adjacent buildings. The apparatus itself has no particular protographic interest beyond this capital three-colour print, except that studios are commonly built, in cities, on the topmost floors of houses, and their proprietors, in case of fire, might have some difficulty in finding their way into safety without the help that such an appliance would afford. We have learnt by a recent sad experience that the fire escapes at present at the disposal of the London Brigade are

far too short to reach the upper windows of high buildings, and, for some reason or other, this one from Frankfort has not met with approval over here. It is different on the Continent and in America, where several of these pneumatic contrivances have been in use for the past two or three years, and have been instrumental in saving many lives. Its backbone, so to speak, is formed of steel tubes, which telescope one into the other, and to each section a ladder is attached. When required for use, the turn of a tap admits compressed air into these tubes, and they immediately shoot out vertically to a height of 85ft. or more. If the object is merely to extinguish a fire, a man and hose are carried up with the extension of the ladder, but if to save life, the man goes up without the hose, and assists any unfortunate being who can be got at through a window to step on to the ladder. Then, at a signal, the air is let out, and the machine once more telescopes and the person is brought to the ground in safety. In one case no fewer than eighteen lives were saved at a fire in this neat and expeditious manner. We are intensely conservative in this country with regard to the adoption of anything new, and although this has its advantage in allowing us to profit by the experience of others, we are sometimes landed in a quagmire. It was the case with the up-to-date guns required in the recent war, which we had to purchase, all in a hurry, from a foreign Power. Possibly, after a few more holocausts, we shall see the advisability of adopting the pneumatic fire escape, which has already been added to the armament of many foreign fire brigades.

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The New Potsdam Refractor. About two years ago a new refractor was erected at the Royal Astrophysical Observatory, Potsdam. Some particulars of the instrument, with a print showing the interior of the observatory with the telescope in position, are now published in the "Zeitschrift für Instrumentenkunde." This telescope seems destined to play an important part in astronomical research, for, although not the largest, it is one of the best of the giant instruments made of recent years. The atmospheric conditions at Potsdam and the weight of the spectrographic attachment, induced the authorities to decide in favour of a refractor rather than a reflector. The new telescope is a twin instrument, with an object glass of 31½ inches aperture for photographic purposes, and another of 19⅔ inches aperture for visual observation. By means, however, of a correcting lens, the photographic objective may be converted to a visual telescope, and it has been so nicely calculated that the focus coincides, within a small fraction of an inch, with that of the smaller object-glass for visual observation. The focus of the telescope is about 12 metres, or rather more than 40 feet. The mechanical part of the work was entrusted to A. Repsold and Söhne, of Hamburg. The discs of glass were supplied by Schott and Genossen, of Jena. The lenses were calculated and made by C. A. Steinheil Söhne, of Munich, and it will be remembered that the head of the firm, Dr. Rudolf Steinheil, was decorated by the German Emperor with the Order of the Red Eagle for the perfection of the work. The spectroscope and other optical accessories of the instrument were also made by the same firm. As the tubes were made in Hamburg, whilst the lenses were made in Munich, the contract appears to have stipulated that the lenses should be made of a given focus within a margin of a few centimetres, which was done. The dome, stool, etc., weigh together about 200 tons, and may be moved either by hand or electric power.

The following are the details of the cost of the entire equipment:—

	£
Cost of mounting, carriage, etc.	7,1[illegible]
Large photographic objective, 31½ inches aperture, correcting lens, and other optical accessories	3,3[illegible]
Visual objective, 19⅔ inches aperture	1,2[illegible]
Observer's chair, electrical accessories, etc.	6[illegible]
	£12,37[illegible]

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A Consular Report. One important duty which a consul is called upon to perform is to send periodical reports to his home government upon the state of particular industries in the country of his adoption so that manufacturers and dealers may answer demand by supply. It is not often that photography forms the principal feature of one of these documents, and still more seldom is it the case that a photographic publication is held up to admiration in one of them. But the unexpected has happened. In a recent report from the United States Consul at Tamsui (Japan), Mr. J. W. Davidson, there is a note with regard to photographic apparatus which is extremely gratifying to English manufacturers generally, and an appreciation of the "British Journal Almanac," which brings cheer to the editorial heart. The consul is evidently a photographic enthusiast, for two years ago he took part in the organisation of an amateur photographic club, which counts among its members no fewer than five nationalities. All the members speak well of American photographic appliances, but they complain of the prices. "A good, reliable English plate," says the report, "can be bought for half the money asked for the American article." We are also told that the Americans are behind the English, Germans, and French in catering for the demand for photographic appliances which has arisen. The consul is then kind enough to speak in complimentary terms of our Almanac, and, at the risk of seeming to blow our own trumpet—albeit he finds the wind—we cannot refrain from reproducing some of his remarks. "I believe," he writes, "this publication to be one of the most valuable advertisement mediums in the world. With the Journal Almanac in his hand, a foreign dealer is in close touch with the English supply trade . . . . the dealer has before him the abridged catalogue of practically every maker in Great Britain." The consul speaks well of the American annuals, and gives them well-deserved praise for the manner in which they are printed and got up generally, but he complains that "they lack the most valuable feature of all—representative advertising. I have seen," he continues, "considerable orders for miscellaneous photographic appliances go to English manufacturers merely from the fact that the Almanac placed before the dealer a complete review of the latest novelties in the entire photographic line." Apart from our own particular interest in this matter, it is gratifying to note, in these days of American combines, and the alleged capture of commercial England by America, that in one department of trade at least the old country is holding its own.

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West Indian Photographs. Now that the terror and horror caused by the volcanic outbursts at Martinique and St. Vincent have had time to subside, it is well that it should be ascertained how many lives have been lost and how much property swept away by those appalling catastrophes. It is certain that many of

he accounts which have been published have been much xaggerated by the enterprising journalist. It was out f his power to improve upon the awful facts so far as the ctual cataclysm at St. Pierre is concerned, but he has unortunately allowed his imagination to run riot in such ead lines as "Colonies to be Abandoned," "Islands overed with Dust," "Ruin of the West Indies," etc. West ndians are, naturally, complaining of this kind of report, nd the Administrator of Dominica has been constrained o write a long letter to the "Times," protesting against he action of these irresponsible scribes, who have by heir pens spread needless alarm and made people shun he West Indies as if the islands were all doomed to mmediate destruction. He says: "With the exception of he blasted triangle on the western slope of Pelée, the whole colony of Martinique is still dotted with flourishing plantations, handsome homesteads, and prosperous villages." And as to the other islands, with the exception of St. Vincent, nothing at all has happened except a fall of dust, which, in Dominica, "was so slight that its presence could only be detected on the surface of palm leaves and other large foliage." The Administrator attributes much of the exaggerated reports to the custom of news agencies offering liberal payment for telegrams, and as the Island of Dominica is the nearest to Martinique, the first news was telegraphed from there, and the place became associated with ruined St. Pierre. The best thing to be done to contradict all these pernicious reports would be to circulate photographs of various parts of the islands, so that people here in Europe and elsewhere could see for themselves that the land was still in a productive and prosperous condition. Photography is not used half as much as it might be in the exploitation of newly-developed lands, and here is a case in which it would do incalculable good in allaying the fears of those who have been led to believe that the West Indies are at present a kind of *inferno*. Returning once more to the letter from Dominica, the writer says: "I learn that, as an instance in point, a large enterprise intended to develop the latent wealth and resources of the island has been nipped, if not killed, by the incorrect reports that have been spread." The actual loss of life seems to be comprised in the destruction of the 30,000 inhabitants of St. Pierre and 1,300 at St. Vincent. At the same time, thirty square miles of country have been laid waste in Martinique, and seven or eight plantations destroyed at St. Vincent. It will thus be seen that the actual area of volcanic disturbance was confined within two very small areas.

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The Metric System and the Colonial Conference.

There seems to be little question that a considerable amount of British trade is lost abroad through our adhering to our old-fashioned and somewhat confusing system of weights and measures, while the metric system prevails in most foreign countries. This question, it appears, was fully discussed at the recent Colonial Conference, when a resolution was adopted in favour of the establishment of the metric system of weights and measures throughout the Empire. In America the metric system is not yet adopted, but it is under consideration. We understand, from a telegram from the "Standard's" Washington correspondent, that the officials there express pleasure at the Colonial Conference resolution regarding the metric system, thinking that it will promote the American legislation on the subject. It is true that this system is now legal here, but it is not generally adopted; nor is it likely to be until it is made compulsory by law, for it would not be practicable to carry on some general business under the two systems of weights and measures at the same time. The mercantile point of the question does not much interest photographers; it is rather in formulæ that they are concerned. All, or nearly all, the photographic formulæ that come to us from abroad are written in the metric system, and they often suffer in the conversion from that into our own system when the photographer compounds them. In the tables given in the "Almanac," the equivalents of the two systems are given. Now we will for a moment suppose that a formula under the metric system, when translated, stands somewhat thus: A, one ounce three drams and so many grains. The photographer, in compounding it, usually takes an ounce avoirdupois weight, which contains 437½ grains, and three dram weights, which are apothecaries' weight, the ounce by which contains 480 grains, consequently the drams contain eighty grains each; hence we have more than we ought to have in our mixture. Therefore, we do not get the correct formulæ as given under the metric system. The best way in compounding foreign formulæ is really to adhere to the metric system intact. We ourselves have a set of measures graduated on both sides, one side according to the English, and the other to the metric system. We also have a set of weights according to the metric system, upon which we have stamped, with number punches, their equivalent in English grains, so that both weights and measures can be employed under either system. Metric weights and measures should cost no more than English ones, as the glass graduators charge so much per graduation, whichever system it is. Our set of weights, of French make, weighing from a centigram to three hundred grammes, in a neat wooden case, cost us, we think, about four shillings, and they are extremely accurate. We think it would be worth the while of photographic dealers to stock cheap weights and measures according to the metric system, for it would be a convenience to photographers in accurately compounding foreign formulæ, and it would certainly conduce to the popularising of the system here, for, sooner or later, it will be generally adopted for all purposes.

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A well-known Engraver.

The death is reported, in his eighty-seventh year, of Mr. George Dalziel, who was one of the best-known exponents of wood-engraving at a time when process blocks were quite undreamt of. Perhaps it is not generally known that the first process block had nothing whatever to do with photography, but was strictly a mechanical production. We cannot call to mind who was its inventor, but we have a distinct remembrance of some pictures produced by its aid, which in many cases were presentable, although the lines lacked the vigour of a good wood-cut. The drawing was executed in a special ink upon a sort of plaster surface, which had the thickness of an ordinary wood block. The effect of the ink was to harden the material, so that when, as an after-operation, the block was vigorously attacked with a hard brush, the white parts were reduced to a lower level, leaving the lines standing up, ready to be printed from direct, or stereotyped. It is more than probable that such a method of getting over the necessity of engraving would be bitterly opposed by such a worker as Mr. Dalziel, as much on artistic as upon commercial considerations. It would be impossible to overestimate the good work done by this engraver and his brother at a time when pictorial illustration was quite in its infancy in this country. Bewick, who was an artist, as well as an engraver, died in 1828, and after his death the art of wood-engraving languished, both for want of men to carry it on and also

because our wars with France had left us impoverished, and the overtaxed people had little inclination to spend their money upon luxuries. And a wood-cut in those days was a luxury, and an expensive one, too. In Mr. Mason Jackson's entertaining volume, "The Pictorial Press," an anecdote is told which shows that this was the case. "I have heard," he writes, "the late William Harvey relate that when Whittingham, the well-known printer, wanted a new cut for his 'Chiswick Press' series, he would write to Harvey and John Thompson, the engraver, appointing a meeting at Chiswick, when printer, designer, and engraver talked over the matter with as much deliberation as if they were about to produce a costly national monument, and after they had settled all points over a snug supper, the result of their labours was the production, months afterwards, of a small wood-cut, measuring perhaps two inches by three." Then came the Dalziels upon the scene, and William Harvey was one of the artists who worked hand in hand with them. But Gilbert, afterwards Sir John Gilbert, was the artist to whom people looked for book illustration, and his style of drawing suited the engravers better than any other. Later on, the Dalziels engraved the work of such famous men as Millais, Burne-Jones, Frederick Walker, Leighton, Watts, and many others, and the curious can find plenty of examples of such pictures in the early numbers of the "Cornhill Magazine." For many reasons, one cannot look back upon those old times without a sigh of regret. The little wood block, the little supper, and the close friendship between artist, engraver, and publisher, is so very different to the way things are done now.

HOLIDAY PHOTOGRAPHY: A SUGGESTION.

The camera has probably been the cause of quite as much pain as pleasure during holidays. It can become a physical and a mental burden. In the abstract, starting out in the morning fully equipped for recording the pleasant features of the spot chosen for the holiday is all very well. In practice, the gilt soon gets worn off the gingerbread. The weight of the lightest camera is something one would willingly do without after carrying it for a couple of hours. But worse than the weight is the limitation to swing and freedom of petty personal movement that its carrying entails. The chief enjoyment of a holiday is due to the loosening of the bonds of the conventional that bind so tightly in the ordinary working life. Stiff dress and polished boots are exchanged for the ease of flannels and canvas slippers. Introducing the weight and care of a camera goes against this instinctive principle of easement. Mental liberty is also trenched upon by the camera. Its carrying has to be justified in results, and attention is too much on the alert for possible pictures. In short, the breadth and freedom that have so much to do in making up a successful holiday are directly opposed by the petty mechanics of photographic practice. On the face of it, the best thing would appear to be to leave the camera at home. Frankly, if the aim be the usual record of scrappy, but pretty, holiday pictures, we think it would. The price paid for them is too high. But is orthodox holiday photography the only type practicable? We think not, and also think so highly of the photographic art as to believe that, with a modification of existing practice, it could not only help out holiday pleasure, but intensify the higher worth and function of a holiday. To do so there must be a renewal of the practice obtaining, and an adaptation of photography made to holiday mood, instead of holiday mood to the demands of the camera.

The methods of spending a holiday vary so much that to go beyond the ineffective practical reach of generalities, and suggest a plan, we must advance something specific. As far as we are ourselves concerned, we do not regard sustained or violent physical exertion as a necessary element in a holiday. Many think otherwise, and have, of course, a perfect right to do so. Acting on the belief, they go in for cycling tours, walking tramps and boating cruises. Photographic records can be obtained of all these, but the results can hardly be regarded as pictures. A photographic picture, like that of the artist, supposes a certain amount of thought to have been devoted to its making, and the making, a suitable frame of mine. This frame of mind will not run with the special one that goes to make a holiday of rapid motion a success. Fortunately, it will with the more general idea of a holiday that embodies leisure, and no necessity for much exertion. The majority regard a holiday, and rightly so, we think, as a time not exactly for doing nothing, but a time in which body and mind are to be allowed to do what, and as little as, they please. Even if the body does nothing, the mind is certain to be at work, and its vague, diffuse action is extremely pleasant and valuable as a contrast to the concentrated action necessary for carrying on the work of the profession or business. In being free from all outside pressure, this holiday thinking is certain to bear the strong stamp of a man's individuality, and if it were possible to preserve something of it in a picture, it is certain that that picture would prove a very acceptable one to him. We think that this is possible, and that, so far from spoiling the agreeable loose holiday thoughts and feelings, it will crystallise them into a heightened and more permanent pleasure.

A man chooses his holidaying spot because of some feature about it that appeals particularly to him. He may not be fully conscious of what the charm is due to. He should try to do so, and embody it in a picture—in one picture. Assuming that he is at the seaside for instance, the sandy space of the shore, or the "air" of the sea, may be the features that are stimulating his soul to thoughts that are strangers to it in the office, consulting room, or shop. If he is to do justice to his subject in a picture, it will take him half his time to think out and arrange the best conditions for taking, and the other half to wait for the fitting opportunity. There are so many methods of doing a broad, big task, so many points of view, that to do justice to even the attempt there need be no worry as to its compelling anyone's artistic and technical best. And as a just reward of high labour, how different the picture of sand, sea, and moor to the usual "photographic scraps." Where are the "photographic scraps" when one feels hipped and tired in the course of the fifty weeks out of the fifty-two of the year spent at home? Are they turned to when the revolt against the sordid and selfish small things of life sets in? No, if a man has any capacity for the task, let him express his individuality in what he is attracted to as the most pleasing in his holiday. This upon a broader scale is the artist's method of working. We can rest well assured that the best course has been evolved by him from long use and practice. He does not go out with half-a-dozen canvasses to catch a possible chance, but with the determination of expressing a salient something grateful to his feelings, to which a particular scene lends itself. His plan is a very safe one to follow, and the reward would also borrow something of the desirable value of that of the artist.

If this plan be adopted, the camera would be taken along with the luggage, and not more than half-a-dozen plates. If a man could trust to one plate only it would be all the better. The care in making one exposure that cannot be

reated is far more likely to prove a success than the less amount bestowed upon half-a-dozen exposures upon the same subject. Still, it might be good sense to hold a reserve of plates so as to guard against the odd adverse condition. It is also possible that the better of two sets of different conditions of taking cannot be decided upon, and an exposure under each be desired. But this is not so material as long as the aim is one picture. In carrying out this scheme the camera can rest in the lodgings until all has been decided as to what it is to do. It will thus be merely the mechanical instrument of the mind, and not its exacting master. As to the field of action, it will be found wide enough to suit the most diverse tastes. We have instanced sand and sea and moor; we might further suggest subjects that would come under such titles as "Early Morning in the Village," "Twilight in the Village," "A Village Inn," "A Village Church," "The Manor House," "The Bridge," "The Corn Wain," "The Brook," "Full Tide," "Ebb Tide," "Sea Toilers," and so on. England is full to the brim of artistic and psychological picture possibilities at all times of the year, but particularly so at this season of the year.

THE PROBLEM OF PORTRAITURE IN COLOURS.

A CONSIDERABLE amount of interest seems to exist at the present time concerning the possibility of taking portraits in colours by photographic agency, and it would not seem to be altogether unsuitable if we were to consider the existing methods of solving the problem. Colour photography, as popularly understood, is still a dream of the experimentalist, but there are certain methods whereby colours can be reproduced photographically. In the Lippmann process we have the nearest approach to real photography in colours, but the manifold difficulties which are encountered in working it practically leaves it in the hands of the expert laboratory operator. There are three great drawbacks to this method, if it were employed for portraiture: 1st, The great length of the exposure; 2nd, the impossibility of reproduction; 3rd, the awkwardness of the method of viewing the result. As regards the first point, in this country, in the month of June, with a lens working at f.6, and using bright light, five minutes' exposure would not be too long. In a studio, of course, we should have to give much more. When Mons. Lippmann demonstrated the process at the Society of Arts, he showed a specimen of a young lady reclining on the grass. This was taken in bright sunshine, in a perfectly clear atmosphere, in France, with an exposure of two minutes, using a lens working at full aperture. Having got the negative, this has to have a glass prism cemented to it, to avoid surface reflections, and then has to be held at a certain angle to see the colours. This process, beautiful though it is, must be dismissed by us in our search for a practical method, for everyday use. The other direct processes, such as they are, unfortunately cannot be employed, for the simple reason that they are in a very embryo stage, nor, indeed, can their prognosis be said to be favourable.

Seebeck, in 1810, and Poietvin, in 1865, are generally considered to be the first of experimenters in the silver subchloride methods, in which the sensitive substance is supposed to assume the colour of the light waves to which it is exposed, but undoubtedly the late Carey-Lea's name is inseparably associated with this process. Full particulars of his work are published in the ALMANAC for 1902, and should be carefully studied by all interested therein. Verres' work in this method was very favourably commended on by Dr. Eder, in the "Jarbuch" for 1891, but the results are not permanent for any appreciable length of time. Vallot, Messrs. Lumière, Wiener, and more recently Dr. Neuhauss and Karl Worel have experimented with organic dyes, the idea being that, when using a coloured transparency, the colours transmitted therefrom bleached those dyes by which they were not absorbed, and thus produced a print in colours. Even if quite successful, this method would only be a printing process, and so we need not go any further into the matter.

Undoubtedly the finest results that have been obtained are those produced by the indirect method of three-colour work. The theory on which this method is based may briefly be stated as follows:—All colours which the eye is capable of recognising consist of one of three "primary" colours, or are a combination of these primaries. I entered very fully into the physical and physiological foundations of this method in a paper which was published in this JOURNAL on the 24th of January, 1902. To that article I wish to refer the reader who desires to go into the subject more fully than I can in the present paper.

However, working on the theory given above, we find that white light, which is a combination of all the colours we know, can be reproduced by a suitable proportion of the three primaries, red, green, and blue. Now, the ordinary photographic plate is almost insensitive to red light, while being exceedingly sensitive to the blue rays. Plates are, however, to be procured which by certain treatment in their manufacture, are made sensitive to the red rays, but no method is at present known whereby a plate can be made equally sensitive to all the colours of the spectrum.

To show an even amount of photographic action in all colours, we have to compromise by giving different exposures. Here, then, our difficulties begin. We have to make three exposures, one for each of the primary colours, and these exposures have to be of different length. On the other hand, they must be absolutely proportionately equal, otherwise we should upset our colour balance. Three separate exposures are made through carefully worked glass screens of the colour of the three primaries. Our negatives will, of course, show no colours, but should be a record of the colour of our objects. These negatives must be very perfect ones—that is, correctly exposed and correctly developed. It is a difficult matter at any time to make three negatives exactly similar, but the task is made all the harder when uneven exposures have to be given. There is another great drawback to this method of making the negatives from the portraitist point of view, and that is the length of the combined three exposures.

Elaborate cameras have been designed whereby it is possible that, with one exposure, the three plates are exposed simultaneously. I consider that in the state of perfection to which this instrument can be made lies, to a large extent, the future of three-colour work. I have been so fortunate as to see prints from photographs made by Mr. F. E. Ives with such a camera, which he has himself designed, and I was told that very little etching was done on the plates. This being so, a great advancement has undoubtedly been made, and once again Mr. Ives places us under an obligation to his knowledge, perseverance, and enterprise. Mr. Sanger-Shepherd has also, I believe, a similar camera for sale, and perhaps it is hardly too much to say that between them, Mr. Ives and Mr. Sanger-Shepherd share the honour of being the chief practical English-speaking heroes of the three-colour processes. Others there are, whose names occur to me as I write; but these chiefly owe their prominence to the great efforts of these two gentlemen, as they in their turn do to the early experimentalists.

There is one point in connection with three-colour work which is often overlooked, and that is the question of impurity of the colours. Unless the greatest care is taken in the adjustments of the various details of the process, this is bound to be noticeably present. The reason is that when two or more colours are mixed together, there is formed, besides the new colour, a certain quantity of black, or in the case of coloured lights the impurity is due to an admixture of white. The more impure the colours used for making the mixture are, the greater will be the impurity due to the black or white, since the intensity of the sensation increases in logarithmic progression with the quantity of black or white present. This is a very real trouble in all three-colour work, and if it were only more fully realised, we should not see so much of the faulty work which is at present turned out. Let us now enquire whether it is possible to obtain a perfect set of three colour negatives, in the studio, of the living subject. In the first place, we should have to make a fresh adjustment of our apparatus, on account of the peculiarities of the light in the studio. It must be remembered that the rays have to pass through the glass, and so would suffer on this account, and as the ordinary blinds used would cut off far too much light, it would be almost advisable to specially construct a studio for our purposes. This, I think, would hardly appeal to most professional photographers. Many of my readers may have in mind the optimistic remarks which closed a recent paragraph in this JOURNAL dealing with a splendid specimen of three-colour life portraiture, by Dr. A. Miethe. I am the fortunate possessor of a copy of the specimen referred to, and can vouch for its excellence. This specimen, though, was taken out-of-doors, in very bright light, with a total exposure of five-and-a-half seconds, and evidently, from the fuzziness of the background, at the full aperture of the lens. The screens were specially made by Dr. Miethe, who is an expert in this process, and were most carefully adjusted for the red, green, and blue, with relative exposures of 2.5, 2, 1. In a studio, I should say the exposures necessary would have been out of the range of practical work. Moreover, in this specimen, bright colours predominate, while in ordinary work the large quantity of greys presents still further increase of the difficulties already existing. Undoubtedly, with a camera constructed for taking the three negatives at once, and with a specially designed studio, it would be possible, under favourable weather conditions, to obtain good three-colour negatives, using a suitable support for the model.

Presupposing that we have, however, obtained our negatives, the next point to consider is the style of our positive work. We have the choice of three methods; we can either view them with coloured light by means of an instrument such as Mr. Ives' Kromskop, or make a transparency of them by means of superposed dyed films, as practised by Mr. Sanger Shepherd, or we can make a print of them on paper. Both the results shown by Mr. Ives' Kromskop and Mr. Sanger Shepherd's superposed methods are very beautiful, but as the first requires a special viewing apparatus, and the second is in the form of a lantern slide on glass, they do not commend themselves to the average clients of a professional. Paper prints are what are wanted, and would have to be supplied. Now, the production of such prints is a matter of photo-mechanical operation, and, like all such work, it is a very costly affair, unless a large quantity of prints is required. Three separate half-tone blocks have to be made from the set of tri-chromatic negatives, the inherent faults of these negatives have to be carefully removed from the blocks by a delicate process of etching, and then put in a press, specially made to register accurately; prints therefrom are made by giving each block a coating of a different-coloured ink (spoken of as the complement to that through which the negative, from which the block was made, was taken), and the three printings done on top of one another. It will be at once seen what an elaborate and costly process this is. The blocks have to be most perfectly made, and the etching can be done only by a most skilled artisan. The inks employed have to be most carefully selected for their purity, as well as for their permanence, two qualities which are almost in this case paradoxical, and which can only be approximately realised by a delicate compromise, and finally a special quality paper must be used, and each print most carefully watched during its progress through the press. There is no stage whatsoever in three-coloured work which can be scamped; each little detail has to have individual attention, and only those with a complete knowledge of the whole theory and practice of the process can ever hope to turn out really good results. Much of the work which is thrown upon a generous public as three-colour work is not only a disgrace to its producer, and an insult to a very beautiful process, but is, moreover, a genuine means of keeping back what should be one of the most used and useful printing methods of the present century.

Another form of three-colour work is that known as the Joly, or McDonough, process. Here, instead of making three separate negatives, only one is made. The result is effected by means of one screen ruled with fine parallel lines of red, green, and blue alternately, in place of the three separate colour screens. The result is a mosaic negative, from which a positive on glass can be made, and which, when bound up with a similarly ruled screen to that through which the negative was made, gives us our picture in colours. Instead of adopting the transparency method, we can make a print. For this purpose, a piece of suitable paper is ruled with the three primary colours, and the press copy is made to accurately register over these lines. There seems to be a dark cloud hanging over this beautiful process, for it has never achieved the success it deserves. The reason of this is not difficult to perceive—in a nutshell, it is because it left the hands of the scientists, who should have been able to make it perfect, and came into the control of the capitalist before its incubation stage was complete. The result was a prematurely born child, which, thrown upon an unsympathetic and suspicious world, succumbed to the ill-treatment to which it was subjected. This is no poetic way of telling the melancholy history of this ill-starred process; it is, on the contrary, the plain truth. Only recently this method was resuscitated in this country by an enterprising American. The process had been considerably improved since it left Dr. Joly's hands, and a little more work on it would have made it a completed reality. As it was, it fell into wrong hands in this country, and was crushed to death. I have myself made hundreds of the most perfect colour pictures by this method, and I confidently assert that no other process has ever shown such varied and perfect results as this method has. Here was a grand process for portrait work; and, indeed, some specimens taken by Mr. Stein, of Milwaukee, have aroused the unbounded admiration of more than one crowned head in Europe. The screens I used were ruled 300 lines to the inch, but this was not fine enough, except for work at least 15in. by 12in. in size. This fact not being recognised constituted the first failing of the scheme, and only brought on the enterprise the contempt of narrow-minded critics. The paper specimens shown were exceedingly poor, and the promise they gave of a brilliant future could only be recognised by a farseeing individual. The inks used were very impure, and the printing of the lines hurried; moreover,

e half-tone blocks were far from being high-class. The re-
lt was, of course, that the print lacked all purity and
illiancy of colour, and only disappointed those who were led
expect great things. Undoubtedly they should never have
en shown in the state in which they then were. This, how-
er, was not the case with the transparencies, many of which
re absolutely marvellous in their accurate colour-renderings.
have taken a lady with two dogs on a garden lawn, in the
nshine, with one second's exposure, and obtained a perfect
sult! When we consider this, and knowing, at the same
me, that nearly all the faults of the process were mechanical
nes, which were capable of being removed, it is not to be
ondered at that the failure of the business aspect of the
uestion is almost capable of being classed as of the nature of
n international calamity.

However, for the present, it is dead; and we can only hope
hat if in the future it is revived, it will be guided by the
cientist as its captain with a sound business man as its
econd in command. When I think of its great promise of
uccess, and then realise its present extinction, I can, indeed,
ay with Virgil, "Horresco referens." In this necessarily
ondensed account of the processes of colour photography
hich can be commercially practised, I have given a candid
tatement of the present position of the subject. I cannot
elp warning those who may be induced to take up this in-
eresting branch of work, to be very careful not to be led away
y the somewhat hasty and ill-advised statements which ap-
ear from time to time in the literary and advertisement pages
f the photographic press. Colour photography is a subject
hich requires the most careful study, and its pathway is full
f pitfalls even to the advanced worker. It is, however, a
ost delightful field of work, but must be conscientiously
ttacked from its physiological, physical, and photographical
spects.

The three-colour methods as practised by Mr. Ives and Mr. Sanger Shepherd are matters of commerce, and should be worked by the student; while the more elaborate and delicate process of Mons. Lippmann will also prove most valuable for teaching the intricacies of light problems, and should receive careful attention. The literature of the subject is scattered, but "A Handbook of Photography in Colours," by Messrs. Thos. Bolas, Alex. Tallent, and Edgar Senior, together with Hübl's "Die Dreifarben-Photographie," are the two leading volumes. As an introduction to the sublect, I can recommend the summary by Mr. Thomas Bedding, F.R.P.S., which appeared in the BRITISH JOURNAL PHOTOGRAPHIC ALMANAC for 1901, as being most ably, concisely, and pleasantly written.

ARTHUR V. KENAH.

SCREENS AND DIAPHRAGMS FOR HALF-TONE AND THREE-COLOUR WORK.

A Paper read before the Camera Club and reprinted from its "Journal."

II.

A CONTINENTAL process authority named Fleck has suggested that stops should be cut out with apertures like enlarged spaces of the irregular-grained screens in order to get an irregular-grained screen effect from a cross-lined screen, but I do not know what success attends the use of extraordinary stops. Possibly they might be useful to work with irregular-grain screens. Another class of diaphragms about which very little has been published is what I may term translucent stops. These consist of coloured films inserted between the front and back components of the lens in or near the plane of the diaphragm. I think Mr. Ives was the first to adopt this idea for half-tone, and the method he pursued was to coat pieces of optically-worked glass with slightly yellow-tinted collodion, and to scrape away a clear centre. The diaphragm slot was enlarged to take these stops, and the theory was that they held back the spreading of the dots in the high lights until the shadow dots had time to form, and, in fact, had the same effect as is now obtained by two or more stops of varying aperture. Mr. Sanger Shepherd showed a similar stop at the Crystal Palace Exhibition of the Royal Photographic Society, the only difference being that he used a green film instead of a yellow one. As an instance of the way old ideas are re-invented or re-patented, I may mention that in 1901 there was patented a form of light filter for orthochromatic photography, which is known as the Artlett screen, and the description in the specification is exactly the description of the method of making Mr. Ives' translucent stop, which has been in use for ten years or more. The only variation is that the two films are different in colour, one being a strong light yellow, and the other a clear strong red. In the centre of the yellow film is a small circular vacant space, and in the centre of the red film a comparatively large circular vacant space, and the two are cemented together concentric to each other. The inventor states that the screen transmits a small quantity of the very energetic blue and violet rays (along with other rays constituting white light) through the central space left vacant in both films, a large quantity of the green rays (with the red and yellow) through the yellow annular space which intervenes between the central clear space and the red film, and a much larger quantity of the comparatively inactive orange and red rays through the outer red or red-cum-yellow portion of the compound screen.

Another curious stop of the translucent class is called the chromatic balance shutter—introduced in connection with the MacDonough-Joly colour process. The slide I project herewith explains it. The first figure shows a yellow disc and orange sectors over it. The second is a rotating set of orange sectors, and is made to rotate over the first one, to produce the effect of the third, which shows the shutter as it would be used. Its object is stated to be to compensate for variations in the taking screens and plates. It has occurred to me that probably a very good form of translucent diaphragm would be a zone plate, which is a plate of glass ruled with concentric circles whose radii are proportional to square roots of the natural numbers. Such a plate can be used instead of a lens, and I see no reason why it should not be used as a diaphragm in half-tone, although I have not had time to try the idea. Another idea of Mr. Ives, which may be mentioned in this connection, was a transparent colour cross-line screen, the lines being ruled through a collodion film coloured with "brilliant green" dye. With this screen the closing up of the high light dots is accomplished by the light directly transmitted through the coloured lines where not crossed, and by this means the injury to definition of detail, and the outline due to diffraction in ordinary opaque cross-line screen work, is practically reduced to about one-fourth. A difficulty which prevents the full realisation of theoretical conditions in three-colour printing is the want of transparency in the inks generally used.

In connection with this matter, I was very pleased to receive recently from Messrs. Fleming some new samples of dry colour which they had prepared for the purpose of making transparent inks. To test their transparency, I rubbed the colours out on glass with a little mastic varnish, and the result you will see projected in the three slides I show you now. Comparatively, I show you the ordinary three-colour inks, and you will

see how opaque they are under the same conditions. I show you also the same inks spread out on white paper and on tracing paper. [The lecturer here showed slides illustrative of the result of this experiment, and also the examples of the same inks spread out on white paper and on tracing paper. He also showed samples of a set of inks prepared by Mr. Edgar Senior, which, when tested by the Abney colour sensitometer, were said to be theoretically perfect. He would like to see these inks tried in colour printing, but so far they had only been made in an experimental quantity.] In considering the effect of colour screens, it is always necessary to correct for ultra-violet, which is generally a bugbear to successful three-colour work. In this connection, I have been making some experiments with Tallent's diffraction spectroscope camera, which I have had fitted up with quartz right through. Here is a quartz condenser, then a quartz cell to take the coloured fluid, next a collimating lens, also of quartz, then a quartz prism with one of Mr. Thorp's most perfect grating films mounted on it, and finally a quartz photographic lens. The only possible obstruction to the ultra-violet rays is, therefore, the exceedingly thin film which forms the grating, and it is hardly possible to conceive that this can have any appreciable effect on the results. The spectrum of the electric arc produced with this camera is of extreme beauty and brilliancy, and it extends far into the ultra-violet. By using an "enclosed" arc, I am able to get a large volume of ultra-violet, and thereby it is easy to estimate its effect.

I have found one of the very best absorbers of ultra-violet is a strong alcoholic solution of chlorophyll. This gives a dark green tint by transmitted light, and a red surface colouration when presented to ultra-violet rays. It is easy to prove whether the solution is an absorber of ultra-violet by presenting another cell of the solution to the light coming through the first cell. No red surface colouration is visible, and consequently we can assume that no ultra-violet has got through. The same thing may be proved by presenting other liquids to the transmitted light. Paraffin oil and machine oil, which have a beautiful blue fluorescence under ultra-violet rays, are inert when the chlorophyll is interposed. Sulphate of quinine, dissolved in dilute hydrochloric acid, is said to be one of the best absorbers of ultra-violet, but, according to my experiments, this seems to be an absolute fallacy. It certainly gives a fluorescent blue surface tint, but it still transmits a good proportion of the ultra-violet with all the other rays. The visual tests are corroborated by the photographic tests: sulphate of quinine allows practically all the spectrum to pass, even with brief exposures. Aesculin, which is an extract from the bark of the horse chestnut, and is a light white powder somewhat resembling pyrogallic acid in appearance, is a good absorber of ultra-violet. One part dissolved in 500 parts of water is sufficient to make a solution which will act as a screen for the ultra-violet. By transmitted light it is perfectly transparent, but it gives a beautiful fluorescent blue surface colouration when exposed to the electric arc. Its absorption effect on the spectrum is very marked, both visually and photographically. Filters which absorb or subdue the ultra-violet without absorbing other portions of the spectrum may be described as compensation filters, and they are useful in the orthochromatic reproduction of paintings and in spectrum photography. Of these Cadett's Absolutus and Gilvus filters are good examples

The next class of light filters may be called contrast filters. If it is required to pronounce or exaggerate a colour, a light filter of a complementary colour is used as a contrast filter. Examples of this type are the screens used in photo-micrography and the photography of clouds. Protection filters are known better under the name of safe-lights. Most of you are familiar with the Cadett safe-light, and Rheinlander's safe lights, which we are now using in collodion emulsion work for lighting the dark-room. The first example shown upon the screen is a red light, and is used for emulsion, which is sensitive to all rays from violet to green, and is accordingly used for preparation and development of the negatives for the yellow and red printing plate. The other is a green filter, and is used for developing the negative for the blue printing plate. It is surprising what a large volume of perfectly safe light these filters give, and it is quite a comfort to work in the dark-room under such illumination. The lights are perfectly monochromatic, and it is very curious to note the ebony blackness of every red article in the room under the green light. We now come to the question of selection filters, which are those used in the three-colour process. They pick out certain portions of the spectrum, or of coloured pictures and natural objects, whilst absorbing the other parts, and approximately the colours of the screens are red, green, and violet. In the case of some sets, orange, green, and violet would be a nearer approximation to the colours. There is no method so simple and so certain of revealing the photographic value of a colour filter as photography of the spectrum, and for this reason I put forward Mr. Tallent's spectroscopic camera as an instrument of the highest practical value. You have here at once the means of ascertaining all you want to know about the performance of your colour filters and plates, not only in regard to absorption of colour screens, and quality of illumination, but also the colour sensitiveness of your plates and the relative exposure required. Apart from this, almost every kind of spectroscopic studies may be performed upon this camera, and it is suggested that it should be exceedingly useful in any kind of testing where colour forms the basis of the test. In the filters made by Mr. H. O. Klein for Dr. Albert's Collodion Emulsion, the bands of absorption are arranged to co-operate with the insensitiveness of the plate for certain spectrum rays. For instance, if the violet filter should pass a little red it is unimportant, because the plate is insensitive to red, showing the undesirability of adhering too closely to visual tests with the spectroscope, without taking into account the colour sensitiveness of the plate. By ignoring those parts of the spectrum which are not likely to affect the plate, even if they pass through the filter, we are able to make our filters very transparent and thus reduce the exposures. The colour sensitising of the plate is a wide subject, which I cannot go into to-night, but I would just like to call your attention to the two newest sensitisers, titan-scarlet (for the red) and ethyl-violet (for the blue); both are powerful colour sensitisers, which greatly reduce the exposure.

Mr. J. A. C. Branfill was one of the earliest to suggest that all three colours might be introduced into the diaphragm at one time, by having three apertures, each covered with a film of coloured collodion. His idea was that the apertures should be in the ratio of the relative exposure values, though it would be possible, of course, to have them the same size, and reduce the colours to a common luminosity. A ruled screen has to be interposed in front of the plate, and the diaphragm photographed on the pinhole principle of half-tone. To produce the printing surfaces the negative was to be masked by another screen, which would successively cover up the set of dots or lines corresponding to each particular colour, so that the three separate plates could be obtained from the one negative first taken. This method has been actually realised in what is called the Brasseur-Sampolo process, so far as concerns the masking of a single negative to produce three plates from it,

but they do not use the diaphragm idea. The composite negative is produced by a modification of the Joly screen. A much closer approximation to Mr. Branfill's idea formed the subject of a patent taken out by Szczepanik, who has also invented a method of applying the half-tone process to the making of cards for the Jacquard loom, and also has a patent for telegraphing pictures. [Two slides are shown which illustrate the Szczepanik modification of Branfill's idea. The diagram shows the usual half-tone projection lens, diaphragm, ruled screen, and plate. The next slide explains the diaphragm. Suppose you put this square diaphragm in the lens, and the screen is a single-line one, a diaphragm, such as here shown, would give black bands on the plate. If the screen is moved away from the plate, a position is reached where the light bands join up and form a continuous image.] Now, other things remaining the same, the substitution for the diaphragm of one of equal width, but one-third the height, will give an image broken into dark bands twice the width of the light bands. The successive use of the three diaphragms will permit the exposure of the whole of the plate in sections, and if these diaphragm openings are covered with colour filters, a negative is obtained representing the colour sensations very much as is the case with negatives taken through the Joly screen. A positive made from this negative is projected in the colours of the original by inserting a diaphragm containing equal stripes of the three primary colours. To make the matter plain, I have coloured the openings with the three filter colours—red, green, and violet. But if the inventor meant to imply by the letters "R. J. B.," that the openings were to be filled with red, yellow, and blue—expressed by the initials of the French words, *rouge, jaune, bleu*—he evidently did not know the principle of what he was trying to invent, for no practical three-colour worker would think of taking his negatives with the same filters as those used for projecting transparencies. Before closing, I would like to acknowledge my indebtedness to Mr. H. O. Klein for his assistance in preparing slides relating to the application of collodion emulsion to three-colour work; to Mr. Edgar Senior, of the Battersea Polytechnic, for his slides illustrating the three-colour process and the metzograph grain, and for the loan of an ingenious colour sensitometer [which I show therewith]. By its means the colour-sensitiveness of plates and the absorption of screens can be very readily and simply tested. Also I have to thank Mr. W. T. Wilkinson, of the Goldsmiths' Institute, for the slides illustrating the photogravure and metzograph grain, and some slides showing excellent enlargements of the half-tone dot.

WILLIAM GAMBLE.

THE CONSTRUCTION OF ANASTIGMATS WITH NORMAL GLASSES.

ON August 1st we published a paragraph, giving the purport of a letter from Dr. Rudolph to the "Central Zeitung für Optik und Mechanik," in reply to an assertion by Herr K. Martin, that every anastigmat introduced prior to that of the Rathenow Optical Co. was dependent upon the use of heaviest Barium Crown glass.

Having published Dr. Rudolph's criticism, we feel it our duty to give the following translation of Herr K. Martin's reply, which has just appeared in the "Central Zeitung."

Dr. P. Rudolph, the well-known head of the photographic department of the firm of C. Zeiss, of Jena, for whose knowledge and ability as a photographic optician I have hitherto entertained the greatest respect, has favoured my article in No. 13 of the "Central Zeitung" with a reply, in which, as I will show, he infelicitously attacks my claim to priority in the construction of an anastigmat with normal glasses.

The surprising rapidity with which the writer replied shows that he has not read my article with that amount of care which his contention required should be given to it.

Dr. Rudolph has converted the question of the construction of an anastigmat made of normal glasses to one of an anastigmat without heaviest Baryta Crown. In consideration of the first Planar patent, I purposely avoided stating that all anastigmats of prior construction contained heaviest Baryta Crown. The statement, which has been called in question, reads as follows:—

"Although they (the anastigmats) differed so much from each other, they had one characteristic in common, that of the new Baryta glasses, and especially heaviest Baryta Crown."

It must be admitted that I have not expressed myself quite correctly. I should have said, instead of "new baryta glasses," "principally new glasses," or "new baryta, borate, phosphate, etc., glasses," as the combination which has been cited, forming the subject of the (German) patent No. 92,313, does not contain a baryta glass in its hyperchromatic dispersive lens, but a new glass by Schott, to which I will refer subsequently. This combination, so far as I am aware, has never been manufactured commercially.

If Dr. Rudolph really writes this in support of the due historical recognition of previous work of others, as stated at the outset of his reply, such grounds existed long ago. Dr. Moritz von Rohr, the assistant of Dr. Rudolph, has written concerning the planar in his excellent work on "The Theory and History of the Photographic Objective," Berlin, 1899, p. 390:—". . . . And in 1896 the known use of the hyperchromatic dispersing lens was followed (in the Planar). We thus have another instance in which the correction of Seydel's four aberrations of definition, for finite apertures and angles of incidence, is associated with the use of the new kinds of Jena glass."

In the year 1900, the same author, on the occasion of an address at the Gesellschaft zur Pflege der Photographie, Leipsic, stated that the construction of chromatically corrected anastigmats first became possible through the introduction of the new glasses by Schott. (See "Phot. Centr.-Blatt," VI., No. 7, p. 146.)

These statements are in flat contradiction of Dr. Rudolph's last remarks, and we are constrained to ask why these expressions were allowed to appear, or left uncontradicted, if Dr. Rudolph had so much at heart the due historical recognition of previous work of others. From the text-books of Lummer, Drude, etc., it may be seen that this incorrect opinion of von Rohr has become the common property of the text-books of physics, and this should have been a further reason for its contradiction by Dr. Rudolph.

Without knowing the constants of my lens, Dr. Rudolph also affirms that it is closely related to A. G Clark's, and differs from it only to a small degree in the radii and thicknesses.

My lens differs from Clark's as fundamentally as does the planar, in the anastigmatic flattening of the field. If Dr. Rudolph, in his reply, claims anastigmatic flattening of the field for A. G. Clark's lens, then any reasonable person must hold that the planar is a pseudo-improvement of the older lens. If the requisite anastigmatic flattening of the field was already attained in that objective, why has Dr. Rudolph increased the number of lenses from four to six, by using the hyperchromatic dispersing lens, which was already protected by the German patent No. 88,889?

Dr. Rudolph cannot refute this, and must admit that he does

not believe in the good correction of the Clark lens for flatness of field. Apart from this, I can prove it does not exist.

It is, perhaps, generally known that Petzval's formula, through neglecting the thickness of the lenses, leads to systems of infinitely small aperture, when it is used for the analytical calculation of anastigmats, but it is nevertheless a good criterion in testing systems in their finished state for the possible presence of anastigmatic flatness of field. In calculating $\Sigma \frac{\phi}{n}$ we do not always obtain o in the case of anastigmats, or a vanishing quantity in relation to the reciprocal focus of the whole, which the theory requires, but in objectives with anastigmatically flattened field $\Sigma \frac{\phi}{n}$ is considerably less than in others.

The radii of Clark's lens—as Dr. Rudolph should know—are given in the American patent specification, No. 399,499, as follows, for one component of a combination of 12in. focus, starting from the inner surface:—

$R_1 = -2\,4''$
$R_2 = -3\,3''$
$R_3 = -6{\cdot}3''$
$R_4 = -2{\cdot}05''$

This gives the following curves for focus = 1.

$\rho = -5\,00$
$\rho_1 = -3{\cdot}62$
$\rho_2 = -1{\cdot}90$
$\rho_3 = -5{\cdot}85$

If we take the index of the crown as 1.51 and the flint as 1.61, the use of Petzval's equation gives $\Sigma \frac{\phi}{n} = +0{\cdot}81$. According to the derivation of Petzval's law, this means that the radius of the curvature of the field is equal to the focus of the system divided by 0.81, and the curvature of the field is consequently very considerable.

The following are the data for the components of a system according to my calculation (not the lens on the market). The focus is 190 mm., and the figures are given from the stop outwards:—

$R_1 = -27{\cdot}25$
$D_1 = 7{\cdot}48$ $^nD = 1{\cdot}6040$ $n\rho^1 = 1\,62496.$
$R_2 = -51{\cdot}82$
$D_2 = 1{\cdot}47$
$R_3 = -226{\cdot}54$
$D_3 = 6{\cdot}97$ $^nD = 1{\cdot}5012$ $n\rho^1 = 1{\cdot}51170.$
$R_4 = -39{\cdot}03$

Distance of stop = $-6{\cdot}19$.

From this we obtain, analagously to the former case, for $\Sigma \frac{\phi}{n}$ the value + 0.10, i.e., the radius of the curvature of the field, according to Petzval, is about ten times the focus, which consequently is very small. Besides this we have the fact that in the anastigmatically corrected Gauss objectives (Planar, Aristostigmat, Busch-anastigmat), $R_1 > R_4$, whilst in Clark's lens the opposite is the case, consequently the latter cannot be perfectly corrected anastigmatically.

Dr. Rudolph has also advanced, as proof that anastigmats of normal glass were previously known, a lens by H. D. Taylor. The curves of the field of this lens are given in Plate 1, No. 94, of von Rohr's work. The drawing shows that the system, calculated in the state in which it is given, is further removed from anastigmatic flatness of field than, for instance, Steinheil's portrait aplanat of 1875 (Fig. 115, of the same plate). Even if the astigmatism of Taylor's system were eliminated by appropriate alterations, the curvature of the field for rays of rather greater obliquity would still be considerably more than for my system, as given above. Von Rohr writes that this lens was not placed upon the market (presumably because it was of no value), and all the specimens of this type which have since been brought out all contain the new glass (heaviest Baryta Crown).

I now come to the third objective, which has been adduced, the Planar.

As already mentioned, two new glasses are used, in this case, in the construction of the hyperchromatic dispersive lens, corresponding to the Schott types, 0.608 and 0.144. Both glasses are emphasised in Schott and Gen's catalogue by heavy type, as varieties of glass of distinctly new composition, first manufactured by Schott und Genossen.

If Dr. Rudolph *had* been able to avoid these difficulties by using two ordinary kinds of glass, the fact remains that he *has* not. Besides this, a hyperchromatic dispersive lens, the components of which possess considerable difference of dispersion, involves *eo ipso* the presence of abnormal glasses.

With reference to the remark that the Unar also permits of the use of any variety of crown glass, I beg to point out that I gave expression to this possibility in my paper, prior to Dr. Rudolph, in the following words:—"Instead of the Gauss objective, I could, of course, have taken any other doublet construction which is capable of astigmatic correction by means of anomalous pairs of glasses.

So far as I am aware, however, the firm of Zeiss does not use ordinary glasses, exclusively, for the Unars, which are on the market.

In conclusion, I desire to add that, far from desiring to belittle the great services Dr. Rudolph has rendered in the improvement of the photographic objective, I recognise fully and completely that he was the first who pointed out the possibility of correcting the Gauss type perfectly for astigmatism. But all the possibilities have not received his consideration, and especially the more closely allied and simple constructions have escaped him. I am at a loss to understand it, but were this not the case, the totally inadequate drafting of patent specification No. 92,313 would be utterly incomprehensible.

For these reasons, Dr. Rudolph should no longer dispute the modest service I have rendered, in being the first to discover the possibility of a true anastigmat, composed of normal, or old varieties of glass, and publishing it.

BACKGROUNDS.

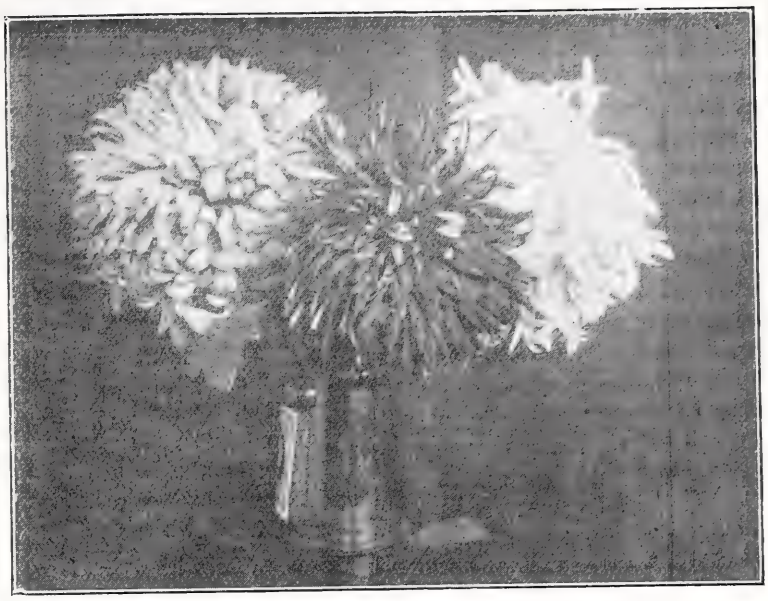
Every picture or portrait, whether taken out-of-doors or in the studio, may be said to have a background, but what this brief communication refers to is the artificial and not the natural background.

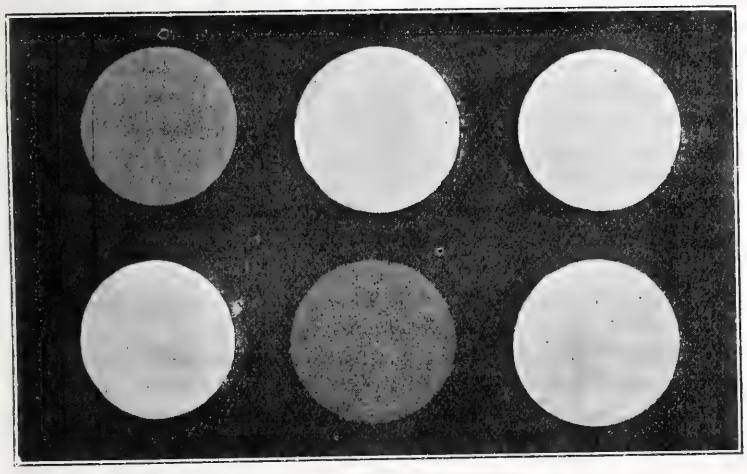
From the interesting demonstration given by Mr. Harold Baker at the recent Photographic Convention, at Cambridge, it is quite obvious that backgrounds play a more important part in the taking of a subject than is generally recognised.

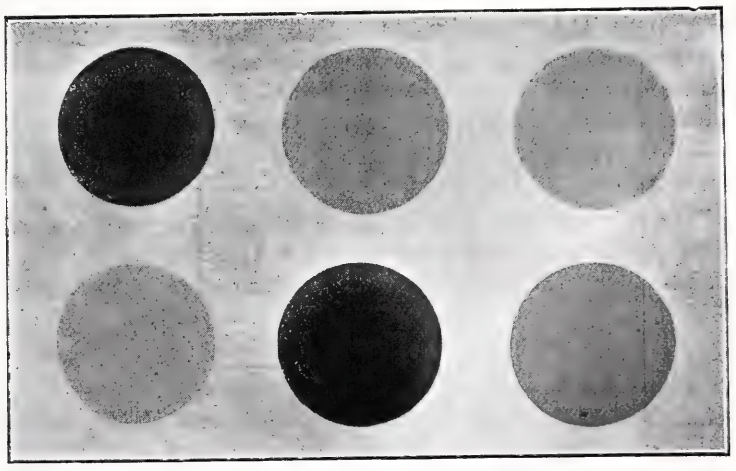
In a paper read by myself before the Croydon Natural History and Scientific Society, which was printed in the British Journal of Photography for Feb. 1st, 1895, p. 71, I pointed this fact out; and again in the British Journal Almanac for 1899, p. 716. The subjects there treated of were not, as in Mr. Harold Baker's case, portraits, but coloured charts and flowers, the results, however, were equally striking.

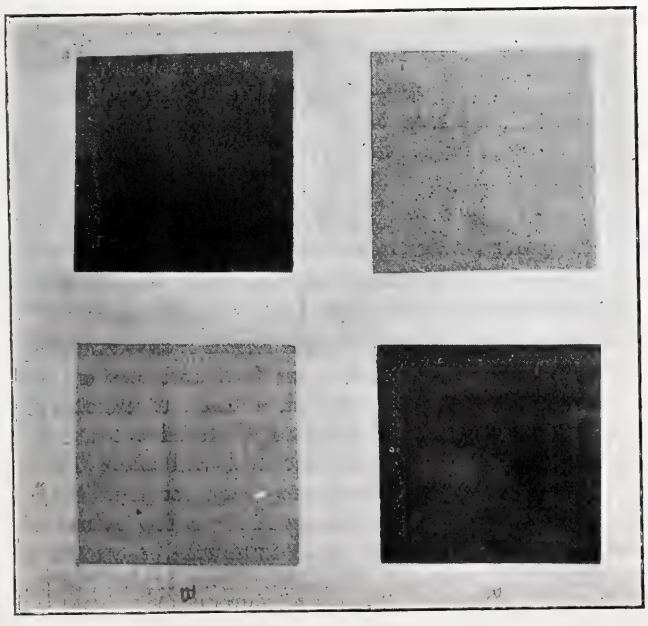
It seems to go almost without saying that when a picture is taken, the effect on the plate depends on the light reflected from the component part of the picture, and transmitted to the plate through the medium of the lens, plus the white light surrounding the subject, always in an outdoor picture, unless a coloured screen is used; and frequently in indoor work; hence it ought to follow that a different result is obtained when backgrounds of any colour other than white are employed.

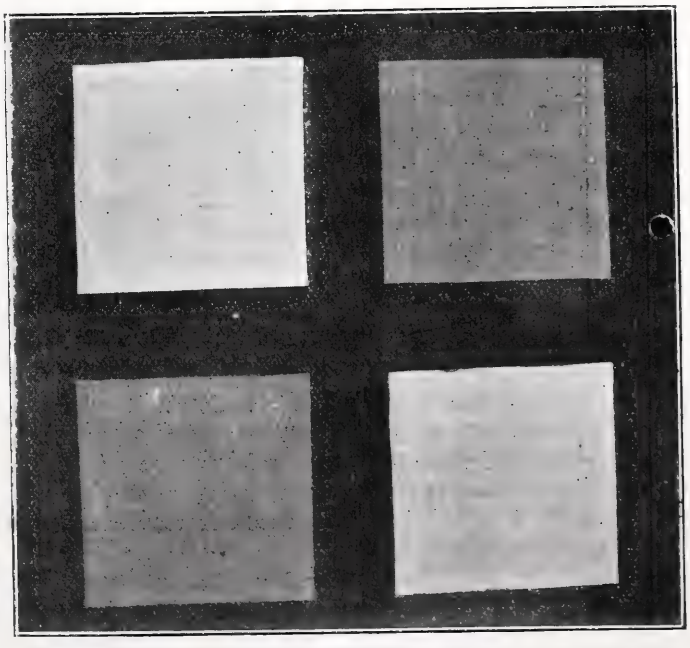












It will be remembered that in the Lumière competition, some few years ago, the winning picture was taken in a room, the windows of which were covered with orange paper, and the subject illuminated by, I think, paraffin lamps, the exposure extending to several hours; this, though all very well for a competition picture, is, of course, quite impracticable for everyday use. The effect of this was practically to take the picture by monochromatic light, a result which also occurs when a screen of whatever colour is used; in either case no white light is allowed to enter the lens.

Everyone knows the beautifully soft effects which may be obtained in the evening, when the sun is low, and the light more or less of a yellowish or pale orange colour; this is only another way of stating the case. In my second paper, referred to above, in 1899, I there stated that in photographing flowers I had obtained results, late in the evening, without a screen, quite as good as those obtained in the daytime with a screen. Everything, therefore, seems to show the importance of having a background suitable to the subject, the object being to regulate, minimise, or quite exclude the entrance of white light into the lens.

I enclose a few prints which will, I think, roughly illustrate what I mean. The flowers were chrysanthemums as nearly red, yellow, and white as I could get them. The discs were red, blue, orange, green, light blue, and yellow. The squares were red, light blue, green, and yellow. The plates, exposure, development, etc., for each pair were exactly the same, the only difference being in the background, and I think you will agree with me that this has made a very material difference in the result.

J. H. Baldock, F.C.S.

[The prints kindly sent by Mr. Baldock effectively show the influence of the background on the subject. As regards portraiture, Mr. Baker has also pointed this out in lectures at the R.P.S., the Camera Club, etc.—Ed. B. J. P.]

THE DARK-ROOM KICKERS: A DRAMA IN ONE ACT.

[Reprinted from "The Photo American."]

Dramatis Personæ.

Mrs. Developer.
Mr. Plate.
The Man.
Scene.—A hot, ill-ventilated dark-room.
Time.—Seven p.m., August 1st, 1902.
Temperature.—150 in the shadows, 200 in the highlights.

Enter The Man with a plateholder containing two exposed plates.

The Man.—Whew! it's hot. Still, I *must* develop these two plates, come what may. Well, what do the instructions say? 1oz. of No. 1, 1oz. of the alkali solution, and 2oz. of water. Ought to know it by heart, seeing that I've used the same old formula since la t December. (Proceeds to mix.)

Mrs. Dev.—Say! Go easy on the alkali! A whole ounce now?

The Man.—Sure, why not? The formula says 1oz. of——

Mrs. Dev.—Supposing it does. That may have been all right a couple of months ago, but there are other things to hustle me along now.

The Man.—I don't quite understand. What other things?

Mrs. Dev.—Honestly, you don't know?

The Man.—No; I wouldn't ask you if I did. The formula

Mrs. Dev.—Slave to the formula, eh! Well, here's another precept to be remembered as well as 1oz. of No. 1 and all that—heat accelerates chemical action, cold retards it. So don't you see that this confounded heat does some of the work that usually falls to the lot of the alkali? Make it ¾oz. of alkali.

The Man.—Just to please you, I will; so don't say any more, but get ready for work.

(The Man commences dusting the plate off with a brush.)

Mr. Plate.—That's good! Lay it on thick!

The Man.—Lay it on thick?

Mr. Plate.—Why, the dust, of course. Can't you see that I'm damp and tacky, and in fine shape to gather all the dust there is in your dirty brush? Suppose you'll wonder later on where the pinholes come from! Fact of the matter is, I don't really need brushing off at all, but if force of habit compels you to do it, use a small piece of soft velvet, and if it's clean, and you don't polish me like you would your shoes, you won't find me full of pinholes—not from this cause, any way.

(The Man hunts up the proposed substitute for a brush, goes over the surface of the plate gently and slowly, and then drops it—the plate, not the velvet—into the developer.)

Mr. Plate.—Heavens alive! This bath's fearfully hot. I'll fog and frill and do all kinds of stunts if you don't cool it off.

The Man.—What! kicking again? This must be a regular strike. Keep quiet a minute, and I'll put some ice beside you.

Mrs. Dev.—Ice don't agree with me. Sure, it'll make it more comfortable for Mr. Plate, but all the time I get thinner and thinner, until my strength is completely exhausted, and then you wonder why I don't work. I'll tell you something that beats ice. Make a mixture of ammonium nitrate, five parts; potassium nitrate, five parts; water, sixteen parts. Stand my tray in a pan containing this concoction, and Mr. Plate will develop well and comfortably. By the bye, it isn't much use doing this unless you ventilate the room somehow. Even with the freezing mixture, I can't keep cool long in this stuffy atmosphere. Should think you'd realise that it's just as bad for you, as it is for me. The first thing I'd do would be to put that hot, odorous old lamp outside the room, and content myself with the use of its beams through an aperture cut in the door. If the wife won't let you do this, drink a few less sodas (?) and buy one of those electric lamps. They're fine.

(Just before the plate is fully developed, The Man leaves the dark-room to make up an acid hypo fixing bath. On returning, he proceeds to dump Mr. Plate therein, grasping him with thumb square on the film side.

Mr. Plate (to himself).—I can see his finish, but I won't say a word. This fixing bath is giving me chills all over, but The Man is so touchy because I have been trying to set him right on a few things, that I'll just stand the cold, and teach him a lesson.

The Man (ten minutes later, on removing Mr. Plate from the fixing bath).—Frilled and blistered after all! Your advice was great. I thought you said that——

Mr. Plate (interrupting).—You needn't say another word. Just let *me* tell you what made me frill and blister; I should have warned you before, only you seemed to take my advice with such poor grace. I frilled and blistered because you took me out of a warm bath and put me in a cold one. The sudden change in the temperature was too much for me. If you had let the hypo stand in the dark-room for a few minutes till it warmed up a little (though not too much), I would now be free from spot and blemish. Another thing, instead of grasping me by the edges, as you ought to have done, you have put your thumb right on my wet film. This will make me blister every

ime. Never, *never* take hold of me except by the edges, no matter whether I be wet or dry.

The Man.—You're a born kicker. Well, I'll wash you, anyhow.

Mr. Plate.—The fixing bath episode ought to have left a sufficiently strong impress on your mind so that you will see that the wash water is neither too hot nor too cold. However, I'm tired of talking to you. Here's the whole thing in a nutshell—with developer, fixing bath, and wash water at about the same temperature (and one not too hight at that), I'll come out without spot or blemish; a too great variation in temperature will cause me to frill and blister. Sixty-five degrees Fahr. suits me O. K.

(The Man takes advantage of the hint, and an hour later stands Mr. Plate on the rack to dry.)

Mr. Plate.—Now, hustle up on this too, old man. Put me in a current of dry air, free from dust and dirt. If you try and dry me in a stuffy old room, I'll be half wet for twenty-four hours, and turn out coarse and ugly.

The Man.—You're a——

(A car passes just at this moment, and the representative of "The Photo-American" failed to catch the rest of what The Man said, but he took it for granted that the lost sentence was just about as coarse and ugly as Mr. Plate promised to be, because everything pointed that way.

F. Voitier.

New Apparatus, &c.

The Adams "Natti" Camera. Manufactured and sold by Adams and Co., 26, Charing Cross Road, London, W.C.

The latest model of this camera, which has long been favourably appreciated for its compactness, portability, and delicacy, as well as variety of movement, has been given some further improvements which render the instrument an almost perfect example of mechanical precision in the way of photographic cabinet making.

When the camera is opened for use, the flap, which holds the body rigid, is now held in position by means of two spring bolts, which renders the camera as rigid as a box camera. A plate-lifter is also added, by means of which the plates are more readily changed, and at the same time the plate is raised it registers a number automatically. Another refinement is that by moving a spring catch the gauge inside the camera can be adjusted to permit the use of either plates or films. The door at the back of the camera for the purpose of charging the instrument is now hinged and fastened in position by means of a neat spring lock. Perhaps in no camera of its size and class are there concentrated so many beautiful movements. The "Natti," in virtue of these qualities, appeals to a very large class of workers, with whom fineness of adjustment is a desideratum, and to these an inspection of the instrument may be confidently recommended.

The Wellington Celluloid Film. Manufactured and sold by Wellington and Ward, Elstree, Herts.

It was inevitable that such a progressive firm as Messrs. Wellington and Ward, to whom during the past few years photographers have been indebted for more than one kind of pellicular negative support—stripping and non-stripping—should place a roll celluloid film in the market. Quite recently such a film has been brought within the reach of the users of cameras which carry roll-film in cartridges. During one of the few intervals of sunshine with which the present very sombre month of August has been fortunately blessed, we took occasion to make some exposures on a sample of the Wellington celluloid. At f/11 we gave 1-32nd of a second (approx.) on well-illuminated groups, and upon development we found that the results had been fully timed. With a pyro-soda developer, a clear, grainless deposit was obtained. The emulsion is evidently one of a high sensitiveness, and amply fast enough for snapshot work. The behaviour of the sensitive pellicle in its passage through the developing, fixing, and washing solutions was all that could be desired, and, judged by the sample submitted to us, Messrs. Wellington and Ward are distinctly to be congratulated on having added to the resources of photographers a film of very fine quality indeed. The film is sent out in rolls to fit all cameras; and we are asked to state that whatever the result of certain proceedings which are still sub judice may be, Messrs. Wellington and Ward will continue its manufacture. This statement should remove any misapprehension that may have arisen amongst Messrs. Welington and Ward's clientèle. We have much pleasure in welcoming the Wellington celluloid film into the photographic world, and wish it a long and prosperous "run." Qualitatively, it deserves a great vogue.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

August.	Name of Society.	Subject.
23.....	Southampton Camera Club...	Ramble—Shawford.
23.....	Brentford Photographic	Chertsey and Laleham.
26.....	Birmingham Photographic	The use of the new enlarging table will be explained by Mr. Bernard Moore.
27.....	North Middlesex Photographic	*Rotograph Bromide Paper. Printing and Toning.* Mr. W. A. Sims.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

August 14th.—Mr. P. Everitt in the chair.

Re the discussion on albumenised paper, at a previous meeting, the hon. secretary read a letter from Mr. H. E. Bullen, in which was stated that his "Bos" albumen paper would keep in good condition for five or six months, if carefully stored; and he is also prepared to supply amateurs direct. Some excellent examples of work done on this paper were passed round and appreciated.

Mr. Wicks passed round several negatives on rollable film, all showing curious branchlike markings It was remarked that these defects were not in one spool of film only, but he had found them in others.

Mr. A. Haddon said the markings were caused by electric sparks, due to stripping the film from its glass support after it had been coated, The marks being latent, are naturally unnoticed when the films are spooled up, but become very evident when developed.

Mr. A. L. Henderson passed round the results of some experiments he had made in the direction of producing a silver printing-out paper that, after printing to the necessary depth, merely requires washing or soaking in plain water to give a finished picture. The emulsion is a gelatine silver compound, and the paper coated in the usual way, the chief difficulties in the production of this paper being to obtain a paper free from any impurities and also to wash in pure water, distilled for preference. Mr. Henderson remarked that the process was a slight modification of his Argentic Stain formula, published some years ago, with the omission of some of the chlorides and addition of certain other suitable compounds.

The chairman, in bringing up the question of modern lenses, said that it was an interesting fact that by the use of air space between the combinations the old crown and flint glasses could be used in the construction of anastigmat lenses. For a number of years it has been thought necessary that to make an anastigmat lens some of the new glass must be used, which is quite true when made with cemented combinations; but with the use of single glasses of crown and flint, with air space between, the necessary corrections have been arrived at. A discussion followed on the advantages and disadvantages of the older types of lenses over the new.

Commercial & Legal Intelligence

Messrs. Wilkinson and Co., photographers and dealers, 1, Royal Arcade, The Walk, Norwich, write:—"Would you mind making a note that we have removed to larger and more convenient premises in the very centre of the city, having had a splendid studio erected, and laying ourselves out very largely for the amateur department?"

We are informed by Messrs. Seabrook Bros., and Co., the agents for the Manhattan Optical Company, who make the "Wizard" Cameras, that the two companies, the Manhattan Optical Company, of New York, and the Gunlach Optical Company, of Rochester, have amalgamated and now form one company, under the title of the Manhattan Gunlach Optical Company. With their several factories combined they are now in a position to turn out with the greatest facility and economy their own lenses shutters, cameras, and other photographic goods, every single part of which will be made in their own factories. Messrs. Seabrook, Bros. and Co. have the control of their output for Europe.

The Warwick Competitions.—The following is the list of awards of the Warwick Competition for the current month:—£1 prize, H. Avery, 319, Queen's Park Road, Brighton, "Cattle Study"; £1 prize, W. R. Barrow, 2, Riby Terrace, Norfolk Street, Boston, "Gwen"; £1 prize, F. W. Beken, Blenheim House, Cowes, "Naval Review, 1902"; £1 prize, G. W. Cordock, 32, High Street, Scunthorpe, Doncaster, "When shall we three meet again"; £1 prize, Dr. H. G. Deller, Hotel Belvedere, Davos Platz, Switzerland, "Stormy Sunset, Lake Geneva" £1 prize, J. Etherington, Eton Lodge, Sale, Cheshire, "Haddon Hall"; £1 prize, H. H. Lee, 69, Wandle Road, Croydon, "Riverside Scene"; £1 prize, Miss Hilda Reston, The Studio, Edge Lane, Stretford, "A Study"; £1 prize, G. W. Seville, Photographer, Granby Street, Leicester, "Impudence"; £1 prize, J. W. Watts, 8, York Buildings, Clifton, Bristol, "The Trysting Bridge."

News and Notes.

THE Austin-Edwards Monthly Film Negative Competition.—The prize camera for the current month has been awarded to Mr. F. C. Mortimer, 5, Pembroke Road, Portsmouth, for his negative, "Lord Kitchener's Reception at Southampton."

LONDON and Povincial.—On Thursday next, the 28th inst., Mr. Welford will show a set of lantern slides illustrating the Photographic Camp. Members are invited to bring their lady friends, and visitors are always welcome at the "White Swan," Tudor Street, E.C.

WITH the view of further popularising telephotography, Messrs. A E. Staley and Co., of 35, Aldermanbury, E.C., are offering a limited number of half-plate sets at a nominal price to the first fifty applicants. Particulars are given in Messrs. Staley's announcement in our outer pages.

MR. JOHN HASSALL (says the "Athenæum") is publishing through Messrs. Dean and Son an "A B C" book with coloured designs. The work, which is in his best style, consists of twenty-six humorous pictures of all sorts and conditions of people, whose eccentricities are hit off by alliterative adjectives. The "A B C" will be Mr. Hassall's sole Christmas book for this season, and will be accompanied by clever verses by Mr. G. E. Farrow, author of "Wallypugs," etc.

A NEW Incandescent Lamp.—According to the "Scientific American," a Californian inventor has devised a new incandescent lamp, which presents many promising points. The bulb has an interior tube, open at one end. The tube and bulb are so connected that the vacuum is not destroyed, and that a brush can be inserted in the tube to apply silver to the walls in order to form a reflector. The filament is coiled round the tube, so that a maximum amount of light-producing surface is provided.

BRITISH Association.—With regard to the forthcoming meeting at Belfast, we do not find in the accounts of the projected business at the various sections much matter of interest to photographers. In Section A (Physics) there is to be a department of astronomy and cosmical physics, to be presided over by Professor Schuster. No doubt the important evidence of photography will be the main factor in the discussions which will take place on the papers to be read on Eros, the Moon, and on Nova Persei, and especially in the projected discussion on the Nebular theory. Photographs from Yerkes Observatory will, it is stated, probably be shown.

SOLUBILITY of Gold in Cyanide.—In the "American Chemical Journal," in a study of the electro-chemical properties of certain metals in connection with cyanide, it is incidentally stated that a solution of cyanide of potassium must be diluted to the extent of 0.001 per cent. before it ceases to have any action on gold. It has often been asked why cyanide of potassium—which could be so easily washed out of a print, and would not involve the possibilities of fading that characterise hypo—is not used as a print-fixer. This little fact is a complete answer. No matter how diluted the solution was, it would act on the image, and remove the gold deposited by the action of the toning solution, for 0.001 per cent. means about a grain and a half to the gallon, which would be practically inoperative in a fixing-bath.

A NEW Acetylene Lamp.—Automobilism will be the means of introduction of many useful inventions which will appeal not only to the owners of horseless vehicles, but to the general public as well. We note, as of probable value to photographers, for example, the advent of a new acetylene lamp which is of such brilliancy that it is stated that it will light up a road for 600ft. The lamp is described in "La France Automobile." The generator consists of an outer shell that fits in the rear part of the lamp. This shell is filled with water almost to the top, and contains a sheet-metal cylinder with openings admitting water from below. A special carbide of calcium, termed "acetylithe," is used for producing the gas, and is placed in the upper part of the inner cylinder. The issuing gas is strained by asbestos packing to remove the moisture before reaching the bent tube leading to the burner, which consists of two tips inclined in such a way that the issuing gas is mixed before complete combustion takes place. It is claimed that the lamp can be readily extinguished and relighted frequently, and that it is perfectly safe.

A SIMPLE Trough for Light Filters.—Herr C. Winther, in a German technical journal, describes a new trough for holding liquids so as to form a light-filter. It is of simple construction, though of small size—6 by 6 by 2 cm. A block of wood of these proportions is pierced by a cylindrical hole 3cm. in diameter also drilled from one edge to the centre. These holes are well lined with pitch, and plates of glass are then cemented with pitch to the sides of the block. The cylinder is filled through the narrow side aperture, which is then closed by a paraffined cork. The troughs may be used for acid solutions, but not for alcohol or benzine. It appears to us that the pitch might with advantage be replaced by a thick shellac varnish, for as the former material never really sets, the tendency would be for the continual, if gradual, slipping of the plates. Further, the pitch might be replaced by bichromated glue when alcoholic or similar solutions were employed. We might suggest a still further improvement, namely, the addition of a second filling aperture, which would prevent any difficulty arising when filling, by providing an air exit.

METEOROLOGY and Photography.—In a review on a recently published German work on Meteorology, "Nature" writes of this "remarkable book":—"The illustrations are all most carefully selected, excellently reproduced, and some of them are impressive examples of the possibilities of photographic reproduction in what may be termed the department of the natural history of the atmosphere." The book contains really practical hints, as a trivial example of which, and as giving useful prognostics for photographic probabilities—in the Metropolis, at any rate—we may again quote:—"Those who are interested in such matters"—and photographers naturally are—"may see at a glance that at Kew, in the summer, the most unfavourable hours for a garden party are from 2 to 4 in the afternoon, and, next to those, from 4 to 6, when the frequency of rain is about half as much again as it is between 6 and 8 a.m.; whereas, in winter, from 4 to 6 is the best time of day from the point of view indicated." With regard to these data, we might say that there is not much probability of garden parties being given in winter between 4 and 6 in the afternoon.

EXPLOSION of Potassium Chlorate.—According to the "Lancet," the tragic death of Mr. P. H. Secker calls attention to the latent powers of danger in the compounding of even well-known drugs. As previously reported, Mr. Secker, a well-known veterinary surgeon of Boroughbridge, was engaged in the preparation of some horse powders, containing as their chief constituents sulphur, potassium chlorate, and iron. From the evidence given at the inquest it would seem that those substances were being ground together in a mortar when a terrific explosion ensued, which wrecked the room and resulted in the death of Mr. Secker. The cause of the explosion does not apparently need much investigation. Sulphur is ready enough to combine with oxygen, and potassium chlorate, rich in that element, provides the means for the sudden detonation which concussion in the mortar would bring about. To prevent a repetition of such an accident, observes the "Lancet," it is essential to remember that with mixtures of this character the ingredients should be ground separately, and afterwards mixed, the mixture being effected with as little friction as possible.—"The Pharmaceutical Journal."

MR. R. H. WAITE, the proprietor of the American Studios, Liverpool, Birkenhead, and Cork, invited all his assistants to a day's outing on Thursday, August 7th. The party, numbering about thirty, left Birkenhead, and proceeded in brakes to Chester, where an excellent dinner was served at Messrs. Cottle's restaurant, Bridge Street, full justice being done to good Old English beef and the greater part of a once frisky lambkin, with the usual accompaniment of mint sauce, green peas, and "murphies," all disappearing with marvellous rapidity. Dinner over, a move was made to the River Dee, where the company embarked on the steamer, which conveyed them to Eccleston Ferry, where several groups were taken, a ramble through the magnificent grounds of Eaton Hall, boating on the river, etc., then tea at the Old White House, which, like the dinner, was provided in a most Eccleston—or rather excellent—manner. Returning to Chester at 8.30, the brakes were boarded, and the homeward journey commenced. Reaching Birkenhead, the host entertained the whole company to supper at his private residence, after which an impromptu concert was gone through, the programme including pianoforte solos, phonograph selections, etc. After according Mr. and Mrs. Waite a hearty vote of thanks for their kindness, a most enjoyable time was brought to a close in the "wee sma' hours" by the singing of Auld Lang Syne.—(Communicated.)

MR. JOHN BADDELEY writes to "Nature":—Colours Between Clouds at Sunset.—About sunset on the evening of Sunday, July 13th, being at Ripon, with my son, our attention was arrested by an unusual appearance, which I will briefly describe. Two large clouds, covering a considerable portion of the western sky, and separated by an interval leading generally towards the west, were each bordered along this interval by a bright and well-marked double spectrum. The two spectra forming this were together of the width of about one-and-a-half times the diameter of the sun; they followed the foldings of the edge of the clouds, and, which suggests a partial explanation, were at right angles to a fringe of nebulous striæ, which bordered the clouds, so that, except that the spectral colours were parallel instead of consecutive, the phenomenon had in some degree the appearance of the reflection from a grating. Our observation lasted about twenty minutes, and it was especially noticeable that when, through the fading light, the more refrangible colours had disappeared, the two red lines on the rim of each cloud remained clearly marked to the last. Never having previously seen or even heard of such an appearance, any information on the subject would be much appreciated. I might also report that on the evening of July 17th the pink streamers mentioned by some of your correspondents could be well observed, and had they been less stable, and had they radiated from the north instead of from the position of the setting sun, the appearance would have much resembled the Aurora Borealis.

ANNUAL Dinner of the R.P.S.—The last number of the "Journal" notified the members that the Council had consented, at the request of several members of the Society, to organise a dinner during the coming autumn amongst the members and their friends. The following gentlemen have kindly expressed their readiness to act as stewards and to receive intimations of the intention of members to be present:—Mr. Henry E. Davis, Mr. T. Sebastian Davis, Mr. W. E. Dunmore, Mr. Henry E. Hull, Mr. H. Vivian Hyde, Mr Francis Ince, Mr. J. C. S. Mummery, Mr. T. C. Turner, Mr. H. Snowden Ward, Mr. T. E. Freshwater, Dr. E. C. Fincham, Mr. Martin Jacolette, Mr. Alfred Ellis, Mr. Frank Bishop, Dr. A. R. F. Evershed, Mr. James Brown, Mr. George W. Tottem, Mr. John H. Gear, Mr. R. Lang Sims, Mr. Leslie Selby, Mr. Ernest Marriage, Dr. C. F. Grindrod, Mr. C. F. Inston, Mr. Thomas K. Grant. The dinner will take place on Modnay, September 29th, at the Café Royal, Regent Street, London, W., and the price of the ticket will be half-a-guinea, exclusive of wine. The date has been specially chosen to suit the convenience of members residing in the provinces as well as that of the London members, following as it does the conversazione and the private view of the exhibition which always attract a large attendance of members from all parts of the country. The Council and the Dinner Committee entertain the hope that there will be a large attendance of Fellows and members and their friends. It is important that early intimation of an intention to be present shall be in the hands of the com-

mittee, and members are requested to inform the secretary at the earliest possible moment whether or not it will be agreeable to them to take part. Proceedings of Council:—The Council have admitted the following members to the Fellowship of the Society: John Thomas Ashby, Downings, Loughton, Essex; Douglas English, Hawley, Dartford, Kent; John Charles Stephen Mummery, 81, Pellatt Grove, Wood Green, N.; John James Henry Sturmey, 9, Middleborough Road, Coventry. Applications from eleven members were considered, but the seven whose names do not appear failed to secure admission.—"The Photographic Journal."

THE Royal Academy.—The Royal Academy has already issued to its members a report on the exhibition which has just closed at Burlington House. The report is of a private nature, and the Academicians, very properly, decline to disclose any of its financial particulars But they are less reticent about other details, the publication of which is inoffensive to the Forty and of great interest to the artistic and general public. Such details, for example, are those relating to the number of works submitted by outsiders. Last spring, on March 27th and 29th and April 1st and 2nd, the number of works submitted by outsiders to the Council of the Royal Academy was fourteen thousand two hundred and nineteen. Of these only one hundred and twenty-seven were accepted outright, and the "doubtfuls," from which the greater number of pictures shown in Academy exhibitions are always chosen, this year numbered no more than two thousand seven hundred and seventy. The greater number of the works sent in, eleven thousand three hundred and four out of the grand total of fourteen thousand two hundred and nineteen, were rejected at once, and eighteen works were condemned for various reasons as "inadmissible." The examination of the fourteen thousand two hundred and nineteen works by the Council, and their distribution into the classes mentioned, occupied exactly seven days. Including the members' works there remained, therefore, about three thousand works to be dealt with by the Hanging Committee, or Committee of Arrangement, as it is called at the Academy. The members of the Committee of Arrangement commenced their duties on April 9th, the day after the first examination of the submitted works was finished by the Council, and by April 22nd the exhibition was completed. To the phenomenal badness of the sales at the recent Academy attention has been several times drawn in this column, but it is evident that the exhibition has, nevertheless, lost none of its attractiveness for the general public, as the visitors in 1902 were more by several thousands than in 1901. The most popular of the shilling days at the Academy is usually the opening Monday, but in the recent season May 19th (Whit Monday) carried off the palm for the greatest number of visitors. The Whit Monday figures were exceeded on August Bank Holiday, but on that occasion the admission fee was reduced to sixpence and the exhibition remained open until half-past ten in the evening.—"The Morning Post."

MY Assistants.—"Bookseller" writes to "The Publishers' Circular": "The real bookseller's assistant is fast disappearing," said a publisher's representative to me recently. "In almost all the large bookshops I find fresh faces on each of my half-yearly visits. Why is this?" This set me thinking that perhaps I was wrong in my supposition that I must be one of the most unfortunate members of the trade in my choice of assistants. The first one I had was in appearance a most intelligent young man, apparently just what I was needing. He had not been with me many days when he astonished me by refusing to, what he called, "sweat" a note all the way to ——, after shop hours, in spite of the fact that he passed the address on his way home. Shortly afterwards a customer was paying a bill, the amount being 10s. 6d., with 1s. 9d. discount to be deducted. My new assistant wrote 1s. 9d. under the 10s. 6d., and then said "How can you take 9 from 6?" I explained the process of borrowing 12 in the pence, etc., to which he replied that he "seemed to recollect something about it," adding "It's a ripping dodge, isn't it? but the worst of the dodges is that they don't always answer." I informed him that it wasn't a dodge, but was a rule. Another customer paying a bill 7s. 6d., with 1s. 3d. discount, he still borrowed 12 in the pence, and actually handed my customer the bill with "15" in the pence column. I gave him "notice" on the spot, which he thought very unfair, as he said "I myself said borrowing 12 in the pence was a rule, not a dodge." He also added that he should try to get again into a shop "where there was a proper clerk to see to accounts." Another assistant I had possessed a mania for economy. Having bought some books from a lady, I told him to send her £4 in P.O.'s. The poor old lady came in the next day, almost in tears, with £4 worth of penny stamps, begging me to pay her in some more convenient form, as she didn't think she should "live long enough to use up all those stamps." My young man thought he deserved a word of praise rather than censure, as he "sent her stamps in order to save paying commission on P.O.'s." Another unfortunate mistake made by this man was as follows. A customer handed him a few books, saying, "How much?" My assistant replied: "I am sorry we can't make you an offer, sir; these books are all out of date now, and are absolute waste paper." The customer then said: "Oh! I didn't want to sell them. I have just taken them from your shelves, I want to buy them." "Oh! I beg your pardon, sir! 18s. is the cash price," was the young man's unblushing reply. Another assistant having sold to an old lady a set of "Waverley Novels," in forty-eight volumes, calf, calmly said, "Will you carry them with you?" This one came to me on Monday, but didn't appear on the following Thursday. On Friday morning he apologised for his absence, saying, "It was a most extraordinary thing sir! but it was —— races yesterday, and I went, but as I got out of the train I thought, 'What a fool I am, I didn't ask for the day off,' but of course as I was there, sir, I thought I had best stop." Yet another assistant, being greatly impressed with the fact that many large businesses spring from small beginnings, thought he would like to try to pave the way to fortune by taking out a few books on a truck. I presented him with a truck and stock. At the end of a fortnight he was so disgusted at the lack of customers that, instead of pushing home his truck at night, he pushed the whole lot, truck included, into the river, and decided to give up bookselling. However, the real bookseller's assistant may turn up yet.

THE Camera Club.—"The Journal of the Camera Club" for August contains the following announcements:—Members will regret that Mr. J. W. Gordon, who has for several months most successfully acted as Editor of the Journal, has been obliged to resign that post, owing to the pressure of his professional work, and to his appointment upon a legal commission in the West Indies, which will necessitate his absence from England for a somewhat prolonged period. We are sure that all members will join in tendering him our sincere thanks for the energy and ability which he has shown in the interests of the Club, and the work he has done on its behalf. We have to announce that Mr. Wallace Godfrey, who has again taken on the duties of Honorary Secretary, has been appointed a member of the Committee. Mr. O. D. Huskisson has been appointed Honorary Curator, and under his management members may be sure that the distribution of journals, magazines, and newspapers to the members will be satisfactory. We may add that all members who have used the dark-rooms and other photographic accommodation of the Club will, we are sure, join in expressing our appreciation of the work he has done for several years on their behalf in superintending the chemical department with such zeal and courtesy. During the long vacation it is proposed to carry out, as far as possible, the necessary and most desirable repairs and improvements in the Club premises. However, during this time the Club will not be closed entirely; but these repairs will be carried out gradually and seriatim, so as to cause as little inconvenience to the members as possible. The hon. sec. is very often appealed to by members going abroad for advice as to the best cameras, plates, etc., to be taken, and on many subjects connected therewith. We have on our list a very large number of foreign members, serving in all quarters of the globe, who would be able to advise on these and other subjects. His idea is to form a sort of book of reference, giving (in epitome) the opinions of those who have experience, in order that it may be used for the benefit of their fellow members who may be journeying to those parts. He therefore appeals to the members who have the necessary knowledge and experience to assist him, by writing and giving him the desired information, and enabling him to keep such a register, to which he can refer and give the desired advice. Further, the Editor would most earnestly ask such foreign members and others who go abroad, even only temporarily, to write him, from time to time, not necessarily articles, but letters from which extracts could be taken. By this means he is sure that the members would be brought into closer touch with one another, even though thousands of miles apart. This would greatly increase the interest in the Journal, as he is sure that it would be very gratifying to those "at home" to hear of the welfare and doings of those "far away." It must be recollected that one letter in this case would be of the greatest interest to dozens of the absent one's friends, to each of whom individually it would be impossible for him to write. Besides, too, the information that could be given would be of great value, not only to the photographer, but also to the traveller. The hon. sec. suggests that as we are to a great extent travellers—he objects to the term "tourist," at all events as applied to himself—it would be very desirable that we should have maps and guide books. Now, doubtless, many members have such, which they would be willing to present to the Club, and which, though not of the latest editions, would be extremely useful for mapping out and arranging a tour, and he is sure that a small and convenient library of these, under the care of the hon. curator, would be of great use in the Club and highly appreciated by many members. Our congratulations to our colleague, Mr. Freeman Mitford, C.B., upon the honour conferred upon him by being created a member of the "Upper House." In taking the title of Lord Redesdale, a barony has been revived which became extinct by the death of his cousin, the second Baron and first Earl of Redesdale, who was so well known some years ago for the strong and energetic manner in which he acted as Chairman of Committees. Members will be very pleased also to hear that the Kaiser has distinguished Mr. Gamble, the second officer of the Fire Brigade, who is so well known and so popular in the Club, by conferring upon him the Order of the Red Cross. We all hope he may live long to enjoy so well deserved an honour. Mr. Edgar Wallace, who has distinguished himself in so many ways as the War Correspondent of the "Daily Mail," is just now in London, and has visited the Club, of which he is a member, several times. He returns to Johnannesburg on the 16th of this month to start the "Rand Daily Mail," of which he is to be the responsible editor. Mr. Alfred Harmsworth entertain him to dinner at the Savoy Hotel, on Coronation night.

THE British Museum.—The annual Blue-book [No. 130] relating to the British Museum has been issued. It contains an account of the income and expenditure of the British Museum (Special Trust Funds) for the year ended March 31st, 1902, and a return of the number of persons admitted to visit the Museum and the British Museum (Natural History) in each year from 1896 to 1901, both years inclusive, together with a statement of the progress made in the arrangement and description of the collections, and an account of objects added to them in 1901. In his report on the general progress at the Museum in Bloomsbury, Sir E. Maunde Thompson, Director and Principal Librarian, says the grand total number of visits to the Museum in the year 1901 was 718,614. This is an increase of more than 29,000 on the total of the year 1900, which was 689,249; and that total, again, was an increase of more than 25,000 on that of the previous year. This gratifying augmentation of upwards of 54,000 visits during the past two years has carried the total of last year above the average of the years 1880-1883, when the removal of the natural history collections to Cromwell Road was accomplished and entailed a

serious diminution of the numbers, the total for 1884 being only 468,873. It is also satisfacory that the number of visits on Sunday afternoons has steadily increased year by year, the total for 1901 being 48,895, as against 43,892 in 1900. The number of visits of students to the reading-room has risen to 200,035, as against 198,566 in 1900—a daily average of 664. In the several departments other than the reading-room there has been a further increase in the number of visits of students, the total last year being 57,943, as against 56,043 in 1900. The departments of prints and drawings and of coins and medals have been more frequented; but there has been a decline in the number of students drawing in the sculpture galleries. Improved electric alarm circuits have been installed both within and without the building. The report on the British Museum (Natural History), prepared by Professor Ray Lankester, the Director, states that the total number of visits paid by the public to the Natural History Museum in 1901 was 417,691, as compared with 485,288 in the preceding year. It is noteworthy that, although there is a considerable drop in the total number of visitors, the record of Sunday attendances again shows an increase, 57,797 visits having been recorded, as against 56,302 in 1900. The average daily attendance for all open days during the year was 1,157; for weekdays only, 1,165 and for Sunday afternoons, 1,111. The report also states that the survey of the fishes of the Nile has been continued by the Egyptian Government, in co-operation with the Trustees, and has resulted in the addition of several species to the list of Nile fishes and in the discovery of ten new species, two of which deserve to be made types of new genera. An account is given of a series of excavations undertaken by the Trustees in the Lower Pliocene bone beds at Pikermi, Attica, and of recent geological explorations in Egypt. The excavations at Pikermi continued from April 17th to July 13th, and the total area of the bone-beds uncovered was about 400 square mètres. No complete skeletons were discovered, but good remains of nearly all the genera and species of extinct mammalia known from Pikermi were obtained, while a few specimens may represent new forms. An extensive collection was left for the Athens University Museum, while forty-seven large cases were packed and safely despatched to London, where the specimens are now being prepared for exhibitio . Dr. C. W. Andrews was enabled, by the courtesy of Captain Lyons, Director of the Egyptian Survey, to visit several localities of great interest from a palæontological point of view. The first of these journeys, which was taken in company with Mr. T. Barron, of the Egyptian Geological Survey, was to Mogara, a small oasis about 150 miles west of Cairo. This was reached after seven days' march across waterless desert. In this locality bones of Lower Miocene vertebrates had been previously collected, and on the present occasion several forms, including Mastodon aff. aigustidens, were obtained for the first time. Later, a visit to the Fayum, in company with Mr. H. J. L. Beadnell, also of the Egyptian Geological Survey, resulted in the discovery of early forms of Proboscidea, Sirenians, Zeuglodonts, a remarkable marine snake, and a python-like serpent of gigantic size. These all occurred in rocks of Middle Eocene age. Later on, a more prolonged visit led to the discovery of further Proboscidean bones of the greatest interest at a rather high horizon. Professor Ray Lankester adds that the genus to which the name Palæomastodon has been given seems to have been the direct forerunner of Mastodon, and it therefore appears certain that the Proboscidea, the centre of distribution of which has long been a doubtful question, must have originated in this region, probably on a large land area to the south. Other important discoveries in this locality will, no doubt, be made, and will throw light on many obscure questions of geographical distribution. The Trustees have received a letter from the Emperor Menelek II., giving assurance of help and protection to all English people who may go to Abyssinia in the interest of science. The Blue-book also contains reports from the heads of the various departments.—"The Times."

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

BRUSH TONING FOR P.O.P.

To the Editors.

Gentlemen,—I should like to occupy a little of your space to record my thanks to F. J. Mortimer for his most useful article on "Brush Toning for P.O.P.," in this year's Almanac. I always have a large number of whole plate prints to tone after my summer holiday, and this year I have adopted his method, and as an amateur photographer of over forty years' experience, can truly say that I have never obtained more beautiful, brilliant, and uniformly satisfactory results on P.O.P. or any other kind of paper than in this way, and with far less trouble than with dish toning. Any tone may be obtained from a rich brown to deep purple, provided the printing has been deep enough, and my experience is, that printing should be carried to a very considerable depth, more perhaps than is usually deemed sufficient. I have used Mr. Mortimer's toning formula on Ilford P.O.P., but doubtless any other formula on any other paper would answer equally well, though I have not tried. The prints have, of course, to be dealt with singly, but this has always been my practice, and I find that by brush toning I get through much more work in a given time than I did when I used the usual method. The brush I use is a soft, flat camel-hair one, one inch in width. I may say that I have constructed a piece of apparatus consisting of an inclined sheet of glass, with its lower edge projecting over a glass trough, in which is contained the toning bath, and to which is returned the bath as applied by the brush, which greatly facilitates the work. I shall never return to the dish so long as I obtain the results I now do with the brush.—I am, yours, etc.,

AUGUSTUS WHEELER.

Park Villa, Stockwell Park Road, S.W.
August 16th, 1902.

VIEW-FINDERS.

To the Editors.

Gentlemen,—I was recently away for a few days at the seaside, and took a small folding camera with me. The negatives I obtained were most satisfactory, but unfortunately in several the horizon, instead of being in an horizontal plane, assumed a more or less diagonal position. Experiments were tried to find out where the fault lay, and I discovered that the view-finder was the evil genius which was responsible for my trouble. This view-finder was a separate attachment to the camera, and turned on a hinge for horizontal and vertical pictures It was ascertained that when pushed round as far as it would go, the plane of the ground glass of the finder was not at right angles with that of the sensitive plate, hence the crookedness of the horizon. The remedy consisted of a small nail being driven into the body of the finder, so that when it was completely turned the two planes were at right angles to each other in all points. This will, I fancy, prove a serviceable hint to many of our readers.—Yours, etc.,

A TOURIST

August 16th, 1902.

"SCULPTURED LIKENESSES."

To the Editors.

Gentlemen,—With reference to your notes on "Sculptured Likenesses," p. 643, it is interesting to note that the addition of horns to a man's head is not necessarily suggestive of hoofs and tail, but may be, as of old was the case, intended as symbolic of wisdom. As your Journal is not a political one, it will be out of place for me to debate in it the question whether the mason who so adorned Mr. Joseph Chamberlain's head on St. Giles's Church, Camberwell, may be said to have employed them as symbols prophetic of wisdom, or, if so, whether his message has proved to be false or true.—Yours, etc.,

W. R. BLAND.

August 16th, 1902.

THE CONVENTION GROUP.

To the Editors.

Gentlemen,—It is a long time since I attended the Convention; lack of time and business worries have prevented the enjoyment of a much-desired outing, but in spite of that absence, I have still a warm side to the annual photographic picnic—if I may so term it—and year after year I arrange to be present, only to have my fond hopes dashed aside. To such an enforced absentee as myself the annual photograph published in the B. J. is an oasis in the realm of work, and I eagerly look forward to its appearance, and anxiously scan it on its arrival o see if there still remain in it any face I can distinguish. The crowd of new faces puzzle me, but there are veterans—veterans in the sense of attending the Convention—who I can still recognise, and a thrill of joy takes possession of me in the thought that when I am able to attend the Convention—and every year I hope it may be the next.—there will be some conventioners to whom I will not be an entire strnager.

Seated beside the President—whom I recognise from your admirable portrait of him—my eyes light with pleasure on the face of the worthy secretary—long may he continue in that office, as it will be a very difficult business to get a successor capable of filling his shoes. Just behind him, and forming an appropriate centrepiece, I see that grand old man, John Stuart, and right glad I am to see him again amongst the "bright band." Kindly, "couthie," and in every sense a man, I trust that he may long be spared to go out and in amongst us. Near by is Godfrey Bingley, of Leeds, who will always live in my memory as the beau-ideal of helpfulness. Well I remember how when first I joined the Convention, he unostentatiously but helpfully smoothed the rough places, and made me, an utter stranger, feel very much at home. May he long continue a conventioner, and the creator of those exquisite lantern slides associated with his name. But what is wrong with the Crooke of Edinburgh? Is he frightened that the President will fail at the critical moment of exposure that he gazes so earnestly towards the central group, or is it merely a desire to be portrayed in profile. He's one of the good ones, and is always ready—but, then, what conventioner is not?—to assist in making the annual gathering a success to everyone. The serious face beside him of Harold Baker gives no indication of the wealth of fun concealed behind the pincenez; but one or two may remember a fusilade of pease which disturbed the serenity of a certain official group. Away near the other side of the picture, supporting a column, is the "hail fellow, well met," of the Convention, Snowden Ward. He seems to "know everyone, and everyone seems to know him." He suffers from the disadvantage of a talented better half, which to some extent throws his own abilities into the background; but we could not afford to do without Mrs. Ward, or who would reply for "The Ladies"? Near the outside right of a picture is a prominent man, a veteran whose personality I remember well, but whose name at the moment escapes me. I looked in vain for a black-bearded face which you, Mr. Editor, may know, but I can't fix it.*

Others I might mention, but, no, no. I wait and trust to meet them, in the flesh, shall I say, as I have always hoped, next year?—I am yours, etc.,

A. Scot.

[* The face is there, minus the beard; look again, friend!—Eds. B. J. P.]

CHEMISTS AND PHOTOGRAPHERS.

To the Editors.

Gentlemen,—Please allow me to vigorously protest against the unfair competition we poor wretched photographers have to contend with. I refer more particularly to photographic chemists. I as a professional can only get my 10 per cent., although I do a good bit of dealing. My clients come to me and ask me to get cameras, lenses, etc., for them. Naturally, I do not refuse; but what is the result? After all my time and trouble and paying carriage I get 10 per cent., whilst my dealer gets his 33 per cent. Now comes the hard part. This same dealer develops and prints amateur's negatives, enlarges, and when there is anything special on takes negatives and sells them all below my prices, and why? Of course, he can afford to do so. Sirs, this is not an isolated case. Finally, Mr. Editor, who are these people who do this work? Why amateur (so-called) photographers, whom, I assert, are not qualified in many cases to undertake the work. I should like to hear what others have to say on the subject.—Yours faithfully,

C. S.

IRRITANT POISONING BY PHOTOGRAPHY.

To the Editors.

Gentlemen,—I began to write my experience in reply to your correspondent, "C.," but seeing he omitted in his list both bichromate of potass and metol, I thought I would wait to see if anyone had a similar experience apart from either of these. Some years ago I worked a good deal with bichromate, and then probably from it there was developed a skin eruption. After discontinuing its use and a course of arsenic treatment, it disappeared, I may say, entirely. About nine months since I began to use metol for development of negatives, when almost immediately appeared the old eruption, though I think in a rather worse form. As I read of its tendency I took the precaution to have a tap of running water near, into which I placed my fingers after each immersion in the metol solution, but this did not prevent its action. I accordingly gave up its use, good though it is in some cases; and now as to cure. I washed affected parts daily in Calvert's carbolic soap and then anointed them with vaseline occasionally after washing, applying sulpholine lotion, to be bought at any chemist, with the result, the eruption is practically gone again. I think this, with other experiences, recorded in your last, proves that metol decidedly, with some, produces the eruption, and the only course is to avoid it or similar compounds. "C." included in his list mercurial intensifier. It is probable with some it may have a like result. Though I have used it for years as occasion required, in my case it seems it did not cause any eruption, or it would have appeared in the interval of some years between the use of bichro. and metol. I question if bichro. affects much unless pretty constantly used.—Yours,

Old Professional.

DOING THE REST.

To the Editors.

Gentlemen,—I should like to say a word re. your interesting article "Doing the Rest," in last issue. Practically, it is asked, why does not the professional "do the rest" for amateurs? I reply, often because it does not pay. The amateur dealer, so-called, has helped to this condition of things. Two cases in point have recently come to my notice. 1. A lady amateur called with a bull's-eye Kodak film and asked if it could be developed. I replied, "Certainly, Madame." "But what is your charge?" she asked. "The same as the Kodak Company, 3s." "Oh," she replied; "that is too much. I only paid 1s. in B———." "Well, Madame, it will pay you best to post them there." 2. A gentleman brought a packet of twenty Frena films, the small size, to be developed, and inquired the charge. "The same as the Frena makers," and produced their list, 4s. "Oh, that is too much; I only paid 1s. 8d. in such a town." I replied, "they cannot be done properly at the price."

Now this, I believe, is the crux of the whole thing. Amateurs conclude, because chemicals cost so much, and so much is needed to develop so many, therefore the price should be so much. Allowing little or no margin for use of plant or brains, the result is that those who value their brains prefer to use them better than "doing the rest," unless the customers are prepared to pay a fair price. The amateur dealer of the chemist class often allows a junior assistant, with no photographic training, to develop, and most often he puts a dozen ¼-plates in a dish at once, and treats them all alike, and no wonder if half are spoilt. Though I have not tried, I believe it would pay better to do the cabinet part at 1s. than to develop twenty Frena films at 1s. 8d.—Yours,

P. W.

Answers to Correspondents.

*** *All matters intended for the text portion of this* Journal, *including queries, must be addressed to* "The Editors, The British Journal of Photography, 24, *Wellington-street, Strand, London, W.C.*" *Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* Messrs. Henry Greenwood & Co., 24, *Wellington-street, Strand, London, W.C.*

Photographs Registered:—

Frederick William King, 29, Osmaston Road, Derby. *Photograph of Town Hall, Derby, illuminated at night, August 9th, 1902.*

John Pollard Milnes, Hanover Street, Stranraer, Wigtownshire. *Photograph of Sunset at Dunskey Castle, Port Patrick*

John Bailey, 73, Shirley Road, Southampton. *Photograph of Hampshire Cricket Team, 1902. Photograph of Surrey Cricket Team, 1902.*

T. W. Jones, Caron House Studio, Tregaron. *Photograph of Square and Monument, Tregaron. Photograph of Tregaron.*

Formula Wanted.—H. West asks: "Please give me formula for gumming stamp photos."—In reply: A solution of gum acacia, to which a little glycerine has been added, is as good as anything. Dextrine may also be used, but as most of the commercial samples are acid, it is not to be recommended, as it may have an injurious action on the photographs.

Thos. Dunkerton.—(1) We expect you will have to have a brick foundation. (2) We do not think putting the structure on wheels will exempt you at all. The building bye-laws vary so much in different localities that we cannot give an opinion; what would be allowed in some would not be in others. We should advise you to consult a surveyor in the neighbourhood who is familiar with the bye-laws of the town council.

Book Wanted.—M. King asks: "Would you kindly inform me the best

book I could obtain on working up enlargements?"—In reply: So far as we are aware, there is no book wholly devoted to finishing enlargements published. Johnson's book on the "Art of Retouching, Finishing, and Colouring Photographs" will give you much information on the subject. It may be had through any of the dealers.

COPYRIGHT.—"J. B." writes: "I have been called to copy an engraving from a very valuable oil painting that has lately been exhibited in Birmingham. Would you please inform me if I can make an enlargement and exhibit the same, not for sale, but just as a specimen of work?"—In reply: Certainly not, if the engraving is copyright—and most likely it is. The fact that the copy is not for sale makes no difference.

LENS QUERY.—"BURTON" writes: "I have a lens offered me, which bears following inscription, 'R. O. J. A. Vorm Emil Busch. Busch's Portrait Aplanat, No. 4. Foc. 14in.' (1) Is this a reliable maker, and can first-class work be done with same? (2) Is it a quick lens? (3) What distance would be required for full-length cabinet? It is quite new."—In reply: (1) We have had no experience with the lenses named, so cannot speak as to their merits, but the house of Busch has a good name. (2) As we do not know the aperture, we cannot say. (3) About 20ft. between the lens and the sitter.

STUDIO BUILDING.—"PROPER ANGLE" writes: "Would either of the enclosed plans make a really satisfactory studio for general work? Which is the most practical? I should like to avoid, if possible, an outside screen. Would you kindly suggest any improvement? The studio is to be built over ground-floor offices. They are corner premises, very solid timber and plaster walls, but the addition must be iron outside. As this looks rather ugly, I do not want it higher than necessary on the south side, which runs up a street."—In reply: Either design is good, and it is quite a matter of opinion as to which is the best. Some prefer one form and some the other. On the whole, we should rather prefer the design marked "B" ourselves.

DEVELOPING ALPINE EXPOSURES.—J. B. R. S. writes: "I have noticed in old numbers of the JOURNAL letters giving the exact exposures of successful Alpine negatives, but an equally important point is the treatment of such negatives during development. Could you, or any of your correspondents, instruct me as to the best method of developing negatives having dark trees and chalets in the foreground and bright snow mountains in the distance?"—In reply: The only instruction we can give is to begin with a very dilute developer, so as to get out all detail before the negative acquires density. When all detail is out, finish off with a stronger solution. That is the way to deal with subjects having strong contrasts.

FOGGED NEGATIVE.—COLONEL GUBBINS writes: "I enclose a negative, which please return in the envelope sent herewith. Will you kindly tell me the cause of the fog on it? Also of the row of dots? I thought it an ordinary case at first, but the fog extends over the part protected by the rebate (this shows very clearly if the negative be put on a sheet of white paper), so it could not have been caused in the camera. I think that the two defects point to a fault in the manufacture."—In reply: It is difficult to account for the fog, but it has all the appearance of having been caused by light. The spots rather appear to be due to the film, but they may be caused by some mechanical impurity in the developer. We can, however, give no definite opinion on the point.

IDENTITY OF PROCESS.—"SALOPIAN" writes: "The plate sent herewith is an old photo, taken probably about 1870, and most likely at Shrewsbury. Can you tell me what process it is, and whether there is any possibility of restoring it? As the portrait of a deceased member of my wife's family, it is of considerable interest to us, and as an old specimen it may be of value. I enclose stamps for its return."—In reply: The picture is a Daguerreotype, but it has been ruined by careless handling and fingering. The image is almost all destroyed, and cannot be restored. You surely could not have read the articles on the subject that appeared in our issues for July 25th and August 15th, or you would not have sent the picture packed as it was. It has been returned, as desired.

STUDIO BUILDING.—"LIGHT" asks: "I am having a new studio built with east light; could not have north because there is a high church that stops the light, and the owner of the property is having a high hoarding erected to preserve his ancient light. What I want to know is whether the boards (which will be much higher than the studio light) will make any difference to the light, and would it be better to colour the boards or leave them natural colour? All the glazing is ground glass. The hoarding runs north to south, and studio is at right angle, and uninterrupted in the front by any building, but of course the sun will be on my side of the boards all day."—In reply: If the studio has an east light, and you work with that, and that is uninterrupted, we do not see that the hoarding will interfere at all, whatever colour it may be.

DRY MOUNTING.—"MOUNTING" writes: "Three weeks ago there was a note in "Ex Cathedra" on mounting prints flat; that suggested to me coating the prints after dry with a plaster similar to that used in ordinary medical sticking plaster, and then after that has set, mounting the prints by applying heat from a flat-iron, or any other means. I inquired of a chemist what the nature of the plaster was, and he told me that lead was used in making same. That I suppose would be injurious to a photograph; but perhaps a plaster could be made that would have the same sticky nature without anything injurious in its composition, and would also be cheap."—In reply: We do not think the lead plaster would be found suitable for the purpose, even if the lead had no injurious action on the pictures. Why not get some of the material mentioned in the article you quote? It is said by the makers to be harmless.

LENS QUERIES.—"IBEX" writes: "(1) Is it the short focus of a lens, or bad quality, which makes the hands appear abnormally large? I use a portrait lens of cheap make (City Sale and Exchange), 8½in. focus, working at f/4, and find this defect in results. (2) Would a Cooke lens, series 3, of 7½in. focus, working at f/6.5, or an Optimus Euroscope, of 8¾in. focus, at f/6, be better than my present lens for portraiture? (3) Would either the Cooke or Optimus Euryscope be equal to a medium-quality portrait lens? (4) And which would be the best for portraiture of the two above-mentioned lenses?"—In reply: (1) If a short-focus lens be brought very close to the sitter the more prominent portions will appear abnormally large. (2) The longer the focus of the lens the less will be apparent distorting, because the sitter will be further away. (3) Both have a smaller aperture than the usual portrait lens, and consequently are slower in action. (4) The one with the longest focus.

FERROTYPE WORK.—"BEGINNER" writes: "Would you please explain cause of failures re ferro plates herewith? I have tried all ways of exposing, and timed developing and fixing in proportion to exposure, etc., but do what I will, this objectionable creamy appearance will not disappear unless the plates are developed about four or five seconds, then blank plates naturally follow, as underdeveloped. Is it essential to gauge exposure and time developing and fixing to a fraction of a second? It is a new departure to me, but persevere as I will I cannot get a clean result. My solutions are made up as per formulæ on box of plates. Might I ask some of your readers to write me, and give some information of their experience, and how better results may be obtained? I would return postage to them for any reliable hints on ferrotype work. The book I have, although by a great authority, is no blessed good. The exposures mentioned are miles out of the way; in fact, the camera I got last Friday is a farce. The affair has already cost me £9, and I have not got a decent negative with it yet. I may add, although the camera is perfectly new, and arrived here last Friday, it was sent to be repaired the day it arrived, and has travelled there and back every day since. I wonder people are allowed to sell such rubbish. It is a case of send cash first, and then you are nicely done. None of the faults for which the camera was sent to repair are caused by the railway company—it is rotten work. If I sent the camera back we all know what follows. The camera seems to work right now, but I cannot get on with the exposing, developing, and fixing."—In reply: "As a matter of course, in the ferrotype, as in every other process, the proper exposure is essential. So is proper development. You must not expect that the mere purchasing of the apparatus will enable you to produce perfect results with a few trials. We judge you are quite ignorant of photography, because you say you have not been able to get a decent negative. The ferrotype is not a negative process, but one for taking positives. We notice that all the examples sent are not focussed at all. We should advise you to get someone to give you a little practical instruction in the use of the apparatus.

*** NOTICE TO THE TRADE, WHOLESALE AGENTS AND BOOKSELLERS.—*A Contents Bill is issued with each number of the* JOURNAL, *and copies may be had on application to the Publishers.*

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*** *The Editor can only be seen by appointment.*

*** *We do not undertake to answer letters by post.*

EX CATHEDRA.

Compressed Acetylene. As our readers are no doubt aware, the strictest supervision is exercised by Government, and, indeed, by railway companies also, over explosive materials. The former lay down rules as to what may and may not be permitted to be manufactured and dealt with, while the latter have stringent rules as to the carrying of explosives and dangerous goods. Such as they undertake to carry at all can only be sent at certain times, and the rates are very high. Among them are several of the materials used in photography—nitric acid, pyroxyline, etc. Many interesting particulars in regard to other substances are to be found in the annual reports issued by his Majesty's Inspectors of Explosives, and published by Messrs. Eyre and Spottiswoode. In the recently issued report for 1901 there will be found in Appendix F an order by the Secretary of State regarding acetylene. For the future it is not, when compressed into certain porous substances, to be treated as hitherto, as a prohibited explosive. Whether the removal of the prohibition will tend to further developments in the manner of using it cannot be foreseen; but that the use of it for an illuminant is only in its infancy we feel assured. The absurd restrictions with which ignorant and timorous officialdom surrounded its manufacture, storage, and use are one by one being removed. Railway trains travelling at the fearful rate of twenty miles an hour were once considered highly dangerous, and, similarly, we hope to see acetylene gas robbed of the public fear of its danger, and take a high place among domestic and technical illumination.

* * *

A New Fireproof Substance. One great cause for the high rates charged for insuring some photographic studios is the inflammable nature of so many of the erections used for photographic work, wood being the chief constituent of the building. There is, however, a possibility that all this may be changed, and that a studio can be built which would be actually indestructible by fire by the use of a newly-invented material called uralite. This new material is mainly composed of asbestos, and it can be cut with a knife or saw. The latter, we may say, is no novelty; some of our readers may remember the interest felt at the Bath Convention upon seeing the famous Bath stone cut, not with a chisel and mallet, but with an ordinary hand-saw. It can be painted, framed, polished, and glued, like wood, and can also be veneered. Further, it will not split when a nail is driven through it. The principal ingredient in its manufacture is, as we have said, asbestos. This material is cleaned and afterwards mixed with chalk and water as a hardening agent to make a pulp like paper pulp. The mass is rolled into sheets, first, and to secure its stability, a small quantity of silicate of soda is added. The sheets thus formed are cut into sizes, and put aside to dry, leaving fibrous asbestos boards. These are again steeped in silicate and dried, and afterwards placed in a bath of bicarbonate of soda and again dried, a coating of silicate being then deposited upon the fibres of the asbestos, with finally a driving off of 75 per cent. of water. The final result is a hard slab, indestructible by fire, and possessing the qualities above described. It should be a most valuable material for studio-building.

* * *

A Suggestion about Ordnance Maps. Apropos of the new ordnance maps on the scale of four miles to an inch, a specimen of which has just been issued by the Ordnance Survey, a correspondent sends us a suggestion, which we may place on record. The new map, by the way, is spoken of in the highest terms by our scientific contemporary, "Nature." "The technical production," this journal writes, "leaves nothing to be desired, and we confidently place this map before any other in the world on the same scale for beauty of finish, accuracy of execution, and sound judgment in the selection of features and names." The names and general detail are printed in black, railways in a strong black line, county boundaries in a dotted line, roads in three classes in brown, rivers, etc., in blue, the surface relief

being cleverly represented by half-tone reproductions of washes in colour. Our correspondent's suggestion is that, instead of the usual map-drawing, the details should be purely photographic, and made by two or more successive reproductions superposedly printed in one or more colours from negatives taken from raised models. Each colour might have its own type of subject. The result would be, if the model were properly illuminated, a striking representation of the actual appearance of the mapped area. Something of this sort has already been done, but our correspondent's first suggestion we believe to be quite novel. It is that the whole model should be photographed in one colour on a small scale, and that the print should be in the form of a stereoscopic view and examined in a stereoscope. The whole area would then be so vividly represented to the eye that it would almost immediately and permanently be impressed upon the brain.

* * *

A New Hardening Solution.

The use of alum and chrome alum as hardening agents, both in negative and positive work is universal, and till the introduction of formalin we may safely say that there were practically no other hardening substances used. Of the two, chrome alum, which, by the bye, has no aluminium in it, was considered the better, its action on gelatine being to raise the melting and setting point from eight to ten degrees. So far as we are aware, there has been no systematic investigation of the tanning effect of these two alums, and the statement that they did harden having been made, it was accepted, and passed on from writer to writer, till it has become axiomatic. Professor R. Namias, who is well known for his photographic research, has been examining the action of the alums, and he has found that chrome alum has really very little effect, and this, he says, is due to the acid character of the salt, and that if it be mixed with excess of solution of ammonia and heated till there is only a slight precipitate of chromium hydroxide left, its tanning action is so increased that a 20 per cent. solution will, after one hour's action, prevent even a 2 per cent. solution of hydrochloric acid from causing the gelatine to swell, and that after twelve hours the gelatine has lost its suppleness. As the result of his experiments, he suggests the use of the following mixture, and states that its action is so great that a negative film after treatment by it will not expand when treated with hydrofluoric acid for stripping, and, further, gelatine thus treated has not the chara teristic green colouration given by chrome alum. A 10 per cent. solution of chrome alum, neutralised with ammonia so that some of the chromium hydroxide is left in suspension is to be mixed with a 10 per cent. solution of ordinary alum and then boiled for some time. About 1893 Dr. Stolze suggested for tanning gelatine-chloride papers a solution of chrome alum which had been rendered distinctly alkaline with ammonia, his reason being that the gelatine was less likely to be stained by this than by the ordinary solution, and that it did not make the film acid; but he did not state that it rendered it harder, though he recognised that the alkaline solution was equally as effective in this direction as the acid.

* * *

Electricity and Photographic Films and Plates.

Plates and films, when developed, sometimes show markings that their users are quite unable to account for, and can in no way attribute them to anything in connection with their own manipulation; neither are those we refer to. At a recent meeting of the London and Provincial Photographic Association some rollable film negatives were shown with curious branch-like markings upon them. Others have also, at times, met with similar defects. One of the members present was, however, able to give a correct explanation of their origin when he said that they were caused by electric sparks, due to stripping the film from its glass support after it had been coated. Now, celluloid, collodion, and its congenitors are very electrical substances when in a dry condition, and a slight friction will generate electricity. If we take a glass plate coated with plain collodion, that has become perfectly dry, and strip off the film, we shall find it in a highly electrical condition when first stripped. It will curl up and adhere to anything that is close to it at the time. If the surface is large, and the film is pulled away suddenly, an audible "crack" will be heard, and in the dark a spark will sometimes be seen. If the collodion supported a highly sensitive emulsion, of course, this sparking would affect the film more or less. Such effects, however, cannot be detected when the film is examined, any more than can that caused by its being fogged by light. It is not all rollable films, however, that are made on glass plates. Those made by coating the finished celluloid film may be expected to be free from this defect. There is another trouble that sometimes arises through electricity with plates, as well as films. Some dark slides are fitted with ebonite shutters. Ebonite is also a highly electrical substance, and slight friction on it, when it and the atmosphere is dry, will generate electricity. When these shutters are used the light is trapped with velvet, and if, when this is abnormally dry and the atmosphere also in that state, the shutter be quickly withdrawn or closed, electricity is generated, and a spark may be produced and the light from it affect the plate. When using these shutters in warm and dry weather it is always well to withdraw or replace them very slowly; then no harmful result will follow.

* * *

Misplaced View-Finders.

The letter from a correspondent, that we published last week, details a trouble that many have met with when relying on the finders as fitted to their cameras. Our correspondent found a remedy in his case—though only after negatives had been marred—by "driving a nail in the body of the finder." In this case the remedy, though practical, would not be a desirable one to adopt with a costly apparatus. View-finders are more often than not placed in the axis of the lens, more especially in the cheaper forms of cameras. Consequently, the picture as seen on them does not coincide with that found on the negative when developed, which too frequently leads to disappointment, the subject found on the negative, as regards composition, being quite different from that shown by the finder. This is especially likely to be the case with those finders that are hinged, through the hinges not being properly fixed. They may be right when used horizontally, but just the reverse when turned vertically. If purchasers of cameras were to test their finders before using them, by, say, placing them at a window and comparing the image as seen on the ground glass with that shown on the finder when that is in an alternately vertical and horizontal position, any discrepancy is easily rectified. A small slip of thin cardboard, or thick paper, at one end or other of the fitting will usually do the needful. There is another point in connection with finders, which often applies, not only to the cheaper forms of cameras, but to some of the more costly ones, namely, that the angle of view shown by the finder does not coincide with that obtained in the negative. It may be more, or it may be less, as the case may be. This, however, is

f minor importance when it is fully realised, as it is asier to make mental note of the discrepancy and to allow or it when fixing on the point of view from which the icture is taken. Adapting a finder, or finders, to a camera hat includes exactly the same angle as the lens, and at the ame time is precisely in its axis when the camera is used ither horizontally or verticall- requires greater time nd care than can be bestowed on cameras that are sold or one or two pounds.. Purchasers of new cameras, whatever price may be paid for them, would do well if they pent an hour or so, and a few plates or films, with them n a "full dress rehearsal" before taking them on a tour way from home. If this were always done, much disppointment would often be avoided.

* * *

Wood Engraving versus Process Blocks.

This is a question that has often been discussed, both *pro* and *con*. The subject was again dealt with in a leader in the "Standard" of Saturday last, anent a letter from a correspondent, who questions if the pictures in the illustrated papers of to-day are equal to those of times past. The correspondent quotes illustrations of great events, such as the opening of the great Exhibition of 1857, as compared with those of the ate Coronation at Westminster Abbey, and questions if n this class of illustration we have advanced at all. He asks, "Will it be possible fifty years hence for anyone to ake up any of these pictures, and say, from the features here presented, that was the Primate or that was the Bishop of London, and so on?" In conclusion, the writer says, "Comparing the old with the new, it seems, in my humble judgment, that the old was better." We must confess there is some ground for this criticism, for we happen to have by us an old cheap work entitled "The Crystal Palace and its Contents," published in 1852. The blocks, we are told, were old ones, that had been used in one of the illustrated papers the year before. The work was printed by Bradbury and Evans, and we must say the illustrations are superior to the pictures in many of the best papers of the late ceremony at Westminster Abbey. Of course, they are printed from hand-engraved wood blocks by good artists, and the paper that the pictures are on is of what may be termed of very common quality, and would be quite useless for modern process blocks. In its leader, the "Standard" very forcibly points out that the old style would not fulfil modern requirements of illustrated journalism, either as regards cost of production and in the time required for producing wood blocks, mentioning that now, for a sovereign, it is possible to obtain a half-tone block that half a generation back would have cost eight or ten, or even more, on wood, and adds that there might still be a chance for wood-engraving, which, as an art, is almost extinct in England, if the public were content with less for their money. That is so; it is simply a question of demand and supply. The public demand for their sixpence a large number of pages, containing, perhaps, nearly a hundred pictures, and these can only be supplied by process blocks, from photographs made from wash-drawings, or from nature. It is true that from good process blocks, and careful printing by good machines, and on suitable paper, excellent results are produced, but it is questionable if they are, artistically, as good as used to be produced from engraved wood blocks. Be that as it may, the present style of illustration gives ample work for photography and its allied processes.

BOTANICAL PHOTOGRAPHY.

Judging from our annual photographic exhibitions, both in London and the provinces, but little attention has been given in England to recording photographically the various phenomena of plant life; and this opinion is certainly strengthened by an examination of most of the photographic illustrations reproduced in the weekly and monthly journals devoted to horticultural matters. Certainly, many of the photographs reproduced by those journals are beautiful examples of landscape work, showing us charming leafy vistas and quiet old-world gardens, in which we would gladly wander for the rest of our days, forgetful of the hideous rush and struggle for existence in this prosaic twentieth century. For these landscape and garden photographs we have nothing but praise, for they tell how truly and steadily increasing is the progress of artistic photography. But when we turn to the majority of the photographs of individual trees, plants, fruits, and flowers—alack, what a falling off is there! The peaches and grapes have lost their exquisite bloom in the developing dish; the flowers have grown stiff and rigid, as if aware that their delicate tints are not going to be too faithfully rendered; while the trees look mournful and depressed; all have lost, to a greater or lesser degree, their natural grace and individuality.

The reason for this contrast between the photograph of a garden and a photograph of one of its inhabitants is not far to seek; the photographer, in nine cases out of ten, has not thoroughly realised that plant life and human life are really very near akin to one another. Each tree, plant, and flower has its own peculiar characteristic shape, colour, mode of growth, and mode of life every bit as much as a human being, and unless that fact is fully realized and careful attention paid to the correct delineation of those characteristic traits, the photographer will produce but a poor, if not utterly false, idea of the original.

The successful portrait photographer gains his reputation from studying, at least, the elements of facial anatomy, by mixing with his fellow-men and closely observing those little traits of expression, gesture, pose, and effects of light and shade which give individuality and distinction to each sitter. The same method and principles must be applied, if really life-like and characteristic photographs of plant life are to be obtained. The would-be exponent of plant portraiture must be prepared to go forth into the fields, lanes, and forests, to tramp over moorland and marsh, and climb the mountain side at all hours of the day, watching the daily life of the plants, and the effects that varying atmospheric conditions have upon them. He must bring to his aid a genuine love for the wonders of plant life, so that the delicate spiral of a vine tendril and the exquisite bloom on a fruit may have the same joy and significance for him as the gracefully curling lock of hair and delicate flesh tints have for the portrayer of human beauty.

Few trees are more difficult to really satisfactorily portray photographically than pine and yew trees; and yet they have beauties peculiarily their own, which can be found in no other trees. On the other hand, few trees are more susceptible to atmospheric conditions, and the varying play of light and shade, than the different species of pines. Out on the hill-side, as we rest beneath their shelter through the warm, star-lit, summer night, the branches form a delicate tracery against the deep indigo sky, and gently stirred by the soft west wind, ever and anon whisper some peaceful lullaby. An hour before the dawn we throw off our plaids or rugs, and climb to a spur from which we may watch the sun rise and send its first rays across

the sky to kiss the summit of the mountain. In the grey dawn, the clump of Scotch pines under whose shelter we spent the night stand out like dusty sentinels, keeping watch above the glen. Grey gives place to a pinkish hue in the East, and the highest point of the mountain is touched with the rosy glow of approaching dawn. With all possible speed, we set up our camera and focus the pines, still sombre amongst the dark shadows. All is ready, and almost breathlessly we wait and watch that eastern light, which is momentarily growing stronger. Broad beams of rosy light, swift heralds of the approaching sun, stream out across the sky, bathing the mountain tops in exquisite hues. Suddenly, as if some magic wand had touched them, the pine trees stand out against the eastern sky, each branch and trunk transformed to burnished silver. As rapidly as possible, we make our exposures, and if we keep cool and steady may be able to make three or four ere this wonderful effect, the greeting of the pine trees to the rising sun, has passed. It lasts but a few minutes, just as the sun begins to rise above the horizon, and is gone until the morrow. Ten minutes later, at the most, the silvery glow has vanished from the trunks of the pines.

As quickly as possible, we descend to the valley, where many of the flowers and trees are still asleep, with the sparkling dew-drops upon their foliage. Look at that half-opened rose, with a splendid tear of dew scintillating with the colours of a priceless pearl upon its expanding petals; it will make a far more beautiful and characteristic photograph now than at high noon, when its petals will have lost their fresh bloom and crisp curl, and the tear-drop vanished for ever. Good old "John-go-to-bed-at-noon" is very wide awake at this early hour, and even though but a humble species of dandelion has a beauty all his own, with his big yellow head and cool green leaves all silvery with the dew. In a couple of hours his head will begin to droop, the big golden disc will gradually contract, and "John" will sleep. So while he is fresh and wide awake we will photograph him.

After breakfast we stroll out into the garden, to smoke a pipe and watch the bees at work amongst the flowers. The warmth of the sun is making some of the unopened flower-buds of the poppies rapidly expand, and here is a chance of obtaining a photographic record of an interesting phenomenon. We set up our faithful camera and focus a group of poppy buds that are beginning to expand. Our first exposure will give us a record of the sepals just breaking away from the base of the petals. A few minutes later the sepals have parted sufficiently to give us just a peep of the tightly-folded petals within, and we promptly expose another plate. And thus, with a little care and watchfulness, we obtain a record of the first separating of the sepals, until they fall to the ground, and the petals unfold and expand in the warm morning sunshine. The whole operation will have barely taken an hour, and we are the richer by a most interesting series of photographs.

An hour before noon the wild roses are generally at their best, some of the dainty blossoms having expanded to their fullest, while others still coyly arch their half-opened petals, as if reluctant to part from the golden wealth of pollen to the lusty bees. The will not bear transference from the hedge to the studio, these delicate pink and white children of the lanes, and, therefore, to gain a photograph of them at their best we must wander forth and seek them in their native environment.

All day long the pretty pink flowers of the red campion are wide awake, with their petals fully expanded; but if we want to photograph its cousin, the delicate-scented white campion, we must wait until the sun has nearly set. Then, too, we shall be able to get a good photograph of the evening primrose, which also sleeps all day, and only expands its yellow petals as the shades of evening approach. The grand old oaks, elms, beeches, look their best in the soft yellow light of the sunset hour; at midday their foliage is more sombre and heavy, except, of course, in the spring, when they are just unfolding their dainty young leaves.

Fruits require the greatest care and attention to successfully photograph; they must be carefully selected, handled as lightly and as little as possible, and photographed as soon after being gathered as circumstances will permit. Grapes, peaches, plums, and all fruit, depending on their delicate bloom for their most perfect condition, are probably amongst the most difficult subjects to render in a faithful and characteristic manner. The greatest attention must be given to the lighting, so that the delicate transitions of colour and form are seen at their best. Fruits with glossy skins, like some apples and pears, will be found rather troublesome, and require a more subdued mode of lighting, as their skins are apt to reflect back any strong beams of light, and hard patches of light will appear in the photograph.

Where it is desirable, for scientific reasons, to isolate a single plant growing in a field, or in any situation where it is closely surrounded by other plants, a piece of greyish, washable canvas background will be found most useful. It should be mounted on two light iron rods, pointed at one end, so that they can be easily pushed into the ground; and in this way the background can always be placed in the most suitable position, and a good photograph obtained without in any way disarranging the natural position of the plant. Two or three such backgrounds of varying tints, all made to slip on the one pair of iron rods, can be easily rolled up together and carried, and will be found most useful when at work in the fields and lanes. They can be slipped behind sprays of flowers, foliage, or fruit growing on the hedge-rows; and if we have with us a faithful and interested companion, one of these backgrounds can be held up as a screen, to cut down the too strong light that may be falling on one side or on the top of our subject.

Of course, in this branch of photography the use of the isochromatic plate is imperative, if the colour values of the flowers, fruits, and foliage are to be anything like correctly rendered. Where a very full exposure is possible, in the rich golden light of the sunset, wonderfully orthochromatic effects can be obtained by the use of a slow plate and careful development.

It is important not to force development under any circumstances, no matter what plate has been used, and the developer with which the worker finds he can obtain the greatest amount of gradation and freedom from chemical fog is the one which must be used.

To be able to mount with each herbarium specimen a photograph showing the plant in its natural environment, and giving as nearly as possible the correct colour values, will make our collection of botanical specimens of the greatest possible interest and value. Once really earnestly taken up, the photographic study of plant life will be found of the most intense and absorbing interest, and we venture to say will never be dropped until the worker has grown too feeble with age to rock a developing dish or focus a lens.

PATENTS in Germany.—In 1900 there were 1,565 patents taken out for electrical inventions in Germany. For telegraphs and telephones the patents numbered 283; for primary batteries and accumulators, 208; thermopile, cables, and distributing system, 368; motors and distribution accessories, 199; meters, etc., 149; lighting, 250; auxiliary apparatus, 58; heating and cooking, 50.

PHOTOGRAPHERS AND THE DIVINATORY ARTS.

I WONDER what stern readers of the BRITISH JOURNAL OF PHOTOGRAPHY have thought when preparing to devour their weekly fare, and finding in their menu what at first sight must have appeared an unpalatable dish, under the rubric of "Photography and Palmistry," and how many have stared and then wondered if, by a printer's error, some of the matter belonging to the Proceedings of the Psychical Research Society had not got transposed into this matter-of-fact organ of a rational art science? No doubt, a large number of the gentle, suave section of the devotees of the camera must have shuddered at so unexpected a reference, made, without any warning, by hardened Editors, whose concern of sensitiveness must be limited to one of films, and have meekly asked to themselves what photography and photographers may have in common with palmistry? The answer may be two-fold, and must be guided entirely by the writer's intention: Nothing, if by Palmistry the writer merely intended to refer to the rather diverting, and to-day fashionable, inoffensive pastime obtainable in most of the best-behaved réunions; but a very great deal if his reference were taken in the sense of a misnomer, and intended to refer to the combined arts of chiromancy and chirognomony, forming to-day a synthetical, exact science, capable of surprising revelations of the inner man, *Anthropometry* being purely and simply a branch of the above, and, therefore, capable of rendering immense services to everyone in general, and to Portrait Photographers in particular.

It is evident that the photographic friend introduced by the Editor must have held this view, and that, moved with a justifiable desire to ascertain all the peculiarities of his sitter's personality, but being totally or insufficiently versed in the secret of the art of Divination, he sought the aid of the man "who does the rest," while you wait. Every science, trade, or profession can produce a goodly number of these helpers (?), arrayed with more or less self-granted honours, diplomas, medals, and the rest, but this particular branch of the occult may reasonably be considered a very good second in the professional race of humbug champions, with a variety of favourites, not only hailing from the proverbial "Sheffield," but also genuine wizards direct from Egypt-by-Bow, real Hindoos, prophets, born in the vicinity of Kennington, or self-styled French Professors, natives and direct from the Ville Lumière, with lots of knowledge, and an Irish accent; one and all in great demand; possessing secret and wonderful formulæ, dosed with double occult occultism's essence; very dark in appearance, but warranted to give results free from fog, and crisp details, from deepest shadows to purest high-lights.

L'embarras du choix makes a choice difficult, and our friend may be, perhaps, free from blame, if the adepts of his choice proved rather ignorant in the application of their "profession," yet if incapables in bringing out details with clear perfection, they have at least given undeniable proof of talent in the fixing and reducing process of their clients' precious metal, and all with a good degree of permanence in the client's memory. I would not affirm that if good fortune had led this friend to a diviner with less honour and more science that the desired result would have been obtained, but there would have been, at least, an immediate saving of time and fees, and an addition to commonsense knowledge, for on principle, whatever the nature of a research, it is necessary that an experiment be carried on in a rational way, else failure must be the only possible result. What kind of rebuff would the tyro in our art science be likely to receive from any serious advanced worker, if, when seeking his help in the initiation of how to reveal the unseen, he made some ridiculous condition, such as, for example, the refusal of a developing agent of any sort, and insist to go in straight for the hypo tub, and when coming out with a blank, declared the whole game to be a perfect fraud?

Extraordinary as this metaphor may seem, the researcher referred to in "Photography and Palmistry" did as bad, if not worse. First, he starts on his errand equipped with certain photographs, presumably on best glossy P.O.P., extra enamelled, portraying the hand of a third party, ignoring, or failing to ascertain, that his material was unfit for the edifice. For, if the human hand may permit or give any reliable disclosure, it is only on condition that the lines, marks, and signs shown thereon, and not only therin, are read and considered subjunctively with the texture, temperament, colour, and complexion, which in their synthetical sense are the key to the individuality, and a centre from which all other indications radiate. Can all this be shown in any graphic reproduction, including the most sharp P.O.P. print? Then again, a single sign or mark is fully admitted to be nothing more than a meagre indication, a presumption, but by no means ever a certainty, until fully corroborated elsewhere. Again, "la main, comme l'écriture, n'a pas de sexe," even anatomically; thus the hand of many a man of the psychic type (conical shape) would appear, specially in a photograph, much more like that of a woman, than the latter's, if of the type known as elementary (square, thick, relatively heavy hand), and it must stand to common sense, that a great many indications, really favourable in a woman's, should be considered as so many unfavourable signs in that of a man's.

I could offer a long string of considerents, but the above would probably be considered quite enough to demonstrate the necessity for our friend to endeavour to do better the next time, and also to bear in mind that if divination is at all possible, it is so only within limits, and that it is no more rationable to expect any useful or dependent revelations and indications from a photograph than from the time-honoured tooth or lock of hair taken by the croyant to the fortune-teller, and that, in his reported endeavour, he received the only result likely to be ever derived, viz., a relief of an over-burden of ready cash. That the human hand is capable of revealing not only a fair amount of fairly accurate facts, and more specially past events, but positively certain indications as regards the owner's personality, dispositions, aptitudes, character, and tendencies, is beyond reasonable denial; proofs of this are not only many, but as plentiful as the proverbial blackberries, only much more easily and quickly obtained. A mere glance, rapid as the shortest exposure, may sometimes be quite sufficient to tell one all one may need to know of another. The finer divination belongs to chiromancy, and is obtained by the aid of lines, marks, signs, etc., not only within the palm, but over the whole of the hand, front, side, and back; certainly a difference, and perhaps can we assign to this the explanation why the name of palmist is applied to a large number of would-be occultists, taken as a derivation of palm—palmed—palming. "They palmed the trick that lost the game." (Prior.)

To presume that the number of these helpers (?) is less than formerly, and that the craze for palmistry is not so rife as of former years, is an erroneous idea. A perusal of the advertising columns of the daily and weekly fashionable press will soon dispel this view, for not only has the number very much increased, but is still growing. The assertion that professors of palmistry have been prosecuted is not quite correct, for, in reality, the reading of the hand could not possibly be treated as illegal, being in operation in the office of every European Government, but so-called palmists generally cumulate, and are not only readers of the hand, but readers in crystal, readers in cards, manufacturers of charms; not only diviners in all branches, but clairvoyants and fortune-tellers, and that is where

the law wisely steps in. Erroneous also, the time-honoured, but exploded theory that the lines of the hand may only be regarded as a consequence involved in the necessary apparatus of opening and closing the fist (sic). We all know that constant action generally tells tales—it does so on the bellows of our camera, also on our trousers, specially at the portion covering the knee, but the human frame does not seem indicted in this ruling, otherwise the hands of persons following the same craft or trade, using the same kind of tools, and doing the same manipulations, would, perforce, offer if not exactly identical marking, at least a very great similarity of lines, etc. But it is not so. Then, again, the hand of the penman, the artist, and any other calling demanding the production, more from the brain than from the hand, would leave the latter almost virgin of rays, or, at least, with much fewer lines than should appear in the hand of a mechanic, so that the facts, the undeniable facts, that it is quite the contrary, that brain workers display a much greater number of lines, in and on the hands, than the labourer or average mechanic, should be sufficient answer to this fallacy! Lord or peasant, artisan or poet, journalist or tinker, there does not exist, the world over, two pairs of hands alike, and similarity is only found with geniality, never properly with profession, calling, or trade. At part with this error is the reference to apes. Will the writer give me a single instance in which the hand of an ape is, or can be, more marked than that of a human being? Although the ape is the nearest approach to man, and an animal fairly supplied with brain and thinking qualities, to brain power, quality, and action are the lines and the marks of the hands attributed and undoubtedly due.

The suggestion advanced, that the modern West End diviner gains more information by the study of character (physiognomy) than by that of the hand is paying these "professors" an undeserved and unnecessary compliment, the former being much more difficult in its application and far less reliable than the latter; the facial organs being mobile, and therefore easy of control, the hand free from possible dissimulation, hence the invaluable help it may give to all seriously concerned in the study of the individuality of man, amongst whom is the Portraitist. Every text book wisely recommends the student desiring to progress in the fascinating but oftentimes difficult, thankless study of portraiture photography, to carefully observe the personality of the sitter, and give a pose congenial to the personality; but these, probably from a number of causes, omit to explain how the student is to gain this precious knowledge that must open the door to success! The amateur, usually practising with some good friends, using the word good in its fullest intent, may have ample opportunity to do so, ditto with the painter, crayonist, etc.; but where is the over-criticised studio operator, who seldom has greater opportunity than exchanging a few words in about as many seconds with the sitter he is expected to accurately portray? A small, very small, knowledge of the hand could provide all the necessary. The full study is neither suggested nor necessary to his practical needs. The knowledge of chiromancy, and past or future events in the life of his sitter, concern him not, but individuality does, and the elements of chirognomony (the study of the form of this organ) give all that. A mere glance at one's hand may often tell him more than a close scrutiny of one's face. Modern painters are well cognisant of this fact, nor is this organ scantily treated by them to-day, as of yore—it has a meaning, a signification. The stern and matter-of-fact Government officials in every large country have at last recognised that it is so, and practically apply the science, with excellent results. Why not the portraitist? A few hours' serious study would do it; it is so simple, so easy, and yet so ignored!

GEORGES D'ARMORIC.

A FORECAST OF THE BRITISH ASSOCIATION.

[Abridged from "The Times."]

THE last Belfast meeting was, in one respect at least, one the most memorable in the history of the Association. T President of the meeting was the late Professor Tyndall, a his address roused the greatest excitement, and even consterna tion, not only in scientific, but in religious circles. It dea mainly with the supposed conflict, if not between science an religion, between science and the Church. Its concludin words were especially memorable, and one phrase in particula may be said to have become a literary commonplace. Speakin of the human mind turning to the mystery from which it ha emerged, seeking so to fashion it as to give unity of though and faith, Professor Tyndall concluded:—"Here, however, touch upon a theme too great for me to handle, but which wil assuredly be handled by the loftiest minds when you and I like streaks of morning cloud, shall have melted into the in finite azure of the past." It is interesting to note that th President of the second Belfast meeting is Professor Tyndall's successor at the Royal Institution, Professor James Dewar F.R.S., whose distinction as a chemist is known to all, and whose success in the liquefaction of gases has been almost sensational. Professor Dewar is not in the least likely to emulate his famous predecessor, so far as the subject of his address is concerned. He will keep to his own special subject of chemistry, and will probably trace the progress in physical chemistry through the schools of Boyle, Black, Andrews, and Thomson, pointing out what it has led up to in our own day.

The attendance at the Belfast meeting of 1874 numbered 1,950, a number rather below the average, and not likely to be much exceeded at the meeting which begins on Wednesday, September 10th. For the following particulars as to the work of the several sections, we are indebted to the courtesy of the sectional presidents and recorders

The general programme of Section A (Mathematical and Physical Science), the president of which is Professor John Purser, has not yet been definitely arranged. Professor Purser's address will be in the main biographical, giving an account of the Irish school of mathematicians and physicists in the last century (not living). He will refer to the two Lloyds, Bartholomew and Humphrey, to Dr. Romney Robinson, Lord Rosse, Rowan Hamilton, M'Cullagh, Bishop Graves, Dr. Jellett, Sir Andrew Hart, Samuel Haughton, Michael and William Roberts, Townsend, Casey, George FitzGerald, Preston, Andrews, and James Thomson. There is this year to be a department of Astronomy and Cosmical Physics, under the presidency of Professor Schuster. To this department communications on the work done on Eros and on Nova Persei will be made, and it is hoped that some stellar photographs from Yerkes will be exhibited. Some points in the nebular theory will probably come up for discussion, and the subject of seismology will be brought prominently forward. In the section itself Lord Rayleigh will probably raise the question of the conservation of weight in chemical reaction; Professor Tronton may be able to show his experiments on the magnetic field due to the motion of a charged condenser; Professor Martin will communicate some results in electrical oscillation and some experimental work done by students under his direction; while Dr. Larmor will have something to say on the temperature of radiant energy. Mr. Petavel has promised a paper on radiation experiments, with a view to the construction of a more trustworthy standard of light, and will also, in conjunction with Captain Bruce-Kingsmill, consider the question of a high pressure gauge for artillery.

Section B (Chemistry) will be presided over by Professor Edward Divers, F.R.S., the subject of whose address will be

The Atomic Theory: What it has become in the course of a entury." Referring as little as possible to the structural con- itution of the matter, Professor Divers proposes to treat this ubject in a comprehensive and somewhat novel manner, which ill not, however, it is expected, be found uncongenial by odern thinkers. The most important papers in Section B are The constitution of the Diazo-derivatives," by Dr. G. T. Morgan, and "On reduced derivatives of benzene," by Dr. . W Crossley. The first of these is a *résumé* of our know- dge of the subject, and a criticism of our views upon it. Other papers are "The alkylation of the sugars," by Professor . Purdie and Dr. Irvine; "The synthetic action of enzymes," nd "On glucosides," by Dr. E. F. Armstrong; "The colour of odine-containing compounds," by Miss Ida Smedley; and "The ction of distilled water on lead," by Dr. F. Clowes, of the London County Council. Professor D. Vorländer, of Halle, nd Professor E. Knoevenagee, of Heidelberg, are to attend as uests of the section.

Dr. Cannan will preside over Section F (Economic Science and Statistics). The staple of his address will probably be the hesis that economic theory is useful in regard to practical questions, such as protection, housing, and other municipal nterprises (especially those connected with locomotion), the Post Office, and various means of raising revenue. He will maintain that better knowledge of economic theory would ob- viate the necessity of many costly experiments and much pain- ul experience. In order to make this clear, Dr. Cannan will probably have to begin his address with a brief sketch of what he takes "economic theory" to mean. As in other sections, he general work of the branch will largely deal with Irish sub- jects. Mr. Benjamin Allen is expected to deal with the effect of the adoption of free trade on Ireland, the Rev. Professor Finlay with rent in Ireland, Mr. Lloyd Paterson will trace the history of the linen industry, while the Right Hon. Horace Plunkett will discuss technical instruction and industrial de- velopment. The effect of factory legislation is the subject of the work of a committee which will make a lengthy interim report, and Miss Hutchins (Regulation of Home Work) has promised a paper on her work, as has Miss Harrison (Adminis- tration of the Factory and Workshops Act in Workshops) on hers. Other papers are on miscellaneous subjects, including central and local administration, which will be dealt with by Mr. P. Ashley; Indian prices, by Professor T. Morison; the Survival of Domestic Industries, by Dr. Cuningham; Municipal Trading, by the Hon. R. Porter (director of the U.S.A. eleventh census); and the Position of Economics and the Applied Sciences in the University training of men intended for a com- mercial life, which will be discussed by Dr. W. R. Scott. Dr. Alexander will contribute a paper on industrial superannua- tion; this, with Professor S. Chapman's paper on the regulation of wages on the basis of prices and profits, together with the report and papers on factory legislation, will give labour ques- tions a fair share of attention. There will be a paper by Mr. Ashley on municipal policy and state control. Specially in- teresting at the present time should be papers by Dr. Gins- burg on Shipping Combines; Professor Graham, on Trusts; and Judge Shaw, on Preferential Tariffs. Papers are also ex- pected from Professor S. J. Chapman, Professor Gonner, and Mr. A. B. Clark (of Edinburgh).

Professor John Perry, F.R.S., who presides over Section G (Engineering), will have something very incisive to say in his address on the Training of Engineers. He does not think that German methods are at all suited for English boys, and he affirms, moreover, that such methods are unpractical. Being of opinion that the great technical colleges of England suffer because their pupils have had no good general education, he will urge that an endeavour should be made to instil into all boys—whatever profession they intend to enter—(1) A know- ledge of English, as distinct from classical, subjects; (2) the power to compute—to achieve this the present methods em- ployed in the teaching of mathematics must be completely re- vised; (3) a knowledge of the methods of study in experimental science. Professor Perry will contend that the average boy is not stupid, and that what is needed is a radical change in our educational systems. The great technical colleges themselves need reforming; for one thing every teacher at an engineering college, whatever his subject, ought to have engineering ex- perience, and many more and better-paid teachers are required. Among other points that will come under discussion are whether workshop experience ought to come before, or after, or during an engineering college course, and the reforms due to foreign competition going on in engineering-shop management and methods. In the general work of the section, Professor Hele- Shaw is expected to present an important report embodying the result of the deliberations of the Road Traction Committee, while the report of the Screw Gauge Committee is likely to conclude a prolonged discussion of an important point of detail in small mechanisms. Among the papers that have been pro- mised are the following:—"The combustion of bituminous coal," by Mr. W. H. Boots; "Water power in Ireland," by Mr. F. J. Dick; "The Belfast water supply," by Mr. L. L. Macassey; "Exhibition of electrical apparatus," by Mr. M. B. Field; "Recent progress in large gas engines," by Mr. H. A. Hum- phrey; "The importance of minor details in engineering work," by Mr. L. Holroyd Smith; and "Direct reducing levelling staff," by Mr. G. W. Herdman. Papers on some electrical subject have been promised by Mr. P. McMahon and Mr. F. Holden, and Mr. J. E. Knigsbury will discuss some aspect of telephony.

Professor W. D. Halliburton, F.R.S., the president of Section I (Physiology), will take as the subject of his address, "The present position of chemical physiology." This is the first occa- sion in the comparatively short history of this section on which the chair has been occupied by one whose research work has been identified with the application of chemistry to the solution of physiological and pathological problems; and as would, perhaps, have been anticipated, Professor Halliburton will dwell upon the recent great advances in this branch of science. These are due to a growing *rapprochement* between chemists and physiologists. Physiological chemistry, as it is sometimes called, is yearly becoming a more exact science, as is shown by our increasing knowledge of the constitution of such sub- stances as the starches and sugars, uric acid, and the purine compounds. The constitution of albuminous substances which are the main constituents of living material, and are found nowhere else, is not yet revealed, but earnest investigators in many countries are paving the way to this final conquest of organic chemistry. Another striking instance of the progress of chemical physiology is seen in the application of physical chemistry to the investigation of physiological questions; the modern doctrine of solutions, of ions and electrolytes, has produced quite a revolution in the ideas of physiologists in con- nection with the important processes of osmosis and secretion. Among the other subjects that will be considered are the views of the modern vitalist; the usefulness of bold theorizing as exemplified by the work of Ehrlich in connection with the sub- ject of immunity, and of bold experimentation as exemplified by the work of Pawlow on digestion; and the extension of chemical methods in the elucidation of the nature of nervous activity. In the general work of the section, Mr. Barcroft has a paper on the estimation of small quantities of uria, Professor Halliburton and Dr. F. W. Mott, F.R.S., will discuss nerve regeneration, Dr. W. Page May will deal with the morphology

of the camel's brain, Dr. W. A. Osborne (recorder) and Mr. S. Zobel will consider the Hydrolysis of Glycogen, Dr. John Turner will discuss some new features in the structure of the human cerebral cortex, and Professor E. A. Schäfer, F.R.S., will contribute papers on the paths of conduction for volitional impulses, and the functions of pituitary body.

As Professor H. E. Armstrong, F.R.S., may justly be said to be the originator of the new Section L (Educational Science), his address may be expected to be one of unusual interest, and the reforms which he will probably advocate will be somewhat drastic. The address will be devoted largely to a discussion of the educational outlook. Professor Armstrong will consider the deficiencies of the present curriculum and the directions in which it needs reform, and will also deal with the question of the training of teachers, which is of such importance to the future of education. Following the practice of last year, a definite programme has been arranged for the section, so that a number of important subjects may be debated. The first two days will be mainly devoted to the discussion of Irish educational problems. Dr. W. J. M. Starkie, Resident Commissioner of National Education, will deal with recent reforms of Irish education, primary and secondary, with a view to their co-ordination. A debate on intermediate education in Ireland will be opened by Mr. R. M. Jones, M.A., of the Academical Institution, Belfast, and another on the introduction of practical instruction into Irish national schools, by Mr. W. Mayhorne Heller, B.Sc., Head Organiser of Science Instruction, Dublin, and recorder of the section. In a debate on technical instruction in relation to industrial development in Ireland, the Right Hon. Horace Plunkett, Vice-President of the Board of Agriculture and Technical Instruction, has promised to take part. More general debates later in the meeting will be on the training of teachers, about which Professor Withers and Miss Walter will have something to say, and the teaching of English, in which Mr. P. T. Hartog and Canon Lyttelton will take part. Dr. Kimmins will discuss the subjects to be taught as "science," and the order in which they should be taken, and papers on educational experiments have also been promised. Reports will be presented on the teaching of mathematics, the teaching of science in elementary schools, the conditions of health essential to the carrying on of the work of instruction in schools, and on examinations. For the Tuesday afternoon a joint discussion with Section G, on the training of engineers, has been arranged. The Friday evening discourse will be by Professor J. J. Thomson, F.R.S., on Becqueral rays and radio-activity, and that on Monday evening will be by Professor W. F. R. Weldon, F.R.S., on the subject of inheritance. The lecture to working men on Saturday evening will be by Professor Miall, F.R.S., and will deal with gnats and mosquitoes.

Technical Education.—A return recently issued shows that the amount spent on technical education in England and Wales by local authorities during 1900-1, exclusive of the sums allocated to intermediate and technical education under the Welsh Intermediate Education Act, was £1,051,422 0s. 9d. The amount raised by loan on the security of the local rate under the Technical Instructions Acts was £152,833 14s. 4d. The amount of the residue received under the Local Taxation (Customs and Excise) Act by councils of counties and county boroughs in England (excepting Monmouth County) for 1900-1 was £924,359 19s. 10d., of which £863,846 11s. 5d. was appropriated to educational purposes, and £60,513 8s. 5d. to relief of rates, the latter sum including £32,711 9s. 2d., devoted by the London County Council to the relief of rates. The amount of residue paid to the county and borough councils in Wales and Monmouth was £44,358 5s. 10d., the whole of which was devoted to intermediate and technical education, chiefly under the intermediate Education Act. The various councils are making grants out of rates under the Technical Instruction Acts, and the total amount expended on technical education under these Acts during the year was £44,791 4s. 9d.

THE TONING OF BROMIDE AND CHLORO-BROMIDE PAPERS.

A treatise on bromide paper and its uses a year or two ago would probably not have broached the subject of producing various colours with it, or, at any rate, would merely have treated the subject in a perfunctory manner; a great deal of attention is now, however, being paid to the various methods and much valuable information regarding them is to be gathered from the recent work of Franz Loescher, "Vergrössern und Kopieren auf Bromsilberpapier." Theroetically, there are three ways of producing an ultimate warm tone: (1) by using a special emulsion for the paper, such as "Alpha" emulsion; (2) by sulphur toning; (3) by producing a chemical deposit of various metals and their salts upon the reduced silver image. The first may be passed over as being out of the range of the practical worker. For the second, a direct or indirect means may be employed; thus a warm bath may be used as follows:—

Sodium thiosulphate	150 gms.
Alum	15 gms.
Hot water	1000 c.c.m.

This bath, according to Loescher, should be kept a day before use, and used warm; toning takes up to half-an-hour, according to the colour desired. A similar method, advocated, we believe, by Dr. Wilson, is to bleach the prints in a solution of mercuric chloride and lead nitrate, wash well, and then treat with a 30 per cent. solution of ammonium hydrosulphide.

For red tones the following is recommended:—

I.—Lead nitrate	1 gram.
Pot. ferricyanide	3 grams.
Water (distilled)	50 c.c.m.

II.—A 1 per cent. solution of uranium nitrate.

III.—A 20 per cent. solution of citric acid.

IV.—A 1 per cent. solution of ammonium chloride.

Take 25 c.c.m. of I., 100 c.c.m. of II., 100 c.c.m. of III., and 20 c.c.m. of IV. By omitting No. IV. brown tones will be obtained.

Various red and sepia tones will result with the following bath:—

I.—A ½ per cent. solution of copper sulphate.

Concentrated ammonium carbonate solution is added to this till the precipitate formed is redissolved.

II.—Pot. ferricyanide	12 grams.
Water	700 c.c.m

Add solution II. to I., shake, and then add more carbonate solution till clear.

The following is a convenient bath for blue tones:—

Ferrous sulphate	1 gram.
Ferric chloride	1 gram.
Water	20 c.c.m.

This follows after a preliminary immersion in a uranium bath. If blue tones are to be got without uranium, another method is offered. Make up the following:—

I.—Lead nitrate	1 gram.
Pot. ferricyanide	3 grams.
Water (distilled)	50 c.c.m.
II.—Ferric chloride	1 gram.
Water	50 c.c.m.
III.—Citric acid	10 grams.
Water	50 c.c.m.

For use take two parts each of Nos. I. and II., and three parts of No. III.

A bath for giving violet tones is the last, and is made up in the following manner:—

A.—Ferric oxalate	1 gram.
Pot. ferricyanide	1 gram.
Water	2000 c.c.m.
B.—Copper chloride	1 gram.
Water	100 c.c.m.

To both solutions ammonium carbonate is added till the precipitates formed are redissolved. The print is placed first in A till it has acquired a Berlin blue colour; it is next placed in B till the desired colour is arrived at, and then well washed. Too long immersion tends to produce red tones.

In all the methods the prints are to be well washed after fixing before treatment with the toning solutions.

T. Thorne Baker.

THE GLUE AND GELATINE INDUSTRY.*

[Reprinted from the "Pharmaceutical Journal."]

Glue, which constitutes a weighty factor in the animal organism, is found principally in the cartilaginous material, bones and skin of most animals. Technically, it is divided into three classes—bone glue, leather glue, and skin glue. In its preparation, the raw material is first submitted to a process of division into very small pieces, either in a stamping machine, or in a mill, very similar in construction to the ordinary flour mill. In this process very careful attention must be given to the temperature of the material. It must not be allowed to get too high, or the product will acquire a very foul and disagreeable odour; the quality of the finished product being, moreover, otherwise injured, in that it loses in tenacity, though the chemical changes that occur in the heating of the substance have not yet been fully cleared up. The ground-up bones (*Knochenmehl*) still contain fatty matter which must first be carefully removed, for which there are various processes, the selection of which depends upon whether the fat is to be utilised or not. The older process consisted of heating the mass in kettles provided with a double or false bottom, which prevents the bony material from coming in contact with the directly heated bottom, and thus getting burned. The fat, on heating, melts and assembles on the surface, from which it is skimmed off as it arises. The difficulty with this method of getting rid of the fat is that it takes up a great deal of time, and does not do the work completely, as the residual fat injures the quality of the glue. A better process is that in which the vacuum pan is brought into play. The kettle is made air-tight, and is connected with an air-pump, which enables the boiling process to proceed under rarified air, and, of course, under a much lower temperature. A good deal of time is also gained by it. By far the best process, however, is removal of the fat by benzol in closed iron cylinders. The benzol being recovered by distillation, the cost of the substance cuts but little figure in the process. When the process of defatting is over, there are other impurities or foreign substances that must be removed, the mineral ingredients of the bone substance—calcium, phosphorus, etc. The most convenient agent for this purpose is hydrochloric acid. This is added to the defatted mass and left in contact therewith, from forty-eight to seventy-two hours, according to circumstances. At the end of this time the cartilaginous material is freely washed with water, and becomes what is technically called "crude" or "raw" glue (German, *Rohleim*). The washing is a very particular process, and must be most carefully done, as the slightest residue of acid will interfere with the clarification of the finished product. A slight remnant of calcium phosphate gives the glue a milky appearance, which is unsightly, but does not injure the quality of the product in the least. To tell the truth about it, baryta, or white lead, is often added to poor glue produced by other chemical methods, by some manufacturers, in order to give their product the appearance of having been prepared by the benzol process. The crude glue now passes to the boiling apparatus in caldrons provided with perforated bottoms. On long-continued boiling, the water, holding glue in solution, gradually separates from the cartilaginous matter (technically called, in German, *Leimwasser*, or glue-water), and, from time to time, is drawn off by faucets, arranged for this purpose. At first the draw-off is very thin, and contains but little glue, but as the boiling proceeds it gets richer and richer in glue, until finally it arrives at a point when it must be transferred to the evaporating pans for solidification. Of late years, evaporation has been carried on, as in the earlier defatting process, in vacuum pans, on account of the advantages thus gained (lower temperature, rapidity, etc.). Evaporation is continued until the gelatinous content of the material in the pans has reached 45 per cent. The pans are now disconnected and removed to the pouring room, where their contents are emptied out into shallow forms provided with glass bottoms. These are arranged in sets, in such a way that an air-space is left around each to facilitate evaporation and solidification. The air is kept in constant motion by ventilators driven, usually, nowadays, by electrical apparatus. Sometimes the glue, instead of being poured into large shallow pans or forms, is poured into deep moulds, and is allowed to solidify in blocks of the consistency of cold jelly, which are afterwards cut by machinery into slices of the desired thickness. The drawback to this process is that it cannot be practised in all kinds of weather—not with the same convenience, at least. When the material has reached a certain degree of solidity it is removed from the glass-bottomed forms and placed into trays with bottoms of wire netting. These are then put on an endless carrier and passed into a series (three or four) of closed compartments, each succeeding one of which is heated a few degrees higher than the one just left. When the space or compartment is reached, whose temperature is deemed most suitable for the material (which depends entirely upon its percentage of residual water), it is taken off the carrier and left in the chamber for a length of time, also dependent upon its hardness. The glue is thus gradually dried, passing from one room to another until it is thoroughly exsiccated. The temperature of the first drying room is 30 deg. C. (86 deg. F.), and it increases by spaces of 10 deg. C. (60 deg. F.). It usually requires about one month to complete the drying process and deliver the glue ready for market.

Gelatine.

Gelatine is nothing more than an especially pure glue, obtained from bone-glue by means of sulphurous acid, and its manufacture is in no wise to be distinguished from that of glue. As raw material the parings and clippings of the shoe factories and shops, odds and ends from tanneries, old leather (boots, shoes, belts, scraps from book-binderies, etc.), calves' trotters, heads, etc., are also used. America carries on this manufacture on a very large scale, there being several very large gelatine factories that are supplied with raw material by the gigantic abattoirs of that country. The raw product is first submitted to a process technically called "liming," in which the material is acted upon by dilute milk of lime. This process is a long one, lasting from fifteen to twenty days for the thinnest and lightest leather parings, to thirty, or even forty, days for beef hides. The milk of lime arrests decay,

* Translated from the "Drogisten Zeitung" (Vienna) for the "National Druggist."

decomposes the products of fermentation, dissolves the fleshy matter, saponifies the fats, and, finally, loosens up the cartilaginous matter. The lime, together with the saponified fats and other products, is now removed by thorough washing, best with running water. The further handling of the material is, in general, the same as that already described in the manufacture of glue, with the exception that the process for getting rid of the mineral contents of the raw material is dispensed with. The first drawing of the glue-water yields the best glue, the second an inferior sort, while the third is almost destitute of adhesive property. It can only be used by adding to it a portion of the first or best sort. The solutions must all be more or less refined, according to the uses for which the glue is intended. To this end the liquid is first brought to a boil, and then cast into blocks, which are cut into slices and dried. This is what is called "cabinet-makers' glue."

By-Products.

We now come to the by-products. The fat is usually sold to the soap makers, by whom it is converted either by the hot or cold process into soap (after having, as a usual thing, some palm oil or stearine added to it). The better class of these fats are also used for the manufacture of stearic acid, which plays a considerable part in the manufacture of candles. When so used, they are first saponified with lime, then hot dilute sulphuric acid is added. This converts the lime to a sulphate (plaster of Paris), which is thrown down by elainic acid, and the stearic acid thus left free. The next by-product of the glue factory is phosphorus, of which the crude material carries a high percentage. The glue residue is first carbonified, and then treated with sulphuric acid, which produces calcium phosphate. This is mingled with coal, packed in retorts, hermatically sealed, and brought to a white heat. Phosphorus is distilled off, and is caught under water. A third by-product of the industry is bone-black, or animal charcoal. A good article of bone-black is of a deep, intense, matt-black, and plays a very prominent part in the arts and industries, especially in the manufacture of colours. It has the characteristic property of absorbing from other substances colouring matter, lime, and salts, and hence it is used in the decolorisation of oils. It is also used as filtering material in sugar refineries, as it removes all traces of colour and leaves the sugar of a snowy whiteness. Another use of bone-black is in the preparation of blackings. After the fats and gelatine are extracted from bones, the latter are very brittle, but still contain some calcium phosphate and about two per cent. of nitrogen, and possess considerable value as a fertiliser. Formerly farmers used to cover their land with coarsely-powdered bone. It was, however, made plain that in this condition the material had but little fertilising value. Now they are ground to meal or very small bits by a machine especially devised for the purpose, which not only comminutes the material, but sorts out the product. Bone meal has great fertilising value, the utility of which is further much increased when it is made soluble in water. This is done by submitting it to the action of sulphuric acid and converting it into superphosphate. In conclusion, we would remark that it is an interesting fact that every particle of the seemingly worthless residue of the slaughter-houses has been, by chemical skill, converted into substances of value in the arts and industries. Absolutely nothing is lost, but all made valuable. Even with the by-products cited by us, we have not yet reached the end, and might follow the residues of the soap and candle factories, and show how glycerine is got from them. This, however, belongs to another article, and we will leave it for that time.

Ernst Paul Rehfeld.

THE INVISIBILITY OF TRANSPARENT OBJECTS.

[Reprinted from "The Physical Review."]

A transparent body, no matter what its shape, disappears when immersed in a medium of the same refractive index and dispersion. Could a transparent solid substance be found, whose refractive index and dispersion were the same as those of air, it would be absolutely invisible. We can find a solid, the refractive index of which is equal to that of air for light of a certain wave-length, but unfortunately it is not a transparent substance. If it were, we should have an example of a solid absolutely invisible when illuminated with monochromatic light. The dispersion curves of some of the aniline dyes cross the line of unit refractive index for certain wave-lengths, but the point of crossing is in the immediate vicinity of the absorption band. Cases of this nature will be discussed more fully under another heading.

The disappearance of a transparent substance when immersed in a medium of identical optical properties is usually illustrated by dipping a glass rod into Canada balsam, but the disappearance is not complete, for the dispersion of the glass and the liquid are not the same. A better fluid is a solution of chloral hydrate in glycerine, which is quite colourless. The glycerine is to be heated and the crystals added until the refractive index is of the required value. The hot liquid will dissolve a most astonishing amount of the chloral, ten or fifteen times its bulk, if I remember right, and only a very small amount should be placed in the beaker to start with. This solution has almost exactly the same dispersion as glass, and finely powdered glass stirred up in it becomes perfectly transparent without showing a trace of Christiansen's colours. A glass rod disappears completely when dipped into it, and when withdrawn presents a curious aspect, for the end appears to melt and run freely in drops.

Lord Rayleigh, in his article on optics in the "Encyclopædia Brittanica," points out that perfectly transparent objects are only visible in virtue of non-uniform illumination, and that in uniform illumination they would become absolutely invisible. A condition approaching uniform illumination might, he says, be attained on a top of a monument in a dense fog. I have recently devised a method by which uniform illumination can be very easily obtained and the disappearance of transparent objects when illuminated by it illustrated. The method in brief is to place the object within a hollow globe, the interior surface of which is painted with Balmain's luminous paint, and view the interior through a small hole.

The apparatus can be made in a few minutes in the following manner:—A quantity of Canada balsam is boiled down, until a drop placed on cold glass solidifies. The Balmain paint, in the form of a dry powder, is stirred into the hot balsam until the whole has the consistency of thick paint. Two glass evaporating dishes of equal size are carefully cleaned and warmed and coated on the outside with the hot mixture, which can be flowed over the glass. and by the dexterous manipulation of a small Bunsen flame made to cover the entire outer surface. I first tried painting the inside of a copper sphere with the commercial paint, but the surface was unsatisfactory and could not be easily cleaned. Probably two perfectly plain hemispherical finger-bowls could be used instead of the evaporating dishes. As soon as the coating has become hard, a small hole is cut through it, to enable the interior to be viewed. If the lips of the dishes are placed together, the interior can be seen through the small opening, but in this case the line of junction, which is always more or less dark, comes opposite the aperture, which is a disadvantageous arrangement.

If the inner surfaces be exposed to bright daylight, sun, or electric light, and the apparatus taken into a dark room, a

crystal ball or the cut glass stopper of a decanter placed inside, it will be found to be quite invisible when viewed through the small aperture. A uniform blue glow fills the interior of the ball, and only the most careful scrutiny reveals the presence of a solid object within it. One or two of the side facets of the stopepr may appear if they happen to reflect or show by refraction any portion of the line of junction of the two hemispheres.

PROF. R. W. WOOD.

PRISMS AND PLATES FOR SHOWING DICHROMATISM.

[Reprinted from "The Physical Review."]

THE usual method of showing dichromatism, or the change in the tint of the transmitted light, with increasing thickness of the absorbing medium, is to superpose two or more stained films or strips of suitably tinted glass. The method has a disadvantage in that it does not demonstrate very clearly the cause of the change of colour. As is well known, the change is due to the fact that the coefficient of absorption is greater for one absorbed region than for some other. If the medium be given the form of an acute prism, and a source of light be viewed through it, the transmitted colours are separated, and the change in the intensities of each can be followed, as the thickness increases by moving the eye from the refracting edge towards the base.

I have made prisms of this nature in the following way: A quantity of Canada balsam is boiled down until it will harden on cooling, and a quantity of brilliant green is dissolved in it. The dye must not be added to the balsam until it has cooled almost to the point of becoming thick, otherwise it will be decomposed and a very muddy green result. The amount of the dye should be such that a layer of the liquid 1.5 cm. thick appears blood red. Thin layers appear blue, and if a prism be made of this mixture it will show a blue-red dichromatism. A green-red dichromatism is much more striking, and the requisite green colour can be produced by the addition of a quantity of naphthol yellow. This mades a beautiful dichromatic medium. A small hollow prism made of two strips of plate glass mounted together with wooden sides, in which grooves have been cut, is warmed and filled with the mixture. As soon as the balsam is hard, a small quantity of melted sealing wax is poured on top of it, which materially increases the strength of the prism. A lamp flame viewed through this prism is separated into a red image and a green image, and as the eye is moved along towards the base the green image fades rapidly away, while the red one scarcely changes at all.

If a broad flame be used, the overlapping portions of the two images will be seen to be coloured yellow, secondary yellow due to the mixture of red and green light on the retina. The thickness of the prism at the point where this yellow is purest is the critical thickness, or the thickness at which the change from red to green takes place. If we consider the colour change as a subjective phenomenon, there are three distinct colours seen with different thicknesses of this medium, green, yellow, and red. This can be shown better by making the balsam solution of the dye much stronger, and pressing it out between plates of glass. It is easy to prepare in this way plates very slightly prismatic, which are red along one side, yellow in the middle, and green along the other side. The yellow is always a little puzzling, especially if a flame is the source of light looked at. The lack of achromatism in the eye causes the yellow image to have red or green borders, the effect being difficult to describe. In the case of one of my plates, the colour of the transmitted light is almost exactly that of the sodium flame, and yet a sodium flame is absolutely invisible through it.

The dependence of the colour on the original composition of the light is also well shown by these plates, some of them appearing red by lamplight and bright green by daylight, a phenomenon exhibited by the well-known Alexandrite crystals.

I have a prism which I made several years ago which is dichromatic by lamplight, but not by daylight, which illustrates well that dichromatism depends on the relative intensities of the different parts of the spectrum of the light used, as well as on the different absorption coefficients. If I remember rightly, this prism was made of malachite green.

The prisms should be made about 4 cm. long, and 2 cm. thick at the base.

PROF. R. W. WOOD.

LECTURE ROOM DEMONSTRATIONS OF ASTIGMATISM AND OF DISTORTION.

[Reprinted from "The Physical Review."]

THE astigmatism of a lens for an oblique pencil of rays may be shown subjectively by looking obliquely through a magnifying glass at the rulings on a piece of cross-section paper. The lens may be adjusted to show one set of rulings distinctly, when, upon moving the lens nearer to or farther from the paper, the other set of rulings will become distinct. The conditions necessary to bring out the astigmatism in a striking manner are that a narrow pencil of rays be employed, passing through a small portion of the lens, and that the field angle be narrow. This is substantially realised in the above use of the magnifying glass, inasmuch as the pencil of rays from any given point in the sheet of paper is delimited by the pupil of the observer's eye, and inasmuch as the field angle where the eye is fixed upon a given point of the paper is determined by the extent of the region of distinct vision, that is by the size of the yellow spot in the retina of the eye.

The astigmatism of a lens for an oblique pencil of rays may be shown objectively by projecting on the screen an image of a cross-ruled transparent plate, the projecting lens being turned so that its axis makes an angle of twenty or thirty degrees with the optical axis of the lantern. Under these conditions the vertical or horizontal lines may be sharply focussed at will, and if the lines are very fine, it may easily be that the one set of lines is rendered invisible by blurring, when the other set of lines is sharply in focus. A small portion only of the plate should be used, the remainder being cut off by a diaphragm; and the lantern should be adjusted so that the light from the condenser may be focussed as it passes through the projecting lens.

The error of a lens known as distortion, an error which is exhibited to a marked degree by the so-called view lens of the amateur photographer, may be demonstrated by means of the projection lantern, and the principle of rectilinear lens may be shown. In this connection it should be remembered that the distortion produced by a simple lens or by a simple achromatic doublet is very small except when a stop or diaphragm is used at some distance in front of the lens to improve the definition. Instead of a diaphragm, it is more convenient to adjust the lamp in the lantern so that the condenser lenses focus the light in front of or behind the projecting lens, as may be desired, the position of this focus corresponding to the position of a diaphragm or stop. To show this error as large a field angle as possible must be used.

A large cross-ruled transparent plate is placed in the lantern, and projected by means of a simple biconvex lens. If the lamp is adjusted until the focus of the condensing lenses lies, approximately, in the plane of the projecting lens, and the projecting lens is adjusted to give the sharpest possible image on the screen, the image shows little or no distortion. If the lamp is adjusted as that the condensing lenses focus the light

some distance in front of the projecting lens, and the projecting lens is adjusted to give the sharpest possible image on the screen, the image is distorted, the lines being concave on the side towards the centre of the field. If the lamp is adjusted so that the condensing lenses focus the light some distance beyond the projecting lens, and the projecting lens is adjusted to give the sharpest possible image on the screen, the image is distorted, the lines being convex on the side towards the centre of the field.

In the symmetrical orthoscopic or rectilinear doublet the diaphragm or stop is midway between the lenses of the doublet, that is, in front of one lens and behind the other, and the distortion of one lens is opposite to that of the other. The distortion is thus compensated.

W. S. Franklin.

THIS WAY TO THE LUNATIC ASYLUM.

My friend Smith departed in high spirits for the annual club outing.

"We're sure to have a jolly time," he said, as I bade him farewell at the station; "you have no idea how fraternal people are. The chaffing and joking are endless, and everybody's temper is literally angelic."

But when he came back, alas and alack—as the classics have it—he had a weary little twinkle in his eye. I met him that evening, and he immediately buttonholed me.

"Why did——?" he began.

"What was the field meeting like?" I interrupted.

"Oh ripping! But, I say, do you know why did——?"

"Have you got many negatives?"

"Yes, lots. But have you heard this: Why did——?"

"Don't ask me why did the owl 'owl."

"No, no; these are quite new. Why did Photop-ake?"

"Of course, I give it up."

"Because she saw Glissoline on Ethelbert Henry. Ha, ha!"

"What a rotten one! Where did you pick it up?"

"Composed it myself. But here's a better one: What would you do if you got too fond of Käse-bier? Why, of course, you'd have to stick to Adam's Yale."

"Oh, lor'! They can't have stuck to it at the field meeting, if that's the kind of giddy jest they bandied about."

"My dear fellow, that's nothing to some of them."

"Well, let's have a few samples."

"Let me see. Oh, yes. What was Photographic Salon?"

"How do you expect me to know what the young lady was on? Tell me at once."

"Eastman's Brownie."

"What? Sal was on Eastman's Brownie?"

"Eastman's Brown knee, don't you understand?"

"My sainted grandmother!"

"And can you explain: Why did Gambier Bolton?"

"No, I can't."

"Because they made Waterhouse stop."

"Spare me!"

"No, I will not spare you. Look here. Why is Burroughes Wellcome? Because he can always make develo purr. What was it that Lancaster? The secret is only by Hydroki-none. What was it that the Cadett? A slice off a Velox. How was Lamb-ert? By seeing Gly-cin. How much does Solio? More than Cooke Lens. Where did they washer? In Eastman spools. What gave the studio window pane? To see the roller blind. Why is it that the camera bellows? Because it's just been punished fo'cussing. Where did——?"

"Halt! I can't endure any more." And I wrenched myself free and fled home.

That night sleep did not visit my eyelids for many hours. I had caught the disease, and lay tossing upon my couch inventing fresh conundrums (or should it be conundra?), to outvie those of my friend; and, *en passant*, I may mention that he is my friend no longer.

"Why were W. and D. Downey?" I pondered. "No; I have it! Why weren't W. and D. Downey? Because sometimes Bros. Moult. (Ho, ho! good one, that!) Let me see. How do you know he has Vevers? Obviously by his tungstate. Why did Hyposulphite? Because he saw the plate box. (Um, um; that's rather feeble.) How does Wainwright? So badly that he really Autotype. Why wasn't Shardlow? Because the P.A.J. was a Wellborne Piper. (That one has a trifling fault; it's Cockney.) To proceed: Why did he refuse the Jewell? Because you might expose two seconds. (Rather smart, that!) Why did the dark-room sink? Under the weight of an extra photo-gram. Why did the roll-holder? To prevent her falling on the dark slide."

Eh, me! but I was weary before I fell asleep. Next morning in my bath I made my last riddle, and swore a solemn oath to make no more. It was: What are photographic riddles? And the answer simply is: Bausch!

Ward Muir.

THE THEORY AND PRACTICE OF INTENSIFICATION.

Part II

THE FERRICYANIDE INTENSIFIERS.

When metallic silver is brought into contact with an aqueous solution of a salt of hydroferricyanic acid, it acts as a reducing agent, removing portion of the acid from the salt, and converting it into a ferrocyanide. Upon this reaction are based the existing processes of photographic intensification by means of ferricyanide solutions.

The intensification, as was mentioned in my former article, may be either direct or indirect. In the former case, the ferricyanide bath is itself the true intensifier, but in the latter the action of the salt on the image is not an intensifying one—despite the fact that ferrocyanides are still produced—but has merely the effect of converting the silver film into a state capable of being readily intensified by after treatment in a solution of a chromate, sulphide, or other suitable salt.

In direct intensification it is customary to make use of a bath containing uranium ferricyanide as the active constituent, whilst in indirect lead ferricyanide is the salt employed. The combining proportions of the constituents of uranium ferricyanide have not been exactly determined, but seeing that hydroferricyanic acid is tribasic, there is reason to suppose that the composition of the salt is accurately represented by the formula $U^3(Fe(CN)_6)_4$.

On the assumption that such is the case, the reduction of the uranium compound by silver may take place in accordance with the second of the following equations, the final products of the reaction being a mixture (or perhaps a double salt) of the ferrocyanides of silver and uranium, constituting the image, and potassium nitrate and acetate, which pass into solution:—

First stage:—$8Ag_2 + 10K_3Fe(CN)_6 + 3UO_2(NO_3)_2 + 12HC_2H_3O_2 = 8Ag_2 + 6K_4Fe(CN)_6 + 6KNO_3 \times U_3(Fe(CN)_6)_4 + 3O_2 + 12HC_2H_3O_2$;

Second stage:—$8Ag_2 + 6K_4Fe(CN)_6 + 6KNO_3 + U_3(Fe(CN)_6)_4 + 3O_2 + 12HC_2H_3O_2 = 4Ag_4Fe(CN)_6 + 3K_4Fe(CN)_6 + 6KNO_3 + 3UFe(CN)_6 + 6H_2O + 12KC_2H_3O_2$.

Uranium ferricyanide is first formed by the double decomposition of uranyl nitrate and potassium ferricyanide, and the remainder of the latter salt is converted into ferrocyanide. Part of the ferrocyanide is then, in its turn, decomposed, and silver ferrocyanide is formed in its place, while the uranium salt is reduced to ferrocyanide at the same time.

In practice it is usual to acidify the uranium bath by the addition of acetic acid, as a safeguard against the staining of the film during the operations of intensification. The addition of the acid is also to be recommended, on account of the circumstance that an acidified solution has less solvent action on the products of intensification than one which is neutral or markedly alkaline

Before employing the uranium bath the plate to be intensified should always receive a few minutes' soaking, either in water alone or preferably in a very weak aqueous solution of acetic acid, say, one part by volume of the acid to seventy parts of water.

In effecting the double decomposition, it is customary to add the solution of potassium ferricyanide by degrees to the bath containing the acidified uranyl nitrate solution, after a few minutes' treatment of the plate in the latter, and this plan has its advantages, as it is possible by its means to obtain the maximum intensifying effect of the bath by taking the simple precaution to add no more ferricyanide solution than is necessary to effect the conversion of the image into uranium and silver ferricyanides. When an intensifying bath containing an excess of ferricyanide is made use of, a certain percentage of silver ferricyanide, a comparatively soluble salt, is always formed along with the ferrocyanides, and by the continued action of the bath this salt is partly dissolved, the result being, of course, a partial reduction of the density of the image.

As to the strength of the solutions that should be employed in these operations there is considerable diversity of opinion. Generally speaking, a bath containing from two to three grains per fluid ounce of mixed solution of each of the salts employed will be found efficacious. If a stronger bath is required, the percentage of uranyl nitrate should be increased in preference to that of the ferricyanide.

It is, unfortunately, impossible to estimate otherwise than roughly the amount of ferricyanide required to produce the maximum degree of intensification, because the weight of the silver constituting the image after the operations of develpoment and fixing are completed cannot be determined, and without its weight to guide us, we cannot say what the weight of the intensification products will be. The quantity of acetic acid which ought to be added to the bath is also variously stated, some writers recommending the addition of two volumes of acid to every ninety-eight volumes of water employed, and others again no less than seven times as much. Speaking from my own personal experience, I have found a four per cent. solution to give very satisfactory results.

The ferrocyanides obtained by the action of the uranium bath differ much in appearance. Silver ferrocyanide is a white compound which is said to assume a blue colour on exposure to air, a circumstance which serves to explain the rich deep hues exhibited by a negative which has received a treatment of some hours' duration in the intensifying bath. Uranium ferrocyanide, on the other hand, is a compound of a fine brownish-red colour, inclining to orange in its lighter, and to crimson in its darker, tints. It is a very non-actinic colour, too much so, indeed, to be entirely satisfactory as regards the facilities which it affords for rapidity of transmission of light in the process of printing. The slow printing qualities of the negatives intensified by its means, is, however, the only serious objection that can be urged against the use of the uranium ferricyanide bath, which in other respects is a valuable photographic adjunct, and is perhaps the only intensifier upon which entire reliance can be placed.

The increase of density (*i.e.*, weight per unit volume) produced by the action of the uranium bath is very considerable, being no less than 646.21 parts by weight for every four molecules (861.28 parts) of metallic silver present. There is also a large increase in the volume, the amount of which I am, however, unable to state, as the value for the specific gravity of uranium ferrocyanide necessary to make the calculation has not apparently been determined.

The process of indirect intensification with the ferricyanide bath has next to be described. The chemical reactions involved in the process are, in all respects similar to those which we have just been considering, the only difference being in the composition and appearance of the deposit forming the latent image produced by the decomposition Its two constituents, ferrocyanide of silver and ferrocyanide of lead, being both colourless bodies, are not, truly speaking, intensification products, but rather what may be styled—using the expression in a purely photographic sense—products of reduction. The solution of lead ferricyanide employed in the treatment of the plate is usually prepared by double decomposition, the salts selected for this purpose being potassium ferricyanide and nitrate of lead. The formation of the compound is represented by the following equation:—

$$2K_3Fe(CN)_6 + 3Pb(NO_3)_2 = Pb_3(Fe(CN)_6)_2 + 6KNO_3.$$

It will be seen that, besides the ferricyanide, a large percentage of potassium nitrate is formed. It is not necessary that this should be withdrawn from the solution before employing the bath, as the salt does not appear to exercise any injurious action upon the reduction products.

The equation representing the conversion of the image into lead and silver ferrocyanides may be written thus:—

$$4Ag_2 + 4Pb_3(Fe(CN)_6)_2 + 24KNO_3 = 2Ag_4Fe(CN)_6 + 6Pb_2Fe(CN)_6 + 24KNO_3.$$

If the bath is too strong in ferricyanide in proportion to the amount of silver present in the image to be intensified, some ferricyanide of silver will be formed, in a manner quite analogous to the behaviour of the uranium bath acting under like conditions. Assuming what in actual operations is never likely to occur—viz., that all the silver is converted into ferricyanide, the action may be represented thus:—

$$3Ag_2 + 4Pb_3(Fe(CN)_6)_2 + 24KNO_3 = 2Ag_3Fe(CN)_6 + 6Pb_2Fe(CN)_6 + 24KNO_3$$

Hence it is inadvisable to employ a highly concentrated solution, particularly when a very weak image, poor in silver, is to receive intensification.

As a matter of fact, lead ferricyanide is only sparingly soluble in water alone; but, as in the process of direct intensification, it is usual to add acetic acid to the solution, and this has the effect of increasing the solubility of the salt.

For the production of lead ferricyanide, theory requires the presence of rather more than sixty-six parts by weight of potassium ferricyanide for every hundred parts of lead nitrate employed. In practice, notwithstanding, the addition of a considerable excess of the former salt, is generally recommended, and this, no doubt, together with the acetic acid present, tends to increase the solubility of the lead compound.

The following standard formula, which will be familiar to most photographic readers, may be taken as a fair representative of its class:—

Uranyl nitrate, 100 grains.
Potassium ferricyanide, 150 grains.
Acetic acid, one fluid drachm.
Water, five fluid ounces.

As to the time that will be required to effect the necessary reduction of the image in the bath, no definite rules can be given. All depends upon the degree of intensification which is sought to be imparted. In the case of a very weak image it may be necessary to prolong the action until the whole of the silver is converted into ferrocyanide, and entire bleaching ensues. Usually, however, notwithstanding the statements to the contrary that are to be met with in certain photographic text books, an immersion such as will produce a decided but merely superficial whitening of the image will be sufficient to give the effect desired.

In order to remove the last traces of soluble ferricyanide, the film after treatment must be well washed in running water, for at least twenty minutes. Upon the thoroughness of this washing the success of the subsequent intensifying operations very largely depends.

For intensifying purposes a solution of ammonium sulphide is usually recommended. As the commercial salt, however, consists of a mixture of sulphydrate and sulphides, and is, besides, a very unstable compound, better and more certain results are obtained by the use of sodium sulphide. The following equation exhibits the decomposition of the reduction products, representing the image when treated with a solution of this reagent:—

$$2Ag_4Fe(CN)_6 + 6Pb_2Fe(CN)_6 + 16Na_2S = 4Ag_2S + 12PbS + 8Na_4Fe(CN)_6.$$

The sulphide acts upon the mixture of ferrocyanides, converting them into insoluble sulphides, and sodium ferrocyanide is simultaneously produced, and passes into solution. The intensification products, silver and lead sulphides, are both dark-coloured bodies. Owing to the predominance of the lead compounds in the mixture forming the image, the hue produced is usually a deep gray or grayish-black.

The increase of density represented by the conversion of four molecules of silver into silver sulphide is obtained by subtracting the number 861.28 (*i.e.*, eight times the atomic weight of silver), from 989.20 (four times the molecular weight of the sulphide), when we have as remainder, 127.72. To this, however, in order to find the total increase, must be added twelve times the molecular weight of lead sulphide, and thus we have:—

$$127{\cdot}72 + (238{\cdot}41 \times 12) = 2988{\cdot}64.$$

This, it will be observed, is more than three times 861.28, the density of the original image.

In regard to the increase of molecular volume, the atomic volume of metallic silver is 10.2, which, multiplied by 8, gives us 81.6. The molecular volume of four molecules of silver sulphide is found by multiplying 989.20 by the reciprocal of the specific gravity. The specific gravity of the sulphide when formed artificially is stated to be 6.85, therefore:—

$$989{\cdot}20 \times 14598 = 144{\cdot}40.$$

The specific gravity of lead sulphide in the condition in which it is obtained in the reaction is 6.92, the reciprocal of which is .1,445. Multiplying the molecular weight of a single molecule, 238.41 by 12 to obtain the molecular weight of the twelve molecules of sulphide produced, and this in its turn by the reciprocal, we have as product, 413.40.

The increase of volume is therefore:—

$$144{\cdot}40 + 413\,40 - 81{\cdot}6 = 476\,20.$$

It will be seen that this increase is no less than 5.8 times the original volume of the silver in the image, a sufficiently striking result.

It is really immaterial what strength of sodium sulphide solution is employed in the intensifying operations, provided always that it is not too dilute. A bath containing from twenty-five to thirty grains of the salt to each fluid ounce of water will be found to answer well, and may be recommended for use.

The chromate bath next requires notice. Unlike the sulphide bath, this gives an image of a very warm quality of tone, somewhat similar to that obtained with uranium ferricyanide. The deposit is composed of a mixture of the chromates of silver and lead, these compounds being produced by the action of a solution of an alkaline chromate upon the mixture of ferrocyanides obtained by the preliminary treatment in the lead ferricyanide bath. In preparing the solution, either the normal potassium chromate (K_2CrO_4), or potassium bichromate ($K_2Cr_2O_7$) may be employed. The latter is the salt usually recommended, but the former, for reasons which will presently be given, is to be preferred whenever it is obtainable.

The following is the equation representing the change produced by the action of a solution of the normal salt:—

$$2Ag_4Fe(CN)_6 + 6Pb_2Fe(CN)_6 + 16K_2CrO_4 = 4Ag_2CrO_4 + 12PbCrO_4 + 8K_4Fe(CN)_6.$$

With a solution of bichromate, the action is rather more complicated, and appears to take place in two stages:—

First stage:—$2Ag_4Fe(CN)_6 + 6Pb_2Fe(CN)_6 + 16K_2Cr_2O_7 = 4Ag_2Cr_2O_7 + 12PbCrO_4 + 12CrO_3 + 8K_4Fe(CN)_6$;

Second stage:—$4Ag_2Cr_2O_7 + 12PbCrO_4 + 12CrO_3 + 8K_4Fe(CN)_6 = 4Ag_2Cr_2O_7 + 12PbCr_2O_7 + 8K_4Fe(CN)_6$.

In the first stage, the products of the double decomposition are silver bichromate, normal lead chromate, chromium trioxide, and potassium ferrocyanide. The two last-mentioned compounds dissolve in the water present. In the second stage, the solution of chromium trioxide attacks the lead salt, converting it into the red bichromate, $PbCr_2O$. As to this secondary action, however, the fact must be mentioned that the conversion of the normal chromate into bichromate takes place so slowly, that, for all practical purposes, the products of intensification may be regarded as consisting merely of silver bichromate and normal lead chromate.

Normal silver chromate is a dark red salt, which is insoluble in water. Silver bichromate resembles the normal chromate in colour, but differs from it in solubility, being attacked in the presence of excess of water and partially dissolved. Owing to this circumstance, it is not possible to estimate with accuracy the degree of density that will be obtained when a bath of potassium bichromate is employed. It is better, therefore, always to use the yellow chromate in the preparation of the solutions that are intended for intensifying purposes.

The colour of the image after intensification is orange or orange-yellow, this being attributable to the large percentage of lead chromate produced.

The increase of density due to the conversion of four molecules of silver into normal chromate may be found by subtracting 861.28 from 1,326.44, that is, 331.61 (the molecular weight of the chromate), multiplied by 4. This gives 465.16 for the silver salt alone. The molecular weight of lead chromate is 322.68, and 12 molecules of the salt are produced in the reaction. Multiplying these figures together, we get 3,872.16, and we have then for the total increase of density, $3872{\cdot}16 + 465{\cdot}16 = 4337{\cdot}32$, which is equivalent to rather more than five times the original density.

The increase in molecular volume produced by the reaction can also be calculated, as the specific gravities of the two chromates have been determined. As before, we have 81.6 for the atomic volume of four molecules of silver. The specific gravity of silver chromate is 5.77, and that of lead chromate is 5.65. Multiplying the molecular weights by the reciprocals of the respective specific gravities, and the products in their turn by the number of molecules, we have:—

Volume of $4Ag_2CrO_4 = 331{\cdot}61 \times {\cdot}1733 \times 4 = 229{\cdot}87$;

Volume of $12PbCrO_4 = 322{\cdot}68 \times {\cdot}17699 \times 12 = 685{\cdot}33$.

Therefore, the total increase of volume is:—

$$229{\cdot}87 + 685{\cdot}33 - 81{\cdot}6 = 833{\cdot}60.$$

The primary and final volumes are thus in ratio of the numbers one to eleven.

A solution containing 25 grains of normal potassium chromate per fluid ounce is recommended for intensifying purposes. The following may be used as a substitute, and gives equally good results:—

Caustic potash, 67 grains.
Potassium bichromate, 175 grains.
Water bichromate, 10 fluid ounces.

MATTHEW WILSON.

THE UNIVERSAL EXPOSITION AT SAINT LOUIS, 1904: DEPARTMENT OF LIBERAL ARTS.

CIRCULAR No. 5.—Photography, Its Processes and Products.

Event to be Celebrated.—The anniversary of that important historic event, the acquisition of the Louisiana territory, will be celebrated in St. Louis by a Universal Exposition, embracing exhibits gathered from every field of human endeavour, both at home and abroad, which will illustrate, to the fullest practicable extent, the developments of a century in art, science, and the industries.

International in Scope.—The national and international scope and character of the Exposition is fully set forth in the organic act of March 3, 1901, in the following terms:—

Act of Congress.—"Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That an exhibit of arts, industries, manufactures, and products of the soil, mine, forest, and sea, shall be inaugurated, etc. The President shall be authorised to make proclamation of the same. And he shall, in behalf of the Government and the people, invite foreign nations to take part in the said Exposition and to appoint representatives thereto."

President's Proclamation.—It is also voiced in the proclamation of the President of the United States, issued August 20, 1901, under the above authority of Congress, who, in the name of the Government and the people of the United States, invited all of the nations of the earth to take part, "By appointing such representatives and sending such exhibits to the Exposition as will serve to fitly illustrate their resources, their industries, and their progress in civilisation."

Fifteen Million Dollars for Buildings, etc.—That this Exposition will be of unusually large proportions is evidenced by the fact that the citizens and City of St. Louis have contributed ten million dollars (10,000,000.00 dols.) and the United States Government five million dollars (5,000,000.00 dols.), a total of fifteen million dollars (15,000,000.00 dols.), all of which will be used in the preparation of grounds, erection of buildings, and kindred expenses pertaining to installation.

Government and States Allotment.—In addition to this amount, there has been appropriated 1,308,000.00 dols. for a Government building and exhibits; 1,000,000.00 dols. by the State of Missouri, and amounts ranging from 20,000.00 dols. to 250,000.00 dols. by the several States and territories of the Union, all for the collection and installation of their respective exhibits.

Site.—The Exposition will occupy a beautiful site, covering about 1,000 acres in area, in and adjacent to Forest Park in the central-western part of the city.

Date of Opening.—The opening date has been fixed on April 30, 1904, and the closing date on December 1 following.

Buildings Designed by a Commission of Architects.—At the inception of the work, the designing of the building and the embellishment of the grounds was assigned to a commission composed of some of the leading architects and landscape engineers in the United States, and the results will undoubtedly be such as to win the enthusiastic admiration of all visitors.

Inner Courts.—By means of colonnades and inner courts they have made special provision for shade and coolness throughout the exhibit buildings.

Area of Liberal Arts Palace.—The Department of Liberal Arts will occupy an entire building, covering an area of about 400,000 square feet, and all exhibits will be on the main floor.

Architects.—The Liberal Arts Palace was designed by Barnett, Haynes, and Barnett, an architectural firm of established repute in St. Louis. It is the most easterly of the main exhibit buildings, and is near the United States Government building.

Estimated Cost.—It will be built of staff, at an estimated cost of 500,000.00 dols. Although following the prevailing style of architecture of the Exposition—the Renaissance—it adheres very closely to classic lines.

The architects describe the structure as designed in the following terms:—

Style of Architecture.—"The style of architecture is a severe treatment of the French Renaissance for the exterior facades. In fact, the treatment embodies rather a feeling of the classic than of the Renaissance. It has been the endeavour of the architects to depend largely on sculpture in the decoration of the building, refraining from the over-use of stereotyped architectural ornamentation.

Main Facade.—"The main facade will be 750 feet long, and will be made interesting by the use of a centre pavilion and of two end pavilions. The centre pavilion is brought somewhat above the connected buildings which unite it with the pavilions on either side. Each of the three pavilions, on the fronts, forms an elegant entrance to the building.

On the main facade there are three entrances, and on the 525-foot facades are two entrances, one in each of the end pavilions.

Main Entrance.—The main entrance will be in the form of a hemi-cycle with circular colonnades. The ceiling of this hemi-cycle will be frescoed on a background of old gold. The decorations and ornaments will be brought out in relief. The plan is conspicuous for the perfect simplicity of its arrangement and the practicability of its exhibit spaces. The ten main entrances of the building intersect the exact centres of the exhibit spaces, the axial lines of these entrances running through the centres of the exhibit spaces from east to west and from north to south.

Exterior Treatment.—"One of the most beautiful treatments of the exterior will be the broad allegorical processional frieze on the interior walls of the exterior loggias. These mural paintings will be executed on a background of old gold.

Light and Ventilation.—"The building is to be constructed without interior columns, the exhibit space being spanned in one truss. The internal court can, if necessary, be used as an overflow exhibit space. The exhibit space is adapted to any kind of exhibit, and the building will be ventilated and lighted by an abundance of windows, both in the exterior walls and in the clearstory.

"The court of the Liberal Arts Palace will be carried out in the Italian school of architecture, and will be enclosed by colonnades embellished with rare statues and beautiful arabesques. The cloisters formed by these colonnades will afford cool promenades for the visitors to the Fair.

"It is the intention of the architects to have this court laid out with flower beds and to install hanging gardens at the attic story line. In these gardens there will be groups of statuary by reproductions from antiques. In the centre of the court will be a beautiful basin of water, in whose limpid depths will be reflected the gardens and the classic lines of the colonnade. This basin is surrounded by balustrades and approached by broad flights of steps. In the angles of the court there will be Italian fountains enriched with statuary. The gardens will furnish visitors a delightful place for resting and for sight-seeing.

"The inner walls of the court entrances will be decorated with mural paintings in the style of Alma Tadema.

"These courts will be one of the charming features of the Exposition, and when illuminated at night with glistening cascades, flowers, and fountains, will form an enchanting picture."

Attractive Exhibits Desired.—Diligent efforts will be made to fill this building with attractive and interesting exhibits of products and processes of the highest types of the various arts and industries of to-day from all parts of the world, and at the same time illustrate their evolution by showing some of the products and processes of the earlier days.

Co-operation Requested.—Your earnest co-operation is solicited, and you are cordially invited to submit plans and specifications for exhibit space in this department in one or more of the groups of the following classification:—

Field Covered by Liberal Arts.—Group 15.—Typography—Various Printing Processes; Equipment, processes and products.

Group 16.—Photography—Equipment, processes and products.

Group 17.—Books and Publications—Book Binding; Equipment and products.

Group 18.—Maps and Apparatus for Geography, Cosmography, Topography.

Group 19.—Instruments of Precision, Philosophical Apparatus, etc.; Coins and Medals; Equipment, processes and products.

Group 20.—Medicine and Surgery.

Group 21.—Musical Instruments—Materials, processes and products.

Group 22.—Theatrical Appliances and Equipment.

Group 23.—Chemical and Pharmaceutical Arts—Equipment, processes and products.

Group 24.—Manufacture of Paper—Raw materials, equipment, processes and products.

Group 25.—Civil and Military Engineering.

Group 26.—Models, Plans, and Designs for Public Works.

Group 27.—Architectural Engineering.

Each of the above groups is divided into several classes.

Photography.—Group 16, relating to Photography, its processes and products, is further described in the following pages:—

GROUP 16.—Equipment, Processes, and Products.

Class 54.—Materials, instruments, and apparatus of photography, equipment of photographic studios.

Class 55.—Negative and positive photography on glass, paper, wood, cloth, films, enamel, etc. Photogravure in intaglio and in relief; photocollography, photolithography—stereoscopic prints. Enlarged and micrographic photographs. Colour photography. Direct, indirect, and photo-colour printing. Scientific and other applications of photography. Artistic photography as applied to portraiture, landscapes, etc.

This group embraces the equipment, processes, and products of photography in all its branches.

Attractive Surroundings.—Photography will here find an attractive home, amid congenial surroundings, filled with displays of the graphic arts, music, the drama, civil engineering, architecture, etc.

Artistic Photography in Art Palace.—Special provisions will be made for the display of selected high-grade examples of artistic photography.

Admission Through National Jury.—Admission to this class will be confined strictly to such art work in photography as may satisfactorily pass the critical inspection of the National Jury of Selection of the Department of Art.

The pictures from United States exhibitors, which are thus admitted, shall be hung in the United States section of the Art Building, to such extent as the room available will permit.

Foreign Exhibits Subject to Foreign Rules.—The pictures from foreign exhibitors will be admitted under similar rules, but must also, in all cases, conform to the rules of the respective foreign sections to which they belong, as to whether they can be hung in the foreign sections of art or not.

Special Place in Liberal Art Palace.—A suitable, attractive space will be specially prepared in the Liberal Arts Palace, where pictures selected in accordance with the above rules, and other high-grade work, may be properly displayed, in case they do not find suitable space in the Art Building.

Display of Highest Order Expected.—Under this system there should be gathered such a fine array of artistic photographs as will merit the admiration of art connoisseurs, and win the plaudits of artists of the older schools of the brush and pencil.

Aid of Photographic Fraternity Desired.—The very large number of professional and amateur photographers in all parts of the world who are daily producing pictures of a high order, will doubtless gladly lend their aid in gathering a most interesting and valuable display of their work.

Colour Photography.—The latest developments in colour photography in all its phases should be freely treated, as also the scientific applications of photography to astronomy, surveying, etc.

The photo processes also afford a fine field from which to gather attractive exhibits.

Cameras and Other Appliances.—All classes of cameras and their appurtenances will find a suitable place in this group.

Historical Exhibits Desired.—It would also be very gratifying to have examples of the work done, and the cameras used by Wedgewood and Davy, Niepce and Daguerre, and others of the earlier workers, to show the progressive steps of this wonderfully fascinating art.

The specific mention of certain features of the several classes are simply suggestions which can readily be amplified by similar treatment of every item in the classification.

Rules Must be Carefully Considered.—The Rules and Regulations of the Exposition accompanying each application blank should be carefully considered before filling out requests for allotments of space. These must in all cases, conform strictly to said rules and regulations.

Make Exhibits Attractive.—In the preparation of exhibits, it should be borne in mind that the best interests of the exhibitor, the visitor, and the Exposition, require that no effort should be spared to make the exhibit attractive in its arrangement and in its movement, and special processes should be shown whenever it is practicable.

Quality Rather than Quantity Desired.—While as liberal allowances of space will be made as are found to be practicable, exhibitors should restrict themselves to as few well-selected examples of their products as permissible with due regard to the creditable display of the best features of their work, rather than attempt to make an exhibit attractive through its magnitude.

Space and Power Free of Charge.—There will be no charge for space occupied by exhibits, and a limited amount of power for the operation of mechanical devices to illustrate processes of special interest will be furnished to exhibitors gratuitously.

Any further information desired will be promptly furnished on application.

ROYAL Cornwall Polytechnic Exhibition.—The following are the awards in the photographic section:—First Silver Medals: J. H. Coath, J. C. Burrow, and H. Speyer. Second Silver Medals: H. T. Jessop, J. R. Gotz, and Rev. H. H. Mills. First Bronze Medals: J. B. Hawke, J. P. Milnes, W. A. Clark, W. Lidgey, W. M. Martin, Annie Blamey, F. Martin-Duncan, R. R. Beard, J. C. Douglas, W. Fleet, Autotype Company, and G. Bird. Second Bronze Medals: C. J. King and Rev. G. E. Hermon.

THE ILLINGWORTH COMPETITIONS.

Messrs. Thomas Illingworth and Co., Ltd., of Willesden Junction, write:—"We shall be much obliged if you can find space in your valuable JOURNAL to mention that our £100 Carbon Printing Competition, which closed on August 1st, has been a great success. It is the first competition held for carbon workers, and over 800 prints were submitted by the leading professional and amateur photographers. The prints were of very excellent quality, and the judges, Messrs. Thomas Bedding and R. Child-Bayley, had the greatest difficulty in adjudging the awards. Appended is a list of the winners:—

List of winners in Illingworth's competition:—Class A. (for small prints by double transfer).—*1, G. W. Morgan (Aberdeen), £14 12s.; 2, Carine Cadby (Kent), £3 3s.; 3, A. V. Kenah (Blackheath), £2. Class B. (for large prints by double transfer).—*1, J. Moffat (Edinburgh), £17 15s.; *2, N. S. Kay (Bolton), £7 5s.; 3, W. R. Lathbury (Bristol), £2. Class C. (for small prints by single transfer).—*1, James Patrick (Edinburgh), £14 12s.; 2, J. Longton (Southwell), £3 3s.; *3, J. Moffat (Edinburgh), £4. Class D. (for large prints by single transfer).—*1, Valentine and Son (Dundee), £17 15s.; *2, Gunn and Stuart (Richmond), £7 5s.; 3, William Clayden (Plymouth), £2. Class E. (for prints on Illingworth's special "gravure" tissue).—*1, R. Fellows Willson (Bond Street, London), £12 10s. *Are professional photographers, and prize includes £2 special award to the working printer."

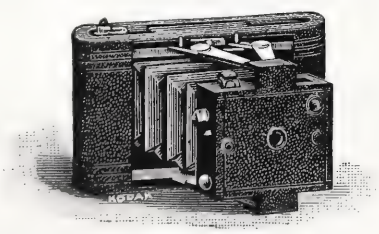
YORKSHIRE UNION OF ARTISTS.

The fifteenth annual Exhibition will be held at the City Art Gallery, Leeds, and will include an international invitation exhibition of pictorial photographs. The exhibition will be opened on Tuesday, October 14th, 1902, and closed on Saturday, January 3rd, 1903. Mr. F. G. Issott, of 62, Compton Road, Harehills, Leeds, writes: "I beg to invite your attention to the enclosed circulars which give particulars of the forthcoming international exhibition of pictorial photography to be exhibited in conjunction with an exhibition of paintings, water-colour drawings, etc., submitted by Yorkshire artists to be held as above. I believe this is the first occasion on which any society of painters has thus far recognised the artistic possibilities of photography as to welcome it to an exhibition side by side with paintings. The exhibition will include work submitted by the Yorkshire Union of Artists, Leeds and Yorkshire Architectural Society, and a thoroughly representative collection of modern pictorial photography by well-known workers in Great Britain, France, Germany, and America, and will be held in one of the finest and best appointed galleries in the United Kingdom. Apart from the members of the Yorkshire and Northern Societies interested in photography, science, art and architecture, the exhibition will be visited by a large and varied section of the art-loving public."

New Apparatus, &c.

The No. 0 Folding Pocket Kodak. Manufactured and sold by Kodak, Ltd., 43, Clerkenwell Road, London, E.C.

The latest addition to the numerous family of Kodak Cameras will not, it is safe to say, be less popular than its relations. It takes photographs 2½in. by 1⅝in., and as it only measures, when closed, 3½in. by 1¾in. by 5¾in., it may easily be carried in the pocket. It weighs about 10½oz. The front of the instrument is extended by means of the well-known lazy-tongs movement, and the back is non-detachable—it folds



back after a small nickelled catch is disengaged. This simple little improvement is to be very widely appreciated. The Bijou Kodak is constructed of wood and aluminium, and is covered with fine-grain leather. The other features of the camera include the Kodak ever-set rotary shutter; three stops; finder; and, of course, the instrument takes spools of roll-film. Compact of form, convenient to hold or carry, and exceedingly simple to use, the No. 0 Folding Pocket Kodak is excellent value for its cost (26s.), and is sure to make its way in popular esteem.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

August.	Name of Society.	Subject.
30	Birmingham Photographic	Half-day excursion to Welford-on Avon. Leader, Mr. H. Wilmot.
Sept. 1	Southampton Camera Club	Print Competition—*Architecture.*
2	Rotherham Photographic	*The Life and Work of George Tinworth.*
3	North Middlesex Photographic	Eighth Lantern Slide Competition.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

AUGUST 21ST.—Mr. H. C. Rapson in the chair.

Mr. Brown passed round two wet-plate negatives made in 1852, and remarked on the splendid condition they were in after all these years. These negatives led to a discussion on the superior brilliance of the wet plates over the gelatine negatives.

Mr. T. E. Freshwater said he had seen a number of similar negatives made some years ago, over which a curious stain has appeared, and the entire negatives seem more dense than they were originally, and the same good quality print cannot now be obtained as when the negatives were first made.

Mr. A. L. Henderson remarked that there was no reason why an iron or pyro developed plate, if properly fixed and washed and then varnished, should not keep almost indefinitely.

Mr. Henderson asked why should a gelatine plate, intensified with bichloride of mercury, become insoluble, even in boiling water, and after it has been reblackened with ammonia or any alkali it should become soluble again.

Mr. S. H. Fry said he had noticed the same thing, but he had still found it insoluble after the reblackening.

The hon. secretary, in announcing the Association's forthcoming competitions and awards, said that the committee had decided that the pictorial competition will be held on the first open night in December, and the pictures must come in a week before. The exact date would be announced later.

The last date for receiving papers for the Henderson award is September 18th, and the decision would be made at a general meeting on October 11th.

The hon. secretary wished it to be made clear that the committee would not take the responsibility of going over all the papers read outside the Society, in the event of any of the papers read before the Association not being accepted, if such papers are not placed before the committee on or before the date given.

NORTH MIDDLESEX PHOTOGRAPHIC SOCIETY.

AUGUST 20TH.—

Mr. F. P. Bayne gave a lantern lecture on "Notes on Photographing Natural History Subjects in the Field." Numerous slides of birds'-nests, with eggs or young birds, were shown, photographed in their natural positions. Birds, insects, and moths were also shown, and the methods by which the results were obtained were explained.

In the Cobham and Leatherhead outing, on Bank Holiday, Mr. Seaborne and Mr. Mummery were respectively placed first and second.

SOUTHAMPTON CAMERA CLUB.

The members of the above Club met on the 18th inst., under the presidency of Mr. G. Vivian, when an extremely interesting and instructive developing demonstration took place. Six plates had been exposed to the same object, with carefully-adjusted time, under precisely similar conditions. Development was carried out by various members, and a very good set of negatives was produced. The different kinds of developer used were pyro-ammonia, hydroquinone, rodinal, pyro-potash, and cristallos.

The negative obtained with pyro-ammonia was considered to have the advantage of the others, which, however, were all of a good workable character, especially that produced with hydroquinone, which was almost equal to the pyro-ammonia one.

Arrangements were then made for an outing on the 23rd inst. to Shawford, that most enchanting hunting-ground for photographers.

"BEFORE I leave the melodrama of Mont Blanc let me mention another item. In the shops where they sell picture postcards they are now exhibiting several photographs of a particularly gruesome kind. The photographs illustrate the process of bringing the dead down the mountain side. Anything more ghastly it would be difficult to imagine. Everybody who is going up Mont Blanc must see these pictures before he starts. The guides have halted half-way down to be photographed. Some of them have posed themselves; others are smoking pipes. The bodies, wrapped up, are lying on the ground, with the ropes atached to them by which they are being dragged on their awful journey. After this, I am sure you will agree with me that the Chamionards do not look upon Alpine tragedies as likely to injure their business. The guide Blanc, with his frost-bites, his wounds, and his bandages, is already on sale in the shop windows."—"Dagonet" in "The Referee."

New Books.

The Beginners' Guide to Photography." 139 pp. Price, 6d. London: Published by Perken, Son, and Co., Ltd., 99, Hatton Garden, E.C.

This very old friend is now in its eighth edition and seventieth thou- and—an eloquent tribute to its practical value. The author, "A Fellow of the Chemical Society"—(times out of number we have found ourselves wondering whose identity is thus concealed)—knows his subject thoroughly, and has the rare gift of being able to write down to the intellectual level of the beginner. He deals with the principal branches of photography in a lucid manner, and gives some useful hints on the choice of apparatus.

"P.O.P." By A. Horsley Hinton. 134 pp. Price, 1s. London: Published by Hazell, Watson, and Viney, 52, Long Acre, W.C.

The author has evidently been at great pains to compile a mass of information relating to the manipulation of printing-out papers, but the book, we think, would have gained by condensation. It consists of eight chapters, the headings of which are as follows:—Introduction, and Paper Described; Printing the Paper; Toning the Print; Variations in Toning; Combined Baths, Fixing, and Washing; Drying the Prints, and Preparation for Mounting; Developing P.O.P. Prints; Collodion Papers—Rapid Printing, etc. "P.O.P." should meet the needs of the beginner, who finds much fascination and mysticism in formulæ. The instructions are given minutely and with a wealth of words that is characteristic of Mr. Hinton, whose reputation, however, can hardly be advanced by such an obvious piece of "bookmaking" as "P.O.P." appears to us to be. Still, it is fair to admit that compilations of a florid kind find much favour with certain classes of readers.

Commercial & Legal Intelligence

Messrs. H. and W. Green, Rotherham, write: "A Mr. J. Menhinick, in your issue of August 15th, asks about a German mount. If he will send a sample, we shall be pleased to supplyhim."

The Imperial Dry Plate Company, Ltd., Cricklewood, London, N.W., write:—"In spite of the large additions to premises and plant which we made in the Spring of 1900, the demand for Imperial plates has again grown beyond our present power of production. To prevent a shortage on the larger and more important sizes, we have for the present stopped making plates smaller than ¼-plate size. We hope to be able to overtake the demand in a few weeks' time, and to supply the small plates by the middle of September. Meantime we are again extending our factory to prevent any delay in execution of orders next year. As we cannot supply small plates, it is impossible for amateurs to enter Class 3 in our Competition; we therefore propose to hold this class over until next year, making the closing date for receiving entries July 31st, 1903, and increasing the prizes from £26 16s. to £50, to be allotted as follows:—One prize of £5 5s.; one prize of £3 3s.; five prizes of £2 2s.; twelve prizes of £1 1s.; thirty-seven prizes of £10s.; total, £50."

Re Frederick Thomas James Morris, 137, White Ladies Road, Clifton, photographer.—The first meeting of the creditors interested under this failure took place at the offices of the Official Receiver for the Bristol District, on August 21st, before the Official Receiver. The summary of accounts showed liabilities amounting to £232 0s. 1d., and assets estimated to produce £235 2s. 2d.; but preferential claims absorbed £56, thus leaving a deficiency of £52 17s. 11d. The Official Receiver's observations were as follows:—The debtor states that he began business as a photographer and stationer eleven years ago, with a capital of £250 or £300 in cash and photographic accessories. He admits that from the commencement he has made practically nothing out of the concern, and that his drawings for personal requirements have only been about £40 per annum. He attributes his insolvency to "keen competition, and the electric trams carrying people past the premises." It is evident from an examination of his stock that it is not likely to realise more than half his estimate, and that he ought to have written off a considerable amount for depreciation some years ago. He has kept a careful record of his receipts and expenditure and ledger accounts with his creditors and debtors, but has never prepared a statement of his liabilities and assets. With the exception of a liability of £20 lent the debtor in the year 1893, and £17 17s. due for undistrainable rent, the bulk of the indebtedness is for goods supplied during the past twelve months. Mr. Darley stated that a substantial offer had been made for the lease of the premises and fixtures.

Messrs. F. York and Son, 67, Lancaster Road, Notting Hill, London, W., have issued their thirty-third annual supplemental catalogue of photographic optical lantern slides, lecture sets, etc., for the season 1902-1903. Messrs. York remark: "From the commencement of our business, the trade quickly appreciated the value of the productions which we introduced. Many leading exhibitors adopted them, and our business was gradually extended from England to all parts of the world, for the reason, we believe, that we have endeavoured to study the wishes of dealers, to conduct our business in accordance with their views, and to spare no expense or efforts to make the best possible productions. We beg to acknowledge the many favours we have received, and to state that we are at all times happy to accept suggestions and carry them out as perfectly as possible. We now submit our thirty-third annual supplemental catalogue, which contains many valuable additions." The catalogue lists the following series:—"Pharaohland. Cairo to Second Cataract." "Pekin: Its Environs, and Forbidden City." "The British Empire in the Twentieth Century." "Wonders of the World." "Constantinople." "Klondyke, and White Pass." "Oxford and Its Colleges—In Chronological Order." "H.M. Men-of-War." "Gas-Making." "Coronation Street Decorations." "Dominion Day at Canada Arch." "Review of Indian Troops by the Prince of Wales." "Return of Lord Kitchener: Passing through Hyde Park." "Coronation Procession." "Coronation Decorations." "The Royal Tour to the British Colonies." "Wit hRoyalty through Canada." "Celebrities."

Re William Henry Parkinson, 115, Newton Street, Bradford, photographer.—The above-named debtor appeared for his public examination at the Bradford Bankruptcy Court, on August 21st, before the Registrar. This debtor was up to 1896 an artist, being in the employment, as principal artist, of a Mr. Ledgard. He then entered into business on his own account, as an artist and photographer, in George Street, Bradford, with £50 capital. In 1892 he removed to Newton Street, his capital by that time having doubled. In 1893 he purchased the freehold for £600, borrowing the whole of the purchase money. His business was at that time prosperous, and he made a comfortable living until two years ago. His turnover then amounted to about £16 a week, but had since, owing mainly, the debtor said, to competition, fallen off by one-half. The principal loss was attributed, however, to depreciation in the value of his property. He filed his petition on creditors beginning to press him, particularly his second mortgagee, who advanced him £650 in August, 1901. The gross liabilities amounted to £1,831, of which £614 was expected to rank for dividend. The assets were estimated at £503, leaving a deficiency of £111. Replying to the Official Receiver (Mr. Binns), the debtor said that, after going to Newton Street, he erected a large gallery in connection with his premises there, for the purpose of doing exhibition work and ordinary work. The Official Receiver: What do you value the property in Newton Street at? Debtor: About £1,200 or £1,300. Would there be any surplus if sold out by auction now?—No. How was it you got so much as £650 lent upon a second mortgage?—It was on the condition that I took Mr. Louis Firth as an assistant, to be paid £3 per week, that his mother lent me the £650. Have you given as much attention to your business during the last three years as formerly?—No, I have not. Is it partly owing to that neglect that your present position has been brought about?—Yes. Have you had dealings with any money-lenders?—Yes. With whom?—With Wolf: I borrowed £100 from him. How much did you receive?—I signed a promissory note for £150. I paid £100, and then I had to pay £50 in a lump sum, which I could not do, and had to re-borrow. I signed again for £150, and got £50. So that you have really got £150, and signed for £300?—Yes, I have paid £190. On the application of Mr. Firth, the examination was closed.

The extraordinary extent to which photography has become popular amongst all classes during the last decade is evidenced by the enormous capital which large companies have laid out in the manufacture of cameras, plates, papers, and other supplies, so as to render the pursuit less difficult for both professionals and amateurs. Before the introduction of dry plates and ready-sensitised papers, only professionals could, as a rule, undertake photography, which then necessitated the use of wet plates and required considerable chemical knowledge on the part of its exponents. Thanks to the great advance that scientists have brought about, photography, certainly in its essential processes, is now reduced to simplicity, and can without hesitation be taken up by amateurs, who no longer need to fear the intricate methods of other days. The expansion of the wholesale drug business carried on by Sharland and Co., Ltd., at their warehouse in Willeston Street, has rendered it necessary that they should take separate premises in a leading thoroughfare for their photographic supply business, which of late years has very much increased in importance. They have accordingly opened a photographic supply depot in a shop in the "New Zealand Times" Company's building on Lambton quay. The shop has handsome fittings of polished cedar and plate glass, designed by Messrs. Crichton and McKay, architects, and constructed by Messrs. Mainland and Barr. A dark-room is fitted up in one corner of the shop. At this establishment Sharland and Co., who carry a very large stock of photographic supplies, and have always catered for the wants of photographers in the very best manner, have on sale cameras, dry plate, printing papers, mounts, and sundries. The company are sole agents for "Velox" paper, "Planiscope" lenses, "Hypax" hypo destroyer, developing "Cartols," "Mabor" limes for limelight production, the celebrated Goerz anastigmat lenses, and the "Southern Cross R.R." lens. The following cameras are held in large variety:—Rochester Optical Company's "Premo," Watson's, Houghton's, Lancaster's, Miller's "Adelphi" (hand), Eastman's Kodak, Talbot and Eamer's "Miral" (hand), Busch's (hand film), and "Alvista" (panoramic). In addition to those already mentioned, the company has for sale lenses by such well-known makers as Taylor, Taylor and Hobson, Cooke, Watson, Ross, Beck-Steinheil, and Busch. They stock Ilford P.O.P., Wellington and Ward P.C.P., and bromide, and Eastman's bromide papers. The company also make a speciality of mounts, a large assortment of which is carried, representing almost every size and shape used for the mounting of portraits, views, groups, etc. Magic lanterns and microscopes, and parts for them, are another feature. Sharland and Co. have a large connection throughout New Zealand, and they do an extensive postal business. They will shortly issue a new illustrated price list, and any photographer at a distance desiring a copy of it can have one posted to him on application.—"The New Zealand Times."

The committee of the Hospital for Sick Children, of which the Duke of Fife is president, have made Mr. F. W. Speaight an honorary life governor of the hospital in recognition of his "great and invaluable services" in having designed the Imperial Coronation Bazaar, by which a sum of nearly £25,000 was raised.

News and Notes.

Mr. Mullins, of Ryde, had the honour of sittings from their Majesties the King and Queen and Princess Victoria of Wales, on board the Royal yacht, on Tuesday, 19th inst.

The Board of Agriculture have made arrangements with the Postmaster General, whereby pocket editions of small-scale Ordnance Survey maps for certain districts will be kept for sale to the public over the counter at head post-offices in some towns in those districts in which there are no agents for the sale of such maps. It is proposed to introduce this system, in the first instance, as an experiment, at the head post-offices in the following towns:—Scarborough, Rochdale, Burton-on-Trent, Southport, West Hartlepool, South Shields, Luton, Worthing, Bury St Edmunds, Huntingdon, Stafford, Macclesfield, Crewe, Stockport, Ilkley Richmond (Yorkshire), Driffield, Sittingbourne, Cromer. Llandudno, Weymouth, Littlehampton, Greenock, Blairgowrie, and Pitlochry. Ordnance Survey maps can at present be ordered through most head post-offices from the depot at Southampton, on prepayment of the postage, but under the new arrangement, which will come into operation at once, copies of small-scale pocket-maps of the districts round the above selected towns will be supplied to the public at the head post-offices in those towns, on application, without any charge beyond the price of the maps.—"The Standard."

Japanese Prints.—Mr. Arthur Morrison delivered a lecture on Saturday, in the upper hall at the Whitechapel Art Gallery, on Japanese prints and paintings. He dwelt on the Chinese influence, and drew on a blackboard some of the signs which represent, not letters, but ideas—as "mountain," "horse." They have been conventionalised so that they can be written by the simple, and Chinese and Japanese can make themselves understood, though they know not a spoken word in common. Mr. Morrison said that his task was a difficult one, because the art of Japan was extremely conventional. The painter of a picture of a woman aimed less at making a likeness than at suggesting something of the grace of all the women in the world. On the other hand, the Japanese object very strongly to the average European portrait, deeming it grotesque and deliberately ugly. Mr. Morrison explained the process of colour printing, and showed a design by Hokusai, which had not been destroyed in the engraving, because the "Old Man mad on Painting" died before he could indicate the colour scheme. With regard to some of the painters, he made assertions which were a little difficult to accept, though they were obviously the result of the minutest study. He held that important pictures were often painted in anywhere from five minutes to half-an-hour. He mentioned that the oldest painting now in Japan was the work of a Korean priest, dating from the Seventh Century. Then he told how Moronobu revived the idea of depicting scenes of common life and obtained at once a host of followers. To begin with, the prints were done in black and white. Then they were occasionally coloured by hand. After a time the idea of colour-printing occurred to certain artists, and results were obtained which have never been equalled in the history of art. At first no more than two colours were used, but it would puzzle most people to decide how many blocks go to the making of a print after Haranobu. Mr. Morrison touched lightly on the work of the artists of the popular school, and explained that their work was done for the people—a sort of equivalent of the latter-day halfpenny evening paper. He told the story of Hokusai and of how he painted the monster picture, his pupils attending with buckets of paint, in order to flabbergast those who had said that he could only work in miniature. Then he dwelt on the lamentable falling off which followed the death of Toyokuni and the introduction of aniline dyes. Afterwards Mr. Morrison descended to the room where the loan collection of prints is exhibited, and commented on most of the examples.—"The Morning Post."

The British Academy.—Last January we published the petition presented to the King for the incorporation of the British Academy for the Promotion of Historical, Philosophical, and Philological Studies, and the names of the disinguished signatories, fifty-one in number. These were contained in the "London Gazette" of January 14th, and it was announced that the petition had been referred to a committee of the Privy Council. His Majesty has now been pleased, acting upon the advice of this committee, to accede to the petition and to grant to the British Academy a Royal Charter. This states that the Academy aims at the promotion of the study of moral and political sciences, including history, philosophy, law, politics and economics, archæology, and philology. Of the original fifty-one petitioners, who, according to the draft charter, were to be the first Fellows of the Academy and to elect a president and council from among their own number, three have died—Lord Acton, Mr. S. R. Gardiner, and the Rev. A. B. Davidson. On the other hand the name of Lord Rosebery has been added to the list, so the following forty-nine gentlemen now become the first Fellows of the British Academy:—The Earl of Rosebery; Viscount Dillon, President of the Society of Antiquaries; Lord Reay, President of the Royal Asiatic Society; Mr. Arthur Balfour, M.P.; Mr. John Morley, M.P.; Mr. James Bryce, M.P.; Mr. Lecky, M.P.; Sir William Anson, M.P., Warden of All Souls College, Oxford; Sir Frederick Pollock, Corpus Professor of Jurisprudence in the University of Oxford; Sir Edward Maunde Thompson, Director and Principal Librarian, British Museum; Sir Henry Churchill Maxwell-Lyte, Deputy Keeper of the Public Records; Sir Courtenay Ilbert; Sir Richard Jebb, M.P., Regius Professor of Greek in the University of Cambridge; Dr. Monro, Provost of Oriel College and Vice-Chancellor of the University of Oxford; Dr. A. W. Ward, Master of Peterhouse and Vice-Chancellor of the University of Cambridge; Dr. Edward Caird Master of Balliol College, Oxford; Dr. H. F. Pelham, President of Trinity College and Camden Professor of Ancient History in the University of Oxford; Dr. John Rhys, Principal of Jesus College and Professor of Celtic in the University of Oxford; the Rev. George Salmon, D.D., Provost of Trinity College, Dublin; Professor J. B. Bury, Regius Professor of Greek in the University of Dublin; Professor S. H. Butcher, Professor of Greek in the University of Edinburgh; Professor Ingram Bywater, Regius Professor of Greek in the University of Oxford; Professor E. B. Cowell, Professor of Sanscrit in the University of Cambridge; the Rev. William Cunningham, D.D.; Professor Rhys Davids, Professor of Pali in University College, London; Professor Albert Dicey, K.C., Vinerian Professor of English Law in the University of Oxford; the Rev. Canon S. R. Driver, D.D., Regius Professor of Hebrew in the University of Oxford; Professor Robinson Ellis, Corpus Professor of Latin in the University of Oxford; Mr. Arthur John Evans, Keeper of the Ashmolean Museum, Oxford; the Rev. A. M. Fairbairn, D.D., Principal of Mansfield College, Oxford; the Rev. Robert Flint, D.D., Professor of Divinity in the University of Edinburgh; Mr. J. G. Frazer; Mr. Israel Gollancz, University Lecturer in English in the University of Cambridge; Mr. Thomas Hodgkin; Mr. S. H. Hodgson; Professor T. E. Holland, K.C., Professor of International Law and Diplomacy in the University of Oxford; Professor F. W. Maitland, Downing Professor of English Law in the University of Cambridge; Professor Alfred Marshall, Professor of Political Economy in the University of Cambridge; the Rev. J. E. B. Mayor, Professor of Latin in the University of Cambridge; Dr. J. A. H. Murray; Professor W. M. Ramsay, Professor of Humanity in the University of Aberdeen; the Rev. Canon William Sanday, D.D., Lady Margaret Professor of Divinity in the University of Oxford; the Rev. W. W. Skeat, Elrington and Bosworth Professor of Anglo-Saxon in the University of Cambridge; Mr. Leslie Stephen; Mr. Whitley Stokes; the Rev. H. B. Swete, D.D., Regius Professor of Divinity in the University of Cambridge; the Rev. H. F. Tozer; Professor Robert Yelverton Tyrrell, Professor of Ancient History in the University of Dublin; and Professor James Ward, Professor of Mental Philosophy in the University of Cambridge.—"The Times."

Flashlight Pictures with Kodak Cameras.—The invention of the flashlight apparatus renders the taking of photographs at night easy with such a camera as the No. 1A Folding Pocket Kodak. The requisites are:—The Kodak; the flashlight apparatus; 1oz. of flash powder. The flashlight apparatus consists of a specially-constructed spirit-lamp, having in front of it a little tray upon which is poured a teaspoonful of flashlight powder. A rubber tube, attached to a blowpipe in the flame of the lamp, conveys a blast of air from the bulb held in the hand, and serves to project the powder into the flame of the lamp when it is desired to take a picture. As soon as the powder touches the flame it flashes up an intense white light, sufficiently strong to make a picture instantaneously. Many interiors can be taken with the flashlight that are impracticable by daylight, either by reason of a lack of illumination, or because there are windows in the direct line of view which cannot be darkened sufficiently to prevent the blurring of the picture. Pictures are taken so quickly that groups of people round a dinner-table or card-table can be taken as clear and sharp as if they were in the open sunlight. This enables the photographer to obtain souvenirs of many occasions which could not otherwise be easily secured. *Photographing a Room.*—The camera should be prepared for time exposure, as directed on page 20 of this manual, and placed on some level support or where it will take in the view of the room desired. *Preparation of the Flashlight.*—The light should always be placed 2ft. behind and 2ft. to 3ft. to one side of the camera. If placed in front, or on a line with front of Kodak, the flash would shine upon the lens and fog the picture It should be placed at one side as well as behind, so as to throw a shadow and give a little relief in the lighting. The lamp should be at the same height or a little higher than the camera. The support upon which the lamp is placed should not project far enough in front of it to cast a shadow in front of the Kodak. A piece of cardboard a foot square placed under the lamp will prevent any powder from the flash doing damage. A sheet of white cardboard set up behind the flash-lamp will act as a reflector and increase the strength of the picture. *Taking the Picture.*—Having the camera and lamp both in position, load and light the lamp according to the directions furnished with it, pouring upon the tray the required quantity of the powder; then set the shutter open, stand at arm's length, and press the bulb. There will be a bright flash, which will instantly impress the picture on the sensitive film. Then push the lever to close the shutter, and turn a fresh section of film into place with the key, ready for another picture. *The Powder.*—The amount of powder required to light a room varies with the distance of the object farthest from the camera, and the colour of the walls and hangings. When more than one tea-spoonful is to be used, all the powder should be poured in one pile on the tray. *Table.*—For 10ft. distance and light walls and hangings use 1 even teaspoonful; for 10ft. distance and dark walls and hangings use 2 even teaspoonfuls; for 15ft. distance and light walls and hangings use 2 even teaspoonfuls; for 15ft. distance and dark walls and hangings, use 3 even teaspoonfuls; for 25ft. distance and light walls and hangings use 3 even teaspoonfuls; for 25ft. distance and dark walls and hangings use 4 even teaspoonfuls. *To Make a Portrait.*—Place the sitter in a chair partly facing the camera (which should be at the height of an ordinary table) and turn the face slightly towards the camera. The proper distance from the camera to the subject can be ascertained by looking at the image in the finder. For a

hree-quarter picture this will be 8ft., and for a full figure 10ft. The amp should be on the side of the camera, away from the face; that is, he sitter should not face the lamp. The lamp should not be placed igher than the head of the sitter. *To Make a Group.*—Arrange the hairs in the form of an arc, facing the camera, so that each chair will e exactly the same distance from the camera. Half the persons comosing the group should be seated, and the rest should stand behind the hairs. If the group is large, any number of chairs may be used, but f any of the subjects should be seated on the floor, care should be taken hat the limbs are not extended towards the camera, because the perpective would be too violent. *Backgrounds.*—In making single porraits or groups, care should be taken to have a suitable backgrourd gainst which the figures will show in relief; a light background is better than a dark one, and often a single figure or two will show up well gainst a lace curtain. For larger groups a medium light wall will e suitable. The finder on the camera will aid the operator to compose he group so as to get the best effect. In order to make the image isible in the finder, the room will have to be well lighted with ordinary amp-light, which may be left on while the picture is being made, prorided none of the lights are placed so that they show in the finder.—From 'Picture-Taking with the 1A Folding Pocket Kodak."

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

BACKGROUNDS.

To the Editors.

Gentlemen, — Referring to Mr. Baldock's illustrations of, and rticle upon the influence of, backgrounds, it has struck ne that it would be interesting to know precisely the effect on the density of the image by the substitution of a black for a white background. Of course, this would be a matter for experts in their measurements, and would require some sort of standard for the tint of the subject photographed and for the backgrounds used, as well as the area of each respectively. It was common knowledge in wet-plate days that more density was gained by photographing in front of a dark screen than in front of a white one, but the explanation seemed then to lie in the fact that the free silver from the whole surface of the plate was, when mixed in the developer, reducible on a smaller area, with a black background, and therefore became a thicker deposit. This explanation would not be applicable with the alkaline developer, and the reason of increased deposit, if proved, would have to be sought for elsewhere.—Yours truly,

SENEX.

August 22nd, 1902.

THE GOERZ LECTURES.

To the Editors.

Gentlemen,—Would you be good enough to announce in an early issue of your paper that I shall this season have three lectures to place at the disposal of photographic societies.

They are called respectively "The Photographic Lens," "What can be done with a Hand Camera," and "How a Lens is Made." They are illustrated by a number of lantern slides varying in number from 50 to 100. The first is a new lecture this season, and deals exclusively with the work of the photographic lens.—Thanking you in anticipation, I am, dears Sirs, yours faithfully,

C. P. GOERZ.

4 and 5, Holborn Circus,
London, E.C., August 26th, 1902.

THE PROBLEM OF PORTRAITURE IN COLOURS.

To the Editors.

Gentlemen,—The pessimistic article under the above heading in your last issue calls for an antidote, as it might act as a deterrent on some who would otherwise be inclined to attempt portraiture in colours.

As to the colour screens, carefully worked glass is quite unnecessary, for if the screens are placed in contact or close to the sensitive plate, then an ordinary dry plate on glass, free from flaws, can be freed from the silver salts and stained and successfully used.

The making of three negatives exactly similar is an easy task, if the time development system suggested by Mr. Alfred Watkins be adopted, and why this should be rendered difficult by the use of coloured screens, necessitating different exposures, all of which would be the so-called "correct exposure," I cannot see. Your contributor seems to imagine that it is difficult for the average professional photographer to gauge different exposures and to be ignorant of the science of developing.

As regards the studio, I am certainly opposed to the view of Mr. Kenah, nor can I for one moment grasp why "we should have to make a fresh adjustment of our apparatus, on account of the peculiarities of the light in the studio." May I ask what are the particular peculiarities to which allusion is made? Assuming that the average professional photographer keeps his glass clean, the only effect, if it were not coloured, would be a suppression or absorption of the troublesome ultra-violet rays and a little loss of general intensity, and actual spectrum composition would not be altered.

What is the particular disadvantage in working with the lens at full aperture, and thus obtaining an out-of-focus background? As a rule, large apertures are generally considered desirable in a studio.

In Dr. Miethe's case, the total exposure was 5½ seconds; assuming that work in the studio required an increase of six times, would 33 seconds be impracticable?

If one can reproduce colours correctly, there should be no greater difficulty in reproducing greys, and it is an open question whether greys do predominate in sitters of the present day.

As regards the positive work, Mr. Kenah seems to totally ignore the possibility of obtaining prints on paper by any other means than the half-tone process. Possibly, he has not heard of the trichromatic carbon tissues of Hoffmann. Personally, I see no difficulty in preparing similar tissues, and it might be possible to use the transparent trichromatic ink powders of Messrs. Fleming or else the synthetic colour powders of Hazura and Heuza. Further, with the new process, for such portraiture in colours would be to the public, there would be no difficulty in using opal glass, ivory, or celluloid as support instead of paper, and these would fetch a higher price.

I am convinced that no photo-mechanical process would be accepted by the public, except perhaps photogravure. The cheapening of illustrated literature and universality of three-colour illustrations, execrable though they be, would deter the average sitter from paying even half-a-crown for a dozen C.D.V. prints, though perfect in their colour rendering.

As regards the McDonough-Joly process, this is certainly not the process for the professional, notwithstanding the advantage of one negative and a brief exposure. Far better results are likely to be secured by using the stained and superimposed film process on celluloid or ivory.

I think that "hasty and ill-advised" statements, such as Mr. Arthur V. Kenah's, are decidedly to be deplored.—I am, yours, etc.,

E. J. WALL.

DRIVEL.

To the Editors.

Gentlemen,—Drivel is an expressive word, which well expresses a mental process, closely akin in derivation to dribble; the concrete simile of the inconsequent dribbling of an infant is closely paralleled in the abstract by the mental dribbling of many writers in photographic journals.

The "oily polloi," in the republic of photography are often swayed by the blatant oratory of some dogmatic demagogue, and are content to allow such an one to form their opinions. There is too great a tendency to chatter, too little writing that is educative. The majority of the papers to which the photographic babe turns for maternal sustenance seem content to "suckle fools and chronicle small beer," without attempting to train their progeny.

It is saddening to read an article crowded with petty details as to bicycle lamps, bicycle tyres, the improvisation of a dark room by blocking out the actinic light from a bath-room window, etc., etc., *ad nauseam*, and when one finds such an article under a name which is deservedly held in high repute, in matters affecting photographic chemistry, "drivel" is not too forceful a term by which to designate such puerilities. One reads criticisms—so-called—of pictorial photography which tend to shake one's faith in the value of honest criticism, so illogical and contradictory are they.

Shrieking diatribes are penned which simulate the inconsequent

scribblings of an hysterical woman, in their false premises and unfounded assertions, products of an ill-balanced brain, for which the writer is hardly to be held responsible. Yet such vapourings are published, an act which flatters the scribe and furnishes cheap copy for the editor, but "degrades the high lights" of photographic journalism. One reads with increasing disgust that type of paragraph which gives minute instructions upon "the uses of a piece of string"; why not with an equal amount of logic give detailed instructions upon "the use and advantages of soap in the morning tub?"

Valuable as such information may be to the crassly ignorant, who among the readers of our photographic papers is so devoid of plain mother-wit as to need instruction on such a technical point (?) point.

In conclusion, let us hope that in the immediate future there will be an increase of virile writing in the photographic Press, typical of a man in his prime and an absence of the emasculated type which one always associates with physical and mental senility.—I am, yours, etc.

ANTI-DRIVEL.

London.
August 25th, 1902.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY, 24, *Wellington-street, Strand, London, W.C.*" *Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

PHOTOGRAPHS REGISTERED:—

E. Kelley, 26, Queen Street, Newton Abbot. *Photograph of Right Revd. W. Vaughan.*

E. Edwards. Excelsior Studio, New Street, Worthing. *Photograph of Revd. J. Purdon. Photograph of start for mile championship of Sussex.*

J. R. Philpotts, Newnham-on-Severn. *Photograph of St. Peter's Church.*

H. R. Mehew, Lynn Road, Wisbech. *Photograph of tea and Coronation mugs given to 3,500 children.*

G. Turner, 70, Lowden Road, Herne Hill, S.E. *Photograph of E Company, 4th V. B. E. S. R.*

G. H. J. Burrows, 62, Princes Street, Perth, N.B. *Photograph of Revd. Prof. R. Morton.*

D. Hedges and Sons, 7, Dicconson Terrace, Lytham. *Photograph of homing pigeon.*

H. T. Lloyd, 26, Earl Street, Coventry. *Photograph of portion of Godiva Procession.*

A. Miller, Barrhill Road, Old Cumnock, Ayr. *Two photographs of Lord Bute.*

"A. LEARNER."— Good results are obtainable with the system mentioned.

G. R. (Corfu).—It is, we believe, a Berlin company, with branches in England and America.

CAMERA.—(1) The address, we believe, is Great Windmill Street, London, W. (2) We have not kept particulars of the publications; any large bookseller would obtain them for you.

OLD NEGATIVES.—"NEGATIVES" says: "Having several gross of old negatives to dispose of, we shall esteem it a favour if you can give us the name of anyone in the London district who purchases same."—In reply: We do not know of anyone who purchases such things. Old negatives are generally looked upon as being valueless, as they are not worth cleaning off for the glass they are on.

SUNSET PICTURES.—"YOUNG PRO" says: "During this month I shall be touring along the coast, and am very anxious to secure a good sunset negative by the seaside. I should therefore be obliged to you if you will kindly instruct me how to do so."—In reply: Space is too limited in this column to give such full instructions as are often desired. We should, however, suggest that orthochromatic plates, backed, be employed, and with a colour-screen as occasion may require. Care must be taken that the sun does not enter the lens.

COPYRIGHT QUERY.—DAVIES AND SON write: "May we ask you to be kind enough to let us know whether a Mr. —— has copyrighted certain views of Aberayron and neighbourhood? We beg you to be so kind as to supply us with this information as soon as possible."—In reply: The only way by which we could answer this question would be by searching the register at Stationers' Hall. Our time is, of course, much too fully occupied for us to do this. The register is open to any to make a search.

PURCHASE OF BUSINESS.—"UNCERTAIN" says: "I should feel obliged if you would give me some information on the following subjects:—I am about to buy a business (photographing). (1) If, after my buying a business, with all fittings, can the creditors of the seller lay any claim on the business or stock? (2) If a seven years' agreement, written out by the landlord, and stamped at Somerset House by me, be binding?"—In reply: (1) No; unless a fraudulent sale can be established. (2) Yes. But it will be well for you to thoroughly consider the terms of the agreement before signing.

BURNISHING.—"BURNISHER" says: "I have just bought a photo-burnisher, one with steel bar heated by gas. I believe the prints have to be lubricated before burnishing. I should be glad of formula for lubricant, and also the heat required. Do prints require much pressure? Any information on the subject would be most welcome."—In reply: Rub the prints over with a solution of Castile soap in alcohol (about a grain or two to the ounce). The bar should be quite as hot, or a little hotter, than the hand can bear. A good pressure is required to get a good polish.

UNSATISFACTORY VIEW.—"INCLINE" writes: "Enclosed is a photograph of a very steep incline. The weight of the empty tub is drawn up by the full one going down, with a man at the top to regulate speed. The photo gives the impression of a very gentle slope instead of being steep. The lens used was a wide angle Zeiss Anastigmat. Kindly say, if you can, what is the cause."—In reply: Evidently the camera was not level at the time the photograph was taken. It would have been better if the camera were further back and a lens of longer focus used. Also if less foreground had been included.

CAMERA WANTED.—"BEGINNER" writes: "I have a fine ¼-plate Anastigmat lens, and I want a good hand and stand camera. I prefer the folding type, but would be guided by you. What should be considered essential in the camera, and what type would be best? I think I prefer separate slides to magazines, unless the latter were best. If you can give me advice, I shall be obliged."—In reply: It is quite a matter of choice as to whether you have a camera with slides or a magazine one. Some prefer one form and some the other. There are plenty of good ones of both types now on the market, and we should advise you to get the catalogues of the leading makers and make a selection from them. It is against our rule to recommend any particular maker's goods.

MAKING P.O.P.—J. B. says: "I am making my own P.O.P., but cannot avoid small bubbles; in fact, quite 50 per cent. of the sheets are rendered useless from this trouble. It is the usual gelatino chloride formula, and the heat I have been working at has been 120deg. The room I have worked in has been about 70deg., and the room in which I have stored my Baryta paper has been about 65deg. Can you tell me how to avoid this? I enclose two pieces for your inspection. I have been most careful in floating it, and do not think the cause lies in this."—In reply: The defects are clearly due to either air bubbles on the surface of the emulsion when the paper is floated, or they get imprisoned between at the time it is floated. The remedy is to see that neither happens. It is simply a question of care.

FAULTY LIGHTING.—"AMSET" says: "I want to photograph an object, of which I send you an unsatisfactory photo. How should I proceed? The centre plaque, with the objects on it, is covered with a very convex glass—made of very inferior glass. I am not allowed to remove the cover glass. I have tried direct side light, but as I only get one side illuminated, the result is very unsatisfactory. The enclosed print shows where the light has been reflected back from the cover glass. I tried also photographing in a room very dimly lighted, but I got such a faint image of the bronze mount that the photo is useless. I shall be obliged for any hint you can give me."—In reply: It is simply a question of judiciously lighting the subject, and there are no set rules for doing that. It is merely a matter of skill and judgment; to avoid the reflections, bearing in mind that the angle of reflection equals the angle of incidence. Probably the faint image of the bronze mount, when the photograph was taken in the room, was due to under-exposure. We should advise you to try with an isochromatic plate, backed, and with a yellow screen.

*** NOTICE TO THE TRADE, WHOLESALE AGENTS AND BOOKSELLERS.—*A Contents Bill is issued with each number of the* JOURNAL, *and copies may be had on application to the Publishers.*

*** NOTICE TO ADVERTISERS.—*A Revised Tariff for advertisements in the* JOURNAL *is now in force. Blocks and copy are received subject to the approval of the Publishers, and advertisements are inserted absolutely without condition, expressed or implied as to what appears in the text portion of the paper.*

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*** *The Editor can only be seen by appointment.*

*** *We do not undertake to answer letters by post.*

THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC FOR 1903.

Edited by Thomas Bedding, F.R.P.S.

The forty-second annual issue of The British Journal Photographic Almanac will be published early in December next. This year's Almanac reached a total of 1,560 pages, and the entire edition of 20,500 copies was sold out a fortnight before publication. Of no other photographic book ever issued can two such unique facts be recorded.

The edition for 1903 will be increased to 25,000 copies, a large number of which are already ordered.

The striking favour with which past Almanacs have been received is the surest proof that the lines upon which the publication is produced meet the requirements of its readers and supporters. Upon such lines we propose compiling the volume for 1903. At the same time, we shall be pleased to receive and consider suggestions for increasing the value of the Almanac in directions which may occur to our readers as susceptible of improvement.

The Almanac for 1903 will appeal to photographers all the world over as a daily reference guide in practical work. The standard matter and formulæ will be revised and added to where necessary, and the latest departures in theory and practice will be chronicled. The year's advances will be recorded, and wherever practicable new features of an informative nature will be added.

Secretaries of societies will oblige us by promptly forwarding lists of officers and other details for inclusion in the directory of photographic societies. We shall also be glad to receive any additions that may be made to the list of telegraphic addresses of the trade, etc. As usual, a section of the Almanac will be devoted to notices of the latest introductions in photographic apparatus, etc. Those firms who wish to take advantage of this feature should communicate with us not later than October 31.

The publishers ask us to remind advertisers that many of the advertisement pages of the Almanac are already booked, and that, to ensure insertion and good positions, orders and copy should reach them without delay.

EX CATHEDRA.

Incandescent Bulb Risks. A few weeks ago we called attention to the danger incurred by placing electric glow lamps in too close proximity to textile fabrics. A case of accident has since been reported which shows, in a most conclusive manner how real is the danger to which we referred. In this case a number of 16-candle power lamps, of the familiar pattern, were enveloped in raw cotton, and very shortly after the current was switched on and the lamps lighted the material began to smoke. When a draught of air was purposely admitted to see what further would happen, the cotton at once burst into flame. From an examination of the bulbs, it would seem that the heat from the incandescent filaments, not being able to radiate into space as it would have done had the lamps been left uncovered, accumulated until it was sufficient to soften the thin glass, which caved in, and became hot enough, by its nearness to the filament, to fire the cotton. The careful man will profit by this experience; but it is easy to predict that others will plead that they know the danger, and are not in the habit of placing lamps where they will do mischief. But now that it is such a common practice to use these lamps in connection with leads which can be shortened or lengthened at will, a lamp can easily by accident be brought into dangerous company. When such a lamp is covered with coloured varnish, as is often the case, for use in a photographer's dark room, the dangers incurred by ignition of surroundings are proportionately increased.

* * *

A Finger Shield. An advance sample of a very useful little implement has just reached our hands, and we have put it to one or two tests, from which it has come out in a satisfactory manner. It consists of a

corrugated rubber finger stall, which will be presently put upon the market at the modest price of one penny. Its primary object is to protect the fingers of readers in public libraries, and elsewhere, whose duty—or pleasure!—involves the turning over of many soiled leaves of books and journals. It is the unfortunate practice of many to wet the finger in order to get a better grip of the paper, and it is not inconceivable that by such means the infection of certain diseases may be carried from one person to another. As we happened to have some reference work on hand, we put on this new finger stall, and found that it gripped the leaves well, and proved to be a very cleanly thing in use. We shall certainly continue to use it whenever we have such work in hand. We think, too, that it will be especially useful to those who have much handling of glass, as in plate-making factories, for a finger covered in this way has a much better hold of the material, while risk of cutting the flesh with a sharp edge is altogether avoided. India-rubber finger stalls for dabbing in chemical solutions are, of course, as old as the hills, but here we have one with a roughened surface, which enables us to get a clinging hold upon slippery materials.

* * *

Portable Buildings. There is to be seen, for a few weeks, on a piece of vacant land at the back of the Imperial Institute, South Kensington, a portable wooden house, containing four spacious rooms, which should be visited by all photographers, whether amateur or professional, who may require a portable studio or an extension of the premises which they already devote to their work. This house has been erected as a specimen of Silbiger's transportable and transformable system of building, and when we explain that the erection was put up in a few days by inexperienced hands, and without the use of tools, it will be seen that the method has much to recommend it. The sole necessity is a piece of levelled ground upon which the house can be erected. Every part of the building is interchangeable, so that when once the framework is set up, doors, windows, or blank panels can be fitted, in any position required. The partitions separating the rooms can also be varied to suit any needs, so that a room can be made smaller or larger with very little trouble, and its doors and windows shifted at pleasure. We can imagine no better system than this for the professional who wishes to extend his workshop area by the provision of extra enlarging rooms, or apartments devoted to any other purpose, or for the amateur photographer who desires to keep his photographic operations distinct from his dwelling-house, without going to the serious expense of a brick and mortar building. We are informed that buildings of any length and up to 30ft. in width can be constructed by this method. A large house can be converted by means of a few extra pieces into several smaller houses, or a large hall into several rooms, and *vice versâ*. Factories have been erected in France, Russia, Germany, and Austria on this principle, as well as in more distant parts of the world. A prospectus which has been handed to us gives a number of half-tone blocks of these portable houses, applied to a number of different purposes, such as bungalows, field hospitals, barracks, chapels, and the like. The houses are perfectly weatherproof, and can be made fireproof, and even guarded against the encroachments of those terrible white ants, which, in various parts of the world, are so destructive to ordinary woodwork. The builders are Messrs. Farquharson, of 85, Gracechurch Street, E.C.

* * *

P.O.P. "Imitation," we learn, "is the sincerest form of flattery," but it is certain that it is more often prompted by the love of filthy lucre. Every trader knows well enough that, as soon as he hits upo thing which succeeds with the public, a number of im tions are at once thrown upon the market. It is the sa in the publishing business, and here is an example. Sc time ago a journal was published with the unique t "M. A. P.," meaning "Mainly About People." Anotl one is now launched on the sea of public approval cal "P. O. P.," having the much-strained sub-title of "Poi on People." It at once suggests a community stuck over with pins, or lightning conductors, but there another suggestion with regard to it which will possil occur to photographers. It may be a fortuitous accide but the fact remains that by adopting this title, the propr tors get a kind of vicarious advertisement through t thousands of packets of "P. O. P." which are sent broa cast to professional and amateur photographers, a through the announcements of the commodity which a pear in our own and other pages. If this result has bee foreseen it is an exceedingly smart piece of business, but i is not original. Many years ago, when the well-know hostelry at the bottom of Tottenham Court Road was i course of erection, it occurred to the proprietor thereof t give the place a bold and mystic advertisement by postin all over London a picture of an enormous horseshoe. Ther were no letters or other indication of what it referred to, nothing but this big horseshoe staring one in the face from every hoarding. And at that time of day pictorial posting was in its infancy, so that this picture was actually aggressive. Everyone was asking what this mural decoration might mean, and the sharp proprietor of one of the minor theatres thought that it would be a good notion to take advantage of the common curiosity So, with the help of a ready writer, he started a big melodrama with the title "The Horseshoe." We never saw it, nor can we call to mind whether or not it was a big success, but the vicarious nature of the advertisement was undoubted. Of course, the Simon Pure of Tottenham Court Road had no redress for the cream thus skimmed off his milk, and in the more recent case the makers of P. O. P. cannot complain. After all, they may get a little reflected advertisement from the title of the paper which apparently hopes to obtain the same from them

* * *

Light from Aluminium. Magnesium has done yeoman service for photography in furnishing operators with the means of lighting up dark places which could hardly have been photographed without its aid. Coal and other mines hundreds of yards below the light of day, caves deep down in the bosom of the earth, inscriptions in rock-cut temples, and many other hidden things have been made plain by means of the flash light. It was pointed out some years ago that Aluminium might answer the same purpose as magnesium for this particular service, but the latter metal has retained its place in the affection of photographers. But that aluminium is capable of furnishing a white light of extraordinary brilliance and splendour has long been known to visitors to the Crystal Palace firework displays, in which Messrs. Brock have been using it with wonderful effect. On the night of the Shah of Persia's reception at Sydenham, some hundredweights of the metal must have been employed, judging from the marvellous blaze of silvery light in which the grounds were enveloped. It would be impossible to exaggerate the beauty of the scene when feathery streamers of Aluminium fire rose up in every direction, and when the water temples seemed to be flowing with liquid silver. This was quite a new item in the programme. Fireworks which, we trust, will be repeated. The metal used for firework purposes is

a such impalpable powder that it flies about as a fine dust when handled, and settles upon the clothes, and is therefore very different in condition to the far coarser magnesium powder commonly used by photographers. It clings to the fingers, and covers them with a coating like silver, and the very fineness of the particles causes them to cling together in clots. It is therefore evident that the ordinary flash-light apparatus employed for magnesium would not answer for aluminium, unless the latter were mixed with some substance which would separate the tiny spangles of the metal, and so enable them to mix freely with air, and burn. Lycopodium, or powdered resin, would, no doubt, answer the purpose well, but we doubt whether the metal so adulterated would give the brilliant flash associated with magnesium. Aluminium should, however, be very useful in places where a time exposure is allowable, and it will be found that by mixing it with certain ingredients it will burn well and quietly in a thin paper case. We have tried a few experiments with it, and find that a very brilliant light is obtainable by mixing one part of aluminium with an equal weight of saltpetre and barium nitrate, together with one-third part of dextrine, and one-sixth of sulphur. These quantities are approximate, and no doubt as good or better results may be obtained by additions to or subtractions from the formula here given. A couple of turns of thin paper round a pencil, with the edge fixed down with starch, makes a suitable case for the composition, but of course if a big illumination is wanted the size of the case must be proportionately increased. The mixture gives off, when ignited, very little smoke, and this is an advantage not possessed by many of the pyrotechnic compounds which have been employed for lighting up dark interiors.

* * *

Monotyping. There are many persons who never seem satisfied with the ordinary ways of doing things, but, with a restlessness peculiar to them, must find out new methods. Such a trait, under proper control, is extremely useful to humanity at large, for from it springs the inventive faculty; but when this desire for change is applied to anything and everything it may be voted a nuisance. The other day we had to chronicle a new process of oil-painting, in which brushes were dispensed with, and the soft paint was made up into sticks, to be rubbed against the canvas. What can be the object of such a procedure unless it be notoriety, and a very ephemeral and worthless one, for the contriver thereof? And now there is brought forward another new process—if it can be dignified by such a respectable word, called "monotyping," which its advocates speak of in hushed tones, as a new means of artistic expression. It is described and illustrated in the current number of the "Studio." Professor Von Herkomer seems to have discovered this comparatively new thing, for he writes: "When I visited America in 1885 I was shown by an American artist a form of work, at that time quite new, of painting on a copper plate with printing ink, and then 'blotting' it off on the paper by means of a printing press. I found it a fascinating kind of work, so suggestive and expressive without labour, that I felt a regret that the plate should only yield one impression." We will now give a rough outline of the method adopted in monotyping, the chief advantage of which process seems to be that the picture is done at one sitting, for the work must be completed while the plate is wet. If need be, however, the necessary softness of pigment can be retained by immersing the plate in water. A smooth, polished plate of copper is covered with a thin coating of oil paint, which must not be too oily. (As we understand it, the plate must be rolled up with an oily ink in the same way that a collotype is treated.) "The picture is then worked out of this, with thumb and finger, brushes or rags, and bits of wood or twisted paper for taking out the high-lights." In other words, you wipe off the greasy pigment when you want your high-lights, tickle it with a brush for your half-tones, and leave it untouched for the shadows. Then, passing this plate through a press, with a piece of Japanese paper above it, you secure your one, and only, impression, which gives the precious process its name—"monotype." The illustrations to the article from which we have quoted are not bad, but they would be much better if executed by ordinary methods and with common tools. What advantages this new and extremely dirty method possesses we fail to see, but we are quite alive to its drawbacks when compared with more legitimate ways of going to work. Why not at once draw on a lithographic stone, and secure those exquisite gradations of tone which the grain of the mineral secures, while, at the same time, any reasonable number of copies can be had from the one drawing? Why choose a method by which the original drawing is reversed? In a word, why not use pencil, crayon, brush, or any other of the ordinary tools of the artist procurable at the shops, and use them in the way which experience has long ago prescribed? Echo answers, "Why not?"

* * *

Submarine Photography. A certain coroner was lately alleged to have remarked that he never believed the newspapers, that they were full of falsehoods, and that if he was presented with a sovereign for every lie which had been printed with regard to himself he would be able to retire into private life. We read this sad pronouncement, and, after thanking the gods that we are not as other journals are, we turned to a fresh page, and came upon a paragraph which at once rivetted our attention, while still the coroner's warning words seemed to creep in through the rivet-holes. The paragraph was headed, "Submarine Snapshotting," and it opened with the astounding statement that the said submarine snapshotting was likely to become a popular pastime. Visions were immediately conjured up, in a perhaps too fertile brain, of visitors to Margate, Ramsgate, Sandgate, and all the other gates donning bathing costumes, or doing without them, diving beneath the surface of the briny ocean with cameras in their hands, and snapshotting one another, posed as mermen and mermaids amid the rocks below. But we were too precipitate. The pastime has not yet arrived at the popular stage; it is only going to. At present it is more in the academical condition, for we read on further that "A well-known scientist, who began by investigating the animal life of the waters, has become an enthusiastic sea-bottom camerist." We must pause to congratulate this gentleman, whose inherent modesty prevents his name being revealed, on attaining to the dignity of this remarkable title. Some men are proud of being made a C.B. or an F.R.S. or a D.C.L.; but here is a man who excels all in being able to place after his name the majestic title, "Sea-bottom camerist." We learn, further, that he has lately published some of his remarkable photographs of submarine scenery, and we can only express our regret that the name of the publisher is withheld from us. He uses, we are told, a hand camera, enclosed in a tight copper box, having a plate-glass window, and it is mounted on a cast-iron tripod. "When is a hand camera not a hand camera?" is the conundrum that we are inclined to ask, the obvious answer being, "When it is fixed to a cast-iron tripod." We presume that the S.B. camerist also carries

with him a steam or hydraulic crane to lift this cast-iron concern in and out of the water; but we are not told so. We are, however, informed that suitable mechanism is provided to expose and change the plates. The difficulty with regard to water pressure at a depth of from 20ft. to 30ft. is surmounted by squeezing air into the apparatus from a rubber ball! We are next told that light fades rapidly in these depths, daylight exposures being impracticable at a depth of 25ft. In order to meet this difficulty, daylight is altogether dispensed with, and magnesium powder is burnt in oxygen "in a suitable glass globe." The wonderful account closes with the remark that "by this powerful illumination instantaneous exposures are made, with interesting results." The paragraph is disappointing, because it follows the fortunes of the instrument rather than those of the sea-bottom camerist. We want to know what becomes of him while the picture is being taken. Does he go down with the cast-iron work, and share the oxygen with the magnesium lamp, or breathe some of the air out of the rubber ball; or does he merely focus the camera, and set the shutter and so on from a boat thirty feet above? In either case, the man is a positive genius.

* * *

Sundials. It is difficult to realise the condition of things when watches and clocks were unknown, and when people had to depend upon sundials—"the wayfarer's time-tellers," as they have been called, when they wanted to find out the time of day. Such dials may still be seen in old gardens and on the southern porches, or the towers, of old churches, and some of these are so quaint and picturesque in appearance that a collection of photographs of them would be a very good object for anyone who travels much about the country to aim at securing. Many of our old dials bear quaint inscriptions, either in Latin or English, most of them referring to the quick flight of time, and the necessity for looking towards another life. Not a few bear an obvious pun, which has no doubt been a source of hilarity to many a generation of rustics. This hoary and oft-repeated jest consists of the words, "We must—" the rest of the sentence being represented by the dial; i.e., "We must 'die all.'" There is a fine sundial in the Temple, London, with the motto, "Shadows we are, and like shadows depart." In the garden form of timekeeper, the dial lies horizontally, and is often supported upon a most picturesque stand or pedestal, and in some cases they are placed on the bases of ancient churchyard crosses. A notable example of a garden sundial stood on the grass at Clements' Inn up to the time that the Law Courts were built. The pedestal consisted of the life-size figure of a stooping negro. We wonder what has become of that statuesque nigger? Sundials are not correct timekeepers—or, rather, we should say that a dial gives the actual clock time only upon four days of the year—and sometimes it is as much as sixteen minutes out in its reckoning. So that the motto which stands on a certain old dial in Yorkshire, "Who dares to say the sun speaks false," is open to question. It falls to the lot of some of us to pass at intervals by one of these old dials, and instinctively we each time compare it with our watch. Seldom do we find the two timekeepers in agreement, and we know well enough that this is because the solar day varies in length, while the twenty-four hours ticked out by a clock do not vary. In other words, the sundial gives the "apparent" time, while the watch gives "mean" time. A new form of sundial has lately been invented by Major-General Oliver, C.M.G., which is a great improvement upon the old model, in that it gives the actual time as denoted by a watch. It has none of the picturesque setting, or the old-world appearance of those ancient dials to which we have called attention, but it is interesting by reason of its novelty, and the way in which an apparently very difficult problem has been solved. We know that in the ordinary sundial the time is indicated by the shadow on a straight edge. In the new instrument, which is called the "mean time sundial," the shadow is given by a curved surface, so that as the position of the sun is slightly higher or lower than the normal, the discrepancy is made up by the curvature of the object which casts the shadow. We should think that very few persons are dependent, in these days of cheap clocks and watches, upon the sun as a timekeeper, and if any such there be, they have, in this year of endless wet and gloom, our sincere sympathy. We must also condole with General Oliver for the fates being against him in this matter, but we have at the same time a very high opinion of his ingenious sundial. It is being made by Messrs. Negretti and Zambra.

ON NATURALNESS.

In those early and unsophisticated days when photography first came into existence, the new art was hailed with delight by many who saw in it a promising means whereby man might be led closer to Nature by a nearer contemplation of what they anticipated would be exact and literal renderings of whatever was placed before the camera, free from the flattery and conventional falsehood of Art. Disillusionment followed fast on their dream, however, for it was soon perceived that the absolutely unsympathetic and cruelly candid truth of the lens was an even worse exaggeration, though in a contrary direction. The photographer, as the person most interested, found himself involved from the very beginning in an energetic conflict with this undiplomatic and undiscerning directness, and forced to devise means and methods by which it might be, if not overcome, at least kept within bounds, and turned to his own purposes. The studio worker took eager advantage of the introduction of retouching to render his negatives more acceptable to his patron's vanity; the landscape man, by careful choice of lighting and position, and all the useful wrinkles that experience taught him, endeavoured with similar intentions, though in a different manner, to circumvent his camera's inconvenient exactness of portraying the things presented to it.

And, certainly, a great measure of success rewarded their labours. Portraits were produced possessing a beauty and delicacy of modelling scarcely dreamed of outside the range of miniature-painting, and flattering the sitters to their hearts' content. And photography in other directions than portraiture seemed equally happy. We are too apt to forget in our pride at the latter-day perfection of our results what really fine work was turned out by many of the pioneers of camera craft. It will often give a wholesome snub to our vanity if we pay a little more attention to such early productions, and will serve in some respects to enhance our appreciation of the general truth of the wise king's dictum, that under the sun is nothing new.

But every movement carries its own recoil; no sooner does the pendulum swing one way than gravitation inflexibly insists on the reverse action. The very anxiety of the photographer to escape from the barren truthfulness which his camera would of itself prefer led by degrees to grave faults of a different kind. Over-elaboration became the order of the day. The primal simplicity of the studio portrait soon disappeared in favour of

abundance of superfluous ornament in backgrounds and accessories; a too great fondness for retouching was evident; the whole work displayed a worrying neatness and attention to trivial details of finish, which repelled rather than attracted. While, perhaps, seen at its worst in the domain of portraiture, similar defects were by no means lacking in other directions. The same want of naturalness, to give the fault a name, was noticeable in the landscape work of that period, although there was certainly, at the same time, much to admire and commend. The photographers of the day were, on the whole, much more concerned in producing what they called good photographs than with any anxiety of mind regarding the artistic side of the object in its broadest sense.

Then, in the fulness of time, came the pictorial movement, the credit of which no wise man would desire to admit to any one school or clique. It was unquestionably a general progression, rendered inevitable by time and evolution. Since its inception the general advance of photographic work in all those qualities which tend to give lasting pleasure has been marked and phenomenal. As was only to be expected, however, in the nature of things, features good in themselves and tending to artistic progress have been here and there overdone and pushed to the verge of eccentricity, so that it might be said that some of these later products of the camera were even more lacking in naturalness than the over-elaborated works that preceded them.

Naturalness is, like most abstract qualities, difficult of definition. It is much easier to say what it is not than what it is. It is essentially something that belongs to the whole effect created by any composition rather than to any individual part or parts of it. We may take up a photograph of a laughing child and say, approvingly, "How charmingly natural!" without probably analysing very deeply the complex aggregation of perceptions and suggestions which have led us to that conclusion. If questioned, we should most likely argue as follows: In the first place, the pose and attitude are free and unstilted, reminding us by their easy and careless grace of other lovable home fairies that, maybe, we know of; then, the expression, in this case most important of all, is full of happy child life and character, and absolute unconsciousness of studio surroundings; finally, we no doubt feel in a lesser degree, for it would not be true art if it struck us at first glance, how all the accessories of the photograph and details of production and finish are quietly and successfully in harmony, forming altogether by well-attuned combination the pleasing picture which we take up so appreciatively.

A photographer, whose name is a household word in the Midlands, tells the following amusing story against himself. He had to take a certain little five-year-old maiden one afternoon—a morsel of femininity who truly deserved to be called a "pickle" if ever child did. And whether it were that his customary skill had for the time deserted him or that his tiny sitter had assumed extra perversity for his especial benefit, certain it was that he could by no means bring to her face the expression that he wanted, nor effectually chase away what was now an offended pout and then a gaze of dismal apprehension. And so it came to pass that he dispatched the resulting proofs with a philosophical expectation of either a re-sitting or a small order. Judge, therefore, of his surprise when, a few days later, the little girl's mother came, full of commendation of what our friend had made up his mind was really the worst proof. "I am perfectly delighted with this," she beamingly exclaimed. "It is so very natural." "I am glad you think so, madam," replied its producer. "Yes, indeed," said the lady; "it is just exactly how she looked when I caught her spilling the ink over the carpet yesterday."

We will not spoil this deliciously naive anecdote by forcibly joining some far-fetched moral to it. It does seem to point out pretty plainly, however, that naturalness takes to itself many forms, and does not always appear in the guise we expect, nor under those conditions by which we seek to attain it. It comes unsought. To strive for it too carefully and painfully is one of the surest ways of missing it. How many a fine landscape have we seen spoilt by the obvious effort and labour for an effect which simply and unrestrainedly expressed would have been perfection. And, again, how often at our exhibitions pictures in every way satisfactory are killed, and have their chances ruined, through unfortunately obstrusive framing—yet another instance of that fussiness and care which, though rightly directed, err by excess, and defeat their own object.

How, then, shall we attain this elusive quality of naturalness, which may not be sought after and resents pursuit? In the beginning, we must avoid and shun all that commonsense tells us is unnatural, and contrary to the evident rules of beauty and simplicity. Then, we must be natural ourselves, "for who knoweth the things of a man but the spirit of man which is in him?" We cannot appreciate and interpret the finer shades and nuances of human expression, nor the ever-changing moods of inanimate Nature, unless we attune ourselves in sympathy with them. In addition, we must, while aiming at perfect mastery of all those mechanical details of our art which constitute good technique, yet try to keep ourselves oblivious of them in the actual execution of our work. This sounds contradictory, perhaps, but it is not so in reality. It is simply the crystallisation of the principle that excess of attention to any one point will lead to its own undoing. The methods and means of the photographer—he, at least, who wishes to produce natural and pleasing work—should always occupy a very subordinate place in his mind, as compared with the intention and motive which shape and fashion, or should do, every picture he is responsible for. And with so many difficulties to overcome and pitfalls to avoid, he is well deserving of the satisfaction he is bound to feel, when he can contemplate his creations, and know of a surety that unnaturalness and affectation are absent.

PHOTOGRAPHIC WORKERS AT WORK.

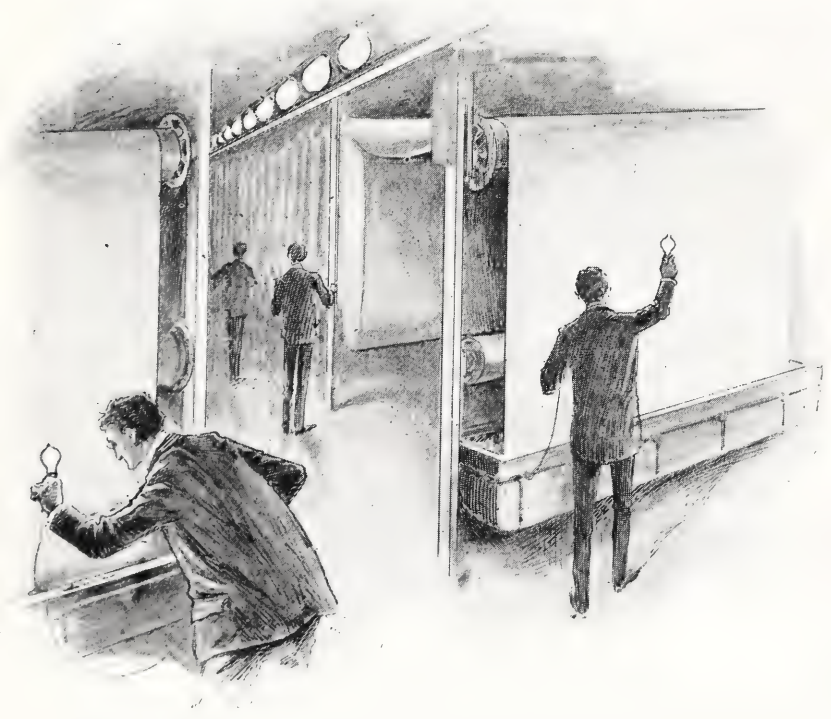
Messrs. J. J. Griffin and Sons (Limited), at Their Photographic Works, East Molesey.

Some of the present generation of photographers may be inclined to the opinion that the house of J. J. Griffin and Sons (Ltd.), is a comparatively new one in the photographic world. That, however, is not the case, for, as a matter of fact, it is one of the very oldest now existing. We have before us as we write a catalogue of Daguerreotype and photographic requisites, as supplied by John Joseph Griffin, F.C.S., the founder of the house, 10, Finsbury Square, bearing date 1853. As it may be interesting to some of our readers to know what the early workers had to pay for their materials, we just give two or three quotations from the list. Pyrogullic acid is quoted at 16s. per ounce, or sixty grains for 2s. 6d.; bromide of potassium, 2s. 6d. an ounce; hyposulphite of soda, 2d. an ounce, or 1s. 4d. per lb. Daguerreotype plates, which the user had to prepare and sensitise at the time of using, are quoted, for the quarter-plate size, at 11s. per dozen; the half-plate, £1 5s.; and the whole-plate at £2 5s. the dozen. High as these prices may seem to us now, we are told that at that time Griffin's was

one of the cheapest houses in the trade. It is not, however, with the house as it existed half a century ago that we are at present interested, but rather as it is now.

A few days ago we received an invitation from the Messrs. Griffin to visit their photographic works at East Molesey, and we availed ourselves of it. Arriving at the Hampton Court Station, accompanied by Mr. F. H. Ibbetson, the manager of the photographic department, a pleasant drive of a mile or so brought us to the works. Photographic works generally are not particularly notable for their outward architectural beauty, and those of Messrs. Griffin and Sons are no exception to the rule. They are designed for utility and not for outside show.

We were first shown into a room where the specimen prints of the different papers, as used on the show cards, are produced. Here are kept albums of trials of every batch of paper that is made, whether the well-known P.O.P.'s, carbona, glycia, or the Climax ready sensitised albumen papers. Each page contains a finished print, a piece of paper merely exposed to the light to just tint it as a test as to the evenness of the coating,



and a yellow envelope containing pieces of the unexposed paper to prove the keeping qualities of every batch. All these trials are numbered according to the numbers on the packets as put on the market, and can be quickly referred to at any future time. From here we went into a building devoted to the making of the emulsions. This was fitted with convenient tanks, heated by steam, to contain the emulsion jars. In the basement of this building is the ice store, a large quantity of ice being necessary in hot weather.

Next we visited the coating rooms, of which there are two, the one above the other. These rooms are two hundred feet long, and of proportionate width. They are furnished with the most recent coating machinery, and this has been further improved upon by the Messrs. Griffin. In the lower room is also a machine for putting a baryta coating on raw paper. Both rooms are lighted by incandescent electric lamps, so that there are no fumes of gas to act injuriously on the paper. The paper, as it is coated—and it can be coated up to 45in. wide—is automatically festooned as it passes to the top of the room. It then travels on chains slowly to the end of the room, and when it arrives there the rods upon which it hangs are caught on a turn-table and the paper comes back on the other side of the room to the reeling-up machine, and by the time it gets there it is dry and ready to be reeled. During its passage the position of the paper on the rods is being continually changed automatically, so as to avoid unequal drying.



The ventilating and drying arrangements are very complete, and no expense seems to have been spared to make them so. The air is drawn in on one side of the room by large fans, and drawn off on the other. As the air is drawn in it passes over steam pipes, so that it can be heated when necessary, which is not the case during hot weather. By means of sliding doors the air, as it enters, can be distributed to different parts of the room at will; the same with the exhaust—it may be drawn off from different directions. In addition to this arrangement, there are smaller fans, actuated by electric motors in different parts of the room, that keep the air in a continual state of agitation, which greatly facilitates the drying. At the time of our visit the coating of a mile and a quarter of carbona paper had just been finished, and we were told that two such batches could be dealt with in each room per day. The arrangements



in the upper room are similar to those in the lower one, and off this is the cutting room. Here are four costly machines. One is used for trimming the edges off the paper as it is unreeled. Another is a slitting machine, which first cuts the paper in strips of the desired width, and then cuts them transversely to the length required, ready for packing. This machine is adjustable to cut any sizes that may be required,

and works automatically. There is also a guillotine machine for cutting the paper into large sheets. These machines are all driven by power. In this room we noticed a very fine large calendering machine with polished steel and compressed paper rolls for calendering paper up to about 4ft. wide. A large proportion of this elaborate machinery was supplied by the well-known firm of Hirsch, of Frankfort-a-Main. It may be mentioned that all the entrances to the different rooms are fitted with "light locks" so that there is no danger of light being admitted as the workpeople pass in or out.

The next place visited was the manager's office and the laboratory adjoining. This was most conveniently equipped, and that is not at all surprising, seeing that laboratory fitting is a speciality in the general business of the Messrs. Griffin. We now pass to the engine and boiler house. Here we find a 40-horse-power engine at work for driving the different machinery. In this room is also a dynamo for generating the electricity for lighting the premises, and for the motors for driving the smaller ventilating fans, etc. The boiler, which is larger than is needed for the engine, also supplies the steam for heating purposes. The water supply for the entire works is spring water obtained from a deep well. Close to the engine room is a smaller one, in which is a still, heated by steam, from which water is continually distilling for making the emulsions, silver solutions, and other purposes for which distilled water is required.

The last room we visited was where the well-known "Climax" albumenised paper is sensitised. Here there are three rows—six in each—of large deep porcelain trays, the full size of the sheet of paper. The floating of the paper is done by girls, who are very expert at the work. After sensitising, the paper is hung up to dry under a canopy of muslin, so as to avoid all contact with dust should there happen to be any in the room. This room, like all the others, is heated by steam pipes when heat is required, for it is essential, in order to obtain an uniform sensitised paper, that the sensitising be done under uniform conditions. In addition to what we have described, there are the packing rooms, mechanics' workshop, etc., but these call for no special notice.

On leaving Messrs. Griffin's works we came away with the impression that they were amongst the most complete and convenient that it has been our pleasure to visit.

THE PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

[The following notes are abstracted from the P.P.A. Handbook No. 3, which was issued to members a few days ago.—Ed. B.J.P.]

Forewords.

The Professional Photographers' Association is the one and only representative body of its kind throughout the British Empire. Its objects are, to improve the status of those who practise photography as a profession; to defend their interests; to assist them by advice; to afford them opportunities for meeting and discussing matters pertaining to the advancement of the craft; and to employ all legitimate means of upholding the rights and dignities of the profession.

In the first year of its existence it has received the active support of between five and six hundred members, and has earned commendation from all parts of the world. Besides its legislative sphere, the Association has its social uses, and it also aims at constituting itself the authoritative governing body of British professional photographers throughout the world.

A vast field of work lies before the Association, in the furtherance of whose objects it is hoped that it will secure the active membership of the many thousands of photographers who have not yet joined.

Officers and Committee of the Professional Photographers' Association.

President.—William Grove.

Past President.—Thomas Bedding, F.R.P.S.

Vice-Presidents.—H. Walter Barnett, W. Crooke, Ernest Elliott.

Committee:

London.—F. A. Bridge, H. J. Dalby, Alfred Ellis, H. Edmonds Hull, M. Jacolette, A. Mackie, Edgar Scamell, G. V. Simmons, Lang Sims, T. C. Turner.

Country.—W. Barry (Hull), H. A. Chapman (Swansea), W. Gill (Colchester), Frank Moffatt (Edinburgh), G. W. Morgan (Aberdeen), H. C. Spink (Brighton), W. D. Valentine, J.P. (Dundee), G. Watmough Webster (Chester), H. J. Whitlock (Birmingham), Alfred Werner (Dublin).

Hon. Treasurer.—William Grove, 63a, Baker Street, London, W.

Hon. Secretary.—Alfred Ellis, 51, Baker Street, London, W.

Hon. Solicitor.—P. E. Marshall, Esq., 62, Lincoln's Inn Fields, London, W.C.

Auditors.—S. H. Fry, 12, South Villas, Camden Square, N.W.; M. B. Barraud, 54, Clarence Street, Kingston-on-Thames.

Bankers.—National Provincial Bank of England.

Notices to Members.

All communications for the P.P.A. should be addressed to the Honorary Secretary, 51, Baker Street, London, W.

Members will greatly oblige by addressing their communications thus:—

Professional Photographers' Association.
ALFRED ELLIS, Hon. Sec.,
51, Baker Street,
London, W.,

to distinguish them from the business letters of Alfred Ellis and Walery.

Members are reminded that their annual subscription became due on July 1st, 1902.

Members are advised, wherever practicable, to become dealers in photographic materials, in order to obviate the unfair competition they are subjected to by shopkeepers, and others, who are not photographers, undertaking the production of portraits, enlargements, etc., which legitimately fall within the sphere of professional photographic work.

*** Members desiring legal advice must make application to the Hon. Secretary, Mr. Alfred Ellis, 51, Baker Street, W., who will place the matter before the committee. Application for advice may, however, be made direct to the Association's Hon. Solicitor, Mr. P. E. Marshall, 62, Lincoln's Inn Fields, W.C., but in such cases the Association accepts no responsibility.

*** It is suggested by the committee that, on their cards, note headings, invoices, and business stationery, members should print the words, "Member of the Professional Photographers' Association."

Fire Insurance.

In accordance with instructions from the general meeting of the members held on February 7th, the committee have made arrangements with the Fine Art and General Insurance Co., Ltd., of 90, Cannon Street, London, E.C., by which any member may transfer his present policy to this company, and obtain a reduction of 20 per cent. on the premiums hitherto paid. To secure this concession, it will be necessary for the member to forward his policy to the Hon. Secretary, Mr. Alfred Ellis, 51, Baker Street, W. A charge note for the premium will then be

sent, holding the insured covered for a period of thirty days to enable the new policy to be prepared.

In cases where the member has not been previously insured, or requires a new policy, it will be necessary to have an accompanying proposal form completed, when the insurance company will allow a discount of 20 per cent. off their usual rates.

Copyright.

The committee, during the past year, having had many applications for advice on copyright matters, make the following suggestions for the guidance of members:—

1. Important.—A copyright photograph is one taken at the photographer's own expense, and for which he does not receive payment or other stipulated consideration. It is recommended that in all cases, distinction should be made in members' books between photographs that are charged for, and those for which no charge is made.

2. Registration.—Every copyright photograph should be registered by the proprietor delivering or sending by post prepaid to the Registrar, Copyright Office, Stationers' Hall, London, E.C., a signed memorandum of such copyright, with a fee of one shilling. Special forms, one penny each, containing full instructions of how to register a photograph, can be obtained on application at Stationers' Hall.

3. Necessity of Registration.—No proprietor of a copyright is entitled to the benefit of the Act until registration, and no action can be maintained or any penalty recovered in respect of any infringement before registration. In registering, the name of the actual photographer should be inserted as author.

4. Transfer of Negatives.—In all cases where a negative of a photograph is transferred for the first time by the owner to any other person, the copyright will cease to exist, unless at or before the time of such transfer an agreement in writing be signed by the transferee reserving the copyright to the owner, or by the owner transferring the copyright to the transferee as may be the intention of the parties. A member purchasing a business or another photographer's negatives should be careful to see that the copyrights are properly assigned and registered in his own name.

5. Reproductions.—Members are advised not to give permission for their copyright photographs to be reproduced until they have full particulars of the size and style of the proposed reproduction, and to formulate their charges accordingly. For example: A newspaper should pay a fee of not less than 10s. 6d. for half-tone black-and-white reproduction not exceeding 6in. x 4in., when printed with letterpress in one issue of the paper; but if it is printed as an inset the fee should be at least one guinea. If printed in colours, collotype, or photogravure, it should be a still higher fee. If the photograph is to be reproduced for advertising purposes, a higher fee should be charged than for newspaper work. In all cases, the permission should be in writing, and state the amount of fee to be paid, the process by which the photograph is to be reproduced (whether in black-and-white or colours), the limit size, and the purpose for which the reproduction is to be used.

The Zoological Photographic Club has vacancies for one or two members. Subscription to May 31st next, 2s. 6d. The hon. secretary is Mr. Chas. Louis Hett, Springfield, Brigg.

We have received from Messrs. O. Sichel and Co., of 52, Bunhill Row, E.C., a price-list of photographic mounts manufactured by the A. M. Collins Manufacturing Company, U.S.A. Some of the mounts catalogued are well worthy the attention of up-to-date professionals, and we recommend them to write for an illustrated price-list of these American productions.

PHOTOGRAPHIC SUPPLIES IN FOREIGN COUNTRIES.

[Reprint of an American Advance Sheet of Consular Reports.]

It is the general impression that the United States leads the world in advertising. This may be true of many lines, but we are certainly behind in the advertising of photographic supplies. Some two years ago I organised an amateur photographic club, which counts five nationalities among its members. This has brought me in close touch with many interested in the art, and I am pleased to find that American photographic appliances have an exceptionally good reputation among foreigners. American manufacturers have reached a more satisfactory solution of the problem of a practical combined hand-and-stand camera than their foreign competitors, and two lines of American sensitised paper are recognised as very superior by advanced workers throughout the world. Our plates and films have a universal reputation for excellence, but owing to the very high prices asked for plates, the latter cannot compete abroad with those of foreign manufacture. A good reliable English plate can be bought for half the money asked for the American article. With this exception, we can hold our own in price. In quality we are not excelled, and in several lines not equalled. We have the material, but lack the enterprise to push our goods abroad. Among the thousands upon thousands of amateurs throughout the world the demand is very large, and it is astonishing to find our makers behind the English, German, and French in catering to this demand.

Setting aside for the moment the subject of foreign advertising, we are without a single photographic publication in America carrying sufficient advertising to make the publication of special interest to foreign dealers on the look-out for photographic supplies. Other lines of American industry have trade journals that are widely patronised by the manufacturers, but the home photographic trade goes almost unrepresented. England possesses, in "The British Journal of Photography Almanac," an annual publication which dealers and enthusiastic amateurs are glad to get. The number for this year (1902) is a bulky volume of 1,550 pages. Of these, 1,010 full pages are devoted to the advertisements of 245 advertisers. As many of the advertisers are general agents representing several manufacturers, there are probably four or five hundred different makers represented. I believe this publication to be one of the most valuable advertising mediums in the world. With the "Journal Almanac" in his hand, a foreign dealer is in close touch with the English supply trade. He finds there every novelty in his line, and as the leading manufacturers occupy enough space to cover briefly their whole field (several firms utilise upward of thirty pages each, and one well-known house fills sixty-five pages), the dealer has before him abridged catalogues of practically every maker in Great Britain.

Now let us see what the United States has to offer in this line. We have several very good photographic annuals, so far as the quality of the reading matter is concerned. Two of these are before me, and I find that in illustrations and general make-up they are in advance of the British annual referred to above. They have a comparatively large foreign circulation, and are much appreciated for the good things they contain, but they lack the most valuable feature of all—representative advertising. The 1900 issue of "The American Annual of Photography," which is the largest of our annuals, contains 489 pages. Of these, 119 pages are devoted to advertisements, and the seventy advertisers represented seem, as a rule, content with a mere uninteresting address card. The publishers, who control a large photographic supply-house, occupy most of the space. Foreign dealers obtain something even from this poor advertising array, but very little as compared with "The

British Almanac." The fault is not with the publishers. They offer a brighter setting for advertisements than their foreign contemporaries, and the advertising rates are no higher. It is our manufacturers who are at fault. If it were only possible to convince them of this and induce them to join in building up an American advertising medium like "The British Almanac," our foreign trade in photographic supplies would increase greatly. I may appear to be over-confident on this point, but I have given the subject much study for the past six years, and feel sure of my position. I have seen considerable orders for miscellaneous photographic supplies go to English manufacturers merely from the fact that the "Almanac" placed before the dealer a complete review of the latest novelties in the entire photographic line. Nothing could be learned about American goods without waiting for three months for catalogues, only then to find, perhaps, that the wrong manufacturers had been applied to, and that certain desired goods could only be obtained from other makers.

Our manufacturers could not do better than to look the field over carefully, select one or more of our photographic magazines and their annuals, and give such publications their hearty support. Let them advertise with illustrations and descriptive matter their most popular lines. The foreign dealer and amateur will, without great delay, find out the journals containing the most advertising, and these publications will soon be in possession of a circulation sufficiently large to make the trifling sum which the manufacturer has expended a splendid investment. Photographic societies are in existence now throughout the world, and they subscribe to the leading photographic papers, American, English, and German. Amateurs vie with one another in obtaining the best apparatus and latest photographic novelties; thus the advertising pages are of exceptional interest. Manufacturers should, therefore, value photographic journals for the quality of their circulation rather than the mere number of copies each may issue.

In foreign advertising American manufacturers apparently take but little interest. I find in the "Tokyo Shashin Geppo" (Photographic Journal) 4 German, 2 English, and 2 French advertisers represented; and in the "Shashin Shimpo" (Photographic News) 9 English, 5 German, 2 French, and 1 American. The charge for space in either of these journals is about 4.00dols. half page, and 7.00dols. a full page for English text. An equal space with Japanese text is given gratis. A large discount is made for two or more insertions, and no charge is made for Japanese translations.

Three or four of our largest manufacturers are heavy purchasers of expensive space in our home magazines, but only the kodak cameras are well advertised in Europe. A small part of the appropriation for American advertising, if expended in foreign journals, would introduce our goods abroad and lay the foundation of a valuable trade. We have many good things in the photographic line. We should let the world know it.

JAMES W. DAVIDSON, Consul.

Tamsui, April 10, 1902.

MR. W. E. DUNMORE, auctioneer and valuer, expert in photographic and optical goods, of 33, Gerrard Street, Shaftesbury Avenue, London, W., writes:—"I have felt for some considerable time that there was an opening for an auctioneer confined to the photographic and optical trade. I have fitted up a large mart at 33, Gerrard Street, capable of accommodating 150 to 200 people, and shall hold auctions of photographic and optical goods periodically. It is my desire to cater principally for the amateur photographers. Having this in view, I have arranged for the auctions to take place in the evening, to give my clients an opportunity of visiting me after business hours. Another special feature is that I offer to sell photographic goods for the amateur free of cost, on the understanding that the money realised shall be expended in photographic or optical goods from my retail stock. I am also willing to accept commissions to bid for any given lot without making any charge should the intended buyer not be in a position to visit the mart."

GRADUATED LIGHT FILTERS.

[Abstract of a Paper read before the Royal Photographic Society and reprinted from the "Photographic Journal."]

ONE of the earliest attempts to correct the erroneous representation, to which I have referred, is to coat the whole of the negative with a stained varnish, and afterwards remove the varnish from those portions, such as the sky of the negative, which are of greatest density, and in this way to effect a certain amount of compensation or equalisation, but it cannot be said that the method is a satisfactory one.

Later, attempts were made to attain the desired end by forms of lens shutters, so devised as to give a greater exposure to the foreground of the picture than to that of the sky portion. A flap shutter opening and closing from the top is one of the simplest of these devices; for, if slowly opened and closed, a much greater proportion of the light from the foreground of the subject falls upon the sensitive plate (Fig. 1).

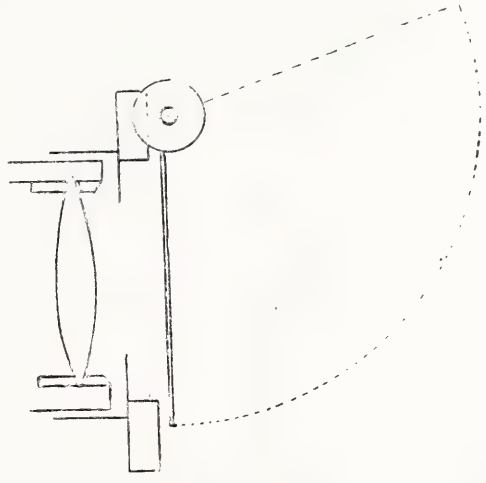


Fig. 1

With such a shutter, however, it is extremely difficult to forecast what result will be obtained, with any degree of certainty.

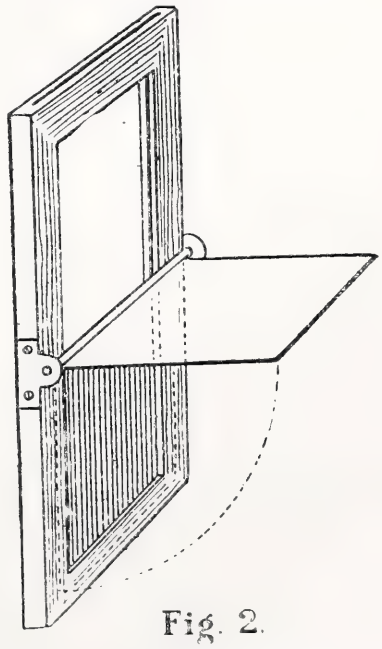


Fig. 2.

Fig. 2 represents a later form of shutter—a combination of the flap and simple drop shutter. In this shutter the flap is gradually opened, and on reaching its highest point, a drop shutter falls over the lens, completing the exposure. Both of these shutters give gradually decreased exposure towards the

sky portion of the negative, but, in order to give greater control, Colonel Durnford devised a very pretty contrivance, which effected its object, but was, unfortunately, complicated and awkward for transport.

In principle this shutter, which I now pass round, is excellent. The front portion of the lens supports, as you see, a flap shutter with a serrated edge. This flap can be made to stand at certain different angles by an adjusting piece. In addition to the flap shutter there is a drop shutter, as in Fig. 2; but working not immediately in front of the lens behind the flap, but at the diaphragm slot. Instead of the drop shutter having an opening equivalent to the aperture of the lens only, it has an additional opening in the form of a slit parallel with the line of drop (Fig. 3).

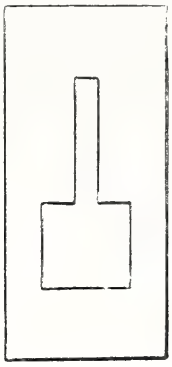


Fig. 3.

In operation the flap shutter is raised to its highest point, and the drop shutter until the larger opening is opposite the lens opening. The image is then examined on the ground glass focussing screen, and the flap with the serrated edge moved up and down until the line of the serrated edge corresponds to the horizon of the picture, and the flap is set in this position by means of the small quadrant. On closing the flap shutter the whole arrangement is ready for exposure. On releasing the trigger the serrated flap opens until it reaches the predetermined point, and up to this point, the larger opening of the drop shutter being opposite the lens—the full effective aperture of the lens is in use. From this point, however, to

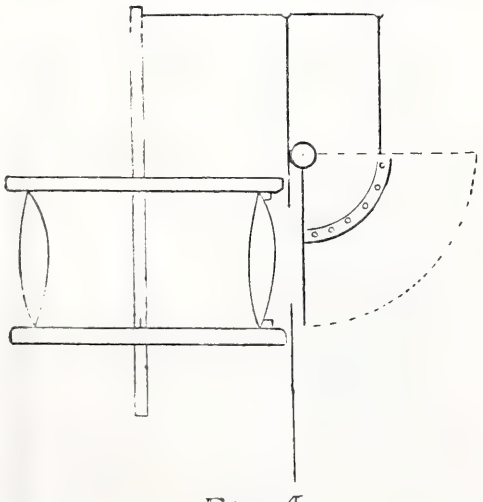


Fig. 4.

the end of the exposure, the slit portion of the drop shutter corresponding to a smaller sized stop, is in action; and, further, although the shutter moves with an uniform motion, the portion of light from the sky which reaches the plate is, relatively, enormously reduced (Fig. 4). This shutter then certainly work well, and it does not seem to be capable of very much improvement, so far as its principle is concerned, but the mechanical construction is ugly and inconvenient, and I propose to show you a means by which the same result can be obtained in a much simpler manner.

You know that some ten or twelve years ago saw the introduction of what was then known as an isochromatic screen, or more correctly, a light filter, and since that time all photographers have felt the increasing necessity for the use of light filters as constant companions, in order to secure the best results. The first light filters were made of yellow glass of very imperfect quality; this yellow glass was made by stirring up a pot of molten glass with a wooden rod. A certain amount of carbon became mechanically mixed with the glass, and gave a yellow colour which was, however, anything but a pure yellow, and far from the most suitable yellow for a light filter. A piece of this glass ground and polished on both sides was placed either before or behind the lens, or against the diaphragm—it does not matter appreciably where it is placed—either of these positions, or immediately in front of the sensitive plate will answer equally well.

A better device was the use of a glass tank filled with colour liquid, as quite a number of different absorptions could be obtained with this liquid filter, by varying the absorption of the liquid used. Liquid filters are, however, subject to many ills—leakages, unevenness, and the effects of changes on temperature rendering them very unsatisfactory for practical use.

Later, filters were made from worked glass, coated with gelatine, stained with a suitable permanent dye—the film being protected by a cover glass fixed to it with Canada balsam. This form of filter has quite superseded all others, as its advantages are enormous. There are now a very large number of analine dyes of proved permanency, which may be used for light filter work; and, by combining two or more coloured films, and by variation in the strength of the dye, it is possible to make light filters of any predetermined absorption.

To return to the question of graduated exposure to the foreground and sky, it occurred to me the simplest method of effecting graduated exposure would be the use of a graduated light filter in front of the lens combination. The first filters

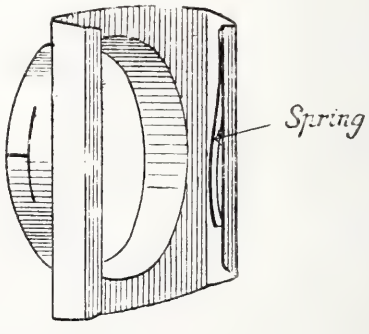
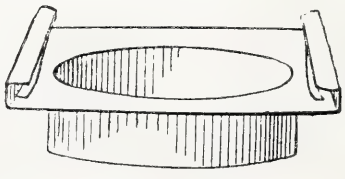


Fig. 5.



I made were simply coloured gelatine cast upon a glass plate in wedge form. By varying the amount of colour in the gelatine

varying steepness of gradation can be secured. Some of these filters were made in Indian ink, and in others I used a similar combination of yellow dyes to those used in the preparation of the Cadett Gilvus filter. The most suitable form of fitting for attaching the filter to the lens is represented in Fig. 5.

It consists of a brass disc turned over at two opposite sides, so as to form two grooves attached to a tube of suitable size to fit the hood of the lens. The grooves are furnished with springs to hold the glass against the brass platen. After using such an arrangement for some time, it occurred to me that it might be desirable, in many cases, to alter the scale of gradation from the straight line given by the wedge-shaped casting. If we represent the relative amount of light transmitted by the different parts of the filter, by varying the height of a line drawn above the base line, as in Fig. 6, I can better explain



Fig. 6.

what I mean. In order to experiment with different curves, the filters were made by printing in carbon transparency tissue under a rotating sector in which suitable shaped apertures had previously been cut. This is a very useful method of translating the curved line drawing into a photographic scale of opacities. Fig. 7 represents the arrangement used. A light

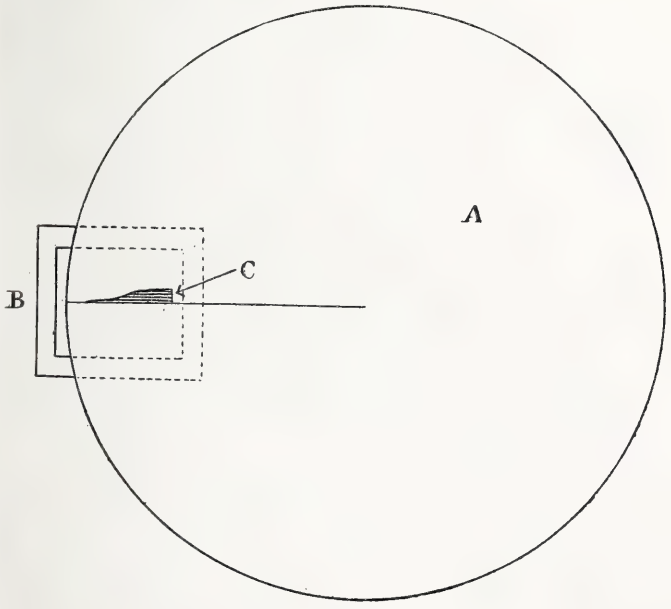


Fig. 7.

opaque sector A is so mounted as to revolve immediately in front of the printing frame B, containing the pieces of sensitive carbon tissue. An opening, corresponding to the required curve of opacities, is cut in the sector, A and C, and the whole is exposed to the light from an electric arc—the sector A being rapidly rotated by an electric motor.

After considerable experiment, I have found that a filter corresponding in opacity to the curve given in Fig. 8 is per-

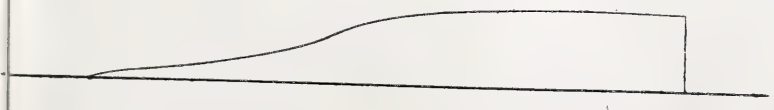


Fig. 8.

haps the most useful. The filter is best made of an oblong form, like Fig. 9, with the maximum change in gradation at about

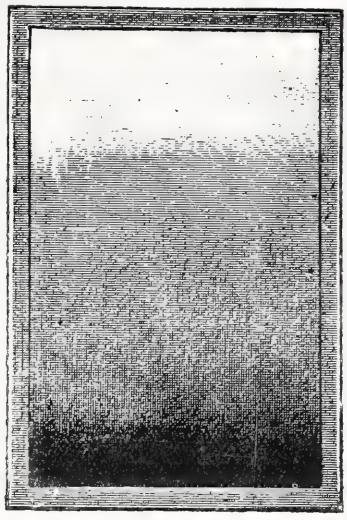


Fig. 9

the centre of the filter. It is then possible to get the maximum change in gradation to correspond with the maximum change of light in landscape, by observing the effect upon the ground glass whilst moving the filter up and down in its mount (Fig. 5).

E. Sanger Shepherd.

UREA IN THE DEVELOPER.

In the June number of the "Journal," there is an abstract of a paper by Dr. R. A. Reiss on "Urine as a Developer for Photographic Plates," published in the May number of the "Revue Suisse de Photographie." In this paper Dr. Reiss claims to have discovered that urea is a developer of the photographic image, not perhaps alone, but in combination with an alkali, as in the case of most other developers. As this statement was contrary to my own experience, I thought it worth while investigating.

In my first paper on thio-carbamide reversals (see "Journ. Pho. Soc. India," 1890) I showed that whereas thio-carbamide, or sulpho-urea, with alkali gives off ammonia and darkens and reduces the silver haloids; and a strong solution of it is capable of darkening a gelatine plate in the dark even without alkali; carbamide, or urea, in ten per cent. solution does not visibly darken a gelatine dry plate film, even with alkali, nor darken or reduce the silver haloids in the absence of light. The experiments on which these statements were based were carried out with freshly precipitated, well washed haloids, and had there been any tendency to reduction by the alkaline urea, it could not have escaped notice, because the reducing effect caused by the addition of eikonogen to the alkaline urea solution is recorded. The addition of urea to the ordinary eikonogen developer for negatives gave only a normal result, and seemed to have no practical effect worth noticing or following up.

Trying again the same sample of urea as was used twelve years ago, with ordinary English dry plates, it was found that a mixture of it and carbonate of potash in the proportions given by Dr. Reiss had absolutely no developing power at all. The same result was obtained with a fresh sample of "pure urea" (synthetic), the plate being left in the solution for two days without showing a trace of an image. Urine was also tried with negative results when used alone, but the simple addition of some pyro-sulphite solution without alkali devoloped an image.

These results led me to suspect that the developed images obtained by Dr. Reiss with his alkaline solutions of urea were not due to the urea, but to some ingredient of the emulsion on the plates he used. On looking up his paper, I found that he had used for all his experiments Mercier's "Intensive" plates, a quite special brand of French manufacture, containing *emetique** (tartar emetic?), eserine (phytostigmine), and morphine, some of them substances of strongly sensitising and accelerating power, while others are retarders, as explained in M. Mercier's paper on the subject ("Bull. Soc. Franc. Phot.," 1900, p. 227). It fortunately happened that I had two of these plates which were given me last year at the Glasgow Exhibition. On trying the urea with them the explanation became evident that Dr. Reiss' results, even on these plates, were not due to the urea at all, and could be obtained without it by means of a simple alkaline solution. The two plates were exposed, and then cut in half, giving four exposed pieces.

No. 1 was immersed in a two per cent. solution of pure urea. There was no trace of an image after twenty hours' immersion, pyro-sulphite added did not bring up the image, but the addition of a solution of carbonates of potash and soda brought it out at once.

No. 2. The same two per cent. solution of urea was used, but with the addition of the solution of mixed carbonates in the usual proportions for pyro development. This immediately gave an image, weak, but full of detail.

No. 3. A solution of mixed carbonates, diluted to the same strength as in No. 2, was used alone, without any urea. This brought out a thin image almost identical with No. 2.

No. 4. To the above mixed carbonate solution (No. 3) some pyro-sulphite was added, and the remaining piece developed readily up to normal density.

The results Nos. 2 and 3, taken in connection with the fact that the alkaline solutions of urea showed no developing power on ordinary English plates, tend to prove that the production of the image in these cases was mainly, if not entirely, due to the action of the alkali and the sensitising alkaloids or other substances included in the French emulsion. Dr. Reiss seems to have confined his trials to these plates, and not to have checked them with ordinary plates or the simple silver haloid salts.

Further trials with pure silver bromide quite confirmed my earlier observations that urea is not a reducing or developing agent. Silver bromide exposed to light and then immersed in solution containing five per cent. each of carbonate of potash and of urea showed no reducing action, and although it was darkened in a mixture of pyro-sulphite solution with a ten per cent. solution of urea it was equally darkened in the pyro-sulphite alone without the urea.

Further tests with exposed dry plates showed in the same way that no development was produced in a ten per cent. solution of urea, nor with a mixture of ten per cent. solutions of carbonate of potash and urea, but with the pyro-sulphite solution and ten per cent. urea in equal parts, a good dense image was developed. Other trials with ordinary dry plates showed that the action of the urea was that of a weak alkali; if it were present in considerable proportion with the pyro-sulphite, it gave a dense image as above, but more dilute solutions developed very slowly, and gave poor images, compared to those in which a mixture of carbonate of potash and urea and pyro-sulphite was used. It may be noted that the solution of pyro-sulphite and urea did not discolour so much as the ordinary developer with mixed carbonates.

As regards the use suggested by Dr. Reiss of urine in making up developing solutions, except for special investigations such as those Dr. Reiss is engaged on, it is not only unpleasant, but so complex and uncertain in its composition that it is not likely to give uniform results, and any advantage it might give could no doubt be obtained with urea, if further trials should show that this substance has any value as an adjunct to the developer. It may be found useful in bringing up a weak, well-detailed image for subsequent strengthening with a stronger developer. At any rate, the results I have obtained seem to show that it certainly cannot be considered as a new developing agent, and can only be of use as a weak alkali.

MAJOR-GENERAL J. WATERHOUSE, I.S.C.

* According to Wurtz's "Dictionnaire de Chimie," several double tartrates of antimony and other metals are known under this name.

A ROYAL UNDERSTUDY: THE CORONATION THROUGH FRENCH EYES:—KING ALPHONSE I.

[Reprinted from the "Daily Express, August 28, 1902.]

I saw the King crowned in the Abbey. It was a very great and noble scene; but perhaps you have read about it in the papers. They all had something to say.

Yesterday I saw the second crowning of the King—at the Alhambra Music Hall. Only it wasn't the real King, but a French gentleman. He looked as if he were called Alphonse. And the Abbey was not the real Abbey, but French lath and plaster; and the peeresses were fair Parisiennes, who were quite pretty, but—well, they didn't take up the sitting room of the dowagers. It was a bioscope representation of the Coronation that the Warwick Trading Company arranged near Paris, and, believe me, it teemed with quiet fun.

They had not done this thing better in France; but no doubt they did their best.

I am so afraid of appearing disrespectful to our good King, whose most loyal subject I am, that I will call the gentleman who took his part King Alphonse I. He had that appearance.

The bioscoped Coronation opens amid grand gesticulations. The Archbishop shrugs his shoulders triumphantly, as who would say, "It is magnifique! It is better than the real thing! Also I myself am very beautiful!" He glances proudly at four empty thrones grouped together. Of course, in our Coronation there were only three—two placed on high in the centre of the choir, and one, the chair which held the stone of Scone, near the altar. But these details do not matter in France.

The transepts of the Abbey are, as you know, broad arms. To the right sat the peers; to the left the peeresses. Also, they were seated some thirty in a row, while behind them was a gallery for the Commons. In the coronation of King Alphonse I. the peeresses are sitting in a gallery that holds eight in a row to the right of the thrones. They smile; they are happy. Are they not well dressed? What would you?

ANNOYING WIGS.

Enter Alphonse I. Behind him follow the officers of the household, in costumes that would have delighted the White Rabbit and brought a smile to the face of even the Walrus and the Carpenter. They wear several yards of horsehair wigs, that stray all over their faces. It is annoying; but they are brave Frenchmen. They would die rather than scratch their noses. A bas les Anglais, who are merely aristocrats after all. Alphonse I. is introduced to the Warwick Trading Company. He is very pleased to see them, and bows to their representative, who is working the bioscope. Through him he smiles upon the Alhambra. But suddenly two trumpeters, arrayed after the manner of French jockeys, rush in and blow a fanfare under his nose. He is discomforted, but calm. There is a general disposition to cry, "Vive"—something or other.

Alphonse takes off his robe and appears in the uniform of a French Colonel. The Archbishop beckons him. He kneels. He kisses a book. A Horsehair flourishes a two-foot quill. He signs the book. There is no ink, but the intention is enough. Sensation!

Enter more Horsehairs carrying canopy. Alphonse sits down nervously on the edge of his chair. He is not accustomed to this sort of ng. It is a torture to him. Poor Alphonse! A bas le British nstitution.

ARCHBISHOP IN A HURRY.

The Archbishop is very quick on his feet. There is no time for lay, for something may go wrong with the machine at any moment. e partially anoints Alphonse, who rises while a huge sword is tied his side. Again a robe is placed on the King. The Archbishop akes quick passes in the air. Horsehairs hurry up carrying the galia on cushions in a manner suggestive of ices.

The Archbishop seizes the crown, and displays it to the Warwick ading Company. Alphonse I. is crowned amid tumult, in which e trumpeters again rush in and the peeresses clap on their coronets—hich is just what they didn't in Westminster. But what matter? ive la France! Vive Alphonse I.! Vive everybody!

The new monarch is led up to the higher throne to be effusively braced by the Archbishop, while the Horsehairs bow so low that ey look like Shetland ponies. The Queen appears and sits beside m. Poor Queen, she is never crowned at all, and seems to feel the dignity. Another moment and darkness. The films have run out.

Have I been too critical? If so, I apologise. The house enjoys the ow thoroughly, and it was an enterprising scheme—even for the oscope.

B. F. R.

THE ROYAL CORNWALL POLYTECHNIC SOCIETY'S EXHIBITION AT FALMOUTH.

HE sixty-eight exhibition was opened on Tuesday, August 26th, by e president, Sir William Preece, K.C.B., F.R.S. There was a large d fashionable attendance, the large hall being packed to excess. The incipal feature of the exhibition was electricity, and scarcely anyone n handle that subject better than Sir William. In his speech he ferred in very high terms to the photographic section, under the anagement of Mr. W. Brooks. He specially mentioned the examples the gum bichromate process by Mr. J. R. Gotz, of London, also e beautiful work of Mr. J. H. Coath, of Liskeard, and the beautiful lpine pictures of Mr. H. Speyer, and Mr. Brooks's exhibits, of about venty examples, which were not in competition, he being one of the dges. The exhibition was then declared open.

Photographic Section.—The judges of the photographic section conratulate the society on the unprecedented success of the department. has broken the record, and the available space has been strained the utmost, and although the pictures in many cases have been acked so closely, not one picture has been overlooked by the judges.

Professional Section. — In the catalogue, Miss Gertrude Boynes nds an effective picture, "Wild Heather at Thurlestone." Mr. H. Coath, of Liskeard (an old exhibitor), is again well represented. e has about thirty frames, and great is the variety of his subjects. or a large picture (730), "Is He Coming?" he has been awarded a rst silver medal. The other pictures in his collection are well worth reful study, especially his studies of cats, dogs, etc. Mr. W. Brooks, f Reigate, sends a collection, which includes a picture of the imperial rown of England (full size photograph from the original), that was sed at the Coronation of King Edward VII. Mr. Brooks' (one of he judges) works are entered "Not for Competition." A second ilver medal has been awarded to Mr. H. Trevor Jessop, for a picture f a child and dog (757), "Quite Weady." John C. Douglas sends ome very artistic productions (765), "Breakers." A first bronze edal is awarded. He also has a very effective picture of an old sherman, "Uncle Ephraim." Mr. F. H. Tim's enlargement of Truro athedral is a little too weak to be effective. Mr. H. Evans's "Gathering in the Hay" is meritorious. Mr. E. Argall, of Truro, is represented by three portraits, printed in platinum, showing careful work, ut are spoiled somewhat by being mounted on white mounts. The ame artist sends two enlargements. Mr. J. C. Burrows, of Camborne, s again to the front with some of his mine pictures of large size. Although taken at a great depth below the surface, he has managed the rtificial light so perfectly that one is impressed that the photographs eem to have been taken by daylight. There is an entire absence f any violent contrasts, as generally seen in this class of work. The udges have awarded him the first silver medal for 771, "Half a Mile Deep in Cook's Kitchen Mine." He also has two others of the same rder. Mr. Walter Fleet has been awarded a first bronze medal for a picture of the genre order, 774, "A Practical Lesson." Another icture by the same artist is admirable, "The Umbrella Mender." All his exhibits show skill and good composition. Mr. W. Moore ends two frames of geological subjects. The Autotype Company, of New Oxford Street, London, is well represented by specimens of their well-known work, which need no description. For a charming interior subject of Winchester Cathedral a first bronze medal has been awarded. Their exhibit also contains some excellent portraits.

Mr. Graystone Bird sends two charming little studies, the best of which is No. 778, "Good Morning," which takes a first bronze medal. A large composite group (T. B. Hawke) of naval officers of H.M.S. shows an immense amount of work in getting together, and is extremely effective; the group was awarded first bronze medal. Mr. P. Garland contributes some pleasing subjects. J. P. Milnes has been awarded first bronze medal for 798, "Study of a Child's Head," which is tender in treatment, and very artistic. Mr. C. M. Wane is again a contributor with some good work. Mr. J. R. Gotz, of Shaftesbury Avenue, London, sends some of the finest examples by the gum bichromate process. 809, "Burnham Beeches, Spring," has been awarded a second silver medal. It plainly shows what the process is capable of in the skilled hands of Mr. Gotz. He also has another picture equally fine, "A Cottage, Aldbury Park." Mr. V. L. Paul is represented by three specimens of his work. Mrs. Bainsmith sends about thirty examples of her work, portraits several lack force, and are somewhat flat, and others are hard. Some of the poses are good, but the judges hope in future to see an improvement.

B. Lyons sends two examples, which show careful work. Mr. C. J. King contributes three examples of flower subjects. To No. 850 has been awarded a second bronze medal, "Narcissi, Double White."

Amateur Section.—First in the list are the beautiful works of Henry Speyer, of Alpine fame. His pictures are perfect gems, and it is difficult to say which is his best; but 854 takes first silver medal; his other five are equally good. W. Wainwright is represented by one picture study of trees in winter; Wm. Howell by four examples of his work. Mr. A. J. Anderson forwards some half-a-dozen, evidently printed by the gum bichromate, which are very poor. C. E. Story shows four pictures, Italian subjects. John H. Rowe sends a frame of twelve small pictures. C. H. Dymond shows ten pictures. Bernard Mitchell's and Mr. Dan Dunlop's pictures show careful work. W. A. Clark receives first bronze medal for No. 908, "In the Choir, Southwell," which is a little gem. T. Lee Lloyd shows one small picture (910), "Within and Without," which is fairly good, but uninteresting. A. W. Gill is represented by some Alpine views, the Matterhorn, etc., which are of considerable merit. W. Lidgey shows about a dozen flower studies, of a very high order, which would be difficult to beat. (920) "Primrose-Coloured Daffodil," a charming little study, takes a first bronze medal. It is a pity they are not printed in a permanent process, such as carbon or platinum, instead of P.O.P. Rev. G. E. Hermon secures a second bronze medal for a capital enlargement for 935, "On the River Fowey." C. Coath, a youth, sends two frames, which show great merit. Mr. F. Martin Duncan sends examples of microscopic work of a very high order; he sends also a very fine production (970), "Octopus Vulgaris," the rendering being faultless, and the judges have awarded a first bronze medal. Mr. W. M. Martin takes first bronze for his interesting work (938), radiograph "Incubation of Pigeon's Eggs," which is very interesting. He also shows a large series of radiographs of fishes, etc., subjects which have been done over and over again for years past. R. B. Moss, J. P. Padwick, and W. Leader show good examples. Mrs. Annie Blamey has greatly improved in her work since the last exhibition; to her series of hand camera pictures of one dozen goes a first bronze medal. Rev. H. Holroyd Mills sends a most interesting series of bird pictures, nests, etc.; also telephoto work of birds in their haunts on the rocks. He has evidently spent a lot of time in the work he has done to his collection; has been awarded a special second silver medal.

Photographic Appliances.—Mr. A. Gregory sends rather a rough contrivance for taking stereographs of X-Ray subjects. Mr. Thomas Thorp, of Manchester, again contributes some of his exquisite defraction gratings, done concave in form and silvered, and a very fine prism mounted grating, used in the construction of the new form of spectroscope, which is fully exemplified by the spectroscopic camera, sent by Messrs. Penrose, of London, which, in the opinion of the judges, had a great future before it, and to those who go in for colour rendering will find it an invaluable instrument. Messrs. Penrose and Co. have put the price exceedingly low, so that it may be within the reach of all. They have also kindly sent two specimens of Lippman colour photography process, being the first seen in Cornwall. They have also sent a set of Klein's colour filters, and some specimens of colour half-tone process, which are of great interest and very instructive. Mr. R. R. Beard the judges are very pleased to see contribute again. He sends three forms of hand feed arc lamps, the workmanship of which is perfect, solid, and substantial. To No. 1,001 has been awarded a first bronze medal. He also sends two portable rheostats for 240 volt circuit. Messrs. Sanders and Crowhurst, of London, send a frame of lantern slides of birds, and also a series of Westminster Abbey, etc. Unfortunately, the same firm sent a camera, which arrived two days after the exhibition opened, and was thereby excluded from exhibition; this camera had several new features in it.

The exhibition in all departments has been a great success. The

president of Thursday lectured to a crowded audience on wireless telegraphy. Mr. W. Brooks during the exhibition was kept busy explaining Tallent's spectroscopic camera, sent by Messrs. Penrose, which we noticed was marked sold. The Autotype Company sent some examples of materials used in the carbon process, which also kept Mr. Brooks on the go, explaining the simple working of the process. In the professional section many of the pictures were sold. Some were selected as prizes in the Art Union.

THE CAMBRIDGE CONVENTION: FINAL MEETING OF THE LOCAL COMMITTEE.

THE Cambridge General Committee, who so successfully organised the 1902 Photographic Convention of the United Kingdom at Cambridge, met last week, at the residence of Mr. C. S. Addison, Market Hill, to conclude business. The president of the committee (Mr. F. H. Sanderson) occupied the chair, and there were also present: Mr. H. A. Chapman (hon. sec.), Dr. Bansall, Messrs. Tams, C. S. Addison, E. Field, J. Johnson, F. J. Stoakley, E. S. Peck, W. F. Bird, Sowdon, and T. B. Hunt.

The hon. sec. presented the balance sheet, showing receipts amounting to £156 6s., and expenditure £158 18s. 9d., leaving a deficiency of £2 13s. 9d. Mr. Chapman informed the committee that, with the exception of the Bury excursion, on which there was a slight loss, the excursions had been run at a small profit. The deficiency on the dinner was small. He thought, taking into consideration the unexpected expenses they had had to meet, they had come out very well, and that the loss was small under the circumstances. Mr. Bridge, the general secretary, had complimented the local committee on the manner in which they had organised the gathering. The chairman endorsed Mr. Chapman's remarks. It was a source of great gratification to find the deficiency so small, and he would be delighted to make himself responsible for the deficiency. It had been a great ambition of his to get the Photographic Convention to visit Cambridge. They had had adverse circumstances to contend with, but he thought they had every reason to congratulate themselves upon the result. There was no doubt the visitors considered the gathering a very great success. The committee had received nothing but praise from them. The excursions gave the members of the Convention the utmost satisfaction. The hon. secretary remarked that before they accepted the chairman's generous offer to make himself responsible for the deficiency, he would like to point out that Mr. Sanderson's name was already in the subscription list for three guineas. Mr. Addison observed that it was not the fault of the local committee that there was a deficiency. It was the fault of the Convention, and he thought the loss should be borne by the council. After more discussion, three members offered subscriptions, and the meeting accepted Mr. Sanderson's offer to make himself responsible for the remainder. It was resolved that a donation of £1 5s. (already provided for in the balance sheet) be made to the Ely Cathedral Fund, and on the motion of Mr. Peck, seconded by Mr. Sowdon, the balance sheet was adopted. Mr. Field proposed, Mr. Hunt seconded, and it was agreed, to leave outstanding matters in the hands of the chairman and hon. secretary to wind up.

Mr. Bird proposed a hearty vote of thanks to the chairman for his unwearying efforts on behalf of the Convention. Twelve months ago, he said, he had the pleasure of proposing the election of Mr. Sanderson as president of the committee, and he wished all the things he had done had been equally successful. The chairman had done all he could to make the Convention a success, had worked hard, and certainly with effect. To him their best thanks were due. Dr. Bansall seconded the proposition, which was carried unanimously. The chairman, in returning thanks, assured the meeting it had been a great gratification to him to do what he could in the matter. He hoped they would all have pleasant recollections of the Convention, and of the many friendships they had formed. He was certain many Cambridge friends visiting the Photographic Convention, wherever it might in future be held, would be heartily welcomed, for he was sure their efforts had been very much appreciated. The chairman moved a vote of thanks to the hon. sec. He said the meeting thanked him as chairman, but he had had nothing like the work to do Mr. Chapman had. The success of the Convention was in a very large measure due to Mr. Chapman's tact, ability, and energy. Personally, he should owe Mr. Chapman a debt of gratitude to the last day of his life. The motion, which was seconded by Mr. Johnson, was carried unanimously. Mr. Chapman returned thanks, and said that though there had been a lot of work, it had afforded him the greatest pleasure. At the Convention he met many delightful men, and formed friendships which he hoped would never be broken. He was specially indebted to Mr. Bird, Mr. Stoakley, Mr. Addison, and Dr. Bansall for their assistance. Thanks were also voted to Sir Robert Ball (president of the Convention), Mr. J. W. Clark, Registrary of the University, Dr. James, the Dean of Ely, Mr. H. I. Hankin (ex-Mayor of St. Ives), Canon Scott (Lavenham), the vicar of Long Melford, Dr. Mann, Mr. F. Dewberry Mus.B., Messrs. G. E. Foster, Jos. Reed, W. F. Bird, Trench Smith C. S. Addison, and Tyndall. After a few words of thanks from the chairman to the committee for their hearty co-operation and support the meeting concluded.

CORONATION PHOTOGRAPHY "AT HOME."

[FROM A CORRESPONDENT.]

PHOTOGRAPHY has played an important, if unseen, part throughout the Coronation period. An especial staff had to be utilised one afternoon at the Richmond Post Office, to send and receive telegrams in connection with photographing the peers and peeresses in their Coronation robes, by Mr. Byrne. Approximately, some three hundred telegrams were sent and received. More than one hundred of the specially invited guests of the King and Queen, at the Abbey, in their Coronation robes, sat to Mr. Byrne. The portraits were all taken "At Home," in the sitters' own residences, and in many cases receptions of friends were held by the sitters while the sittings were proceeding. In some cases as many as fifty friends were present.

The photographs of Lord and Lady Muncaster, by their request, were taken in the garden, on the terrace connected with the house, in Carlton Gardens, the garden itself being separated from the road by only some iron railings. The roads were up, and some two hundred workmen and other spectators, admiring, silent, and well-behaved, were interested witnesses of some twenty different portraits, separately and grouped, being perpetuated.

On Coronation Day some thirty peers and peeresses were subjects, and although several operators, with different carriages were employed, it was extremely difficult to proceed through the crowded streets from one place to another. The matter was successfully negotiated by leaving the night before Coronation Day sets of apparatus and plates at the residences of the principal sitters, Lord Rothschild's, in Piccadilly, Lady Hillingdon's, at Camelford House, and other places. The sittings on Coronation Day commenced at 6.30 a.m., before going to the Abbey, and they practically lasted until dark. On the return from the Abbey many of the peeresses were much fatigued, but came up in even more gallant style "to face the photographic music" than the men.

An especial dispensation no doubt had been obtained, for right through Sunday graceful women and handsome men took their places, in what, after some years have passed may be considered historical portraits.

The robes, as worn, were a greatly improved edition on those at first designed. The alterations in the Lord Chamberlain's department not only greatly improved them, but put them in the best of taste, and, in fact, rendered them most becoming to the wearers. Mistakes will always occur. The peer's surcoats, a species of old-fashioned long under-waistcoat, was to be worn "de rigeur." The surcoat was of rich velvet, trimmed with ermine, of the same colour as the outer robe; it was extremely heavy wearing—hot, trying, and expensive. On reconsideration by the official department, the surcoat was found to be a useless appanage, and an order was issued rendering its use optional. The surcoats had, however, all been bought by them.

Many of the pages attending at the Abbey made picturesque and excellent photographs in their old-fashioned costumes, with their quaint three-cornered hats. Jewels galore! Such a feast of precious stones, family heirlooms, as never seen except on such a rare occasion.

The diamonds in the Rue de la Paix and Bond Street pale before such magnificence, and the jewels possessed the doubly added charm of having human setting off, upon the persons of such fair wearers. Priceless pearls were those of Lady Rothschild—as large as plums, and Emily, Lady Ampthill, and Lady Clanwilliam's were of the utmost magnificence. Lady North's tiara, ear-rings, and necklet, of the finest water diamonds, would presumably vie with any in the world. Pure drops of dew they appeared. Lady Dufferin and Ava had some very beautiful gems, and the Stanhope heirlooms were superb. Many of the peeresses are presenting these "At Home" photographs, printed in one of the permanent processes, to each tenant on their estates. Countess Howe's robes were cut in the style of the Elizabethan period, very wide, short, with stomacher. Lady Sarah Wilson, after being "under fire" at Mafeking, had again to face cannon of another description, in the shape of the camera and lens. Some of the robes had been worn at many previous coronations. Most carefully preserved had they been, and the colour of the old robes was very beautiful, being mellowed with age. No vivid colour was here; of course, all the stiffening had perished. Lord Coventry's robe was traceable back to 1642, veritably a good old age. How long before that it had been in existence it would be difficult to say.

The coronets in connection with these old robes are very beautiful, all the bands of metal work, wrought by hand, either in gold or other valuable metals, and beautifully chased. How different from the modern cast ones. Of course, the weight is great. Mr. Byrne, how-

ever, considers the old robes, however beautiful in colour, not so adapted for draping and making beautiful rich folds.

An amusing contretemps occurred with the sitting of a certain Lord, high in the land. A telegram was received by Mr. Byrne from him, "Cannot sit at noon; hard up." On inquiry at his Lordship's to know what it meant, it turned out to be that he was "laid up."

Coronation Day, for the purpose of photographing, was, indeed, a difficult one. On several occasions, to get from one place to another, when cabs were unprocurable and not allowed in the cordon, Mr. Byrne requisitioned the first empty carriage and pair he could find, the coachman of which did not seem over busy. A little douceur made it thus possible to get, under difficult circumstances, to the next engagement in time.

Coronation portraits are truly regal, the length of robe, when brought round in front of the figure, giving the effect of height to the subject. On many occasions the peers were captured by force by the peeresses to undergo their Coronation photographic christening. The peer's robes were first brought up into the room, the peer then called, and with strong persuasion, and no means of escape, usually capitulated gracefully. On one or two occasions, however, they took to flight. The number and success of these "At Home" photographs, not one of which was taken in a studio, but all in ordinary rooms, demonstrates how entirely independent photography is of such an adjunct. Good work can be done in practically any room, and the most pleasing results obtained rapidly, and in all the comforts of home, without climbing innumerable stairs, in mounting to the tops of houses, let alone the going to and fro, frequently in evening dress. There is no reason for such discomfort and trouble, as is evident by all the Royal photographs, including those of the King and Queen, photographed by Mr. Byrne, being all taken in ordinary rooms.

PRACTICAL NOTES AND HINTS CONCERNING "SULPHITE," "METABISULPHITE," ETC., ETC.

I.

The use of sulphur dioxide (SO_2) either in the form of a sulphite, metasulphite, or aqueous solution (i.e., "sulphurous acid") is now very generally recommended, and widely adopted in the making up of many developers. It therefore behoves the intelligent photographer to have some general knowledge as to why this is done, how it should be done, difficulties likely to arise, etc. The following notes have been brought together with the idea of putting before the reader such information as he is likely to require from time to time, so that he may advisedly take out this page and put it in his cuttings book. To further facilitate ready reference, the subject matter has been divided up into numerous subsections, such as History, Impurities, Tests, Ases, etc.

HISTORY.

Its use in our present connection appears first to have been suggested by Berkeley in 1880. He seems to recommend that an 8-grain soda sulphite per ounce (water) be made up and used for the preliminary soaking—developer compounding—and washing after developing, and before fixing. Watkim and Chapman Jones subsequently pointed out that the quantity of sulphite should vary with the quantity of solution, and not simply with the quantity of the developing agent, e.g., pyrogallic acid, etc.

CHEMISTRY.

If we burn sulphur in air (i.e., oxygen and nitrogen) the sulphur and oxygen combine, yielding a pungent gas (sulphur dioxide—Thus S 20 SO_2). This gas is formed when we light an ordinary sulphur match. The gas combines with the moisture in the nasal membranes, and produces a pungent, stinging sensation and suffocation in the throat. When sulphur dioxide or sulphurous anhydride is dissolved in water it is supposed to form an acid called sulphurous acid, or hydrogen sulphite (SO_2 H_2O H_2SO_3). This readily takes up more oxygen, and becomes sulphuric acid, or hydrogen sulphate (H_2SO_4).

Now, sulphurous acid is dibasic, that is, we can replace one or both of the hydrogen atoms. If one only is replaced, the salt is an acid salt. If both are replaced, we get a neutral or normal salt.

Thus Na HSO_3 is acid sodium sulphite, i.e., soda bisulphite, and Na_2 SO_3 normal or neutral sodium sulphite. If we cause more SO_2 to combine with the neutral sulphite we get the now familiar metabisulphite, i.e., Na_2 SO_3, SO_2, or Na_2 S_2 O_5—formerly known as pyrosulphite (N.B.—Nothing to do with the photographer's "pyro" in this connection). The normal sulphate crystallises with 7 molecules of water, i.e., as a hepthydrate, i.e., Na_2 SO_3 7 H_2 O. Thus its mol. weight, 252, contains 126 (or just 50 per cent.) water of constitution.

PREPARATION.

Into a solution of sodium carbonate a stream of SO_2 gas is passed until saturation is reached. The solution is then allowed to crystallise out, and yields the acid sulphate or bi-sulphate of soda, .H Na SO_3. If, however, we divide into two equal parts our carbonate solution, then saturate on emoiety with SO_2 gas, and then add the unsaturated solution to it, and allow to crystallise, we get the neutral or normal sulphite, Na_3 SO_2. If into a hot and strong solution of caustic soda (Na HO, sodium hydrate), is passed SO_2 gas to saturation, then the crystals yielded are the metabisulphite or pyrosulphite salt.

IMPURITIES.

From the above-given mode of preparation it is easy to see that in the normal sulphite an excess of carbonate is likely, and in the meta salt an excess of very loosely combined SO_2 is probable. Experience shows that these conditions frequently occur. Freshly-prepared meta salt often strongly smells of SO_2, and the normal sulphite is frequently strongly alkaline to litmus.

Now, it very conveniently falls out that we can employ one defect to counteract the other. Used as a preservative, the sulphite should be slightly acid in solution, so that the SO_2 may be readily available. Some writers recommend the addition of dilute sulphuric acid for this purpose. Others recommend citric acid. But it is preferable to add the acid meta salt until the solution shows a slightly acid reaction.

But these do not end our troubles. The normal sulphite is itself liable to change on keeping. The changes are twofold, (1) in dry, warm air the glossy crystals effloresce, i.e., become covered with a white powder. This is due to their parting with some of the water of crystallisation; (2) in damp air the clear crystals also become coated with a white powder, but in this case oxidation has taken place, and soda sulphate has been formed.

The former chance is the less harmful. The crystals should be put into small bottles, and the bottles filled up to the top, a sound cork inserted, and the cork and bottle neck dipped in melted wax or paraffin. Preserving the crystals in ether has been suggested, but the cost is hardly justified for photographic purposes. Commercial samples vary considerably. They should not contain more than 2 per cent. of carbonate or sulphate.

In practice it is a good plan to clean away any surface powder by placing the crystals on a bit of muslin stretched over the mouth of a dish, and then put under the cold water spray for a moment. The crystals are then thrown on to dry blotting paper, dried, and weighed.

N.B.—These impurities have a practical bearing. The presence of sulphate is by some authorities regarded as a restrainer. An excess of acid in the meta salts implies the addition of enough alkali before the developer will begin working properly. An unknown excess of carbonate disturbs our calculation in the addition of alkali.

PROPERTIES.

Solubility.—Soda sulphite, 100 pints water at 32 degrees Fahr. dissolve 14 pints sulphite.

100 pints water at 68 degrees Fahr. dissolve 25 pints sulphite.
100 pints water at 100 degrees Fahr. dissolve 50 pints sulphite.
100 pints glycerine at 60 degrees Fahr. dissolve 4 pints sulphite.
Insoluble in alcohol.

PROPERTIES (Sulphites).

The crystals should not smell of sulphurous acid (SO_2). They should completely dissolve in strong, pure, cold hydrochloric acid, and Ba NO_3 S_2 should not produce any .ppt. in this solution. Aqueous solution should be feebly alkaline, and show but slight effervescence when powdered citric acid is added.

Has a reducing action with Au Cl_3, H_2 Cr O., Fe_2 Cl_6.
Has oxidising action with nascent H, SH_2, Su Cl_2.

PHOTOGRAPHIC USES.

As preservative with pyro-metal, etc; as accelerator with amidol-synthol, etc. In intensification with mercuric chloride. For fixing prints by dissolving silver chloride-bromide, albumenate, etc.

FUNCTIONS.

Primarily the object aimed at is preserving in entire condition the developing agent, i.e., pyro, metol, etc. This the SO_2 does by itself by taking up the oxygen dissolved in the water or adjoining air, and so preserving the pyro, etc. Consequently the pyro being prevented from oxidising, remains a more or less colourless solution. Thus secondarily the sulphite is a stain preventer, i.e., by preventing the developer becoming a dark-coloured fluid, which thus would stain gelatine, paper, or fingers. Hence the advisibility, when clean and stainless negatives or slides are required, of using a sulphate solution for washing the plate after developing and before fixing, and also of the addition of sulphite to the hydro-fixing bath.

Note, furthermore, that in the case of several of the newer developing agents, e.g., amidol, synthol, etc., the sulphite is not only a preserver, but seems to afford also the accelerating functions that a few years ago we usually assigned to the alkali (i.e., ammonia, carbonates, or caustic alkalis). And seeing that a sulphite solution of pure sodium sulphite, which has but a very feeble alkaline reaction, has marked accelerating functions, it would seem that alkalinity is

not—as often so supposed—equivalent to functional activity in this sense.

RELATIVE PRESERVING VALUES.

We have then practically three preparations to select from, viz., aqueous solution of SO_2, or sulphurous acid of commerce; the normal sodium sulphate, and the metabisulphite. To compare their relative preserving powers we must dissect their chemical formulæ, and ascertain what percentage of SO_2 they contain. This we can most conveniently see in tabular form:—

	Mol. weight.	SO_2 contained.	SO_2 percentage.
Sulphurous acid	—	—	about 12 per cent.
Variable strength ...	—	—	—
Sodium normal sulphite $Na_2SO_3 7H_2O$, i.e., $Na_2O, SO_2, 7H_2O$.....	252	64	25.4
S. metabisulphite, $Na_2S_2O_5$, or $Na_2O, 2SO_2$	190	128	67.4 ...

It will be seen that the meta salt has rather more than two and a half times as much SO^2 as has the sulphite.

Sulphurus acid presents no advantages. At 65 degrees Fahr. and normal pressure, 100 parts water contains about 12 parts SO^2. Diminution of pressure or increase of temperature reduces this quantity; and normally the aqueous solution is slowy deteriorating.

It must, however, be kept in mind that the meta salt is acid, and therefore for alkaline development we require to add extra alkali to neutralise this acidity. For various reasons (see impurities, etc.) it seems that a strong balance of advantages is with the meta salt as a preservative. It is not, however, apparently a desirable substitute for the sulphite when used alone as an accelerator.

REV. F. C. LAMBERT, M.A.

New Apparatus, &c.

Kalona: A New Self-toning Paper. Manufactured and sold by Ilford, Limited, Ilford, London, E.

Most, if not all, the self-toning papers at present on the market yield prints of which the surfaces are non-glossy or matted, in virtue of the special system of preparation adopted by the manufacturers; but with that shrewd appreciation of the needs of vast numbers of photographers which has always characterised the Ilford House, the company have come forward with a self-toning printing paper, the surface of which is glazed, and as the appended instructions point out will "give prints of enamelled surface by squeegeeing down on plain glass in the usual way." We suppose that so long as photography itself exists the taste of the individual will range itself upon the side of either "matt" or "glossy" surfaces, and while this difference of taste remains a force we have nothing but commendation for the technical skill and commercial enterprise which allow the photographer to avail himself of the privilege of a choice. Coming to "Kalona," the latest claimant for public favour: at least one morning this week proved bright and rainless, so we had the opportunity of preparing a few trial prints. Kalona prints quickly, and from negatives of fair density gives vigorous reddish-brown images. It will be noticed that in the "toning" formula printed below, ammonium sulphocyanide is a constituent. By way of experiment, in our trial, sodium acetate was substituted for the ammonium compound, with the result that the colour of the fixed and washed images very closely matched that of some specimen prints which Messrs. Ilford have kindly handed us for inspection. These prints have all the appearance of gold-toned images, and the colour is what may be roughly described as a purplish brown of a distinctly pleasing character. Save in the instance referred to the annexed instructions were scrupulously followed in our trials of Kalona: and as illustrative of the expeditiousness of the process, most excellent fixed and washed prints were placed on our breakfast-table on the morning of our trials of the paper. Besides being a quick printer and yielding images of great colourific beauty and refinement, Kalona strikes us as possessing the most valuable of all features in a printing surface: that of giving uniformity of tone. Indeed, we were strongly impressed by the remarkable evenness of our own results. Kalona enters the market at an opportune moment, and we recommend it to our readers as a good thing worth trying and worth using. Here are the makers' instructions:

WORKING INSTRUCTIONS.

Print as for P.O.P.
Immerse prints, without washing, in the following bath:—

Alum (powdered)	1½ ozs.
Ammonium Sulphocyanide	20 grains
Water	20 ozs.

This bath can be used for about 50 half-plate prints.
Keep prints moving for 5 minutes.
Wash for 10 minutes in several changes.
Fix in hypo 3 ozs. Water 20 ozs.
Wash for 2 hours in running water, or many changes.
Follow these instructions exactly and the batch of prints will be uniform in tone.

For convenience the following stock solutions may be prepared:—

No. 1.	Alum (powdered)	8 ozs.
	Water	100 ozs.
No. 2.	Ammonium Sulphocyanide	100 grains.
	Water	10 ozs.

Mix 18 ozs. No. 1 with 2 ozs. No 2.

Mount with starch paste in the usual way. This paper will also give prints of enamelled surface by squeegeeing down on plain glass in the usual way.

Commercial & Legal Intelligence

SIX MONTHS for a Canvasser.—At the Handsworth Police Court, on Friday last, Frederick Bickmore, alias Fred Miller, of no fixed abode, was again brought up on charges of obtaining money by false pretences from various persons. He pleaded guilty. The evidence given at the previous hearing was repeated, showing that the prisoner called on numerous persons in Handsworth, West Bromwich, and Birmingham, and represented himself as the agent of Mr. Hall, a Handsworth photographer. He took orders for portraits and received 6d. or 2s. 6d. on account. When his dupes presented themselves at the photographer's, they were told that the prisoner had no authority to take orders for Mr. Ball. John Albert Ball, photographer, of 33, Albert Road, Handsworth, stated that the prisoner had applied to him for employment as agent, but he refused. Prisoner then asked for some specimen photos to show his friends, and witness gave them to him. He had not authorised the prisoner to receive payments for him, nor had the defendant paid any over to him. Detective-Sergeant Myatt, who arrested the prisoner on the 21st inst., produced a receipt-book showing that the prisoner had victimised over 100 people. Prisoner was sentenced to three months' hard labour for each of the two cases which were proved, making six months in all.

RE the Sensitised Paper Manufacturing Syndicate, Ltd.—A winding-up order having been obtained against this syndicate, meetings of the creditors and shareholders were held at the Board of Trade Offices, Lincoln's Inn, on Monday last, before Mr. H. M. Winearle, Assistant Official Receiver. A statement of affairs was lodged, showing unsecured claims £916 19s. 9d., and assets, consisting of unpaid calls (£907), estimated to realise £607. The chairman stated that the syndicate was registered in June, 1900, for the purpose of acquiring from the Electrical Inkless Printing Syndicate, Ltd., the exclusive license for England and Wales to use an invention for the manufacture of a special paper for printing purposes called sensitised paper, on which printing could be done without ink, upon the application of an electric current. The nominal capital of the company was £100,000, divided into £1 shares, but only seven shares to the signatories were actually allotted. The company was to acquire the license mentioned in consideration of £8,000 payable in cash and £60,000 in fully-paid shares. The company, however, never commenced business, and the agreement was never carried out; nor was an agreement with Mr. F. L. Sanderson for the lease of certain paper mills. No steps were taken to obtain working capital, and beyond the purchase of a small quantity of machinery nothing was done towards the manufacture of the sensitised paper. A brief discussion followed, and the proceedings, in the absence of a quorum at either meeting, were formally adjourned for a week.

PHOTOGRAPHY and the Australian Immigration Act.—The "Immigration Restriction Act" became law at the end of 1901, and provided that no person shall be allowed to land in Australia who, "when asked to do so by an officer (the word officer being defined as meaning an officer specially appointed or any Customs officer), fails to write out at dictation, and sign in the presence of the officer, a passage of fifty words in length in an (*sic*) European language directed by the officer." If this means anything, it means that any Customs officer can confront any person on board any ship and ask him to write out fifty words in any European language which the officer chooses to direct: if the stranger is obviously a Frenchman, he can be asked to write his dictation in Turkish. There are additional clauses providing for the rejection of undesirables, but the first clause is widely embracing enough for all purposes. The only exemptions are Australians who have been away and are returning to their native shore, ambassadors, soldiers and men of the Royal Navy, and crews of trading vessels during their stay in port. Any other persons found at large in Australia contrary to the provisions of the Act can be sentenced to six months' imprisonment, or fined £50. Regulations have been issued under the Act, whereby residents of Australia leaving home are advised to be photographed in four different positions before leaving, so that they may be identified when they wish to return. It would be awkward if the Australian eleven and the Federal Premier returning from England should be shut out of their own country if they had altered from their photographs.—"The Times."

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Sept.	Name of Society	Subject
5.....	Croydon Natural History.....	Lantern slide trial night
6.....	Ashton-under-Lyne Photo	Ramble to Mottram. Leader, Mr. H. Hall
6	Brentford Photographic	West Drayton and District.
0.....	North Middlesex Photographic	*The Origin and Development of Land-cape Painting.* Mr. H. A. Mummery.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

AUGUST 23TH.—Mr. T. K. Grant in the chair.

Mr. Walter D. Welford gave an interesting account of the experiences of the party which formed his Photographic Camp on the River Avon a few weeks ago. The chat was illustrated by lantern-slide views of camping incidents and the surrounding country. The camping party enjoyed some ten days' stay on Glover's Island, near Evesham. The company was primarily a photographic one, and a good deal of camera-work was therefore done. Both ladies and gentlemen took part, and although few in number, it seemed that the time was spent none the less pleasantly on that account. Those who have tasted of the pleasures and pains of camp life will, of course, need no telling of the necessarily rough-and-ready manner of living; but Mr. Welford's party seem to have been well cared for, if one may judge by the roomy tent accommodation, the sound boarded floors, the piano, and so forth. Excursions had been arranged to the places of interest in the locality. That these were patronised, the photographs shown allow of no doubt, but Mr. Welford said that there was no mistaking the kindly feeling for the camp and its living, and the party was not anxious to leave it. Evesham furnished a number of opportunities for the photographic members of the camp. Stratford, near by, also came in for a goodly share of attention, and Mr. Welford was able to show pictures of Shakspeare's house, Ann Hathaway's cottage, the Shakspeare Memorial and the Memorial Theatre. the church, and many bits along the stream. All the views were hand-camera pictures, and amongst them were bits at Fladbury Weir and Mill, Chadbury Weir, Cleeve Mill, and Hardington.

Following this series, Mr. Welford showed a few portrait studies by Mrs. Welford, which drew forth very appreciative applause from the company present.

WEST SURREY PHOTOGRAPHIC SOCIETY.

The glycerine method of developing Platinotype prints was the subject of a demonstration last week by Mr. W. T. Marriott, which was remarkably well attended and very happily given. The want of control, the lecturer said, had been the drawback hitherto with Platinotype printing, but by the use of glycerine and oxalate solutions and their various combinations with bichloride of mercury he was able, as he showed the meeting, to control the development of his picture and restrain or act on portions of it and get such effects as, more or less artistically, he wanted to obtain. And so, too, with colours. He showed sepias, black, brown, and yellow tones produced at will, and said the work had now become quite a pleasure and a fuller means of expression of one's self and ideas in that beautiful and still unrivalled Platinotype process he could not wish for. The demonstration was excellently given, with cheerful variations, and very well received, and followed by a unanimous vote of thanks.

THE Hackney Photographic Society will hold its fourteenth annual exhibition at the Morley Hall, Triangle, Hackney, on Wednesday, Thursday, and Friday, November 12th, 13th, and 14th, 1902. The exhibition will be opened at 7 p.m. on Wednesday, and at 2 p.m. on Thursday and Friday. The judges will be Messrs. Reginald W. Craigie, A. Horsley Hinton, and Rev. F. C. Lambert, M.A. Mr. Alexander Mackie has kindly consented to arrange the pictures for hanging. The following classes are open:—(F) Portraiture and figure studies; (G) Landscape, seascape, and river subjects; (H) Architecture; (I) Still life, animals, scientific, and any subject not included in F.G.H.; (J) Stereoscopic (sets of four); (K) Lantern slides (sets of four). One silver and one bronze medal will be awarded in each class, with the exception of Class B, in which there will be one gold centre, one silver, and one bronze. A gold medal is offered for the best picture in members' classes (A to D), and also a gold medal for the best picture in the open classes (F to I). Certificates will be awarded at the judges' discretion. A silver medal is offered for the best trade exhibit, and a bronze medal for the most useful photographic novelty exhibited, either by the trade or any amateur. Exhibits will be collected free of charge from the R.P.S. and Salon Exhibitions. The entry form must be returned to the hon. secretary, Mr. Walter Selfe, 70, Paragon Road, Hackney, N.E., on or before October 25th, 1902.

News and Notes.

STARS BY DAYLIGHT.—"Are the stars visible to ordinary sight in the daytime?" asks Mr. E. Walter Maunder in "Knowledge." "There is a widespread tradition that they are; that if an observer places himself at the bottom of any deep shaft—as of a mine, a well, or a factory chimney—which may shut off scattered light and reduce the area of sky illumination acting on the retina, he will be able to discern the brighter stars without difficulty. The tradition is one of a respectable antiquity, for Aristotle refers to persons seeing stars in daylight when looking out from caverns or subterranean reservoirs, and Pliny ascribes to deep wells a similar power of rendering visible the stars the light of which would otherwise be lost in the overpowering splendour of the solar rays. The tradition, well founded or not, has often been adopted for literary effect. It seems almost sacrilegious to hint that no star known to astronomers could have shone down unceasingly upon poor Stephen Blackpool during his seven days and nights of agony at the botton of the Old Hell Shaft; that at best he could only have caught a glimpse of it for a few minutes in each twenty-four hours as it passed across the zenith. Dickens, indeed, does not absolutely say that Stephen watched the star by daylight; it is only a natural inference from his description. But is the tradition true? Of course, everyone knows that Venus from time to time may be seen even at high noon; but then Venus at her brightest is many times over brighter than Sirius. Then, again, the assistance of a telescope enables the brighter stars to be discerned at midday; but the telescope not only directs the eye and greatly limits the area from which the skylight reaches the observer, but it enormously increases the brightness of the star relative to that sky illumination. The naked-eye observation of true stars in full sunlight stands in quite a different category. Humboldt, who was much interested in the question, repeatedly tried the experiment in mines, both in Siberia and in America, and not only failed himself ever to detect a star, but never came across anyone who had succeeded. Much more recently an American astronomer set up a tube for the express purpose of seeing the Pleiades by daylight, also with no effect. It has been supposed that Flamsteed, the first Astronomer Royal, sank a well at Greenwich Observatory for the purpose of observing Gamma Draconis, the zenith star of Greenwich, in this manner. The existence of the well is undoubted, though Sir George Airy, the late Astronomer Royal, was unable to find it; but Flamsteed marks it on more than one of his plans of the Observatory, and there is a drawing extant of the well itself, showing the spiral staircase that ran down it. But its purpose seems to have been, not to have furnished the means of observing the star with the naked eye, but to enable the observer to measure as accurately as possible the distance of the star from the true zenith at the moment of transit."

THE Kodak is *the* rage this year. Whole families go about armed with them. You sometimes see father and mother and all the boys and all the girls presenting their Kodaks at the same object. At Clarens, on Lake Leman, I came suddenly upon a priest who was kodaking the scenery, and several other reverend gentlemen were gathered around him giving him hints. All the French officers out with the autumn manœuvres carry Kodaks. As they snapshot the village maidens, the photographing is evidently not for military purposes. In many of the museums and galleries and collections of curiosities they make you leave your Kodak at the "sticks and umbrellas" counter, but I have seem them carried into churches and used while service was being celebrated. The kodaker does not seem quite able to draw the line for himself as to when and where it is permissible to "snap." The etiquette of kodaking has yet to be written. The Paris authorities take away your Kodak before they permit you to enter a public building. I saw twenty-seven Kodaks hanging up by the gates of Père Lachaise. The kodaking mania obtains to such an extent this year that in many places you see people formed up in line waiting their turn to photograph a local specialty. Many amateur photographers, tired of scenery, peasantry, and ecclesiastical buildings, have taken to photographing each other in a variety of attitudes. The uses to which the Kodak may be put by a domesticated amateur was strikingly illustrated one hot afternoon in the garden at Chamonix. A charming French family had taken possession of a little green lawn. The family consisted of papa, mamma, and the baby, and a typical French nurse, all buxomness and cap-strings. I sat under a shady tree, and watched a little domestic comedy of kodaking with the greatest interest. Papa was young and handsome, mamma was young and pretty, and baby was about a year old. First of all papa photographed mamma, who posed for him prettily with a red sunshade and a smile. Then mamma took the baby, and after an effort which lasted a quarter of an hour to make baby turn his head in the proper direction, papa photographed mother and child. Then papa was put in a chair and spruced himself up and mamma proceeded to take a snapshot of *him*. Then mamma sat down and took the baby on her knee, and papa knelt down by her side and held the baby's hand, and the nurse photographed the group. And then occurred a little scene of sweet simplicity that carried me far back into the history of the human race, and made me fancy for a moment that the garden was not in Chamonix, but on the banks of the Euphrates, and that is name was Eden.——[*Was* Eden on the

Euphrates?—EDITOR.]——For, papa having carefully arranged his Kodak, mamma sat down and proceeded to give baby his five o'clock tea, and thus, amid the smiles of a gardener who was at work, a waiter who was in the hotel doorway, and a couple of ladies at an upper window, papa snapshotted his wife and child. The scene was perfect in its innocence, and its simplicity. It was an idyll of the Kodak. It was just what might have happened had there been no serpent in Eden and Adam had had a Kodak and snapshotted Mamma Eve with little Abel.—"Dagonet" in "The Referee."

THE annual report of the proceedings in the Cambridge Observatory for the year ended May 24th last has been published. The weather was, on the whole, rather unfavourable for meridian work, since, of the 100 nights on which observations were made, only seventy-nine could be called clear. Notwithstanding this, fair progress was made with the determination of the places of the 2798 Zodiacal stars in Sir David Gill's Catalogue, and a very few circum-polar stars, re-observed at the request of Dr. Stechert, of Hamburg, on which four nights were spent in July. To these ends 3,315 observations were recorded. The observations for Nadir Point were 54; for Level and Collimation 24. A fresh determination of the intervals of the transit wires was made at the beginning of 1902, from the 138 available observations of Polaris taken during the previous year. The result closely agrees with previous determinations. All the right ascension observations are reduced to centre wire. The instrumental corrections are applied, the time of true transit obtained, and the clock corrections and rates calculated up to May 3rd; and the true apparent right ascensions obtained up to April 18th. The reductions to mean Equinox at the beginning of the year are almost completed up to February 27th. The declination observations are reduced as far as apparent Zenith distance up to May 2nd; the true North Polar distance is obtained up to April 1st; and the reductions to mean Equinox at the beginning of the year are brought up to February 27th. In January began the observations for stellar parallax, which will be the principal work of the Sheepshanks photographic equatorial. A first working list includes some twenty objects of individual interest, and a region of the Milky Way (about R.A. 20h. 15m., Decl. plus 37deg.), which contains eight Wolf-Rayet stars, several variables of long period, and the Nova of 1600 (P Cygni). A preliminary search in the southern part of this region for stars of large parallax has been made by Professor Kapteyn. The weather this year has been peculiarly unfavourable for parallax work. The efficiency of the electric control to the driving clock has until lately been impaired by the very uncertain action of the relay. A new form of relay has been made and presented to the observatory by Captain E. T. Dixon, R.H.A. Much time has been spent on the commencement of the reduction of the photographs of Eros made in co-operation with about fifty observatories of the northern hemisphere during the winter 1900-1 for a new determination of the Solar Parallax. As an experiment, fifty-two exposures made on November 9th and 10th, 1900, were measured and reduced, with the aid of a special ephemeris, which was very kindly computed for the purpose by Professor E. Millosevich. In response to requests made to Professor W. W. Campbell, director of the Lick Observatory, Mt. Hamilton, U.S.A., and to Professor F. P. Leavenworth, director of the observatory of the University of Minnesota, Minneapolis, U.S.A., measures of photographs made at these observatories were kindly communicated, and have been reduced in combination with the Cambridge measures. The results of this preliminary and experimental reduction were very satisfactory and it is now proposed to extend the trial to a larger series of Cambridge plates. The work will be greatly facilitated by the readiness with which M. Loewy, president of the Eros Commission of the Paris International Conference, 1900, consented to publish the new ephemeris of Eros, computed under his direction, in the rectangular co-ordinates from which is required, as well as in the more useful form of planetary ephemeris. Observations of *a* Persei have been carefully discussed for determination of velocity in the line of light, and a note summarising the results was communicated to the Royal Astronomical Society. Considerable time was devoted in the autumn to the study of the material obtained in Sumatra in the total eclipse of the sun in May, 1901, and a preliminary report on the observations was communicated to the Royal Society and the Royal Astronomical Society.

*** NOTICE TO THE TRADE, WHOLESALE AGENTS AND BOOKSELLERS.—*A Contents Bill is issued with each number of the* JOURNAL, *and copies may be had on application to the Publishers.*

*** NOTICE TO ADVERTISERS.—*A Revised Tariff for advertisements in the* JOURNAL *is now in force. Blocks and copy are received subject to the approval of the Publishers, and advertisements are inserted absolutely without condition, expressed or implied as to what appears in the text portion of the paper.*

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

A CONUNDRUM.

To the Editors.

Gentlemen,—Here is a conundrum for your readers. What Shakespearian character does the "Photographic Convention of the United Kingdom represent?" If you cannot guess it, the solution will be given in your next. H. A. L.

THE LANTERN SLIDE EXCHANGE CLUB.

To the Editors.

Gentlemen,—The above club is now making preparations to start its work for the fourteenth year. There are some vacancies through removals, etc. May I be allowed to state in your columns that if any fairly good workers wish to join such a club I shall be happy to send them particulars. Subscription is 1s. a year.—Yours faithfully,

J. S. HAWKER, Secretary.

Mutley House, Plymouth.

THE R.P.S. EXHIBITION.

To the Editors.

Gentlemen,—Permit me to remind your readers that unpacked exhibits for the pictorial, scientific, and technical sections must be delivered at the New Gallery, 121, Regent Street, not later than 8 p.m. on Friday, September 12th. Exhibits sent by carrier must arrive not later than Thursday, September 11th. Copies of the prospectus and entry form may be obtained on application to the undersigned.—Yours faithfully,

A. W. W. BARTLETT, Secretary.

August 30th, 1902.

HEALTHY PHOTOGRAPHY.

To the Editors.

Gentlemen,—I have many films and plates to develop for amateurs. I find it best to use a harmless, and, as far as possible, a stainless, developer. This I find in adurol. I generally use the maker's formula, and never find any skin trouble, such as your correspondent refers to. It developes quickly, and the colour of deposit is good.

I have had forty-two years of photography and have always avoided using chemicals which injure health. One of your correspondents asks how to remove the stains of pyro. I think the best thing is a strong solution of citric acid. It also removes the stain of permanganate of potash and many others.

A stained negative can often be cleaned by taking off the varnish with methylated spirit, and then soaking it in fresh hypo, four ounces to the pint, for an hour or more.—Yours faithfully,

A. SEELEY.

Studio, Hindhead.

THE PROBLEM OF PORTRAITURE IN COLOURS.

To the Editors.

Gentlemen,—In reply to Mr. Wall's criticism of my recent article which you were so kind as to publish, concerning "Portraiture in Colours," I wish, before going into technical details, to express my regret that Mr. Wall should consider it necessary to describe my writing as "pessimistic, hasty, and ill-advised." The two last qualifications are especially objectionable to me, and I cannot help feeling that your correspondent has behaved in an ungentlemanly fashion towards me. I believe I am entitled to my opinions as much as Mr. Wall is to his, and because I express mine in a signed article, that is no reason for anyone to wax wrath thereon. My essay was necessarily very incomplete, and was written for the guidance of the rank and file alone of professional photographers, and Mr. Wall's antidote—as he is pleased to call it—in no way makes me regret my effort, rather I wish most emphatically to remark that "Quod scripsi,

scripsi." And now for Mr. Wall's technical pointers. It is a very difficult matter to make large screens of even density, and from my experience I consider small screens on optically worked glass preferable. They are then available for different size work, are easily placed in position, and are not so readily damaged.

Mr. Wall should recollect that everyone does not endorse Mr. Watkin's method of development; and so again it is, I think, a matter of personal equation. I cannot enter into a discussion on the studio question here, as I have not the space, nor can I speak from actual experience, but only from a personal theoretical hypothesis. You see, I am perfectly frank. I think, though, that 33 secs. is quite an impractical exposure for ordinary work. As regards the predominance of greys, this is, in my opinion, the weak spot in three-colour work, but, like nearly everything else in this process, it is largely a matter of personal judgment when one gets to details. I am quite aware that the carbon process has been used for positive work, but I have never yet had the good fortune to see one really fine specimen by this process. I, however, hope for a great advancement if Messrs. Fleming's new transparent ink powders are used. This particular point is though a little speculative just at present. My views and Mr. Wall's on the acceptability of photo-mechanical three-colour printing by the public are so diametrically opposed that I will not discuss them here. Mr. Wall speaks very emphatically concerning the McDonough-Joly process, and yet does not mention the conversion method adopted by Messrs. Sampolo and Brasseur. Neither did I, for the simple reason that I had already passed my boundary line of space, and had to draw up. And yet this method is quite a pretty problem, and is capable of some most interesting mathematical speculative exercises.

I, however, must now state that I absolutely refuse to answer any more criticisms on my article, in the correspondence pages of this Journal, and I can only regret that I have offended Mr. Wall, for whose experience and writings I have a great respect.—Apologising for encroaching so much on your valuable space, I am, gentlemen, yours, etc.,

A. V. Kenah.

2, Eliot Hill, Blackheath, S.E.

THE IMPERIAL DRY PLATE COMPANY, LIMITED.

To the Editors.

Gentlemen,—We shall be obliged if you will find room for the following letters in youtr Correspondence columns next week.—Thanking you in anticipation, we are, yours faithfully,

The Imperial Dry Plate Co., Ltd.

Cricklewood, London, N.W.
August 29th, 1902.

[Copy.]

The Imperial Plate Co.,

Gentlemen,—We are receiving reports from both amateurs and professional sources that the Imperial Plate Co. is to be Americanised.

We do not usually attach any importance to reports of this nature, but noting the increased frequency of the rumour, we think you should be given the opportunity of setting all doubts at rest.—Yours faithfully,

Drew and Co.

August 23rd, 1902.

[Copy.]

Messrs. Drew and Co.,
227, Borough High Street, S.E.

Dear Sirs,—We are in receipt of yours of the 23rd inst., and thank you for bringing the rumour to our notice.

We may tell you definitely that it is untrue. There have not been any negotiations, as far as concerns this company, which remains under the same control as hitherto.

We shall be pleased to know whether you will allow us to publish this correspondence in the photographic journals, as we feel that a statement affecting us so materially should have a wide and public contradiction.—Yours faithfully,

The Imperial Dry Plate Co., Ltd.

Cricklewood, London, N.W.
August 28th, 1902.

"BIBBY'S QUARTERLY" AND THE PHOTOGRAPHIC PROFESSION.

To the Editors.

Gentlemen,—Some time ago you admitted into your correspondence column a series of letters sent in by one of your readers reflecting on a letter of mine, copied and addressed to a number of the best photographers. I am not too old to learn, and I have now decided upon publishing the names of my photographic contributors, as you will see, if you refer to any council member. I have now addressed the enclosed letter to the same photographers, to whom my former letter was sent, and perhaps you may think it worth while to publish same for the benefit of all and sundry. A copy of my current quarterly accompanies this letter, and I shall be glad should you see any other faults in it, from the photographer's point of view, if you will kindly point out the same in your columns.—Sincerely,

J. Bibby.

(Copy of Letter sent to a Selection of the Best Photographers.)

Dear Sir,—Some considerable time ago we sent you the current copy of our "Bibby's Quarterly," and enclosed a letter asking if, at any time, you had any suitable photos for brightening up our literary supplement—we do not want cattle pictures—you would let us see prints, we would pay 2s. on acceptance, and 10s. 6d. on reproduction, but without *photographer's name*.

We find, however, that there is some objection amongst photographers against the publication of their work without their name appearing under the photograph, and as we have no wish to go against the wishes of our contributors, we are now altering our terms, and will pay 10s. 6d. for each photograph accepted and published, giving under each photo the name of artist, as we have done in the literary section of the current number.

Kindly note that we only want photographs for our *literary* supplement, and that our next number will be the Christmas one.—We are, your obedient servants,

Jno. Bibby.

Exchange Chambers, Liverpool.
August 29th, 1902.

"A CASE FOR THE P.P.A?"

To the Editors.

Gentlemen,—Last week I had the misfortune to lose my wife, and since that time I have received advertising matter of every description with every post. I enclose one of the kind I refer to, which offers a 24 by 19 enlargement for 8s. 6d., usual price one guinea. Is this a case for the P.P.A.?—Yours truly,

J. L. Brown.

St. Bernard's Bank, Knott End, Fleetwood.
August 27th, 1902.

[We append the circulars sent by our correspondent, who does not appear to be a member of the P.P.A. Why does he not join that body and bring his case before the committee?—Eds. B.J.P.]

Dear Sir,—We trust you will not consider we are taking a liberty in offering you our sincere condolence on your recent bereavement. Knowing, however, the value placed on a life-like portrait of one who has departed, we beg to mention that we execute life-size portraits, enlarged from any photo (no matter how old or faded), and skilfully painted in oils, water colours, or black and white, at most moderate prices. We have made this branch a speciality in our business, and have received thousands of testimonials, every one of which proves appreciation of our work.—Apologising for troubling you at such a time, and assuring our best care and attention to your kind commands, we beg to remain, yours obediently,

Elite Portrait Company.

267, High Holborn, W.C. (next door to the Inns of Court Hotel).
August 25th, 1902.

Important Notice.—To introduce our work to you we will make a black and white permanent enlargement, from any photo, no matter how old or faded, artistically mounted, measuring 24 by 19 inches, and will send it, together with original, carriage paid, to your address for 8s. 6d. complete (usual price one guinea). No money required until picture is received and approved by you. This offer is available for 14 days only. Send photograph, with your name and address, to the Elite Portrait Company, 267, High Holborn, London, W.C. Numerous testimonials. Price list for larger sizes, oil paintings, etc., post free on application.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY, 24, *Wellington-street, Strand, London, W.C.*" *Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

PHOTOGRAPHS REGISTERED :—

E. Kelley, 26, Queen Street, Newton Abbot. *Two photographs of the Rt. Revd. W. Vaughan.*
W. Harrison, Holly Bank, Onchan, Isle-of-Man. *Two photographs of King and Queen's visit to Ramsey.*
J. A. Stelling, 60, Peckham Road, S.E. *Two photographs of Dr. J. L. Campbell.*
F. W. Harrison, Holly Bank, Onchan, Isle-of-Man. *Photographs of King and Queen's visit to Douglas.*
G. A. May, Buxton Road, Bakewell. *Photograph of the Duke of Rutland.*
E. Hamilton-Toovey, 36, Royal Parade, Jersey. *Photograph of Sir. W. Laurier and two others. Photograph of Sir. W. and Lady Laurier and others. Photograph of Sir. W. Laurier.*
J. E. Reeves, 48, Hermit Road, Canning Town. *Photograph of West Ham United Football Team. Photograph of W. Linward. Photograph of J. Bigden.*
B. G. Brock, 237, Wellingborough Road, Northampton. *Photograph of the late W. Taylor.*
R. Leak, 60, South Parade, Bradford. *Photograph of Coronation Fete.*
T. W. Steven, 3, James Morrison Street, Glasgow. *Photograph entitled "Lizzie Crew."*

H. TRESS.—The initials probably stand for "J. F. Shew."

PYRO.—Write to Mr. Reginald Craigie, The Camera Club, Charing Cross Road, London, W.C.

SECTIONAL OR PORTABLE.—Your second letter did not arrive till after the answer to the first one was in type; hence the reply appeared, as it did, with your name attached.

ADDRESSES WANTED.—"COLLOTYPE" writes: "Could you kindly give me the names and addresses of the Collotype firms in Paris?"—In reply: We are sorry we do not know the names and addresses of Collotype firms in Paris. There are many Collotype firms in England, and we do not think you will get better work from France than is produced in this country.

HALF-TONE WORK.—"PROCESS" writes: "I wish to make myself acquainted with that branch of photography which deals with the reproduction of pictures from photographs, in the manner similar to the sample I enclose. Can you advise me as to what book or books to read up for this purpose, and is there any place in London where I could get practical teaching?"—In reply: A good work on the subject is "Half-Tone Process: On Zinc and Copper," by Verfasser. We should advise you to join the L.C.C. Technical School, Bolt Court, Fleet Street, E.C., for practical instruction.

BOOKS WANTED.—H. B. writes: "Would you kindly inform me which are the standard and most reliable books on (1) stereoscopic photography, (2) portrait photography, (3) general photography?"—In reply: (1) The "Stereoscope and Stereoscopical Photography," from the French of F. Drouin; or the article in the Almanac for 1900, which fully deals with the subject. (2) "The Studio and What to Do in It," H. P. Robinson. (3) "Instruction in Photography," Abney. On pp. 682-3 of the Almanac you will find a list of the principal works published on photography.

MOUNTING, ETC.—"OLD SUBSCRIBER" asks for the best method for mounting glass enamelled prints on card mounts; and mountant. "I find using warm liquid glue leaves marks when dry. What I desire to use is an adherent that does not spoil the appearance of the enamel surface."—In reply: Most of the large dealers supply an impervious paper, which, when used according to the directions given with it, enables the prints to be mounted on ordinary mounts, with any mountant, without their losing the gloss. You cannot do better than obtain some of that.

FLASHLIGHT PHOTOGRAPHY.—"TIPPERARY BOY" writes: "Will you kindly give me some little hint as to taking flashlight photographs? I intend to photograph a cave close to here. Would you recommend flashlight candles; if so, what exposure on Imperial flashlight plate?"—In reply: The flashlight candles will be very good for the purpose; but we can give no idea as to the exposure, as that must depend upon the number of lights used, their disposition, the size of the cave, the aperture of the lens, etc. Your best way will be to make one or two experimental exposures.

MOUNTING PRINTS.—J. P. S. writes: "I have purchased a considerable quantity of "mounts" from a certain German firm, but cannot get the prints to adhere. I have written to the firm, stating this fact, and they replied, advising me to use gelatine instead of starch, which for thirty years I have found effective, satisfactory, and efficient. Can you kindly advise me as to the best system?"—In reply: If the prints will not adhere with starch—though we should have thought they would, if it were used thick enough—you cannot do better than employ gelatine, as the makers of the mounts recommend. The one mountant is as good as the other, provided the gelatine is free from acid.

FLASHLIGHT PHOTOGRAPHY.—"FLASHLIGHT" writes:—"Could you tell me what is the best flash lamp made for taking 12 by 10 groups at night; for instance, dinner parties, suppers, balls, etc., and the best lens to use for such work?"—In reply: There are so many flash lamps in the market, all of which are claimed as being the best. Better consult the Almanac. You will there, in the catalogues of the different makers, be able to judge which will answer your purpose best. It is a fixed rule with us not to recommend any particular maker's goods. A rapid rectilinear or a lens of the anastigmat type that works with a large aperture is best for the purpose.

PHOTOGRAPHY AS A PROFESSION.—F. B. writes: "I am eighteen years of age, and am about to enter the photographic profession. Would you kindly inform me the best branches of the business to learn that would give me the greater remuneration after my apprenticeship, if I am skilled in such departments?"—In reply: This is a very difficult question to answer, seeing that the photographic labour market is now very much overstocked, and the future outlook is by no means hopeful. Possibly the manufacture of photographic materials offers the greatest prospect. We should advise you to seriously consider whether it will be worth your while to enter the photographic ranks at all.

COLLOTYPE.—W. R. writes: "Could you give me your advice about setting up plant for doing Collotype work? This would chiefly consist of pictorial postcards and view-books. What machinery would be required? How could I learn the process, and at what cost would I be able to put down the plant? If it could be done reasonably, I have no doubt I could make a good thing out of it. Of course, there would probably be the motive power to supply, but this could easily be done by electricity, which can conveniently be put in in this town."—In reply: We should advise you to write to Messrs. Penrose and Co., Farringdon Road, E.C., for their price-list of Collotype appliances; from that you will learn the cost of such as will suit your requirements. With regard to your learning the process, you cannot do better than join the L.C.C. Technical School, Bolt Court, E.C., unless you take private tuition.

MOUNTING PRINTS.—E. B. P. writes: "I have mounted a number of photographs in an album. Round some of these I have ruled lines with Pelican drawing ink. The prints are of various sizes, and it therefore follows that the lines round some of the smaller prints must come in contact with the face of the larger prints when the album is closed. It did not occur to me at first that the ink is a chemical compound and might therefore be harmful to the prints. Can you tell me whether there is any risk in using the ink, or whether the chemicals employed are harmless; and, in the event of there being a doubt as to the safety of this ink, can you tell me what would be safe to use? Would the liquid Indian inks sold by artists' dealers be safe, or are risky chemicals employed in their manufacture?"—In reply: Not knowing the composition of the ink named, we are quite unable to say whether it would act injuriously on the print or not. Indian ink, however, may be relied upon as being harmless.

LENS QUERIES.—"LENS" asks: "(1) Whether a Busch rapid aplanat, f/8, angle 75deg., is superior in every way to the ordinary good make rapid rectilinear lens. I cannot afford the higher-priced anastigmats. (2) Can same be used with a larger stop for general work than the rectilinear, and has it a flatter field? (3) Would you recommend this lens in preference to purchasing an ordinary good rectilinear lens. (4) Would the said Busch lens be more rapid with same stop in comparison with the rectilinear? (5) Can I be sure of obtaining this year's "B. J. P." Almanac through Smith's Bookstall?"—In reply: (1) As we have frequently said before, it is quite against our rule to pass an opinion on the comparative merits of different makers' goods. (2) Much will depend upon the quality of what you term "a good make rapid rectilinear." (3) See Answer (1). (4) No; each would have the same rapidity. (5) We cannot say. Better make inquiry at the bookstall. It was out of print as soon as it was published. Possibly Smith's may have a copy left.

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*** *The Editor can only be seen by appointment.*

*** *We do not undertake to answer letters by post.*

THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC FOR 1903.

Edited by Thomas Bedding, F.R.P.S.

The forty-second annual issue of The British Journal Photographic Almanac will be published early in December next. This year's Almanac reached a total of 1,560 pages, and the entire edition of 20,500 copies was sold out a fortnight before publication. Of no other photographic book ever issued can two such unique facts be recorded.

The edition for 1903 will be increased to 25,000 copies, a large number of which are already ordered.

The striking favour with which past Almanacs have been received is the surest proof that the lines upon which the publication is produced meet the requirements of its readers and supporters. Upon such lines we propose compiling the volume for 1903. At the same time, we shall be pleased to receive and consider suggestions for increasing the value of the Almanac in directions which may occur to our readers as susceptible of improvement.

The Almanac for 1903 will appeal to photographers all the world over as a daily reference guide in practical work. The standard matter and formulæ will be revised and added to where necessary, and the latest departures in theory and practice will be chronicled. The year's advances will be recorded, and wherever practicable new features of an informative nature will be added.

Secretaries of societies will oblige us by promptly forwarding lists of officers and other details for inclusion in the directory of photographic societies. We shall also be glad to receive any additions that may be made to the list of telegraphic addresses of the trade, etc. As usual, a section of the Almanac will be devoted to notices of the latest introductions in photographic apparatus, etc. Those firms who wish to take advantage of this feature should communicate with us not later than Ocober 31.

The publishers ask us to remind advertisers that many of the advertisement pages of the Almanac are already booked, and that, to ensure insertion and good positions, orders and copy should reach them without delay.

EX CATHEDRA.

A Time-Honoured "Par."

The "three-colour process," whether in lithography or in the ingenious Joly system, has rather taken the wind out of the sails of the newspaper paragraphists, who, in intervals of about eighteen months, have for the last thirty years announced the solution of the problem of photographing in natural colours; but he is irrepressible—we might almost say eternal. This is what he has last told us in the columns of the "Daily Chronicle" in a letter from its Geneva correspondent:—"A Swiss amateur photographer, M. Adolphe Gartner, residing at Berne" (it is best to be particular as to details) "has discovered the secret of colour photography, after a number of years of experiments. The inventor takes his photographs on glass porcelain and paper, and in any colour, the best results, however, being obtained from blue, red, and yellow. His productions on glass are veritable pictures, being true to nature in every detail. The secret lies in the 'bath,' and in the developing process, for the photographs are taken with an ordinary camera." This is very circumstantial. It is well, for example, to know that it is not in the fixing solution, nor the varnishing that the secret method comes in.

* * *

Camphor Subs and Photography.

The connection between camphor and photography is not, at first sight, obvious; yet we are credibly informed that the requirements of photographic technics have been such as to influence the market price of that interesting product. It is true that the native method of obtaining it, which involves the cutting down of the camphor tree, must lead to its gradual extermination, and consequent rise in price, yet if the information conveyed to us be correct, the amount of camphor (which is a vegetable pro-

duct of comparatively limited production) required in the manufacture of celluloid is so extensive that it has raised the price above what it averaged in the days when celluloid was a commercial product of no great importance. What it means nowadays in photography our readers do not need to be told. There are, of course, other and minor uses to which camphor is applied; for example, in the making of varnishes the addition of camphor aids in the solubility of certain resins, and again it possesses the remarkable property of greatly increasing the amount of bichloride of mercury that can be dissolved in spirit of wine. This, however, would not be of practical use in intensifying, as the camphor would be thrown down upon the addition of water, and fill the liquid with flocks. This substance possesses considerable chemical interest, and forms one of the list of vegetable bodies which chemists are trying to replace by artificially-formed substitutes. According to "La Nature," practical success has attended the experiments, and M. E. Callemberg, of Lank-on-Rhine, is now making on commercial lines pure hydrochlorate of terebinth, or artificial camphor. A curious property of this new product is its power of dissolving gun-cotton when dissolved in nitro-glycerine, though we imagine that there is little danger of the time-honoured collodion being displaced by this novel gun-cotton solution.

* * *

Other Uses of Collodion.

As we have just said, there is little danger of the solution of gun-cotton known to photographers as collodion, being replaced by a nitro-glycerine-and-artificial-camphor solution. All old wet-plate workers are familiar with the tough membranous-looking substance produced when a collodion-coated plate is soaked in water, but few of them are aware that the same product is made in a different manner and spun into an artificial silk, and on such a scale that there is a large manufactory devoted entirely to its production. There is, however, a possibility that preparation of gun-cotton in its turn may be displaced, for, as explained in an article in the "Lancet," an important step has been taken in the production of synthetic silk. *En passant*, our readers may be reminded that a collodion made from silk has been proposed—a solution in either ammoniacal solution of cupric oxide or of nickel oxide; it is not precipitated therefrom by alkaline salts, sugar, nor gum. What has been produced by synthesis is not actually silk, but the constituent to which it owes most of its properties—the sericine, or rather its derivative by hydrolisis sericine, that has been made. Sericine constituts about 70 per cent. of the natural article. Speaking of the replacement of the natural article by artificially-produced substitutes, the "Lancet" humorously remarks, "It is just possible that in the near future it will be no uncommon experience to hear in the shops a customer precise in his demand for either the synthetic or natural article in accordance with his choice."

* * *

American Import Duties on Works of Art.

Many of our readers are possibly unaware that there is a heavy customs duty on works of art as they enter the United States from Europe. For example, if, say, a photogravure picture enters America it has to pay, whatever its value, an *ad valorem* duty upon it which is pretty high, and, what is worse for Europeans, it may be copied without let or hindrance, as there is no copyright in America, unless the work is actually produced there—that is to say, the photogravure is printed there. Now, when paintings of great value are imported the import duty becomes a very serious item. We read in the "Daily Telegraph" that an organisation of wealthy art lovers is in progress of formation to secure the repeal of the customs tax on pictures. Mr. C. T. Yerkes, speaking recently on the subject, is reported to have mentioned the name of Mr. Pierpoint Morgan, and said that both of them have valuable paintings stored in Europe, which they will not import into America because of the duty exacted by the United States. It is pretty well known through the daily Press that wealthy Americans have, of late years, been purchasing paintings here at almost fabulous prices, and that a proposal has been made for prohibiting the best pictures here from leaving the country, as is the case in some Continental countries. Until that is done, many at home will desire that the American customs tax will remain unrepealed. When it is considered that the import duty is so very high, it must be a very considerable addition to the price actually paid for the pictures, and thus restrain purchases, except by veritable millionaires. Until there is some legislation for prohibiting the works of old masters from leaving this country that does not possess many of them, it is to be hoped that the United States duty will remain as it is.

* * *

The Dark-room Bench.

In too many cases we are afraid the dark-room bench is anything but what it ought to be, and we have found it ere now moist with developer stains, which too readily adhere to the hands, or the bottoms of measures, and even sometimes we have seen a fine crop of hypo crystals showing. If covered with linoleum, they are for a time decent in appearance, but the damp and the alkaline solutions soon attack the structure of the linoleum, and it will rub up to a fine powder, which has a happy knack of adhering to everything. Zinc is readily attacked by spilt fixing solution, and soon becomes riddled with holes. Lead is the only satisfactory metal to use as a covering, but any metal is apt to try the strength of dishes and measures. Common paint, or even bath enamel, will not stand repeated and long soakings with alkaline splashes. M. Clerc in "La Photographie Française," one of the best of our French contemporaries, now states that, having experimented for several years in the chemical laboratories of the Faculté des Sciences de Paris, he has finally adopted the following treatment with every satisfaction; the following solutions must be prepared:—

A.

Sulphate of copper	125 g.
Chlorate of potash	75 g.
Bichromate of potash	50 g.
Water to	1000 cc.

B.

Aniline hydrochloride	150 g.
Water to	1000 cc.

The solutions should be heated to boiling point, and A. is liberally brushed over the bench and allowed to dry, and then B. is applied and allowed to dry. A crop of crystals will appear as soon as the wood is dry, and these must be brushed off, and again successive coats of A. and B. applied as before. This treatment gives a deep greenish colouration to the wood, and if treated with boiled linseed oil or a thick paste of hard paraffin and vaseline, it will be quite impervious to water. The whole operation will only take about four hours, and it should be left for this time to dry thoroughly before use.

ollodion legatives nd Their tability.

At one of the recent meetings of the London and Provincial Photographic Association some negatives by the wet collodion process were shown that were aid to have been made in 1852. If this date be correct iese negatives were made when the wet collodion process or negatives was, commercially, almost in embryo, for it as not until two or three years later that it came into eneral use for negatives, although it did for glass positives. upposing the date to be correct, these negatives were robably developed with pyrogallic acid, for it was not ll some years after that iron was used for the purpose, hough it was the universal developer for positives. The ajority of the pyro-developed negatives were very dense, nd took a long time to print, not because they were tained, as many of the pyro-developed gelatine ones are, ecause the shadows were represented by clear glass. The ng printing was necessary by reason of the density of the mage itself; great density then being considered an ssential to a good negative. Mention was made by one f the members of some collodion negatives he had seen, ver which a curious stain has appeared, and the negatives eemed denser than they were originally, and the same ood quality of prints was got from them as when they ere first made. We have seen many hundreds of nega- ves that were made in the early da--- of the process, but ave not seen any that have become stained. It is quite onceivable, however, that if they were fixed, or incom- letely fixed, with hypo, and insufficiently washed, they ight, possibly, become deteriorated, though we have ever seen any example. The majority of collodion egatives produced by professionals were then, as ow, fixed with cyanide. Its action was quicker, and it as more quickly washed out of the film than is the case ith the hyposulphite of soda. It has, at times, been sserted that collodion negatives become denser with age, ut we very much question if this is the fact. The image f a wet collodion negative, developed with iron, is different om that in a gelatine one. It consists of metallic silver nly in a thin film of quite inert material, and, if that is arnished, the air can have no access to the metal to alter s colour or its condition. By comparison with modern elatine negatives, the old collodion ones do seem very ense, and many may surmise that they were not made so n the first instance, or they would never have yielded good rints. They certainly, many of them, will not on gelatine apers, and that may have given rise to the supposition. ut it must be borne in mind that they were not made for iese papers, but for albumen—the only paper then in ogue—and that was strongly salted and also strongly ensitised to suit them—very different conditions from those xisting in the present day P.O.P.'s.

It was announced, last week, that a new comet has been discovered by Mr. C. D. Perrine, the Assistant Astronomer at the Lick Observatory, Mount Hamilton, California. The comet is only of the ninth magnitude, and is situated in the Constellation of Perseus, its R.A. and N. Dec., at fteen minutes after noon, Greenwich time, being: R.A. 3hr. 17min. 0sec., decl. 34 degrees, 38 seconds. It is thus visible practically hroughout the whole night in this latitude, being low down in the north- ast at sunset, and crossing the meridian 17 degrees south of the zenith bout half past four in the morning. Since the announcement of its iscovery the comet has been photographed at the Royal Observatory, reenwich. The observations there confirm the reported faintness of the bject, and comparison with the figures given with the observation at ick shows that it is moving in the direction of decreasing right ascension t the rate of rather more than a minute of time, and northward about 2 minutes of arc per day. Although the comet is so long visible after ark, it is so feeble in light—being only of the ninth magnitude—that it an only be seen telescopically, and can only be photographed by suitable stronomical appliances. Hence there is no chance of the new comet eing photographed with ordinary apparatus.

UPON DRYING NEGATIVES AND DRYING MARKS.

That a few remarks on this topic will not be out of place could be proved, if it were necessary, by an incident that occurred not very long ago at a meeting of the L.P.P.A., when a discussion took place as to whether a negative was darker or lighter when wet than when dry. There was by no means a unanimity of opinion on the subject. The question of negatives wet and negatives dry was evidently too simple a one to engage the attention of the bulk of those engaged in more important investigations. Yet the drying of negatives being a necessity, it were well to be acquainted with all its possible vagaries. As a concrete example, we may refer to a mistake that no old wet-plate workers are likely to make, though it is by no means uncommon among amateurs—the setting a wet negative to dry, or even to rest, for a moment upon a shelf or ledge not free from dust. The surface tension of the liquid causes particles of the dust to be carried up and deposited all over the surface, to leave spots, roughness, or smears sufficient to considerably mar its perfection. This is one of many common causes of spoiled negatives, and we will briefly allude to others following the course of its progress from developer to drying rack.

Before a negative is put up to dry it must, of course, first be washed. If it be not sufficiently washed, one of two things will follow: either the hypo will dry in visible flat crystals, injuring the film where they form, or else the hypo left in will cause the film to remain soft, and eventually lead to its darkening or staining and to the causing of stains upon the paper when put out to print. These markings on the negative may not appear at first, but are bound to show sooner or later; if later, then the negative may probably be ruined beyond recall. Hence proper drying involves proper washing.

Before a plate is put up to dry there are several points to be attended to, and where (as ought always to be the case) the negative is intended to be afterwards varnished they are of prime importance. In the first case, it is to be observed that a negative placed upright in a trough to be washed may remain without injury for ten times as long a period as would be permissible if it were placed horizontally under a tap from a water-main. Virtually, all tap water contains a greater or less proportion of suspended particles, and these, as the tap water flows over the plate, are deposited on the film, in the case of the horizontally placed, but pass over without adhering to those vertically disposed in a trough. This very simple matter is little known, but the deposited particles are painfully evident when the plate comes to be varnished. A piece of flannel tied over the tap forms an excellent filter. Then, again, now that backed plates are so much used, it will be observed in the case of a backing composed of a powder pigment such as sienna, lamp-black, etc., rather than a soluble substance such as caramel, the powder is very apt to deposit a thin adherent film, either in the developer or the fixing, and before the plate is put up to dry this must be carefully removed by gentle friction with a pad of cotton wool, or otherwise the dried negative will have a film stained in places where the untouched deposited pigment lay, but clear in patches where any handling of the film had taken place, and so removed the coloured surface stain. We have here the explanation of many an undiscovered cause of stained negatives. There is, further, to be considered the kind of water available for the washing. Some waters contain a large amount of dissolved solids, such, for example, as carbonate of calcium, hence when the negative is dry the dissolved matter remains in or upon the surface of the film, and leads to the forma-

tion of mottled or other drying marks. When this state of the water is known the negatives should have a final washing with distilled or rain water. Especially is such a treatment indicated in the case of certain popular films. They have such a repellent surface as though they had been subjected to the action of formaline vapour, that they should always, before putting in the drying rack, be blotted with fluffless porous paper, to remove the surface moisture which otherwise would dry in clots or patches, and lead to irremediably stained negatives. An exception to this principle of action occurs with rollable films, with which it is desirable to add to, instead of taking from, the final washing water. Such films should be immersed for a time in a 1 or 2 per cent. solution of glycerine in distilled water. When dried after this treatment they remain limp and comparatively flat, instead of drying up into quills, as they do if not so treated, causing infinite trouble to print from.

Coming now to the actual drying itself, so long as the plates are kept free from dust or from standing on dusty supports, there is little to be said, beyond giving the caution that it must be regularly done. For example, if a negative, before taking from the rack, prove to be nearly, but not quite, dry, it must be replaced to finish drying, and on no account be heated at the fire to expedite the operation, as such treatment would inevitably result in a dark patch, the last quickly-dried portion coming up decidedly darker than the rest. Further, if the whole film be surface-dry only, the result of finishing it off before the fire will be to produce an insensible partial melting, all the margins of the various objects especially losing their crispness and becoming surrounded by a decidedly marked outline. This aspect of the subject leads to a consideration of the print we first mentioned. Is the negative denser or paler when dried than when wet? Unless under exceptional circumstances the negative upon drying becomes darker, and when varnished the opacity is slightly reduced. We may conclude by referring to a very interesting aspect of this point. Negatives are occasionally marked by splashes of water from the sink, for example, or through raindrops being carelessly allowed to fall upon them. When dry these marks are light, with dark margins, and if present in quantity appear to irretrievably ruin the negative. Yet such is not the case. A complete cure is usually brought about by soaking the maculate plate in water for some time. The effect is remarkable; every trace of the spots will have vanished, and the negative is restored to its pristine excellence.

DISCURSIVE NOTES ON ALBUMENISED PAPER.

At some of the recent meetings of one of the London Societies the merits of albumenised paper has come under discussion, and the reason why it is so little used by amateurs now. There can be no question that gelatine papers have, during the past few years, very largely supplanted albumen, not only amongst amateurs, but amongst professionals as well, though many of the latter who use it freely admit that prints on albumen paper are superior to those on gelatine, still they do not employ it. On the other hand, some professionals still use it for their general work, but many of those purchase the paper ready sensitised for the reason that it saves the trouble of sensitising, and also that it keeps longer than that of home sensitising, both before and after printing, as the latter only remains good, as ordinarily kept, for a day or two in hot weather.

There are, however, some professional photographers with whom trouble is a secondary consideration to the quality of their productions, who still continue to sensitise their own paper, and there is no question that for some tones, such, for example, as the purples, the paper of home sensitising is preferable to that purchased ready sensitised. Paper of home sensitising also tones more readily than, as a rule, do those purchased ready sensitised, though it should be mentioned that there are exceptions even to that rule, for some of them do tone as readily—or nearly so—as the others. Even with the paper of home sensitising the deep rich purple blacks that were so much in vogue some thirty years ago, and which are much sought after by some now, are not easily obtainable, even with negatives of vigorous character, and the paper is sensitised on a strong silver solution—the essentials for securing these tones. It may therefore be as well to explain the reason why.

At the time to which we refer the papers were, comparatively, but slightly albumenised. The albumen was then, often, diluted with water. Now in the commercial papers it is used undiluted, and, more often than not, concentrated by evaporation, or dried albumen is added to it so as to obtain the highest possible gloss. Furthermore, with these papers they are not so highly salted as were those of the old type, which require a stronger silver solution for their sensitising than is required, or even desirable, now. It may be explained that with these thickly albumenised papers the image is mostly confined to the albumen, whereas with the less highly glazed ones it was, to an extent, in the paper itself.

Having pointed out the difference betwen the albumen papers of the olden times and those of the present day, we will now consider the working of what is, commercially, available now, as we must deal with them as we find them on the market, for no one nowadays thinks of albumenising his own. First the sensitising of them by the user. On this point we are often consulted by printers, whose only experience in their work has been with gelatine papers, when they have taken an engagement where albumen paper is used, and it is sensitised on the premises. It used to be said that the sensitising bath should contain from seven to eight times the amount of nitrate of silver that the paper contained chloride, supposing that be chloride of ammonium or an equivalent in other chlorides. Now, as nearly the whole, if not actually the whole, of albumen papers obtainable at the present time are prepared on the Continent, the user has no means of learning the proportion of chloride it contains—or what chloride it is. For this reason he had best sensitise the paper according to the formula supplied with it by the makers. If, when the paper has been sensitised according to that formula, and dried, it be kept between sheets of blotting paper that has been moistened with a solution of carbonate of soda, and dried, as first suggested by the late Mr. William Bedford, it will keep for a week or more without deterioration. All home sensitised albumen papers require to be toned the day, or the day after, they are printed, otherwise the whites will suffer. This is one of the drawbacks of it as compared with the ready sensitised papers.

We will now consider the ready sensitised papers. It was said, at the meetings above referred to, that there was a difficulty in amateurs getting the paper, as many of the dealers did not stock it, because it did not keep as other papers did. Well, it certainly does not keep so well as bromide, or even gelatine P. O. P.'s do, but still it keeps for a long time, and some brands keep for a much longer time than others. We surmise that the reason it is often not stocked by some dealers is because they have but little

demand for it as compared with the demand for gelatine papers. We have just mentioned that the whole, or nearly the whole, of the paper is albumenised abroad, and we may add that much of it is now sensitised there. But there are many firms that sensitise it here, and from them it may be had either in small, or large, quantities, with the assurance of having it freshly prepared. There is one advantage in the ready sensitised paper, beyond their keeping qualities, that may be referred to here. It yields prints of greater vigour from weak negatives than does that of home sensitising, which makes it better for the class of negative that is now so generally made.

All these papers are strongly acid, as citric, or other organic acid, is the preservative, and it is this that confers the greater vigour in the prints from these negatives. This acid retards the toning, and unless it is removed the toning will proceed but slowly, and then often not beyond the red, or red brown stage without mealiness. It is a good plan with these papers, when the silver has been washed out prior to toning, to pass the prints through a very dilute solution of common washing soda, and then give them another rince in water. They will then tone more readily, and take a deeper tint than they would otherwise do. If the prints were always treated in this way we should hear less of the difficulty in toning ready sensitised papers, though some, it should be mentioned, do not require that treatment. Albumen paper is not yet extinct amongst the better class of professionals, or the more artistic amateurs, for there is no question that the results upon it are far more artistic than are those on the garish gelatine P.O.P. papers, to say nothing of their probable greater stability when carefully produced.

A PHOTOGRAPHIC HERO.

Mark Surtees is a photographer, and Mr. Charles Marriott has made him the hero of "Love with Honour." The story opens in the bedroom occupied by Mark and his fellow-assistant, Hermann Fischer, and it is the dawn of the day which releases Mark from his apprenticeship to a provincial photographer named Rangeworthy. During his apprenticeship Mark has been imbibing other ideas than those which appertain to photography; he has come to the conclusion that "our ideas of happiness are all wrong," that "the art of living consists in doing without;" and his resolve is fixed on demonstrating the "folly of civilisation," and on preaching the "gospel of bread, water, and the blue sky."

During the days of Mark's apprenticeship the interest on the thirteen hundred pounds left him by his father has been paid to Rangeworthy as compensation for his tuition in taking negatives, retouching, and finishing enlargements; but now that his indentures had expired he proposed to utilise that forty pounds a year in another way. It would find him in food and shelter while he tramped the country and learnt from Nature at first hand.

As a preliminary to diverting the interest on his capital to new uses, Mark sought an interview with Anthony Pembridge, lawyer and guardian. It was to this worthy man Mark owed his apprenticeship to Rangeworthy; Pembridge had been guided in his choice by "Mark's fondness for pictures and his own general desire for a gentlemanly occupation." Pembridge held exalted notions of photography as "a profession nearly allied to the Fine Arts," and when visited by his youthful client he, without waiting for an expression of Mark's intentions, effusively called for a bottle of his best port that he might drink success to "Mark Surtees, photographer." But his respect for photography as a profession was either only skin deep or merely inspired by admiration for his own wisdom in selecting that occupation for his client, for, on Mark protesting that he did not think he had any real vocation for photography, Mr. Pembridge ejaculated: "Vocation? Fiddlesticks!" It was all very well to talk of vocation in connection with the Church or the Law. "But photography? Pooh! Who needs a vocation for shoemaking?"

Despite his lawyer's sudden depreciation of the profession "nearly allied to the Fine Arts," Mark stuck to his guns. "The fact is," he said, "I have come to consider photography, as it is practised, rather a sham. My work, though it isn't work, really, makes me feel artificial, almost dishonest." So Mark wins his way, and henceforth Pembridge will forward to him, in whatever part of the country he may be, his forty pounds a year in quarterly instalments.

But Mark Surtees was not to be so easily released from the thraldom of the camera. For a time all went well, and presently his peregrinations brought him to the lovely village of Charlcote, in Somersetshire. Various reasons, chief among which was the unsuspected magnetism of Laura Dampier, prompted a long halt here, and Mark took lodgings with one of the villagers. His forty pounds a year are ample for all the requirements of rural life. Suddenly, however, comes a message from Pembridge of the failure of the mines in which his capital is invested, and Mark is faced with the necessity of seeking a source of income elsewhere.

Photography's opportunity had dawned again. In his perplexity Mark wrote for advice to his old fellow-assistant, Hermann Fischer, now settled in London with a studio of his own. Hermann's reply was an offer of work. Would Mark care to supply him with landscape negatives? There seemed to be a demand for large work in platinum and carbon. Hermann said that his present circumstances did not allow him to offer a very good salary, say, twenty-five shillings a week, but that there was every reason to suppose the thing would grow. If Mark liked the idea he could carry it out without interference to his mode of living. Hermann would, of course, supply apparatus and materials, but he suggested the advisability of Mark finding a fixed headquarters where he could develop his negatives, etc. Mark's reply is interesting not only as showing how accurate Mr. Marriott's knowledge of camera work is, but also as containing hints useful to other photographers than heroes in novels.

"If you are disposed to give me a free hand," he wrote, "I'll not only satisfy you, but enjoy myself into the bargain. If, on the other hand, you want me to do the stale old tricks over again, I may as well say at once that I prefer stone-breaking. I am only just beginning to know how rotten the ordinary landscape photograph is, and I see that the fault is not with the medium, but the method. As a matter of fact, I don't remember that there are any landscape photographs in existence except local 'views' and the faked 'art photographs' of exhibitions. Let us come to an understanding upon that question. With your permission we'll have no trick printing, no stock skies or clouds put in with cotton wool on the negative. I propose an honest photographic record of the thing as it happens. There's a lot of material about here, and I don't think I could do better than exhaust this district first, and so save the expense of hiring conveyances to take my traps about. That brings up the question of tools. I should prefer to work whole-plates with a single landscape lens. I think you will agree with me that this avoids the more aggressive vices of the machine. At any rate, it keeps one from Zolaism and the wide-angle; also the size does away with the temptation to enlarge. If you'll take my advice, you won't print anything bigger than you can get direct from the negative, and stick to

platinum and carbon. Let me know what you think; write at once, as I am anxious to get to work; the more I think of the idea the better I like it. Terms you offer will suit me very well."

Waiving the question as to how far Laura Dampier was the unconscious cause of the desire to "exhaust" that district first, we have now to think of Mark Surtees as hard at work at Charlcote in amassing negatives giving a "photographic record of the thing as it happens." Here is an outline of his methods:—

"After a feverish hunt for subjects, ending in failure, he had finally escaped from the obsession of the picturesque, and settled down to a pursuit of conditions rather than of things. He lay in wait for hours to catch the right mood of the weather; a silhouette of pine tops, while all else was drowned in pale vapour; a drift of shadow against the hillside; the delicate veining of light and shade in a distance—little problems overlooked by a hundred for one who responded."

That Mr. Marriott's knowledge of photographic craft is not a matter of mere cramming is evident from the delightful manner in which he uses the art as a storehouse of metaphors by which to help his story along. Mark was watched at his work by Mrs. Winscombe, the widow with whom he had taken lodgings, and who was more keenly interested in Laura Dampier than Mark knew.

"That is beautiful," said Mrs. Winscombe suddenly, as Mark, with brown, dripping fingers, held up a negative in the doorway, scowling the while.

"Is it?" he laughed; "I call it beastly flat."

"Oh, I don't mean the picture, but what you said about over-exposure. The plate is dull and flat because the camera has looked too long on what you were taking, isn't it? Don't you think that explains why folks don't get a very clear idea of what is always before their eyes? I should like to know whether the opposite is true; when a picture is under-exposed are the dark parts very dark and the light parts very light?"

"Yes; the contrasts are exaggerated."

"Do I tire you?" asked Mrs. Winscombe, twisting her apron nervously.

"By no means; you interest me."

"Well, isn't an under-exposed negative exactly like a hasty judgment? If one waited a little while, one would be able to make excuses for people because one would understand."

"One could fill in the half-tones, so to speak," said Mark, falling into the trap.

"I suppose that is what I mean," she answered; then, smiling in an embarrassed way, she added, "I cannot abide that you should misjudge one that I love."

Of course, Mrs. Winscombe was thinking of Laura Dampier. Her woman's instinct had taught her that these two were mated for each other. But Mark had not thought of Laura in that light. How should he? Although his father had been a clergyman of the Church of England, yet he was a mere photographer, and Laura was the daughter of an officer of aristocratic connections. So Mark went on with his photographic work, and allowed destiny to mould the events which were in the end to bring Laura to his side.

By and by Mark moved on from Charlcote to another district, to the estuary of the Severn, in fact, and the photographic reader of his story will find something to arrest him in Mark's method of regarding the subjects he found there for his camera.

"There was not only that he set out to do, the purfled ribbons of river, the sleek sand, the faint hills; but full in his eyes, above little thickets isled in vapour, the breast-like eminence topped by Newbury Church. This eastern view must be caught quickly, before the sun shouldered up from his ambush behind the tump; and Mark thanked his foresight in arranging backed plates overnight. It was all a matter of vivid sky line, and here the photograph, like the sonnet, is 'a moment's monument.'

"The tone problems of the river bed were for leisurely consideration, and Mark selected his points of view with fastidious care. After exposing half a dozen plates, he decided to wait until sun and mist allowed an outline of the hermit's island—or, rather, peninsula—far away down-stream on the opposite shore. While he waited he mentally licked his lips over the subject; broad flat reaches of half-toned mud and flashing pools, narrowing up to one exquisite inch of conflict where water-line, cloud, and point came together."

But how, the utilitarian reader will be asking—how does all this pan out from the commercial side? Given a man with Mark's temperament, this was an ideal life for him, no doubt; but Hermann, the practical man at the other end—what of him? Mark himself thinks he would like to know, and when he visits his old chum's studio in London for the purpose of finding out, this is how Hermann greets him, after placing in his hand a delicately got up oblong folio containing exquisite reproductions of his own photographs:—

"I'm not an oversanguine person, as you know, but, unless I am mistaken, the thing is going to pay hand over fist'; it has caught on like beeswax. Without exaggeration, I believe Watters and Pike are willing to give us a commission to do the whole country in the same series. All they stipulate is that the negatives shall not be used for any other purpose. The two dozen they have used I selected out of what you sent me; I have already done very good business with single prints, and it was this that put the idea into my head. People don't care to frame photographs for their walls, but they are glad to have a book for the drawing-room table. I talked it over with Watters and Pike, and they agreed to stand the expense of canvassing and printing a prospectus with reduced specimen plates. They had a thousand subscribed for in a very short time, and went ahead. It's the price, you see; we get the public that won't have the ordinary book of 'views' because everybody has them."

It is not necessary to follow the fortunes of Mark Surtees beyond this point. What must be obvious is that Mr. Marriott has introduced photography into literature. That there are in this story of "Love with Honour" ideas of educational worth to the photographer will be evident from the extracts given above, but the chief value of the book lies in the fact that, for the first time in the history of fiction, the art of the camera has been worthily, and with knowledge, lifted into the realm of imagination.

H. C. Shelley.

THE LAW RELATING TO THE SALE OF POISONS.

[Paper read at the Annual Congress of the Royal Institute of Public Health, Exeter, Tuesday, August 26, 1902, and reprinted from the Pharmaceutical Journal."]

It has been said that the only true functions of Government were the maintenance of order at home and security abroad. The growth of the power of the State shows that a very liberal interpretation is given to the term "order at home." It is not many hundreds of years since the State was powerless to do anything at home beyond the most crude attempts at the maintenance of the King's peace. The Government of an undeveloped community was not strong enough to interfere in the private quarrels let alone the private commercial relationships of individuals. As civilisation advanced it became the business of the State to protect the lives and property of its subjects, and with that advance came the power to effectively enforce rules governing the conduct of individuals.

During the last century the growth of the power of the State in this direction was exceedingly rapid, and this is seen not only in the amount of domestic legislation but in the increase of administrative interference. We have learnt that the State must assist the higher motives which make men careful as to health, morals, and mental improvement. We now act upon the principle that the physical and moral well-being of the individual are matters within the province of the State. The Government interferes not only to protect those who are unable to protect themselves, such as children against employers or even parents, but has also protected those presumably who would take care of themselves. There is scarcely a commercial transaction or even a private act of the individual to which some rule enforced by Government does not apply. The Sale of Goods Act, Merchandise Marks Act, Sale of Food and Drugs Acts, Weights and Measures Acts, are important examples of the interference of the State in matters apparently only affecting the actual parties to a contract. I may so trust my baker that I consider he is wasting my time and his by weighing my half-quartern loaf, but the State does not leave that matter to the joint discretion of myself and the baker. It orders him to weigh it. If I want to build a house for my own residence on my own land you say I must build it so as to satisfy the local State-created authority that it is a safe house for me to inhabit. If I go into most of the many towns represented at this Congress I cannot bargain with the first man I meet for the hire of a cab. However much I may be impressed with the appearance of the man as a safe driver, or of his vehicle as a suitable conveyance, even if I am a coach-builder, I must not trust to my unaided judgment. The State considers my life of too much value to it to allow of my engaging with anybody but a licensed driver, or for anything but a vehicle which has been examined by a public servant and stamped with the mark of his approval.

It is not surprising then to find that a State which so nurses its subjects has had something to say about the sale of poisons. The Legislature first dealt with the sale of arsenic by a short Act, passed in 1851, which is still in force. It provides that every sale of "arsenic," which includes arsenious acid and the arsenites, arsenic acid and the arseniates, and all other colourless preparations of arsenic, shall be registered so as to give the date, name, and address of the purchaser, and his occupation, the quantity sold, and the purpose for which it is required. It is not to be sold to a person unknown to the seller, except in the presence of a witness known to both seller and purchaser, and the buyer must be of full age. It has to be coloured with soot or indigo unless the purchaser represents that such colouring would render it unfit for the purpose for which it was purchased. Arsenic dispensed in accordance with the prescription of a registered medical man is exempt from the provisions of the Act.

It may be well to mention here two Acts dealing with the sale and use of poisoned grain and the use of poisoned flesh.

The Poisoned Grain Prohibition Act, 1863, prohibited the sale of grain, seed, or meal dipped in or mixed with poison. It also imposed a penalty for wilfully sowing or placing such grain on any ground or exposed place. The selling or use of any solution or material for dressing seed for bona-fide use in agriculture was expressly allowed.

The Poisoned Flesh Prohibition Act, passed a year later, prohibited the use of poisoned flesh, though it allows the occupier of a house or owner of a rick to put down poisoned meat for the destruction of rats or other small vermin, provided the flesh is so placed as to be inaccessible to dogs.

Before 1868 there were numerous attempts at legislation regulating the sale of poisons, instigated largely as the result of notorious poisoning cases. The Pharmaceutical Society, founded in 1841, and incorporated by Royal Charter in 1843, for the purpose of advancing chemistry and pharmacy, of promoting a uniform system of education for pharmacists, and for the protection of those who carry on the business of a chemist and druggist, produced a draft Bill in 1847. It would have prohibited anyone exercising the business of a chemist and druggist, or dispensing for sale or gain any prescription of a medical man, or using any title implying registration under the Act unless he was a registered chemist. It contained exemptions in favour of qualified medical men, vendors of simple and uncompounded drugs, patent medicines, and horse and cattle medicines. A Bill instituted by Mr. Wakley, the founder of the "Lancet," dealing with the medical profession, was at this time referred to a committee. It contained a clause prohibiting the sale by retail of certain poisons except by licensed chemists and druggists. Nothing came of either of these Bills. In 1850 Mr. Jacob Bell, the founder of the Pharmaceutical Society, obtained a seat in Parliament, and in 1851 introduced a Pharmacy Bill. It did not propose to restrict the selling and dispensing of medicines to registered chemists, but to prevent the use of any title denoting a vendor or dispenser of medicines. It was referred to a Select Committee, and was passed after such alterations as left the business and title of chemist and druggist, and the sale of poisons, open to anyone without restrictions. It, however, secured the protection of the title pharmaceutical chemist.

In 1857 the Government introduced a Bill. Its effect would have been to have repealed the Arsenic Act, and to apply its provisions to a large number of dangerous substances. It also proposed that the purchaser should produce a certificate signed by the clergyman of the parish, medical practitioner, or a justice of the peace, stating that he was known to the person signing the certificate, and that he might be trusted with the poison. Packets containing poisons were to be wrapped in tinfoil as well as paper, and bottles were to have the word "Poison" moulded upon them. Vendors of poisons had to keep them in certain vessels and under lock and key. The fine for infringement was to be £20, and for a second offence the defendant was to be prohibited for ever from selling poisons or carrying on the business of a chemist and druggist. It was referred to a Select Committee of the House of Lords, who, recognising the all-important principle that the training and qualification of the keeper and seller of poisons is essential to the safety of the public, recommended clauses restricting the sale of poisons to medical practitioners or vendors licensed after examination. The examiners were to be authorised to enter and search any shop where poisons were stored, and see that the regulations as to storage were carried out. The Government re-introduced the Bill in the following session, but Lord Palmerston was defeated and resigned before the Bill was discussed. Lord Derby, the succeeding Premier, produced a Bill on very similar lines. It passed the House of Lords, but met with such strong opposition from chemists, headed by the Pharmaceutical Society, that it was withdrawn when in 1858 it reached the Commons.

At the end of 1858 a druggist in Bradford supplied a confectioner with arsenic in mistake for "daff," a sulphate of lime. The confectioner used the arsenic in the manufacture of peppermint lozenges, which were sold in the market. Twenty persons were killed, and over 200 were made seriously ill. A new Bill followed in 1859, introduced into the House of Commons by Mr. Spencer Walpole, Home Secretary. It contained nothing about a purchaser's certificate or examination of the vendor, and the Schedule of Poisons was much reduced. The Bill contained provisions for labelling vessels or packets containing poisons in

stock and when sold, and there was to be an entry of sales. Purchasers were to be of full age, as also the witness, for each sale was to be witnessed. On the order of a magistrate constables could search premises where poisons were sold, and penalties were imposed for breach of the regulations. The Committee of the Commons passed the Bill, but the Government was defeated on the Reform Bill before the third reading of the Sale of Poisons Bill was reached. In 1863 Lord Raynham tried a short Bill, called "A Bill for the Prevention of Accidental Poisoning." This simply proposed regulations as to the packet or vessel containing the poison. It was thrown out on the second reading. In 1860 the United Society of Chemists and Druggists, representing chemists who were not members of the Pharmaceutical Society, was founded, and for the next few years took a prominent part in the production of Pharmacy Bills. There was considerable controversy between the Pharmaceutical Society and the United Society, and a Bill from each Society was submitted to the House of Commons. The essence of the Pharmaceutical Society's Bill was the restriction of the business of a chemist and druggist "in the keeping of open shop for the compounding of prescriptions to registered chemists and the protection of their titles." It did not deal with poisons as such. The United Society's Bill would have imposed a penalty of £5 upon any person not a registered chemist retailing or dispensing drugs or medicines, or employing unregistered assistants in such business, and a penalty of £20 upon anyone selling, except under the conditions of entry in a register, and witnessing, etc., any of the "active poisons" named in the Bill. These were pharmaceutical preparations of aconite, arsenic, atropine, ergot of rye, strychnine, and varatrine. A penalty of £20 was to be inflicted upon any unregistered seller of drugs or medicines who called himself a chemist and druggist. The Schedule contained a list of dangerous drugs, apparently the articles the sale of which was to be restricted to qualified men. The General Medical Council supported the Pharmaceutical Society's Bill, but the Select Committee appointed in 1865 to consider both Bills recommended the principle of restricting the sale of scheduled dangerous drugs to examined and registered men. The proposal of the Pharmaceutical Society to restrict the dispensing of prescriptions to qualified chemists was rejected by the Committee. Both Bills were for the time being abandoned. In 1867 the two societies came to a substantial agreement, and ascertained that Mr. Hardy, the Home Secretary, was not unwilling to support a Bill which would restrict the title of chemist and druggist to those then in business, and those who afterwards passed a satisfactory examination, and prevent the sale of certain scheduled drugs to chemists and druggists so qualified. They abandoned their desire to restrict dispensing to registered chemists. The Bill was introduced into the House of Lords in 1868 by Lord Granville. It was not a Government measure. After considerable discussion in both Houses, and some alterations, the Pharmacy Act, 1868, officially described as "an Act to regulate the Sale of Poisons, and alter and amend the Pharmacy Act, 1852," became law. I think no one will quarrel with the principle laid down in the preamble, which says:—"Whereas it is expedient for the safety of the public that persons keeping open shop for the retailing, dispensing, or compounding of poisons, and persons known as chemists and druggists, should possess a competent practical knowledge of their business . . ."

The first fifteen sections provide:—

1.—That no person should use any title implying registration under the Act, or sell or keep open shop for the retailing, dispensing, or compounding of poisons unless
   (*a*) He is registered under the Act.
   (*b*) He conforms to the regulations as to keeping, dispensing, and selling poisons which are prescribed by the Pharmaceutical Society with the consent of the Privy Council.

   It is sometimes overlooked that a registered chemist, if he keeps open shop and neglects to conform to these regulations, forfeits, for the time being, his right to the title.
2.—A definition of the term "poison" within the meaning of the Act, namely, those articles named in the Schedule. Power is given to the Society to recommend to the Privy Council that any article be included in the Schedule, and on the approval of the Privy Council and due notice in the "London Gazette," the article becomes a poison for the purposes of the Act.
3.—That the examiners appointed by the Pharmaceutical Society, with the approval of the Privy Council, shall examine all condidates for registration as chemists, and that at such examination any officer appointed by the Privy Council shall be allowed to be present.
4.—That a register of those qualified for registration shall be kept.
5.—A penalty of £5, recoverable only at the instance of the Pharmaceutical Society by civil proceedings in a County Court—
   (*a*) If an unregistered person uses the title or sells a poison, or keeps open shop for the retailing, dispensing, or compounding of poisons.
   (*b*) If any person (registered or not) fails to conform with the regulations for the keeping and selling of poisons.
   (*c*) If any person (registered or not) compounds any medicine of the British Pharmacopœia except according to the formularies of the Pharmacopœia.

The 16th Section says that none of the foregoing provisions are to apply to—

1.—Legally qualified apothecaries (extended by amending Act, 1869, to legally qualified medical practitioners).
2.—Veterinary surgeons.
3.—The making or dealing with patent medicines.
4.—Wholesale dealers in supplying poisons in ordinary course of wholesale dealing.

It also expressly permits the executors of a chemist in business at the time of his death to continue such business so long as the business shall be conducted by a qualified assistant.

Section 17, as amended by the 1869 Act, offences under which are punishable, after summary conviction, by a fine not exceeding £5, provides—

1.—That all the scheduled poisons shall be labelled with the name of the article, the word "poison," and the name and address of the seller.
2.—The following conditions under which poisons in the first part of the Schedule must be sold:—
   (*a*) Only to a person known to the seller or introduced by a person known to the seller.
   (*b*) An entry made in a register, showing the date, name, and address of purchaser, name and quantity of poison sold, purpose for which it is required, signature of purchaser, and that of the person introducing purchaser.

None of these restrictions apply to any medicine supplied by a legally qualified medical man to his patient, nor apply to any article when forming part of the ingredients of any medicine dispensed by a person registered under this Act; provided such medicine be labelled with the name and address of the seller, and the ingredients be entered, with the name of the

rson to whom it is sold or delivered, in a book to be kept by e seller for that purpose.

I believe there are many medical men who do their own dis-ensing who are unaware that if the medicine they supply con-ins poison, they are liable to prosecution by the police, or deed any informer, unless the foregoing conditions are com-ied with.

Wholesale dealers in poisons need not comply with the pro-sions solely applicable to poisons in Part 1 of the Schedule, d need not put the name and address of the seller on the bel. The label need only contain the name of the article and e word "poison." It is important to notice that the use of isons in the arts and manufactures is not interfered with cept to the extent of insisting that the article is properly belled. I suppose tons of cyanide are used in the Midlands early without any inconvenient restrictions imposed by the harmacy Act.

The following is the list of substances now scheduled as isons:—

PART 1.

Arsenic, and its preparations.
Aconite, and its preparations.
Alkaloids.—All poisonous vegetable alkaloids and their salts.
Atropine, preparations of.
Cantharides.
Corrosive sublimate.
Cyanides of potassium and all metallic cyanides and the preparations of such articles.
Emetic tartar.
Ergot of rye, and its preparations.
Prussic acid, and its preparations.
Savin, and its oil.
Strychnine, and its preparations.

PART 2.

Almonds, essential oil of (unless deprived of its prussic acid).
Belladonna, and its preparations.
Cantharides, tincture and all vesicating liquid preparations of.
Carbolic acid and homologues, liquid preparations of (containing more than three per cent. of those substances, except any preparation prepared for use as sheep-wash, or for any other purpose in connection with agriculture or horticulture, and contained in a closed vessel, distinctly labelled with the words "poisonous," the name and address of the seller, and a notice of the agricultural or horticultural purpose for which the preparation has been prepared, ought to be deemed poisons within the meaning).
Chloroform.
Chloral hydrate, and its preparations.
Corrosive sublimate, preparations of.
Morphine, preparations of.
Nux vomica, and its preparations.
Opium, and all preparations of opium or of poppies.
Oxalic acid.
Precipitate, red (red oxide of mercury.
Precipitate, white (ammoniated mercury).
Every compound containing a poison within the meaning of the Act when prepared or sold for the destruction of vermin.

In my opinion there is urgent need for adding to the Schedule he mineral acids, and sugar of lead, which are frequent sources of accident. Medical men present know too the danger from the indiscriminate use by the public of potent drugs such as acetanilide and antipyrin. Surely these substances should be classed as poisons.

The regulations at present in force for the keeping, dispensing and selling of poisons are as follows:—

1.—That in the keeping of poisons each bottle, vessel, box, or package containing a poison be labelled with the name of the article, and also with some distinctive mark indicating that it contains poison.

2.—Also that in the keeping of poisons each poison be kept on one or other of the following systems, viz.:—

(*a*) In a bottle or vessel tied over, capped, locked, or otherwise secured in a manner different from that in which bottles or vessels containing ordinary articles are secured in the same warehouse, shop, or dispensary; or

(*b* In a bottle or vessel rendered distinguishable by touch from the bottles or vessels in which ordinary articles are kept in the same warehouse, shop, or dispensary; or

(*c*) In a bottle, vessel, box, or package kept in a room or cupboard set apart for dangerous articles.

3.—That in the dispensing and selling of poisons all liniments, embrocations, lotions, and liquid disinfectants containing poison be sent out in bottles rendered distinguishable by touch from ordinary medicine bottles, and that there also be affixed to each such bottle (in addition to the name of the article, and to any particular instructions for its use) a label giving notice that the contents of the bottle are not to be taken internally.

The Pharmacy Acts applicable to Ireland divide the qualified men into two classes—pharmaceutical chemists, who may sell and dispense poisons; and registered druggists, who may sell but not dispense poisons.

A short Pharmacy Act passed in 1898 deals simply with the administration and organisation of the Pharmaceutical Society, and does not touch the subject of this paper.

Legislation for Great Britain dealing with the sale of poisons is practically contained within the Arsenic Act and the Pharmacy Act, 1868. The legislation on this subject stands where it did thirty-four years ago. The 1868 Act, largely the result of compromises, has not been strengthened by subsequent statutes.

There have been many important judicial decisions in reference to cases arising out of the Act. It was not until 1890 that the Courts laid down that when the Act says no unqualified person shall "sell" it means the person who does the physical act of selling, not as in the 17th Section, the person on whose behalf the sale is made. In 1893 it was held that the exemption in favour of patent medicines did not apply to medicines liable to medicine stamp duty as such, but was confined to medicines which were the subject of letters patent.

The leading case, however, is that of the Pharmaceutical Society v. London and Provincial Supply Association 1880. In this case the House of Lords ruled that whereas Sections 1 and 15 of the Act said no person unless registered shall use the title of chemist and druggist, etc., or keep open shop for the sale of poisons, it did not say that no company should do these things. They decided that the word person did not include a corporate body.

There have been many attempts made by the Pharmaceutical Society to secure an amending Act so as to render the 1868 Act efficient; and during the last few years some little agitation for

revision has arisen from outside the Society—an agitation, I believe, actuated by a desire to render easier in the interests of makers and dealers the distribution of certain useful but dangerous preparations. Considering the dixculties which are bound to arise when the Legislature attempts to deal with intricate subjects such as the sale and dispensing of poisons, the administration of the Act which, with the exception of a few police prosecutions under the labelling (17th) Section, has been carried on for over thirty years by and at the expense of the Pharmaceutical Society, has been a marked success. It is an Act which, with a little amendment, can be made to completely fulfil its object, that is, the protection of the public from injury by accidental poisoning, and to make hard the way of the intentional poisoner. The present agitation by makers and sellers of such poisonous substances as insecticides containing deadly poisonous alkaloids, for an alteration in the law which would allow of anyone selling their toxic preparations put up in a very attractive form, has been largely instrumental in the formation of a Committee of the Privy Council to consider the question. Yet it was only in January of this year that a gardener died as the result of drinking by mistake a preparation of nicotine from an old brandy bottle in which it had been suplied to him by the shopkeeper. It was proved that if two tablespoonfuls were swallowed death would result.

It is said by the agitators that the Pharmacy Act is a piece of class legislature—that it provides a monopoly for chemists, who are extortionate people who will only sell these useful preparations at exorbitant profits—that the public have a greater difficulty in obtaining these things than would be the case if they could be obtained of any shopkeeper who chooses to stock them. Of course it would be easier to obtain postage stamps if every shopkeeper sold them, but for the convenience of the department, and therefore of the community, stamps can only be obtained at Post Offices or licensed dealers. Protection from poisoning is not consistent with a system of automatic machines at every street corner for the supply of poisons, and all legislation carries with it some occasional inconvenience, even to the honest citizen. There are over 9,000 chemists in business in Great Britain, many of whom have branch shops, and there cannot be a widespread difficulty in the way of obtaining these articles. Here and there there might be a delay of twenty-four hours, and a slightly increased cost, but is that sufficient reason for tampering with the existing safeguards relating to the sale of poisons?

The monopoly theory will not hold water. I speak from personal experience when I say that but for the distinction it gives the shop of the qualified chemist from the unqualified vendor of drugs, chemists would prefer to be without the business of selling poisons (not dispensing). It is a source of great worry and little profit. If the ordinary member of the public considers how much he spends on poisons during the year, and compares the amount, say, with what his blacklead pencils cost him, he will see that poison selling cannot be a lucrative business for a chemist. I know of no business where competition is keener than the drug trade, and there need be no fear of extortionate profits. Our poison law has worked well, with a minimum of inconvenience to the public. It has been the model for legislation in Ireland and all the Colonies, and the Legislature will do well to consider before weakening in any particular the excellent restrictions at present placed on the sale of poisons.

So far from weakening it, the Act wants strengthening. At present a company consisting of seven or more unqualified men may do as a corporate body what the State would trust none of them as individuals to do. They can call themselves chemists, they can keep chemists' shops, where deadly poisons are stocked and sold. They do not break the law if they have a hundred such shops where poisons are sold every day, and employ not a single qualified man. True, the unqualified assistant, often a boy, who sells a poison is liable for a debt of £5, recoverable in the County Court, if he happens to have anything that can be distrained upon. They need not conform with the Poison Regulations as to keeping poisons, which are binding on individuals. The Legislature has said that the keeper of the open shop, the person responsible for the control of businesses where deadly poisons are sold must be qualified, and this principle is being violated by companies daily.

I feel sure that gentlemen attending the Congress will appreciate the importance of maintaining the principle which is the very basis of the Pharmacy Act. However important regulations and mechanical contrivances may be as auxiliary aids to the prevention of accidental poisoning, the chief safeguard always must be that the man who stands between the public and dangerous poisons should be one who has the hall-mark of competence, that is, duly qualified by examination. Qualified chemists may keep branches in charge of unqualified men provided the manager is prepared to run the risk. The master breaks no law. There is no necessity for registration of shops where poisons are sold, and to which the regulations apply. The law at present allows anyone to dispense poisons; the chemist, doctor, or company may employ the errand boy to dispense strychnine provided the actual sale of the medicine when dispensed is conducted under the supervision of a qualified man. All these defects are met in a draft Bill prepared by the Pharmaceutical Society. It will make the masters, whether companies or not, responsible for the acts of their servants. They will be responsible for registering their shops, and for providing a qualified manager in each. The company must be controlled by directors who have shown by qualification their competence to keep open chemists' shops. The title of chemist and druggist must only be used by those who have earned the right to use it. The public, when they see the word chemist over a shop, will be able to feel secure that that shop is controlled by a man or men who have satisfied the State of their fitness to conduct such shops.

At present the public need warning that the word chemist over a shop run by a limited company does not necessarily mean that there is a chemist anywhere about the place. Whereas they have the security that if the shop is not owned by a limited company the owner who puts up the word chemist must either be properly qualified, or be running a risk of £5 penalties. They should be warned that the law requires the precautions against accidental poisoning from careless storage to be carried out by Mr. Smith, chemist and druggist, whilst there is no such legal obligation on Smith, Ltd., chemists. I do not intend to do more than mention another aspect of the defects in the present Poison Laws. I think you will agree that if the State, in the public interest, call into being a body of trained and examined persons it is the duty to protect their legitimate interests. The continued existence of such a body depends upon its being afforded proper protection. Apart from the question of public safety, the use by companies of unqualified persons of the title of chemist and druggist, a title which individuals can only obtain the right to use by proving their fitness by examination, is a great injustice to a class of men who deserve better at the hands of the community. The draft Pharmacy Bill is hung up pending the report of the departmental committee, but I hope to see it introduced into Parliament next session. May I ask that it should receive the valuable support which members of this Congress can give it?

W. S. Glyn-Jones.

PHOTOGRAPHING DOMESTIC ANIMALS.

[Reprinted from "Wilson's Photographic Magazine"]

Of the thousands who use the camera few have opportunity for long journeys after the rarer wild animals, and not many can engage in the work with enough time, patience, and accessories to make acceptable pictures of fish. Everyone, however, has chances, and constantly recurring chances, to study and to photograph the domestic animals. Dogs, cats, chickens, horses, cows, sheep, swine—some of these are within reach always, for most of us. While the zest of the hunt, the spice of danger, the long tramps afield, are missing in this work, it has its own difficulties, and its rewards are entirely adequate. The writer has a connection with an advanced and elaborately illustrated magazine dealing with country life, and he has been made very sensible, in the past year, of the great scarcity of good photographs of the familiar animals about us. An endeavour to supply certain pictures has fully brought out the difficulties to be encountered, as well as the attractions of the quest. Let us, then, in no wise despise the household pets, the street dogs, the cattle of the field, as objects of interest for our cameras, and, indeed, of profit for our pockets, if success is attained.

The "tabby" of the home is the easiest of the subjects, apparently. Endless are the ways in which cats are pictorial; endless are the contrarieties of the felines! Choose that way and place and attitude which most attract you, and try your camera on the puss. She is calm, peaceful, but by no means immobile you will find. Scan closely the lighting—you must, almost, be showing the house cat *in* the house—and make your trials. Make them at home, if you can; for strange cats, like strange babies, are not favourable to strangers at all times.

The bait of food is often suggested for luring these animals, and for securing attention, but I deprecate its use, unless the scene is plainly a feeding scene. A hungry look is not the most attractive aspect, and it is to be your art to show the sitter in a comfortable or an alert or even excited condition. Familiarity and petting will often do better than food, especially if the photographer has that sympathy with animals which they so promptly recognise, and without which he is at a very great disadvantage in the handling of our domestic pets and helpers.

Delightful work can be done with kittens, given the art of handling them. Where several are photographed at once, a very quick light becomes essential. Outdoors on an overcast day, or in places protected from the direct rays of the sun, this work can be done to advantage. Again, take care of the lighting; the most pictorial and satisfactory effects are not had when the camera light is full on the front of the subject. Before me at the moment are three fine pictures of a beautiful white Persian cat, "Zoroaster," by Alfred Klakring, all lighted at an angle to the camera, and so as to bring into relief by shadows the whiteness of the cat's long hair. In focussing for such a picture, look for shadows in the white parts. If you do not have them, the result will hardly be pleasing.

The familiar pets of the home, the useful helpers of the barnyard and pasture, are anything but easy to photograph. Their very charm of vivacity and alertness is the difficulty. Well do I remember a session had with a splendid and most friendly Scotch collie, who would look at me with rapt attention while my head was under the focussing cloth, only to bound high in the air out of sheer playfulness, when I emerged, all ready to snap the shutter! Many plates were spoiled before we fully agreed. But dogs do acknowledge authority, and will sometimes "stay put." If the alert and active life is to be shown, we must work outdoors, and with quick shutter. The sleeping dog may serve for the slower indoor exposure; and this points the fact that in all this work, whether it be dog or grizzly bear, a *series* of pictures of the same subject is most desirable if it can be had, showing the animals in various attitudes.

As some dogs are of large size, it is well to caution the naturalist photographer as to the focal length of his lens and the position of the animal. With an ordinary lens of, say, six to eight inches focus, an astonishing distortion shows if the big dog is posed with head away from the camera. A full or nearly full side-view, or a view with the head towards the camera, will be best. If several dogs are grouped, consider this matter all the more carefully, to avoid a grotesque result.

With the most rapid plates and a focal-plane shutter, we may succeed in catching the dog's picture as he runs at full speed—and thereby will we acquire some astonishing knowledge as to what queer positions four feet can assume. And the point will be emphasised that instantaneous pictures of an animal in motion do not *show* motion at all.

Of the domestic fowls very charming pictures can be made, especially when the soft, fluffy little balls of down that include very young chickens, ducks, and geese are considered. The swimming animals give a particularly fine opportunity, for the reflection of light from the water affords so strong an illumination as to help greatly. Chicks feeding are good subjects for pictures, practice, and patience, and a little child in the composition adds much to its charm, if properly placed.

Very few good photographic pictures of horses are extant, comparatively. It is not because this noble beast, the friend of man, has not attracted the ubiquitous camerist, but because he has baffled, to a great extent, the efforts to picture him. There are, of course, vast numbers of mere photographs of halter-led animals, but these are not much better, from the pictorial standpoint, than photographs of stuffed museum specimens of birds and the like. Yet such work, to show the "points" of the horse, must be done, I suppose, and it will not be amiss to quote the suggestions of an experienced and somewhat artful professional worker, as recently presented in the New York "Tribune":—

"The best results are obtained by placing the horse on a slight incline, so that the fore feet are a trifle higher than the hind feet. This position throws the head up. Then snapping the fingers or making any slight noise will cause the animal to prick up his ears, and at the moment when he is in this position of attention the photographer makes the picture.

"When horses in harness are to be photographed they must be posed on level ground or on a very slight incline. To make them look alive a hat or a card is sometimes tossed up in front of them, and at the moment when they look up the snapshot is made.

"When pictures of horses in action are made we usually place the camera near the ground, and by that means we get the best hoof positions, which cannot be secured when the camera is held or placed at the ordinary height. To make pictures of jumping horses, the same method is employed, and the height of the jump is sometimes exaggerated by placing the camera below the track-level. An excavation is made in the ground for that purpose, and pictures made from there increase the apparent height of hurdles and make a small jump look something remarkable."

The horse in real action is another matter, and we must go after him just as we would any other interesting animal. If he is to be pictured at work, select the point of view past which the horse will come, being most careful that the camera is so placed as to see the animal either broadside or somewhat "head on." Ignorance or neglect of this dictum produces some remarkable results. I am minded of my own attempt, some years ago, to make a photograph of a horse's head from the carriage he was pulling, with a "fixed-focus" camera. The

film on development showed in the distance a diminutive head, but the hindquarters of the horse, occupying very fully the foreground of the photograph, were anything but diminutive!

To secure pictures of a horse in active motion a very quick exposure must be made, and as the human eye cannot follow the complex movements of a horse's feet when trotting, the result, even when successful technically, may be anything but pleasing.

Fine pictures may be made—if the worker is able to compose them—with real working horses as subjects. What is a better exemplification of power than the strain of a good team pulling a loaded waggon up a stiff incline? How the great shoulders reach forward, and the strong legs set themselves surely on the roadway! Or a team ploughing—here is a fine pictorial subject, for it shows both horses and man in action, and, therefore, life-like, and the speed is not so great as to make good work improbable.

I cannot resist the temptation to express a hope that in the photographing of horses, pictures may occasionally be made of "bob-tailed" horses, deprived by silly fashion of their most useful and ornamental caudal appendage; for their photographs are always disgustingly grotesque, and serve well as tracts against this cruel and foolish practice.

Let not the aspiring maker of horse photographs feel any surprise if some of the negatives from which he has hoped much show an entire absence of one leg, the entire tail, or even the head. Be not alarmed; you are only experiencing a demonstration of the fact that a horse's motions in chasing a fly are somewhat quicker than the leaves of the average camera-shutter.

To get pictures of the horse in his most natural and graceful attitudes, one must find him at liberty in a field. Here even the most sober cart-horse shows his joy at the freedom that has long been denied him. Patience and a quick shutter will tend toward fine results in photographs of the many free and unconstrained positions constantly recurring under these conditions. A good hand-camera, or the twin-lens or Reflex boxes, will also help to get good things without an undue use of patience and plates.

J. Horace M'Farland.

SOME MODIFICATIONS OF THE NORMAL PHOTOGRAPH.

[Reprinted from "The Scientific American."]

The amateur photographer begins with an ordinary camera, becomes dissatisfied and procures a better one, and frequently proceeds in the same manner until he is satisfied that he has secured the best instrument that can be obtained. It cuts the photographic image from the centre to the edge of the plate with fidelity, and he derives great satisfaction in possessing as good a lens as can be made. But before long he learns that a picture photographically perfect lacks a great deal in true artistic feeling and quality, and he begins to remedy the defects of the perfect lens by throwing the plate out of focus, or by using a larger stop, or both, and thus secures to some extent the broad effect that he has learned to admire.

In addition to following out these suggestions he may produce artistic effects in other ways which recommend themselves to the experimenter in photography. One of the simplest methods of obtaining a soft ethereal effect consists in interposing between the lens and the plate a piece of ground glass, glass coated with ground glass substitute, or ground glass celluloid, placed at different distances from the plate, according to the effect desired. A very good scheme is to withdraw the slide from the plate-holder and replace it by a slide of translucent ground glass celluloid, like that shown in one of the illustrations, taking care to exclude the entrance of light by changing the slides under the focusing cloth, the exposure being made through the ground glass celluloid. The resulting picture, whether portrait or landscape, is soft in outline, and is possessed of mellow lights and shades. The finer details of the photographic image are omitted, and the much-desired breadth is secured. If broader effects are desired a square of finely-ground glass can be placed in the camera within or inside of the reversible back. Of course, the farther the glass or celluloid is removed from the sensitive plate the more details are omitted from the negative. If it is desired to show more of the detail than is possible with a translucent slide of the kind described a thin sheet of crystal glass of the size of the plate may be coated with ground glass substitute and placed in the holder along with the plate, with either the film or coated side out, according to the effect desired. The ground glass celluloid when placed either side out in contact with the sensitive film produces a desirable effect. If it is difficult to get ground glass celluloid a piece of fine, thin tracing paper may be secured by its corners to a thin piece of glass (an old negative glass, thoroughly cleaned, will answer). The effect will be quite broad if the glass side is placed next the sensitive film, and the negative will be very soft if the tissue paper is placed next the sensitive film. These interposed films absorb more or less of the light, and necessitate an increased exposure, but the increase is very slight and can be determined only by experiment in each case. A lantern slide produced from a negative of this kind, if well coloured, appears on the screen more like a painting than a photograph.

Another peculiar effect is securer by placing over the sensitive plate a thickness of fine, thin muslin stretched over a frame of common tin, or thin brass plate, the frame being placed in the holder along with the plate. The muslin should be wet when mounted and secured to the frame by stratena or some other adhesive cement. Broader effects may be produced by removing the muslin screen to the reversible back.

Lantern slides printed from ordinary negatives through fine ground glass, or ground glass substitute, lend themselves beautifully to colouring, as they are broader and more like paintings than other coloured slides.

A painter who dislikes to copy an ordinary photograph, on account of the difficulty of omitting detail, will find a copy of a good photograph taken through ground glass or tracing paper much more agreeable to follow than the photo with its many details. Half-tones may also be copied in this way.

This may seem to the ultra-photographer, who takes the greatest interest in sharpness, depth, and multitudinous detail, as a retrograde movement, tending toward the degradation of photography, but the true artist will find use for photographic pictures with reduced detail.

Geo. M. Hopkins.

Travel in Italy.—Mr. Consul S. J. A. Churchill, in a Report on the Trade of Sicily for 1901, makes the following observations:—"Commercial travellers and others likely to be in Sicily for some days, and likely to travel to Girgenti, Syracuse, Catania, Taormina, and Messina, over the lines of the Sicula Orientale, should provide themselves with a photograph on white paper, and take out a first-class ticket for free circulation on this railway in any direction for one month at a cost of 100 lire (£4). This ticket also serves as a certificate of identity during its term of existence. Travellers who have had the misfortune to have their pockets picked or to have lost their baggage, and to have written home for a remittance, appear to expect that the remittance from Malta or the United Kingdom will be payable by the post-office when the letters which announce these remittances are received. This is not the case. No money order can be cashed until the letter of advice concerning it has been received from the central office at Turin. This, in cases of money orders from the United Kingdom or Malta, may take ten days or more. Therefore, any travellers in a hurry should not choose this means of obtaining a remittance. When the remittance arrives there will be the question of identity. This can easily be got over by any commercial or ordinary travellers spending a good deal of time abroad, especially in Italy, by proceeding to the nearest post-office with two known witnesses and a photograph on white paper, and receiving for a fee of 1 lira a 'Libretto di Ricognizione' (Certificate of Identity), good for the Kingdom of Italy. On payment of a fee of 1 lira, a certificate of identity can be obtained for the whole world."

PHOTOGRAPHIC SURVEY AND RECORD OF SURREY.

(Inaugurated May, 1902.)

BJECT.—"The work of the Association shall be to preserve, by ermanent photographic process, records of antiquities, anthropology, uildings of interest, geology, natural history, passing events of local historical importance, portraits of notable persons, old documents, re books, prints, maps, and scenery, so as to give a comprehensive urvey of what is valuable and representative in the county of Surrey." -Rule 2.

PRESIDENT:

The Right Hon. Viscount Midleton, Lord Lieutenant, County of urrey.

VICE-PRESIDENTS.

The Right Hon. C. T. Ritchie, M.P.
H. C. Leigh-Bennett, M.P.
Sir Frederick L. Cook, Bart., F.R.G.S., D.L., M.P.
Charles Ernest Tritton, M.P.
John Burns, M.P., L.C.C.
Percy Melville Thornton, M.P.
R. K. Causton, M.P.
J. Macdona, M.P.
T. J. Macnamara, L.L.D., M.P.
Wm. Keswick, M.P., J.P., D.L.
Edward J. Halsey, C.A., J.P., Chairman Surrey County Council.
Alderman Howarth Barnes, J.P., Mayor of Battersea.
Col. Samuel B. Bevington, V.D., J.P., Mayor of Bermondsey.
W. Scott-Scott, J.P., Mayor of Camberwell.
N. Page, J.P., Mayor of Croydon.
A. F. Asher, J.P., Mayor of Guildford.
C. Burgess, J.P., Mayor of Godalming.
J. White, LL.D., J.P., Mayor of Lambeth.
W. E. St. L. Finny, M.D., J.P., Mayor of Kingston-upon-Thames.
F. Redman, J.P., Mayor of Southwark.

RULES.

1.—This Association shall be called "The Photographic Survey and Record of Surrey."

2.—The work of the Association shall be to preserve, by permanent photographic process, records of antiquities, anthropology, buildings of interest, geology, natural history, passing events of local or historical importance, portraits of notable persons, old documents, rare books, prints, maps, and scenery, so as to give a comprehensive survey of what is valuable and representative in the county of Surrey.

3.—The Association shall consist of photographic and other societies and individual members, with a president and vice-presidents.

4.—Societies, or individual candidates, for election as members, shall be proposed by any member or delegate. The election is vested in the council, and the subscription shall be two shillings and sixpence per annum for each delegate sent by a society, and member.

5.—The business of the Association shall be transacted by a council, which shall consist of a chairman, local vice-chairman, hon. secretaries (survey and general), hon. treasurer, hon. curator or curators, not more than two delegates from each associated society, and not less than six ordinary members.

6.—The annual general meeting shall be held in March, when a report and audited statement of accounts for the year ending December 31st preceding shall be submitted, and the president, vice-presidents, officers, and auditors, and non-delegate members of the council shall be elected for the ensuing year. Voting shall be by ballot. Nominations shall be in writing and signed by at least two members, and shall be in the hands of the hon. general secretary seven clear days before the meeting; but societies shall elect their own delegates.

7.—At every general meeting, the chair shall be taken by the president, or failing him, by a vice-president, or if no vice-president be present, the chairman shall be appointed by the meeting.

8.—Meetings of the council shall be held quarterly, and at such other times as may be necessary. Five shall form a quorum. The council shall have authority to appoint special committees with power to add to their number.

9.—In the event of the death or resignation of any officer or other member of the council, the council shall have power to fill the vacancy, except in the case of a delegate of a society, when that society shall appoint a successor.

10.—*Photographs (including lantern slides) shall be approved by the council before acceptance. Prints must be sent in unmounted, or on the regulation mounts.

11.—These rules shall be altered only at an annual meeting, or at a special meeting convened for the purpose, and notice of any alteration shall be sent out with the circular convening the meeting fourteen clear days before the date thereof.

12.—The general secretary, by direction of the council, or on the written request of not less than ten members, specifying the business, shall convene a general meeting, not later than four weeks after receipt of such direction or request.

NOTES.

(a) *The copyright of a photograph remains the property of a contributor, unless specially ceded to the Association.

(b) A register will be kept by the hon. survey secretary of the names and addresses of contributors who are willing to sell or supply copies of their prints to those applying for them.

COUNCIL:

Chairman: W. Whitaker, B.A., F.R.S., F.G.S.

Local Vice-Chairmen: Hector Maclean, F.G.S., F.R.P.S., President Croydon Camera Club; J. Bulbeck, Vice-President West Surrey Photographic Society.

Hon. Treasurer: W. W. Topley, 3, Marlborough Road, Croydon.

Hon. Curator: L. Stanley Jast, Chief Librarian, Croydon Public Libraries.

Elected Members: W. Watts, M.A., Prof. of Geology, University of Birmingham; J. J. H. Teall, M.A., F.R.S., P.G.S.; Prof. J. W. Judd, C.B., LL.D., F.R.S., F.G.S.; H. Keatley Moore, B.A., B.Mus.; Councillor J. Noaks; G. W. Moore; C. L. Faunthorpe; J. H. Baldock, F.C.S.; A. Roods; G. Clinch, F.G.S.; Alderman F. Foss, J.P.; E. Mawdesley, B.A., LL.B., Town Clerk, Croydon; J. Epps, Junr., F.L.S., President Croydon Nat. Hist. and Scientific Society.

Delegated Members: B. H. Winslow, E. L. Curtis, Norwood Natural Science Society; W. Wood, W. H. Rogers, Thornton Heath Photographic Society; E. Gane Inge, E. W. Eele, Haslemere Nat. Hist. and Micro. Society; E. Salt, H. M. Bennett, Croydon Camera Club; N. F. Robarts, F.G.S., Croydon Nat. Hist. and Scientific Society; R. Hovenden, F.S.A., S. W. Kershaw, M.A., F.S.A., Brit. Arch. Association; M. S. Giuseppi, F.S.A., W. Bruce Bannerman, F.S.A., F.G.S., Surrey Arch. Society; A. C. Haddon, F.R.S. (Pres.), J. Gray, B.Sc., Anthropological Institute; E. A. Martin, F.G.S., Croydon and Norwood Branch Selborne Society; C. Thwaites, Sutton Photographic Club; H. W. Monckton, F.L.S., F.G.S., W. P. D. Stebbing, F.G.S., Geologists' Association; G. R. Beckett, G. Robinson, South Norwood Photographic Society; W. H. Wilshere, West Surrey Photographic Society; R. Quick, M.I.S., Dulwich Scientific and Literary Association; H. G. Quarterman, Society of Architects; F. W. East, Kingston-upon-Thames and District Photographic Society; J. J. Coleman, F. Sears, Clapham Junction Y.M.C.A. Natural Science Circle; W Coomer, W. J. Wilson, Croydon Y.M.C.A. Camera Club; F. R. Taylor, E. W. M. Wonnacott, Architectural Association Camera and Cycling Club; J. M. Hobson, M.D., B.Sc., Croydon Antiquities Protection Committee.

Hon. Secretaries: Survey, H. D. Gower, 55, Benson Road, Croydon; General, J. M. Hobson, M.D., B.Sc., 1, Morland Road, Croydon.

PRACTICAL NOTES AND HINTS CONCERNING "SULPHITE," "METABISULPHITE," ETC., ETC.

II.

QUANTITY TO BE USED IN PHOTOGRAPHIC DEVELOPER (Sulphite).

This is a practical matter of very considerable importance from various points of view, and upon which somewhat widely different opinions have been expressed. The quantities herein suggested may be taken as representing the average opinion of the leading authorities:—

Pyro-ammonia developer should contain 8 grains per ounce of mixed developer.

Pyro soda requires quite double the quantity, say 20 grains per ounce.

With quinol, i.e., hydrokinone, its presence seems essential, and 20-40 grains per ounce seems the range of reliable opinion. The same proportions apply also in the case of erkonogen.

With amidol the quantity should not exceed 60, or at most 80, grains per ounce.

The above quantities refer to the total quantity of sulphite per ounce of mixed developer in the dish when exposed to the air.

Obviously, these conditions are not quite the same as when a concentrated or stock solution of pyro metol, etc., is required.

In the case of pyro stock solution, rendered slightly acid with nitric or, preferably, citric acid, it will be found that 4oz. sulphite dissolved in 8oz. boiled water, then acidified and added to 1oz. pyro, and then made up 10 fluid ounces (i.e., say 5 grains pyro per dram of solution), will keep a light colour fully six months. Amidol, ortol, and metol require less than one-fourth this quantity of preservative, but one in ten is a convenient proportion. It should be borne in mind that an excess of sulphite is harmful, as it is a solvent of silver bromide, and in excess tends to give fog.

METABISULPHITE AS A PRESERVATIVE.

From the above theoretical considerations we should expect to find the meta salt about two and a half times as efficacious as the normal sulphite, but experience shows that its contained sulphur dioxide is

more readily available. Consequently, in practice, we find that one part of the meta salt is roughly equivalent to four parts of the sulphite.

Thus one ounce of pyro needs four ounces of sulphite in 10 of water, but one ounce of the meta salt seems to act quite as well, if not better.

Doubtless many of the complaints anent the use of the meta salt are due to thoughtlessly substituting one salt for the other in equal quantities. A moment's thought will show that if two developers be made up with equal quantities of sulphite and meta sulphite (the alkali being also the same in both) that the meta solution will be much less active, because already so much of the alkali has been neutralised by the acid meta salt.

TESTS, REACTIONS, AND SIMPLE EXPERIMENTS.

The reader is advised to make himself familiar with the properties of sulphites and sulphates by repeating the following very easily performed experiments:—

SULPHITES.

Use sodium sulphite dissolved in pure water.

(1) Add a few drops of dilute hydrochloric acid. A pungent, nose-stinging gas (SO^2) is given off, and suggests the smell of burning sulphur matches.

(2) Cover a few small bits of clean zinc with water, add a few drops of hydrochloric acid. Note that bubbles of (hydrogen) gas are given off. This gas (when pure) has no smell. Now add a few drops of sulphite solution. An evil-smelling (rotten-egg like) gas is given off. This is hydrogen sulphide or sulphuretted hydrogen. Moisten a bit of blotting paper with a solution of lead acetate, and lay this on the mouth of the test tube. The darkening of the paper (by formation of lead sulphide) indicates the presence of sulphuretted hydrogen gas.

(3) To some sulphite solution add a few drops of silver nitrate solution. A white precipitate (silver sulphite) is formed. Divide the milky mixture into two parts. To one part add more sulphite of soda solution. The precipitate dissolves. To the other part add hypo solution (fixing bath). The white silver sulphite also dissolves.

(4) To another portion of sulphite solution add silver nitrate, with shaking, until a permanent precipitate is formed. Now gently heat to boiling, when the precipitate darkens and some metallic silver is thrown down on the inside of the test tube, forming a mirror-like surface.

(5) To a solution of potassium bromide add a few drops of silver nitrate solution. A light yellow precipitate of silver bromide is formed. Fill up the test tube with water and shake well. Allow the precipitate to settle, pour off the clean super-natent fluid, and half fill with water. Shake and divide into two parts. To one part add soda sulphite solution. The silver bromide is dissolved. To the other add clean, fixing bath, hypo solution. The precipitate is dissolved. Compare experiment.

(6) To a solution of sodium sulphite add solution of barium chloride, or, preferably, barium nitrate. A white precipitate of barium sulphite and probably some sulphate is thrown down. Fill up the test tube with water and shake well. Allow precipitate to settle, and pour off the clear liquid. Half fill with clear water, shake, and divide into two parts. To one add either strong hydrochloric acid, or, preferably, dilute nitric acid. This dissolves the sulphite and leaves the sulphate unaffected. Comparison of the two tubes gives a rough idea of the quantities of sulphite and sulphate.

SEPARATION OF SULPHIDE, SULPHATE, AND SULPHITE.

(7) Add barium chloride, or, preferably, nitrate. Sulphates and sulphites are thrown down. Filter. Filtrate contains any sulphides. Test with filbrate with hydrochloric acid. Hydrogen sulphide evolved if sulphide present. Shake the precipitate with pure hydrochloric, or, preferably, nitric acid, dilute. The sulphates are dissolved. Filter. To the filtrate add hydrochloric acid, if it does not already smell of sulphur dioxide. The insoluble precipitate is a sulphate. This experiment is best seen in tabular form.

Sulphide—Sulphate—Sulphite.
+ $BaCl_2$ or $Ba(NO_3)_2$

Precipitate + HNO_3	Filtrate + Hydrochloric acid Sulphuretted Hydrogen evolved by sulphide.
Precipitate Sulphate.	Filtrate Odour of SO_2 of sulphite present.

F. C. LAMBERT.

THE R.P.S. DINNER.

THE following gentlemen constitute the organising committee: Mr. Frank Bishop, Dr. Ernest C. Fincham, Mr. Alfred Ellis, Mr. T. E. Freshwater, and Mr. Martin Jacolette.

The following will act as stewards: Mr. James Brown, Mr. Henry E. Davis, Mr. T. Sebastian Davis, Mr. W. E. Dunmore, Dr. A. R. F. Evershed, Mr. John H. Gear, Mr. Thomas K. Grant, Dr. C. F. Grindrod, Mr. Henry E. Hull, Mr. H. Vivian Hyde, Mr. Francis Ince, Mr. C. F. Inston, Mr. Ernest Marriage, Mr. J. C. S. Mummery, Mr. Leslie Selby, Mr. R. Lang Sims, Mr. G. W. Tottem, Mr. T. C. Turner, Mr. H. Snowden Ward.

The annexed circular has been issued to members: Fellows and members of the Society, and members of affiliated societies, are reminded that the Royal Photographic Society's Dinner will be held at the Café Royal, on Monday, September 29th. Those who intend to take part, and have not yet signified their intention to do so, are requested to send an early intimation to the secretary or one of the stewards, stating whether they will be accompanied by any friends. The tickets are half-a-guinea each, exclusive of wine. Final arrangements have to be made very shortly, and it is important that the committee know how many for whom to provide.

The Secretary,
Royal Photographic Society,
66, Russell Square, London, W.C.

September, 1902.

Please send me Tickets for the Royal Photographic Society's Dinner to be held on September 29th, at the Café Royal.

I enclose remittance for .....

Signed..... .....

Address.....

THE KODAK COMPANY'S NEW PREMISES.

ON Monday last, on the occasion of the official opening of their new showrooms, offices, etc., at 41-43, Clerkenwell Road, E.C., Messrs. Kodak, Limited, had an "at home." The additional premises now forming part of the Kodak headquarters were until recently in the occupation of Messrs. Salmon and Gluckstein, and contain a floor area of some 23,000 square feet. By this acquisition the accommodation placed at the disposal of the firm for extra stockroom and office space for



A CORNER OF THE NEW KODAK RECEPTION ROOM.

present needs, and for future contemplated expansions, has been more than doubled. The frontage of the establishment carries a sign composed of the word "Kodak" in wood letters no less than 17 feet high. The most prominent feature of the interior of the new premises is a handsomely decorated showroom on the first floor. The board-room and the managerial offices are also situated on this floor.

The latest Kodak novelties were demonstrated, together with a full range of Kodak cameras and accessories. An interesting display was also made of bromide enlargements from Kodak photographs. A novelty shown was the Kodak Developing Machine, which is a nickelled metal box, into which the exposed spool is placed. A few

turns of the handle unwind the black paper covering of the film; the developer is now poured in, and the turning of the handle continued until the negatives are developed. Fixing and washing are carried out in the same manner. Demonstrations of the new apparatus were given.

New Apparatus, &c.

Messrs. Erdmann and Schanz, of 116, Bedford Hill, Balham, S.W., are issuing the following stereoscopic slides:—Views of the United Kingdom; royal palaces (interiors and exteriors), London street scenes and principal buildings, Kew Gardens, the Thames, seaside resorts, cathedrals, castles, abbeys, ruins, English, Scotch, and Irish scenery. Views: Foreign; France, Germany, Italy, Monaco, Switzerland, Belgium, Greece, Norway, Sweden, Palestine, Algeria, United States America, West Indies. Views: India and Ceylon. This series includes a large number of type studies, native temples and other buildings, general views, and street scenes. Hoar Frost Scenes. Statuary: Antique and Modern; a series of the principal statues in the Vatican and other noted galleries. Animals (Wild); lions, tigers, elephants, giraffes, zebras, emus, etc., etc. Military types; types of British Regiments, including Grenadier Guards, Royal Horse Guards, Scots Guards, Dragoons, Royal Artillery, Imperial Yeomanry, etc., etc., Australian and New Zealand Regiments, Canadian and West Indian Regiments, French Regiments, etc., etc. Humorous; comic scenes, tableaux vivants and fanciful scenes. Art Studies from Life of the Female Figure. South African War; this series comprises many interesting scenes illustrating the whole of the War. Royal Coronation; a series of scenes of the Coronation Procession, Naval Review and Review of Indian troops. Shipping and Locomotives. Coloured Stereos; this series of hand-painted slides includes flowers, views and tableaux vivants. Messrs. Erdmann and Schanz are also introducing the "Triumph" aluminium stereoscope, with plush-bound and hand-engraved hood, and varnished sycamore shaft. They send this stereoscope on approval to applicants, by parcel post. The instrument is well finished, strong and serviceable, and is of the "Holmes" pattern. The stereoscope and the slides are supplied to the trade.

The Falloroll Camera. Sold by Jonathan Fallowfield, 146, Charing Cross Road, W.C., London.

The "Falloroll," it may be assumed, comes at the end of a long line of new cameras which have been offered to the public during the spring and summer (as we must in courtesy refer to these seasons) of the present year. The principal characteristics of the instrument are thus concisely described in the little handbook which accompanies it:—

"The Falloroll camera is one of the folding type of camera, taking plates or films; the latter can be both put in and taken out in daylight,

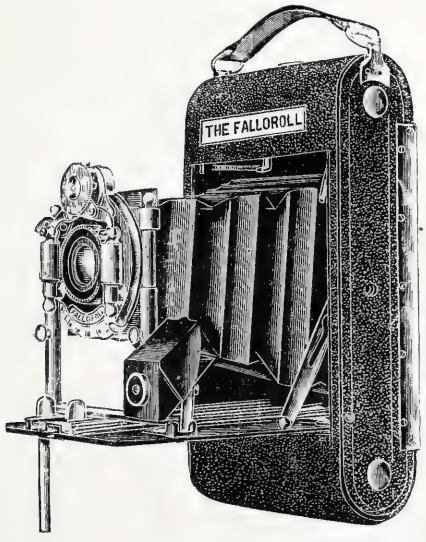


Fig. I.

any make of film may be used in the camera, and by a simple and ingenious arrangement a plate-holder holding two quarter plates can be used with the same back used for films. Fig. II. will show how the plate-holder and the focussing screen may be used. To use the camera press the button on the right-hand side, and this allows the aluminium front baseboard to fall into place. To draw the lens and bellows into position, press the two small handles at the bottom of the lens, at the same time draw the camera front, with lens outwards till the pointer on the left is at the distance (in feet) of the object which you wish to photograph. The clamping is automatic, and directly the pressure on the two handles is released they spring back and hold the front firmly in position. The camera is fitted with a tripod screw hole, and can be used either for portrait or landscape views. It has a reversible finder. The shutter of the Falloroll is of the Unicum pattern, made by the well-known opticians Messrs. Bausch and Lomb. The lens is a rapid rectilinear working at f/8 and having Iris diaphragms.

"To load the camera (see Fig. III.) place the film in the space at the top, and in such a way that the reel is working on the two small pivots which work by springs at either side; see that the black paper winds in such a way that the spool is underneath, and bring the end across the two nickel rollers and space, and slip into the slot of the wooden reel

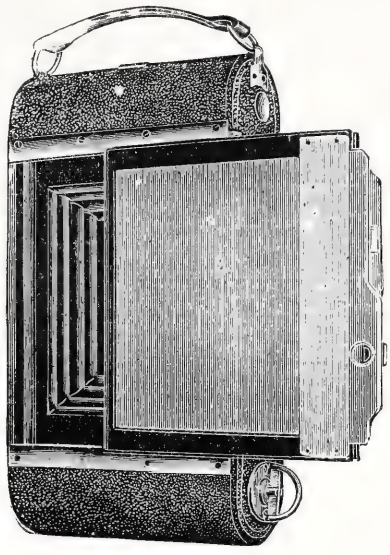


Fig. II.

at the bottom. Then shut the back and wind till a figure appears under the red window (which should be always at the top of the camera). The camera is now ready to take the first picture. Pull out the front and place pointer at the distance marked on metal disc to which the object corresponds."

Nowadays, the difficulty of imparting novelty in design, form, or detail to hand cameras by no means tends to diminish; it may almost be taken as axiomatic that in half a dozen instruments chosen at random the points of resemblance mostly outnumber those of difference. Nevertheless, the makers of the Falloroll have quite succeeded in rendering it distinctive in one or two respects. The back, it will be observed, is permanently hinged, and in place of the removable panel either the focussing screen or the double dark slide may be inserted in the focal plane. The method of inserting the spools is shown in Fig. III. From the practical point of view, we can certify that the Falloroll is an easy instrument to work. The other features of the camera are indicated in the above-quoted description. It is beautifully made, with metal baseboard, nickelled fittings, movable finder, and focussing scale. The shutters of the dark slide are of bright metal. The "Falloroll" appeals to a wide circle of modern photographers, with whom it should become a favourite.

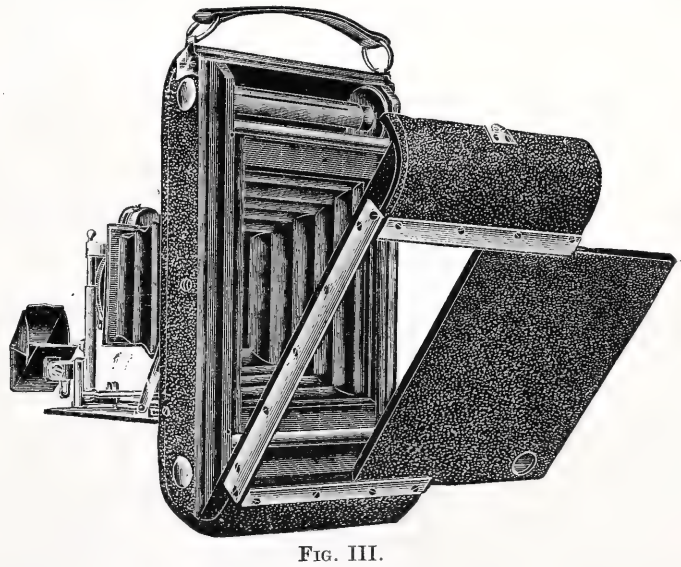


Fig. III.

Mr. Randolph Smith, of the St. Michael Street Studio, Malton, has been honoured by His Majesty the King accepting from him an album of photographic views of the local Coronation celebrations. The letter received by Mr. Smith is as follows: "The Private Secretary is commanded by the King to thank Mr. Randolph Smith for his letter of the 11th inst., and in reply to say that if he will forward the album of photographic views his Majesty will be pleased to accept it.—30th August, 1902."

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Sept.	Name of Society.	Subject.
12.....	Croydon Scientific Society	Consideration of Rules for the Portfolio Criticisms.
13.....	Woolwich Photographic	Barking. Leader, Alex. Lees.
13.....	West London Photographic ...	Richmond Park.
15.....	Southampton Camera Club.....	Demonstration of the "Rotograph" Papers by Mr. W. A. Sims (of the Rotary Photographic Co.)
17.....	Southampton Camera Club.....	Ramble—Beaulieu.
17.....	North Middlesex Photographic	*Bromide Enlarging.* F. A. Haylett.
17.....	Borough Polytechnic	Monthly Outings Competition.

SOUTHAMPTON CAMERA CLUB.

The members of the above club met on the 1st inst., under the presidency of Mr. G. Vivien, when a print competition took place, the subject being "Architecture."

Some very creditable specimens were submitted for criticism, those contributed by Mr. Cooke being pronounced the winning pair. They were excellent enlargements—one of the Norman portion of Winchester Cathedral (north transept), and the other of the ambulatory at St. Cross, near Winchester

Mr. Cooke was awarded the club's certificate of merit.

DEVONPORT CAMERA CLUB.

Mr. R. J. Lamb presided over the annual meeting of the Devonport Camera Club, held at the Technical Schools, Devonport, last week. The secretary, Mr. F. B. Langdon, read the committee's 11th annual report, which stated that fourteen general meetings had been held, at which instructions and practical demonstrations had been given on enlarging, lantern-slide making, Christoid films, gaslight papers (exposing with Dawson's densitometer), Wellington films and slow contact paper, improving negatives and prints, colour photography (on which occasion members of Stonehouse Camera Club attended), and the carbon process. The lantern evenings, at which members' friends, including ladies, were cordially invited, were successful, much credit being due to Messrs. J. F. Coombs, W. G. Parkman, and J. Neal for services rendered in manipulating the lantern. It was to be hoped that good work had resulted from the summer outings arranged to Ivybridge, Dousland, and Yelverton, Denham Bridge, and Buckland Abbey. The visit to the ancient abbey, by kind permission of Lady Eliott Drake, and to whose hospitality the club was greatly indebted, was much enjoyed. At the close of the winter session the late president, who was entrusted and had undertaken responsible work in connection with the proposed exhibition, unexpectedly resigned, which necessitated a postponement. The committee, however, trusted that arrangements would be made shortly for holding an exhibition worthy of the town of Devonport, which had reason to be proud of having given to the photographic world one of its earliest pioneers, Robert Hunt, born in Devonport, or "Dock," as it was called in 1807. The club had been affiliated with the Royal Photographic Society for six years, which conferred upon its members the right of attending the meetings of other affiliated societies. The affiliation now comprised 100 societies in Great Britain, Ireland, India, Australia, New Zealand, and South Africa, with an aggregate membership of between 8,000 and 9,000, every member of which received a copy of the Red Book, its production being a permit to photograph in places where otherwise specific permission had to be obtained.

The committee regretted having to record the death of Mr. Jas. A. Boolds, who filled the office of president two years ago, and was an enthusiastic and valued member; also of Messrs. J. B. Foster and T. W. Earl. Consequent upon the frequent changes in a town connected with Government establishments, some useful and earnest members had resigned. The committee, therefore, hoped others who take interest in photography would become members.—The treasurer, Mr. A. J. Catford, reported a balance in hand of £1 1s. 6d., which the Chairman thought was very satisfactory.—Mr. Langdon remarked that it was so, considering that they commenced with an adverse balance.—Mr. R. J. Lamb was re-elected president for the forthcoming year, and the following officers were also elected:—Vice-presidents, Messrs. C. Croydon, J. F. Coombs, W. H. Lethbridge, and J. Trouern Trend; committee, Messrs. A. Tregise, W. H. Mayne, R. Maw, and R. O. Joliffe; secretary, Mr. A. J. Catford; and treasurer, Mr. F. B. Langdon. Mr. R. G. Lamb and Dr. E. S. Saunders were appointed delegates to the Royal Photographic Society, and Messrs. W. G. Parkman and S. F. J. Heal (assistant) lanternists.

A vote of thanks to the retiring officers was passed.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

September 4th.—Mr. T. E. Freshwater in the chair.

Mr. A. L. Henderson showed a photograph, on a cardboard mount, representing some seaside view, and drew attention to the strong discolouration that it had undergone through exposure to the sea air. He believed it to be not an instance of imperfect fixing, as some would suppose, but an effect due entirely to the atmosphere of seaside places. In his experience such prints were common in the coast towns. He proposed to open a discussion on the matter early in October

The hon. secretary passed round some sample sheets of Mr. H. E. Bullen's sensitised albumenised paper. In reference to a difficulty, recently alluded to, in the getting of blue tones on ready-sensitised albumenised paper, Mr. Bullen expressed his belief that with his paper any such difficulty would be found to disappear.

Mr. Henderson passed round another photograph made by Dr. Grun with his fluid lens in order to test its defining power under severe conditions. The doctor claimed to have made considerable improvements in his lens, and the test shown would probably have demonstrated the fact had particulars of the stop used and the conditions under which the photograph was made been available.

Mr. Henderson then gave a display of slides taken during his recent travels in Spain.

Many of his pictures were of Burgos, the capital of Old Castile, situated on the Arlanzon, one of the small tributaries of the Douro. Its cathedral is one of the finest in Spain, full of richness and beauty,, and containing some fourteen chapels. It abounds in a wealth of beautiful carving and ornament, which compels the admiration, even in a country like Spain, where exquisite taste, luxuriance of detail and superbness of design are to be found in the architecture of past centuries almost at every step. Contrary to what he anticipated, Mr. Henderson found that the beggars were not such important features of Spain as had been represented. His photographs in the streets, however, frequently suffered from the unsightly crowds of youths and children who thought it well to monopolise the foregrounds of his compositions. Notwithstanding this little trouble, however, the photographs were all much admired, and especially the interiors, where Mr. Henderson seems to have spent hours and hours days together reproducing the wonderful beauties of the old palaces, cathedrals and churches. Most of the pictures were from stereoscopic pairs, and a number were panoramic in their nature. Many of the palaces are now used as dwellings by the poorest people, and very picturesque are the "bits" to be found in their vicinity.

Cordoba also attracted Mr. Henderson and his camera. Its former magnificence has much decayed. The cathedral is a splendid edifice, and the mosque, fountains, courtyards, city walls and gates yet make very fine subjects for the photographer. Granada, the capital of the last of the Moorish kingdoms, stands in a plain of much beauty at the northern foot of the Sierra Nevada. It is a most interesting place, and Mr. Henderson was much fascinated by its attractions. The mountains in the distance lend also a charm to the place that is refreshing in its variety. The Alhambra, lastly, calls for almost more praise than any of the preceding places. Its handsome pillared courts and mosaics provide infinite opportunities for the picture-maker, and the lecturer availed himself with his usual success of these fine old Moorish glories.

A hearty vote of thanks to Mr. Henderson closed the meeting.

Commercial & Legal Intelligence

We have received a catalogue of photographic, optical, and electrical goods from Mr. James Henderson, photographic dealer, 164, Union Street, Aberdeen.

Re The Sensitised Paper Manufacturing Syndicate (Limited).—Under the failure of this company adjourned meetings of the creditors and shareholders were held at the London Bankruptcy Court on Monday last before Mr. H. E. Burgess, Assistant Receiver, and it was intimated that the official receiver would continue to act as liquidator under the proceedings.

British Trade and Foreign Competition.—Lord C. Beresford, M.P., in reply to a correspondent, who asked "In what direction should our natural energies be increased in order to meet successfully the competition of foreign countries?" says:—"It is my opinion that if we wish to compete with foreign countries we must work on the same methods which foreign countries have found so successful. During my mission in China, in 1898, on behalf of the Associated Chambers of Commerce, I found foreign countries made and sent out what the people wanted. Many British firms were only prepared to make and send out what they thought the people ought to want. Foreign countries will accept orders so small that such orders really amount to samples only. British firms rarely take small orders, the reason advanced being that they do not pay. In trade the great effort should be to form new connections, and, with this object in view, orders, no matter how small, should be accepted. Foreign commercial firms make out prices and weights of commodities in the language of the country with which they wish to trade. British commercial firms generally give English currency, and use the English system of weights and measures, the most difficult of all for a foreigner to understand. Foreign commercial agents are obliged to learn the language of the country with which they desire to trade. Many British commercial agents appear to take a pride in knowing no language but their own, and seem to regard those who cannot speak English as people wanting in intelligence. The British trader had formerly a monopoly in many of the trading centres of the world. He is now met by the fiercest and most determined competition in every quarter of the globe. Unless the British commercial classes realise this fact, and compete in a manner suitable to modern requirements, British trade and commerce is bound to decline." Now there is no question that there is a great deal of truth in what the writer says. Take, for example, photographic apparatus. The English market is at the present time being flooded with hand cameras of foreign make—French, German, and American—taking the English quarter-plate, a standard size in this country. But in the countries in which they are made it is not, and a difficulty is often met with abroad in getting plates the size for them. All these cameras are made expressly for the English market, and it shows the enterprise of the foreigner.

News and Notes.

DARWEN Photographic Association.—An exhibition of photographic work will be held in the Belgrave Schools, Darwen, from Thursday, November 13th, to Saturday, November 15th, 1902. The judges will be Messrs. Alex. Keighley, F.R.P.S., and Percy Lund. The following classes are open to all amateurs and professionals:—Class 1.—Landscape, seascape, or river scenery. Class 2.—Portraiture, figure, fruit, flower, or animal studies. Class 3.—Architecture. Class 4.—Best print not above half-plate, mounted or framed, any subject, for those who have never won a prize. Class 5.—Set of four lantern slides. Entrance fee 1s. per set. 6.—Champion Class (First prize, silver medal; second prize, bronze medal).—For best picture, any size or subject, and produced by any process, and sole work of exhibitor. Should the entries exceed 80 an extra gold medal will be awarded. Entry form, with full entrance fee or fees, must reach hon. secretary on or before November 6th, 1902. Exhibits must arrive at Belgrave School, labelled "Photographic Exhibit," not later than November 12th. The hon. secretary is Mr. J. G. Thomas, Fern Cottage, Sough Road, Darwen.

CHLOROPHYLL Formation in Absence of Light.—It was shown by Radais (C. R., 130, 793) that Algæ can form chlorophyll in the absence of light. Artari, who has recently occupied himself with the same subject, comes to the conclusion that under these conditions the formation of chlorophyll is controlled by the form in which the nitrogenous compounds are provided. Experiments were made with the green Alga Stichoccocus bacillaris. A culture solution containing cane sugar and the other necessary constituents, except nitrogen, was prepared, and to this was added a nitrogenous compound. It was found that when peptone, asparagin, or ammonium acetate was supplied the alga continued to form chlorophyll in the dark, although it was noted that the chromatophores did not remain quite normal. If, however, the nitrogen was added in the form of leucin or potassium nitrate, then the alga generally lost the green colour altogether. But the colour could be restored either by placing the culture in the light, or even in the dark if asparagin was substituted as the source of nitrogen.—Berichte der Deutschen Bot. Gesellschaft, 20, 201 (From the "Pharmaceutical Journal.")

IN the Right Direction.—We are pleased to see a Bill has been introduced into the State Parliament to provide for and regulate the method of advertising in or near public places. We have on several occasions expressed regret that our beautiful harbour and foreshores should be the dumping grounds of the bill-sticker. So we reasonably rejoice that there is a prospect of our pleasure resorts being so protected that they may display their natural beauties undisturbed. The Bill, among other things, enacts that "no person or body corporate shall erect, or cause to be erected, on the foreshores of the harbour of Port Jackson, any hoarding or other structure for the purpose of placing or exhibiting thereon any placard, sign, or advertisement of any kind whatsoever." Advertisements on buildings are also prohibited, as well as on land adjoining foreshores or adjacent to the harbour. Penalties not exceeding £2 and £5 are provided. We would like to see this desirable measure go a step further, and check the present unsightly practice of sailing boats displaying their pink, blue and black pill announcements. We sincerely trust the Bill may pass.—"The Australasian Photographic Review."

THE Goldsmiths' Institute, New Cross, S.E.—Courses of photographic lectures and demonstrations will be given, commencing September 24th and 26th, 1902. On Friday evenings, from 8.30 to 9.30, a six-months' course on practical elementary photography will be given. On Wednesday evenings, from 7.30 to 9.30, a six-months' course on practical advanced photography will be given, including enlarged negative making, retouching and working-up negatives; carbon and gum-bichromate printing; preparation of printing papers; lantern slides by three-colour process; photo-lithography, collotype process blocks, photogravure, etc. Each lecture will be illustrated either by a practical demonstration of the process under consideration, or by specially prepared lantern slides projected by an electric lantern. Students at the above courses will be eligible to sit for the examinations in photography of the City and Guilds of London Institute, held in May, 1903, at their fee of 3s. 6d. The Friday course will prepare for the ordinary grade examination, and the Wednesday course for the honours grade examination. The ordinary grade must be passed first. Practical courses will be given during quarters commencing September 22nd, 1902; January 5th, 1903; and March 30th, 1903; and including individual tuition indoors and outdoors. For ladies—Monday afternoons from 2.30 to 4.30; Monday evenings from 6.30 to 9. For gentlemen—Tuesday afternoons from 2.30 to 4.30; Tuesday evenings from 7 to 9.45. Fees each course—One quarter, 10s. 6d.; two quarters, 17s. 6d.; three quarters, 25s.

PAPERS Read before the Royal Astronomical Society.—I have upon more than one occasion commented here on the insufferable dreariness of certain papers which the Council of the Royal Astronomical Society has selected for reading—or permitted to be read at the ordinary meetings of the Society. That this dreariness is not always necessarily inherent in the papers themselves I have proof in a series of reprints of some of them which have been issued from the Oxford University Observatory, which, being presented in a form admitting of study, become of very real interest. Notably is this the case with one by Mr. Plummer, "On the Accuracy of Photographic Measures," discussing a paper by M. Loewy, in which I venture to think that our very eminent French confrere by no means gets the best of it. Now I have before remarked in these columns upon the irksome and depressing effect of some of Mr. Plummer's oral contributions to the Society's proceedings; but here, where the reader can peruse it at his leisure, we find a real addition to our knowledge conveyed in a lucid and readable form. The series of reprints of which I am speaking contains also essays by Prof. Turner, including his discussion with Sir David Gill as to the trustworthiness of the late Prof. Pritchard's photographic determination of stellar parallax; an ingenious suggestion for surveying with a camera; on the performance of various object-glasses in photographing stars; and the third paper of a series on stationary meteoric radiant points. Like everything that Prof. Turner puts his pen to, these are all worth reading. Surely the inference from all this is obvious.—F. R. A. S. in the "English Mechanic and World of Science."

THE Late George M. Hopkins.—It is with most profound sorrow that we ("The Scientific American") record the decease on the 17th ult., at Cheshire, Mass., of Mr. George M. Hopkins, so long identified with the "Scientific American" as Associate Editor. It was while enjoying a vacation trolley outing with his wife in this beautiful locality among the Berkshire Mountains that Mr. Hopkins became suddenly ill on the 15th, and despite the best medical treatment, never recovered. His sudden demise will be a great shock to his intimate associates in the "Scientific American. Mr. George M. Hopkins was born in Oakfield, Genesee County, New York, November 21st, 1842, and while a lad went with his father and family to Albion, Orleans County, New York, where he received the usual public school education. He early displayed a liking for mechanics, having a natural ability to discover the reason of things in a mechanical way as they were studied. His father encouraged him to pursue matters to his liking by having him obtain practical information in the workshops at Albion. He early made the acquaintance of Thomas A. Edison, in whose laboratory he worked, and the friendship continued throughout the epoch of the telephone and electric light development, and to the present time. On May 10th, 1876, he became connected with the "Scientific American," beginning his work as an attorney in the Patent Department; it was soon noticed that he evinced a fondness for experimenting in matters connected with physics, especially in a more simple and direct way than was customary. He was encouraged in this work, and from time to time the results were published in the "Scientific American." The experiments were so simple and clear that any boy could understand them. The value of the published experiments was that they were based on actual manufacture of the apparatus and trial before publication. It is needless to add that these many different publications formed the nucleus of Mr. Hopkins' popular book, "Experimental Science," which has been of such assistance to many thousands of students of physics. Some months ago Mr. Hopkins undertook a thorough revision of the book, with a view to bringing it up to date, that many of the remarkable discoveries of the last few years might be included. It is a great gratification to feel that this work was entirely completed, and that the proofs had been thoroughly revised and read by Mr. Hopkins before he started on his vacation several weeks ago. The popularity of the work is shown by the fact that the twenty-third edition has just been published. Of late years he gave particular attention to literary work, editing the special department of "Notes and queries," and contributing to our columns a series of scientific articles which were marked by the clearness and brevity by which his work is easily recognised. Mr. Hopkins possessed in a marked degree the literary qualifications of a scientific writer. To his simplicity and clearness of style, no doubt, was largely due the great popularity of his writings, which attracted and held the interest of the widely diversified classes of readers who were interested in the subjects he discussed and subscribed for his published works. It is certain, moreover, that his directness and purity of style were one expression of the character of the man himself; for our late associate was possessed of sterling traits that wor him the invariable respect and admiration of all those with whom he had business relations. His disposition was most kindly, amiable and attractive. He was ever ready to render assistance and freely impart such knowledge as he possessed. Mr. Hopkins occupied his leisure hours with the practice of photography as a stepping-stone for the study of art. He enjoyed painting small pictures as a pastime, using his photographs as a guide.

GERMAN Legislation Against Advertising Disfigurement.—Mr. R Evans, hon. secretary of the Society for Checking the Abuses of Public Advertising, writes to "The Times": "At this season many thousands of travelling Englishmen are roused to an exasperated consciousness of wrong. They leave home for something more than change of scene. They look for the enjoyment of a certain unspoilt freshness in landscape, for the charm which attaches to the monuments of the past, for the fine effects of architecture, and all the picturesque aspects of the haunts of men. Experience brings its disillusionment. 'Medio de fonte leporum, Surgit amari aliquid.' Year by year the number, the vividness and the size of the intrusive objects that distress the eye increase. The sting of the injury lies in its wantonness. Ten hotel proprietors can kill the beauty of a lakeside town by sticking up monster boards on the sky-line of their establishments; but the effect is to diminish rather than increase the aggregate influx of guests. The place, to quote the brief judgment of the passing tourist, 'is spoilt'; and those whose shortsighted competition does the harm reap no profit. We who have for some years laboured to convince our countrymen that a rational ideal of civilization includes a vigilant regard for aspect, and that no individual should be allowed an unfettered discretion as to the degree in which he practises upon the sight of his fellows, have not hitherto secured a hearing in our own Legislature. But we retain our absolute confidence in the common sense of the nation, and do not doubt that before long the patent defect of our municipal law will be corrected, and powers analogous to those which apply to building, drainage, begging, and so forth will be bestowed on local authorities. The principle has already been recognised in certain private Acts. I desire, by your permission, to offer some account of a stimulating example lately set in Germany—the country to which we so often are told to look for illustrations of the

eminently practical and businesslike temper. An Act to prevent the defacement of scenery was passed in the last session of the Prussian Landtag. It runs as follows:—'With the object of preventing the disfigurement of places remarkable for their natural beauty, the police authorities are empowered to prohibit outside of towns (ausserhalb der geschlossenen Ortschaften) such advertising boards or notices or pictorial devices as disfigure the landscape by means of police regulations issued in accordance with the Law of July 30, 1883. Such regulations may apply to particular areas or spots.' Instructions, we are glad to learn, have now been issued by the central Government to the local authorities for the strict enforcement of the provisions of this salutary measure, and it may be expected that many painfully familiar eyesores on the frequented routes will speedily disappear. There is beauty worth saving in the street as well as on the river or amongst the mountains. But it appears from the proceedings in the Landtag that regulations already exist which are considered adequate for the protection of urban areas. As regards the open country the Prussian Legislature has gone upon the lines which we are anxious to see adopted in English practice. (1) The law is elastic; it places an effective remedy within reach where a grievance exists, but avoids any interference with general usage in the matter of business notices. (2) It sets up no arbitrary distinction between one class of conspicuous signs and another. The sole criterion is disfiguring effect. There is one and the same rule for the big letters on the wall of a building which announces that it is Messrs. So and So's manufactory and for the multitudinous puffs which the same firm sets up along all the highways of travel. (3) The ground of public policy upon which we rely was asserted throughout the debate in strenuous terms. In the report of the committee which submitted the project occurs this paragraph:—'What is needed is the creation of a legal basis. We must do for the country what is already recognised as right for the town. The equitable interest of all who love beautiful nature is in question—that is to say, of most persons, whatever their nationality may be, who travel for pleasure. Nor can we overlook the pecuniary loss that will accrue if the progress of disfigurement diminishes the profits from the tourist traffic.' In the final debate in the Upper House, Herr Spiritus, the reporter of the committee, developed more fully the doctrine of the higher utility:—'We of the Rhine districts see many hundreds of thousands coming every summer from far and near to seek on the sunny heights, wooded hills, and shady valleys rest and delight. All return strengthened and entranced. . . . It is the same elsewhere. I trust that the conviction will grow that it is the sacred duty of our generation, especially of our public men, to preserve for posterity these beautiful tracts of the Fatherland.' Let me add that the assent of the Diet was by no means perfunctory. All the stock objections, the claims for compensation, for exemption in favour of this or that order of advertising sign, were urged and decisively rejected. The Hessian Legislature has included provisions of a similar character in a statute enacted recently for the protection of public monuments. Such is the way in which the wise and eminently practical people of whose progress so much is said amongst us order their affairs. I confess that I feel some patriotic humiliation in reading that the residents of Folkestone are still struggling in vain to rid themselves of a monster of the same kind as that which S.C.A.P.A. some time ago had the honour of helping to drive from the Dover cliffs. All because a House of Commons which votes thousands of pounds yearly for creating and maintaining pleasant places has not yet empowered local bodies to save the unbought and unpurchasable beauties of nature! Let us hope that the reproach will soon be wiped away. The question is not one of refined sensibilities, but of elementary common sense."

THE Late Sir Frederick Abel.—We regret to learn that Sir F. A. Abel died on Saturday, September 6th, in his 73rd year. According to "The Times," Frederick Augustus Abel was born in London on July 17th, 1827, being the eldest son of J. L. Abel, of Woolwich, and grandson of A. C. A. Abel, Court miniature painter to the Grand Duke of Mecklenburg-Schwerin. Undeterred by warnings that it offered very slight prospects as a career, he determined to adopt chemistry as his profession, and was at once met by the difficulties which confronted everyone of limited means, who, in the early years of Queen Victoria's reign, desired good scientific instruction at moderate expense. The Royal Polytechnic Institution was practically the only available place where the latter requirement was fulfilled, and, accordingly, in 1844, Abel's name was entered as a pupil on its books. But it was not long before he found that no attempt was made at methodical instruction; indeed, he soon began to doubt whether the "professor" had the ability to teach, even if he had had the wish. After spending six months in working through a standard textbook of chemistry according to his own devices, he decided that he had had enough of the Polytechnic Institution, and took his leave, the proud possessor of a testimonial setting forth the skill and minuteness with which his analyses had been conducted, and confidently recommending him to any post where a knowledge of practical chemistry might be required. But, luckily, for him, a scheme for establishing in London a school of chemistry on the lines of Liebig's famous one at Giessen was successfully carried through about this time, and thus he was able to form one of the 26 students on the roll of the Royal College of Chemistry, when its temporary laboratory in George Street, Hanover Square, was opened in the autumn of 1845, under the direction of the famous German chemist, A. W. von Hofmann. At the college he spent some six years, during five of which he was one of Hofmann's assistants, and he only left to succeed Faraday as Professor of Chemistry at the Royal Military Academy. A few years later, in 1854, he was appointed Chemist to the War Office—a position which he filled for 34 years. His official duties naturally led him to devote attention to the study of explosives for military purposes, and thus he became intimately concerned in some of the most important developments that the latter part of last century witnessed in the manufacture and use of ammunition. When mineral oils came into use as a means of domestic illumination it was soon found necessary to frame regulations for their storage, because some of the constituents of the mixture termed petroleum are so volatile that at ordinary temperatures it may give off inflammable vapours which in certain conditions become explosive. The first Petroleum Act, passed in 1862, defined as dangerous, and placed restrictions on the sale of any petroleum that gave off vapour at a lower temperature than 100 deg. F., but, as it omitted to specify any method of testing the oil, it was practically inoperative. During the next few years Sir Frederick Abel and other chemists investigated the matter, and as a result, in 1868, the second Petroleum Act was passed, legalizing the Abel "open-test" apparatus. In time it was recognised not only that the indications of this instrument were inherently untrustworthy, but that it lent itself to manipulation on the part of an operator who had some motive for not discovering the truth. In 1875, therefore, the whole question was referred to Sir Frederick Abel. He reported that, though the established flashing point of 100 deg. was calculated to afford adequate protection to the public, the method by which it was ascertained was not satisfactory, and at the same time, as an improvement, he brought forward the Abel "close-test" instrument. This was legalised in 1879, and has been the British standard ever since, besides being adopted, with or without modification, by several other countries. The flash-point of a given oil as determined by the new apparatus not being the same as that shown by the old one, it became necessary to fix the relations between the two. To this end a thousand samples of oil were tested by both methods, and it was found that on the average the temperature at which the oil vapour flashed was 27 deg. lower with the close than with the open test. Hence, the flash-point of 73 deg. was adopted as the equivalent of the 100 deg. prescribed under the old system, and has been adhered to ever since. Agitations (it is to be feared not always inspired by pure regard for the public safety) have from time to time been started to effect an alteration, but without success. The first condition for reducing the annual tale of accidents would rather appear to be due attention to common-sense principles of lamp construction and management, such as are embodied in Sir Frederick Abel's reports to the Metropolitan Board of Works and the Chief Inspector of Explosives. In 1885 Sir Frederick Abel rendered valuable service as a member of the Council of the Inventions Exhibition, and on the formation of the Imperial Institute, two years later, he was appointed organising secretary and general director. The duties of this office he continued to perform, in later years receiving no pecuniary reward for his services, until the end of his life, and practically until the end of the existence of the Imperial Institute as an independent entity; for it was only in July last that the Royal Assent was given to an Act, which will probably become operative at the beginning of next year, for the transference of the Institute to the control of the Board of Trade. The tenure of this arduous and difficult position did not prevent him from undertaking a great deal of other scientific and official work. He ceased to be Chemist to the War Office in 1888, but immense labour was involved in the investigations of the Special Committee on Explosives, which lasted till 1891. As a prominent member of the Goldsmiths' Company he took considerable interest in the subjects of technical education and original research, and was instrumental in establishing at the Imperial Institute well-equipped research laboratories in connection with its scientific and technical department.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

WHO PHOTOGRAPHED THE CANADIAN ARCH?

To the Editors.

Gentlemen,—I have been requested by some customers of mine, at Wrightington Hall, near Wigan, to try and find out a photographer who took the Canadian Arch on July 7th, about 6.15 a.m. There are three civilians and a policeman in picture, all of whom the photographer took trouble to pose. Unfortunately, they did not at the time ask for his card or address, and it is now particularly required, if it can be procured.—I am, Sirs, yours respectfully,

A. RUDOLPH-DOUGLAS.

23, Upper Dicconson Street, Wigan.
September 3rd, 1902.

A CASE FOR THE P.P.A.?

To the Editors.

Gentlemen,—We have read the letter of your correspondent in this week's issue of the BRITISH JOURNAL, and can only agree with your remarks that Mr. Brown (if he be a photographer, which, judging from his indignation appears a little doubtful), should become a member of the P.P.A., of which the head of our firm has been a member since its foundation.

At the same time, we fail to see that anything has been done which calls for the criticism of the committee of the association. Our work

is all we claim for it, as is borne out by the numerous testimonials we have received. We enclose copies of two from customers whose social standing is, at any rate, a guarantee of their value, and must ask you, in justice to ourselves, to give the same publicity to these testimonials, as you have to the communication of your correspondent, Mr. J. L. Brown.—Yours truly,

ELITE PORTRAIT COMPANY.

267, High Holborn, London, W.C.
September 8th, 1902.

[COPIES.]

The Cloister House, Gloucester.
May 28, 1902.

Canon St. John is much pleased with the portrait, and encloses 8s. 6d. He thinks that other members of the family will want copies when they see his.

(From the Hon. Sir Spencer Ponsonby Fane, P.C., G.C.B.).

Brympton, Yeovil.
September 3, 1902.

The enlarged photograph has arrived, and is very satisfactory. I enclose postal order and stamps for your account, 8s. 6d.

(Signed) S. PONSONBY FANE.

THE THORNTON-PICKARD COMPETITIONS.

To the Editors.

Gentlemen,—As our competition closes on October 1st, may we ask you to be good enough to draw the attention of your readers to that fact in an early issue of your valued paper? At the same time we would ask you to mention that negatives need not accompany prints in the first instance, and will be required afterwards only from prize-winners. Complete prospectus and entry form will be sent post free on application.—Thanking you in anticipation, we are, yours faithfully,

THE THORNTON-PICKARD MANUFACTURING CO., LTD.

Altrincham.
September 5th, 1902.

IRRITANT POISONING BY PHOTOGRAPHY.

To the Editors.

Gentlemen,—I should like to express, through the columns of your paper, my thanks to Professor Grün for his letter contained in your issue of August 15. The lead lotion remedy suggested by him has proved very efficacious in my case. Two days before seeing Professor Grün's letter I was developing "Velox," with the usual solution, containing 7 grains metol in 10 oz. water. I accidentally got a little on the fingers of my left hand. The result has been astonishing. My fingers swelled to twice their normal size, probably owing to their tenderness after former attacks, and the irritation was acute. The lead lotion treatment has certainly cured me, and, what is quite as useful to know, the weak prussic acid solution prevents a recurrence if the affected parts are dipped in it occasionally.—Yours very faithfully,

C.

September 3rd, 1902.

THE PROBLEM OF PORTRAITURE IN COLOURS.

To the Editors.

Gentlemen,—I have most carefully read my letter in your issue of the 29th ult. ,and I fail to see what has raised Mr. Kenah's ire, nor why he should call it ungentlemanly. I was not aware that it was considered ungentlemanly to call an article pessimistic, any more than to call it excellent, or satirical, or humorous; but I am always willing to learn. As regards the terms, "hasty and ill-advised," this was borrowed from your contributor's article, and, personally, I should have thought it more ungentlemanly to stigmatise all writers about colour photography and advertisers of goods for the same in all the photographic Press, as unworthy of credence, as he does when he cautions your readers against the same.

I was under the impression that any contribution in the pages of the BRITISH JOURNAL was open to criticism, contradiction, or comment; if, however, your contributor's effusions are an exception to this rule, it would be as well that he should append a notice to that effect to them. I endeavour below to justify my criticism, and the use of the terms complained of, for, personally, I consider them hasty, because to me they seem to have been written from a limited or ignorant point of view, and without consideration, and ill-advised, because they might deter "the rank and file of photographers" from trying the process, and this would be deplorable; the whole article seemed pessimistic, because it left me with the impression that there was nothing the professional could attempt, except photomechanical work.

I can assure Mr. Kenah that it takes somewhat more than his article to offend me, but I consider his letter a display of wounded vanity, deserving of the utmost contempt. Whether he chooses to answer my criticism or not, will not disturb my equanimity one jot or tittle. I, however, claim the right, with your permission, gentlemen, to deal with the subject of portraiture in colours, on the basis that an article has been published in *our* Journal, and has, therefore, received the imprimatur of being worthy of consideration, and that any reader is entitled to criticise the same, but that the author was A. V. Kenah, or Tom, Dick, or Harry, is to me a matter of the utmost indifference. It is to the rank and file of your readers that my statements are addressed.

With regard to the screens, if these are to be used before, behind, or between the lenses, then they should be preferably of optically worked glass; but as this is expensive, patent plate can be used. I have for the last five years used a special thin and white patent plate, about one-sixteenth of an inch thick; it is wonderfully free from flaws, and when using two pieces cemented together, I have not found that it impairs definition at all. I believe this is made by Pilkington and Co., and costs me, retail, one farthing per square inch. It is possible, and some authorities recommend the use of the filter in contact with, or close in front of, the plate, and then an old negative, freed from the silver, may be stained and used with successful results. A set of whole plate screens thus made, I have repeatedly used for practical work.

As to the making of three similar negatives, I have for three years used the Watkins time development system for colour work, and, therefore, I can recommend this from practical experience.

The question as to the light in the studio came under my notice four years ago, when a test chart was photographed in and outside the studio, and no readjustment of the screens was found necessary. I speak in this case from practical experience, and not from a personal theoretical hypothesis.

We now come to the point, and an important one, of the exposure. Dr. Miethe used screens of his own manufacture, but as he has given the regions of the spectrum which each transmits, even to wave lengths, it should not be difficult to make similar screens. The plates he used were made for him by Perutz, of Munich. These can be obtained commercially, and I fancy Dr. Miethe's screens can be had from Dr. Hesekiel and Co., of Berlin. The exposure given was 5½ sec. in all, but according to a statement in the September number of the *Photogram*, with which is supplied one of Dr. Miethe's colour supplements, an improvement has been made in the plates, so that the exposure would be reduced to 3 secs., under the above conditions. My estimate as to the increase in exposure in studio is borne out by an editorial comment on the same colour supplement, in the *Bulletin de la Société Française*, for August, for it says:—"Dans l'atelier, les poses sont naturellement plus longues et varient, avec une lumière moyenne, de 15 à 30 secondes." Let us accept, then, an increase of six times, by the improved plates, the exposure is reduced to three seconds, with F/12.5, the aperture used by Dr. Miethe; if we use F/6, the exposure would be only four seconds, which is surely within the range of practical work.

The predominance of greys in sitters is a matter which the rank and file of professionals can answer better than I can.

Hoffman's trichromatic carbon tissues were obtainable commercially nine months ago; I cannot say whether they are now. I do not expect the average professional to experiment, but there are others who might wish to do so, and to them I suggest Fleming's transparent ink powders. The synthetic colour powders of Hazura and Hruza are described in the *Photographische Correspondenz* and Eder's *Jahrbuch*, for 1900 and 1901. I think I cannot look the matter up, for, having but lately moved all "those wretched books," as someone calls them, are muddled in heaps upstairs, and I am as yet unable to manage even one step.

At the last R.P.S. exhibition there were some excellent specimens of superimposed films on opaque supports, and I think three years ago, at the same exhibition, a print on paper was shown, but this was by the gum bichromate process, and I doubt the practical process of this, for professional work.

The McDonough-Joly process I dismiss, because it is only applicable to transparency work, or to paper by a photomechanical process, and to expect operators to learn how to make half-tone negatives, and blocks, and print from them is an absurdity. Besides, I do not think Strephon will appreciate Chloe's portrait, with her lovely blush rose and creamy complexion, streaked with yellow and blue.

When a friend of mine, to whom I sold a camera, calls next week and tells me he cannot pay me because he has been trying a pretty problem and indulging in some most interesting speculative exercises, in the shape of the Sampolo-Brasseur process, I shall promptly put him in the County Court, but I shall try the dodge on my landlord anyhow, the next time he calls for the rent. If it comes off your readers shall know.

Allow me to append the following extract, from the price list of the Lumière N.A. Company. I fancy the statement is in Mons. Lumière's original paper, but am not sure:—"Prints in colour may also be produced on paper, in which case it will be necessary to employ much fainter monochromes than are used for transparencies. The operations generally are of a more delicate nature, and require extremely careful manipulation."

That portraiture in colours on paper is possible I know, that it is

in such a stage as to be taken up by the rank and file now, I doubt; but an enormous step has been made by Dr. Miethe, and I feel that within a short time it will become comparatively general; but there is an old proverb about the early bird.

I must apologise for taking up so much of your space, but the BRITISH JOURNAL has always been open to gentlemanly and polite letter writers, although they do occasionally become prolix.—Yours, etc., E. J. WALL.

INTERNATIONAL CONVENTION RELATING TO PATENTS, DESIGNS, AND TRADE MARKS.—IMPORTANT AMENDMENTS.

To the Editors.

Gentlemen,—It will be of considerable interest to manufacturers to know that on the 14th September (instant) amendments of importance will take effect in all the States of the Convention—that is to say, in Belgium, Denmark, France, Italy, Japan, Netherlands, Norway, Portugal, Sweden, Switzerland, Tunis, and United States.

The principal amendments taking effect are as follows:—(*a*) The priority granted to applicants for patents, designs, or trade marks, in any of the States of the Convention, shall be *twelve months* for patents, and *four months* for designs or trade marks, reckoned from the date of the application in the State in which the applicant is domiciled. (*b*) The patents applied for in any of the States of the Convention by persons entitled to the privileges thereof shall be independent in duration of patents obtained for the same invention in other States, whether parties to the Convention or not. (*c*) No patent applied for under the Convention shall incur forfeiture for non-working until the expiration of a minimum period of three years from the date of the application.

The extended period of priority given to applicants under the Convention has been granted in Great Britain since the 1st January, 1902, by the amending Act that came into force on that date.—We are, Sir, your obedient servants, EDWARD EVANS AND CO.

27, Chancery Lane, London, W.C.
September 9th, 1902.

SOLUTION OF THE CONUNDRUM.

To the Editors.

Gentlemen,—Transpose (you see) U.C. and then you have it.—"Puck."—Yours, etc., H. A. L.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY, 24, *Wellington-street, Strand, London, W.C.*" *Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

PHOTOGRAPHS REGISTERED:—

T. R. Braybrook, Church Square, West Hartlepool. *Photograph of "The Hartlepools Coronation Souvenir."*

J. Patrick, 52, Comiston Road, Edinburgh. *Photograph of Edinburgh. Photograph of Lady Nairn and Son. Photograph of J. Welsh.*

A. WALKER.—The formula that will probably suit you will be found on page 1,069 of the ALMANAC.

OPINION WANTED.—"RETOUCHING" writes: "Will you kindly inform me as to what you think of my retouching?"—In reply: The work is very creditable, and is better than much that is submitted to us. But we can give no opinion as to how the likeness has been retained, as untouched prints were not sent.

FORMULA WANTED.—C. T. writes: "May I trouble you to let me know of a reliable formula for making toning and fixing solution in large quantities for bottling, for retail to amateurs?"—In reply: We presume you mean a combined toning and fixing solution. A good formula for that is given on page 1,077 of the ALMANAC.

RETOUCHING.—L. G. G. writes: "I should esteem it a great favour if you would comment on the enclosed specimens of my retouching, and advise me as to what salary I could command as assistant operator and retoucher? I am also competent of taking a good negative."—In reply: The retouching may be classed as tolerably good. It is impossible to say the salary you could command simply by seeing two or three specimens. We should say, from what is sent, you could not command a very high salary.

STUDIO CONSTRUCTION.—"PHOTOPHIL" writes: "I should be glad of indications respecting a moderate-sized studio or workroom for copying and photographic reproduction. I can command light all round. The lighting is the chief point."—In reply: There are so many forms of studio that will answer for copying; indeed, all will answer for the purpose, so long as the object is evenly illumined. Perhaps the most convenient to you would be one with a sloping front light, facing the north, as the light from that direction is the most constant. We are assuming that the studio is required for copying only.

NIGHT PHOTOGRAPHY.—"INCANDESCENT LIGHT" writes: "Would you kindly say what number of incandescent burners would be required to obtain a good negative at about two seconds' exposure, using, say, an Imperial flash-light plate and a good, quick portrait lens with open aperture?"—In reply: Very much will depend upon the distance the lights are placed from the sitter and how they are distributed. If they are placed near the sitter, as they may be when only, say, a bust portrait is desired, fewer will suffice than when a full-length is necessary, and the lights have to be much further away. Again, the mantles deteriorate as they are used. Try from eight to a dozen for a medium distance.

SPOTS ON C.C.—"BHOS" writes: "Can you tell us cause of black spots on prints enclosed? They are on —— paper. We have used this make for about six or eight months, and up till about three or four months since we have never been troubled with these spots, although there is no change of treatment. Previous to that we used ——, and found that excellent; but, somehow, they gave over sending the latter."—In reply: Beyond saying that the spots appear to be caused by contact with something that has reduced the silver where they are, we can give no decided opinion. We should advise you to send a few examples on to the makers of the paper; they may perhaps be able to tell you more decidedly the cause.

CRACKED FILM.—W. S. B. writes: "I have a 1-1 plate negative, subject of value to me. The glass has got cracked, but the film is undamaged. Fair good negative, but perhaps a little thin. It has been retouched, therefore rubbed over with retouching medium. What is the best and safest way to transfer to another glass? If necessary to remove the retouching medium, please say how? I don't mind whether it is same size or allowed to expand. Only the latter may make it still thinner, in which case it may not print very brisk."—In reply: The method of stripping negatives has often been described in the JOURNAL. Briefly, here it is again: Place the negative face upward on another glass, and immerse in a solution of alum, if the negative has not previously been alumed. Rinse and put into water, to which four or five drops per ounce of hydrofluoric acid have been added. In a few minutes the film will have been loosened, and may be floated off on to another glass which has previously been coated with a thin solution of gelatine, and allowed to set. It may then be allowed to dry. The retouching medium had better be removed beforehand.

SPOTS ON PRINTS.—"PERPLEXED" writes: "Please tell me cause of white spots on enclosed platino-bromide prints? They were developed with amidol. Suspecting some foreign substance had got into amidol or sulphate of soda, new stuff was procured from the dealer. Still the bad marks continued to appear. Everything used in making these prints was perfectly clean. The moment the image began to appear these spots became visible, as if they were non-sensitive parts of paper. Do you think impurities in the water may have been the cause? Will you also kindly say cause of spots on enclosed negative developed with pyro and soda?"—In reply: The spots on the prints seem to be due entirely to careless work. Evidently particles of dust or dirt in the solutions are the cause. This is also the cause of the spots on the negative. On that the particles can be distinctly seen. We do not think they come from the water. However, you might put a couple of thicknesses of fine flannel over the water-tap and see if the spots appear then.

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The British Journal of Photography.

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THE BRITISH JOURNAL OF PHOTOGRAPHY.

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*** *The Editor can only be seen by appointment.*

*** *We do not undertake to answer letters by post.*

THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC FOR 1903.

Edited by Thomas Bedding, F.R.P.S.

The forty-second annual issue of The British Journal Photographic Almanac will be published early in December next. This year's Almanac reached a total of 1,560 pages, and the entire edition of 20,500 copies was sold out a fortnight before publication. Of no other photographic book ever issued can two such unique facts be recorded.

The edition for 1903 will be increased to 25,000 copies, a large number of which are already ordered.

The striking favour with which past Almanacs have been received is the surest proof that the lines upon which the publication is produced meet the requirements of its readers and supporters. Upon such lines we propose compiling the volume for 1903. At the same time, we shall be pleased to receive and consider suggestions for increasing the value of the Almanac in directions which may occur to our readers as susceptible of improvement.

The Almanac for 1903 will appeal to photographers all the world over as a daily reference guide in practical work. The standard matter and formulæ will be revised and added to where necessary, and the latest departures in theory and practice will be chronicled. The year's advances will be recorded, and wherever practicable new features of an informative nature will be added.

Secretaries of societies will oblige us by promptly forwarding lists of officers and other details for inclusion in the directory of photographic societies. We shall also be glad to receive any additions that may be made to the list of telegraphic addresses of the trade, etc. As usual, a section of the Almanac will be devoted to notices of the latest introductions in photographic apparatus, etc. Those firms who wish to take advantage of this feature should communicate with us not later than Ocober 31.

The publishers ask us to remind advertisers that many of the advertisement pages of the Almanac are already booked, and that, to ensure insertion and good positions, orders and copy should reach them without delay.

EX CATHEDRA.

Another Photographic Competition. The Parisian journal, the "Figaro," announces another photographic competition. As it enjoys a large circulation, amateur and professional, photographers may think it worth while to enter prints. The selection of subject is restricted to artistic, ancient, and ecclesiastical architecture and decoration. The prints must not be smaller than 9c. by 12c., and must be sent to Monsieur Voisin, Secretary of the "Figaro" Photographic Competition, 26, Rue Drouot, Paris, from whom further particulars may be obtained. Prints will not be accepted after October 5 next.

* * *

The Transparency of Ebonite. Monsieur Perrigot has made a further communication to the French Academy upon this subject. In his communication of April 20 last he showed that ebonite was transparent, and that the phenomena of so-called black light might be explained by photographic reversal. He has continued his experiments with sheets of ebonite 0.5mm. thick, perfectly polished, using Carbutt films for the impressions. Ebonite apparently acts as a colour screen, and this may be perceived by examining it with a beam of light of great intensity. The rays transmitted are orange-red. Experiments with orthochromatic plates, very sensitive to red and yellow (Lumière, Series B), gave similar results with much less exposure. Sheets of ebonite 2m.m. thick, although opaque to the eye, still transmitted sufficient light to affect a plate, especially if the sensitiveness extended to the red and yellow. This was ascertained by exposure to sunlight and electric light, and normal results, or reversal, could be obtained, either by using the

plate in its original state, or by giving it preliminary exposure.

* * *

The Decimal System of Weights and Measures. There is no question, as we have said on previous occasions, that the decimal system of weights and measures will be universally adopted in this country for all purposes. For some time past the metric system has been legal in trade transactions in this country. Here is a further step towards its general adoption, at least in one branch of business. One day last week the following announcement was made by the Liverpool Cotton Association: "On and after the 1st October next trading in 'spot' and 'futures' American cotton in Liverpool will be in hundredth parts of a penny per pound, instead of sixty-fourth parts and on the same date the discount of 1½ per cent. hitherto allowed will be abolished. This important change in terms will result in a lowering of quotations by approximately 4-64ths to 5-64ths or 6-100ths to 7-100ths per pound, being the equivalent of the discount no longer given, the net value thus remaining unaltered. On the same date the weight of the American cotton contract for futures will be altered from 47,200lb. to 48,000lb." This, it is true, is but a small step, inasmuch as the penny is not the decimal part of the £; still, it is a step in the right direction for the decimal system becoming universal.

* * *

New Lenses. A further interesting development in lens construction has recently appeared in Germany. The calculator of this new instrument is Dr. Harting, one of the leading men at Messrs. Voigtländer and Sons', of Brunswick. The lens is an anastigmatic triplet, with a relative aperture of *f*. 4.5, this intensity being not only attained in the smaller sizes, but throughout the series. It is thus little short of the rapidity of the ordinary portrait lens. The front and back lenses of the combination are both formed of two cemented components, and the middle lens is, apparently, a single biconcave. The combination has been named the "Heliar." Owing to its large aperture, it is specially suitable for very rapid instantaneous work, portraiture, tele-photography, enlarging, and lantern work. Professor Aarland, to whom a specimen of about 14in. focus was submitted, speaks in high terms of its performance, and draws special attention to the good correction for coma. We also see that a patent has been granted to A. H. Rietzechel for a symmetrical combination closely resembling Steinheil's Orthostigmat. Although both components consist of four elements, instead of three, the middle one of the Orthostigmat, a meniscus, has been split into a plano-convex and plano-concave of slightly differing refractive indices. Dr. Hugo Schroeder has also taken out a patent for two unsymmetrical combinations, the components in both cases being of four lenses each. The specification does not, however, give any particulars of the indices of the glass, the radii, and the thicknesses. The relative aperture and the angle included are likewise not specified.

* * *

The Amount of Silver Bromide on a Plate. The "Allgemeine Photographen Zeitung" contains a communication from Dr. Bellach, of the Royal Technical High School, Berlin, concerning the determination of the quantity of silver bromide present in the film of a photographic dry-plate, and it is recommended for its simplicity and approximate correctness. The film is placed in a dish, containing a 5 per cent. solution of cyanide of potassium, for about fifteen minutes, or sufficiently long to convert the whole of the bromide of silver. Place the solution in a beaker, rinse the dish with distilled water, which add to the solution. After warming the same, add nitric acid, which precipitates the silver bromide and liberates hydro-cyanic acid. This should be done with great care. Pure hydro-cyanic acid is one of the deadliest poisons, and even the inhalation of a small quantity of its vapour is fatal. After precipitation of the bromide, pour off the supernatant fluid and filter through a well-dried, double filter-paper, which has previously been weighed. Wash the bromide by pouring hot water through the filter several times. Dry and weigh. The excess above the weight of the filter-paper will indicate the amount of silver bromide. The following result shows that the process is sufficiently accurate:—

Given amount of silver bromide by weight, 0.31 grammes. Amount after decomposition and precipitation, 0.32 grammes.

Two plates, 9c. by 12c., of different make, were tested, and found to contain 0.21 and 0.24 grammes respectively.

The chemical process may be stated as follows:—

$$\text{I.}\quad Ag\,Br + 2KCN = K\,Ag\,(C\,N)_2 + K\,Br.$$
$$\text{II.}\quad KAg\,(C\,N)_2 + 2\,HNO_3 = Ag\,NO_3 + KNO_3 + 2HCN.$$
$$\text{III.}\quad Ag\,NO_3 + KBr = KNO_3 + Ag\,Br.$$

The silver may also be recovered by electrolysis from the solution of silver bromide and potassium cyanide. It should then be weighed, and its equivalent of silver bromide found by calculation.

* * *

Tri-chromatic Portraiture. We have recently had the opportunity of communicating with the firm of O. Perutz, of Munich, concerning the colour-sensitive plates prepared by them, according to Dr. Miethe's formula for colour photography. Since we drew attention to the remarkable colour print, which Dr. Miethe published in the "Atelier des Photographen," very considerable interest in the possibilities of tri-chromatic portraiture has been awakened. There can be no doubt that excellent colour photo-mechanical prints may be produced by the photographer who has mastered the three-colour process, provided the light is good when the photographs are made. We have had numerous inquiries upon the subject, and in answer to these we have much pleasure in publishing the further particulars which have been supplied to us by Messrs. Perutz. In our "Ex Cathedra" notes of August 15 we mentioned that we believed the plate sold for these photographs was the "Perorto," but we were misinformed. The plate used for the purpose is the "Perchromo." It is sensitive to blue, green, and red light, and has a speed of about 25 Warnerke. As stated in a previous note upon this subject, it is very important that the three exposures should be correctly timed, according to the sensitiveness of the plate, for the three primary colours. Further particulars upon this point may be gathered from our issue of April 11. But not less important is the fact that the three negatives must be simultaneously developed, with the same solution, for the same length of time, otherwise the negatives will probably vary in density, and produce bad prints. Those who have studied the Hurter and Driffield theory will understand the importance of this precaution. The colour screens prepared by Dr. Miethe may be obtained from Herr Perutz, of Munich. Great care must be used in the dark room and a suitable screen for development may be prepared by thoroughly staining a fixed and well-washed dry plate, first with 1 gramme of

methyl violet dissolved in 400c.c. of water and then with 1 gramme of tartiazin dissolved in 100c.c. of water. Hitherto the most frequent cause of failure has been a disregard of the precaution to develop all three negatives simultaneously for the same length of time. We recently drew attention to another plate, manufactured by Herr Perutz, called the "Perxanto." This is very sensitive to green and yellow, but not to blue. It is an orthochromatic plate, giving a true rendering of colour without the use of a screen. Its speed is about 23 Warnerke.

* * *

Cloud Effects and Stock Cloud Negatives.

These lines will reach the reader at about the time of the Autumnal Equinox, and when many amateurs will be thinking of relinquishing photography—out of doors, at least—for some months, and will be devoting their attention to producing results from the negatives they have secured during the past summer season—or such a photographic summer season as we have had in this country. With gelatine negatives, it is pretty well known that, when taken under ordinary conditions, natural clouds—that is, printable clouds—are not secured in the negative. Therefore the prints appear with white or tinted skies, unless the sky be printed in from a second negative. But how many amateurs have a stock of cloud negatives from which they can select one to suit any particular picture? All that many have are half a dozen, or perhaps a dozen, purchased commercially, from which they select one that the best fits in for the picture, though it may be quite unsuited to the subject. At this time of the year there are to be obtained a greater variety of cloud effects than at any other time, not excepting the Vernal Equinox; yet many amateurs do not embrace the opportunity, much as these cloud negatives might improve their pictures, however small they may be. This is the more surprising, inasmuch as they may generally be obtained without leaving home, and on plates that may have deteriorated by keeping, or at least such as one would not care to take away on a day's outing; old stock may be utilised for the purpose, as the margins are of little moment in cloud negatives. Hence it will be seen that a large stock of cloud negatives may often be secured without any outlay for plates, and only for the small trouble of exposing and developing. One of the chief faults of stock cloud negatives is that they are taken with the camera pointed too much to the zenith, so that the light upon them does not accord with that upon the landscape. That is too often noticeable in some of the so-called "art pictures" seen at some of the exhibitions. Unless the introduced clouds are in unison with the landscapes, they are better omitted. One often sees in pictures of the type just alluded to wild, turbulent skies introduced into serene land or seascapes, and the result is often extremely ludicrous in the eyes of artists. Much of this might be avoided if the photographer had a good stock of negatives to select from, and had judgment to make the selection. Now is the best time of the year to secure such a varied stock, as all kinds of clouds, summer, autumn, and winter, are to be seen about this time of the year. Years ago it used to be said that introduced clouds in lantern slides spoilt the picture, but that idea has now been dispelled, particularly when the clouds are printed on the cover glass.

* * *

Dangers In Compounding Flash-lights.

The season is now fast approaching when photographers will be requisitioning artificial light to supplement daylight for many purposes. Where electric light is not available, "flash-lights" are frequently employed, and often by those who have no idea of the danger that lurks in many of them, particularly those that contain chlorates. This fact is once more called to mind on reading the report, recently made, by Captain Desborough to the Home Office upon the accident which occurred in the building used for the manufacture of non-explosive ingredients at the factory of Messrs. Pain and Sons, Mitcham, on June 15 last, when two persons were killed. In his report, Captain Desborough says: "The fact of an explosion in a non-danger building must, on the face of it, be evidence of an illegality having been committed." In concluding his report, he says: "To prevent the possibility of a chlorate coming in contact with other ingredients, I have requested Messrs. Pain to take steps to keep all chlorates in a separate store, and to arrange that all the operations of sifting and weighing such chlorates may be carried out in a building into which other chemicals are never brought." The accident that necessitated this report occurred at a firework factory, where it might be supposed that the character of the materials employed were well understood. But that is not always the case with photographers who compound flash-light compositions for their own use from published formulæ. In these formulæ often no special precautions are given, beyond "Pulverise separately and then mix." Whenever we have been asked for formulæ by correspondents we have always impressed upon them the dangerous nature of the manipulations when chlorates are amongst the ingredients. Chlorate of potash, for example, under normal conditions, is a perfectly harmless substance, but when mixed with some others, say some that enter into flash-light compounds, it becomes highly explosive and dangerous, although all the other ingredients may be quite harmless by themselves. The danger only steps in when they are mixed together. In compounding flash-light compounds containing chlorates or oxygen-forming substances, all the ingredients should be dried and pulverised separately and only mixed together at the time of using, and then only in quantities for a single flash, as many of them are liable to go off spontaneously and when least expected. The mixing should always be done on a sheet of paper, with a slip of thin carboard as a spatula, and even then used at arm's length, so that if an accident should happen no great injury will be done to the operator. This is by no means the first time we have called the attention of readers to the great risk there is in compounding flash-light powders by those who are ignorant of the materials with which they are dealing.

THE Austin-Edwards Monthly Film Negative Competition.—The prize camera for the current month has been awarded to the Rev. Canon Pearce, The Vicarage, Bedlington, R.S.O., for his negative "The Bettmer Alp."

THE Professional Photographers' Association.—There will be a meeting of the General Committee at 51, Baker Street, W., to-night, Friday, at 6 o'clock, at 51, Baker Street, London, W. Business: Fire Insurance Policy; Appointment of Assistant Secretary; Birmingham Branch Formation; Price Cutting, etc.

BOROUGH of Southport.—A Photographic Exhibition will be held in the Atkinson Art Gallery, Southport, from November 24th to December 6th, 1902. The judges will be Messrs. Harold Baker, R. Child Bayley, F.R.P.S., and H. Snowden Ward, F.R.P.S. The following is the Selecting and Hanging Committee:—Councillor F. W. Brown, Chairman Art Gallery Committee; Dr. Baildon, Vice-Chairman Art Gallery Committee; Messrs. D. E. Benson, A.M.I.C.E., C. H. Brown, Willis Brunt, Geo. Cross, J. Noton, and F. W. Teague. The exhibition will be open on Saturday, November 22nd, by a private view, and will continue open daily (Sundays excepted) from Monday, November 24th, to Saturday, December 6th, from 10 a.m. to 10 p.m. Each Monday, Wednesday, and Saturday evening, an exhibition of lantern slides will be given by the Southport Photographic Society. The exhibition will be divided into six sections, namely:—(1) Selected Pictorial Photographs; (2) Scientific Photography; (3) Lantern, Stereoscopic, and Decorative Transparencies; (4) Photo-Mechanical Processes; (5) General Professional Work; (6) Photographic Apparatus and Material. Entry forms can be obtained of Mr. F. W. Teague, Curator, Atkinson Art Gallery, Southport.

ON SOME PHOTOGRAPHIC FETISHES.

It is doubtful whether in all modern social history the survival of so many fetishes can be paralleled by what we see in the every-day practice of photography. The primitive savage, when he hangs a bit of coloured rag round his neck, in the full trust in its efficacy to ward off evil, and in many ways to help him in his daily life, simply discards it or tears it to pieces and jumps upon it when it disappoints him in his expectations; it is not generally taken up and fondled by a neighbour or a rival in his dusky affections. But in photography the discarded beliefs of its early days and the proved uselessness of many of the practices of its adolescence are picked up again and hugged, and metaphorically prayed to by an immense number of its devotees and adherents. Take what is perhaps the most familiar example of all, the experience of the very earliest daguerrotypists. The sitters sat, sweltering in the sun, motionless, and with instructions not to blink, for a period of time not counted by seconds, or fractions of a second, but by actual minutes, until the use of bromine enabled the exposures to be brought within reasonably practical limits. Then wet collodion reduced the minutes to seconds, and gelatino-bromide to fractions of a second. Yet to the very present the full conviction of the need of sunshine and the fatal effect of blinking during exposure survives, and is a fetish whose absurd inefficacy cannot be fully brought home to the public mind. Photographers deride it and explain the falsity of the idea, but what our great-great-grandfathers were taught to believe in is still cherished by a vast proportion of their modern descendants—arguments seem powerless to cause its banishment—and every day the professional has to listen to the praises of the "beautiful day" for photographing, all the while he is silently anathematising the sun for spoiling his outdoor group-lighting or causing his studio-sitters to screw up their eyes through its glare. But, on the other hand, can we truthfully say that he has no fetishes of his own in his own practice? Scarcely. Let us take his management of his lenses. If there is one belief the average photographer holds more strongly than another, it is that a landscape lens must not be used for architectural subjects, and he becomes great on "pincushion and barrel-shaped distortion" when he discusses the question. He would be surprised to learn—indeed, he would most probably be incredulous—upon being told that some of the best architectural photographs, interior and exterior, that have ever been taken are the results of the use of landscape lenses. It is absolutely true, and not a consequence of the introduction of modern improvements, that the so-called landscape lenses—single lenses, simple or cemented, achromatic or non-achromatic—may be used with perfect safety for taking architectural subjects, the only restriction being that a comparatively narrow angle only can be utilised. We say comparatively narrow, but a sufficiently large pictorial angle may be used without the marginal straight lines of the subject losing their rectilinearity in the negative. Bringing the question to a practical issue, it may be said that if a landscape lens be employed with a focus double the length of the longest side of the plate, and its axis be directed to the centre of the plate (that is to say, the camera sliding front is not raised or lowered), curvature of marginal lines would not be noted. If, however, such a lens with a focus, for example, of eight or ten inches be used to take buildings upon a whole-plate size, we should expect to see bent lines towards the edge of the negative. But even here, in a very large number of the subjects that are likely to be photographed, the limits we have set down would be unnecessarily large. We have before us as we write a 12 by 10 print of a building used as a bank; it was taken for the bank authorities, to show the grandeur of their property, so that it naturally almost fills the plate. Yet, though taken, to our knowledge, with a 16½in. focus landscape type of lens, and the camera front raised so as to include the chimneys, it would take a most acute observer, armed with a straight-edge or compasses, to detect the slightest deviation from a straight line in even the outside angles of the building. In other words, the supposed need for a rectilinear type of lens in lieu of a landscape is a fetish only. Yet another example of a lens fetish—so-called "depth of focus." It is not long since we saw in a leading lens manufacturer's advertisement a lens recommended for its "depth of focus," which, it was stated, had been brought about by adopting certain materials in its construction, clearly implying that the "depth" was a function in the structure of the lens. Leaving aside the undesirability of the use of the term "depth of focus," which purists in technology deprecate, we would point out the utterly misleading nature of such a recommendation. If there be an absolutely inexpugnable statement in photographic technics, it is that depth is not a function of any particular form or material of construction of a lens, but is solely governed by the relation of effective aperture to focus. A common spectacle lens working at *f*. 16, for example, would within its area of sharp definition have as much depth as the dearest anastigmat ever produced. The rubbishy lens attached to the lowest grade of hand camera, with paper imitation leather covering, and working with an aperture of about *f*. 12, is equal in depth to its aristocratic anastigmatic neighbour, surrounded with all its glory of real morocco and silver fittings. Indeed, it might be more truly stated that the cheap lens has the most depth, seeing that it cannot be worked with a larger aperture than about *f*. 12, while *f*. 4 or *f*. 5 represents the rapidity of the other type at its quickest when depth is conspicuous by its absence. This rule holds good, whatever the type of lens employed—simple or compound, achromatic or non-achromatic, wide or narrow angle, with or without air lenses—made with Jenn glass or ordinary glass. If we could feel that what we have here written would have some effect in spreading the truth about depth, we should feel we had done real service; but so long as such advertisements, and others, as grossly misleading, like them, continue to be published the depth-of-focus fetish will still be worshipped.

An Act of Vandalism: Works of Art at Guildhall Slashed about with a Knife.—Indignation was expressed at the Guildhall a few weeks ago owing to the treatment to which two pictures were subjected by an unknown person. One of them was deliberately cut with a knife, and the other was extensively damaged by, apparently, a man's boot. A strict inquiry made at the time failed to discover the person who had done the damage. This week a third picture has been disgracefully slashed about with a knife. The men employed on the premises were closely questioned, and finally one of them confessed to having done the damage to the third picture, but could give no reason for his act. He has been in the employ of the Corporation for some time, and appears to have conducted himself well. The man has, of course, been suspended, and the City Lands Committee will consider what steps should be taken with regard to the matter, and, further, to discover, if possible, whether there is any connection between the present outrage and the two previous ones.

COPYING.

The most useful type of all lenses for copying is the anastigmat, which term includes all the newer lenses, which, with a large aperture, possess a flat field. Of the older type of lenses, the old Ross portable symmetrical is one of the best, as it possesses an unusually flat field. As regards the focus of the lens, there is not much to be said, though personally I prefer to use one of as long a focus as possible, as the illumination at the corners is far better than with an extremely short focus lens; the only case in which a long focus is sometimes objectionable is when copying full size, when the necessary extension of camera bellows becomes sometimes too great.

It saves a lot of trouble, if one, before starting work, calculates out the conjugate foci for the lens that is going to be used. In every copy of the "British Journal Almanac" will be found the necessary table giving the conjugate foci for reduction, but it may not do any harm to give the well-known rule. Divide the longer side of the subject by the longer side of the desired reduction, and the result will be the times of reduction; to this add one and multiply by the focus of the lens; the result is the distance between the lens and subject. To find the lesser conjugate focus, or the necessary extension of camera, divide the greater conjugate focus by the times of reduction.

It may happen that only one camera is available, but if there is a choice one of the old-fashioned square bellows type, focussing at the back is to be preferred to the front focussing. In all cases the focussing screen should be ruled with parallel lines in both directions, and I have found it a great convenience to rule these lines at intervals of one inch, and mark also the half and quarter inches by short lines, and further, to commence the numbering of these lines from the centre of the focussing screen, so that if it is required to reduce the copy to a given size one can easily see the measure on the focussing screen.

Above all things, for really critical sharpness, it is highly desirable to cement two microscopic covering glasses to the ground glass, one at the centre, and the other in one corner of the screen. It is necessary to first mark the ground glass with a cross in lead pencil, and then, if the focussing magnifier is set so that this is in focus, one can be quite sure that the image is in focus on the plane of the ground glass. At the risk of telling an oft-told tale, the following is my method of cementing these glasses down:—The focussing screen is removed entirely from the back and warmed over gas or in the oven till hot, then a good-sized drop of Canada balsam is placed in position, the cover glass dropped on to it, and then gently pressed down with a wine cork; if the balsam does not spread to the edge of the cover glass the whole is put into the oven and heated still further and again pressed down. Any balsam exuded should be wiped off, when quite set, with a rag wetted with spirit.

The ideal process for the reproduction of black and white or line work is wet collodion, but equally good results can be obtained on dry plates, when you know how to do it. The only plate that is suitable for this class of work is the slow photo-mechanical plate. Sometimes it happens that for lecture purposes it is required to reduce a diagram to the regulation lantern size, then one can use any of the commercial lantern plates for black tones with equally good results as the photo-mechanical plate.

There are two distinct methods of working, the one to use as large a lens aperture as possible, and develop as long as possible without any deposit showing in the lines; the other to use a small aperture, a blue screen, and develop till extreme density is obtained, regardless of the lines, and then reduce with Howard Farmer's reducer. Personaly, I prefer the former method, and rarely fail to obtain full density with bare glass.

The best developer for this work is undoubtedly one suggested by Lumière, which is without alkali and bromide, and gives extreme density with correct exposure: the formula is:—

Hydroquinone	8 grains.
Sodium sulphite	80 grains.
Formaline	10 grains.
Distilled water to	1oz.

Should it happen that after fixing it is found that there is not quite enough density—and this only occurs with incorrect exposure—it is extremely easy to intensify, and for preference with the potassio-silver cyanide formula.

Pencil drawings sometimes give trouble by a deposit in the lines, though I have found it advantageous to disregard this whilst developing and then reduce. A few months back I believe that at the Photographic Club Mr. A. Mackie suggested placing a piece of fine ground glass over the pencil drawing and copying through this, as it made the pencilling photograph cleaner. This, however, I have not tried.

Blue or ferro-prussiate prints sometimes give a lot of trouble, and the best method of working I have found is to use a slow isochromatic plate and a yellow screen, this being sufficiently deep to make the blue print, when examined visually, look a deep dirty green.

Of all troublesome things to copy, miniatures, or other pictures from which one must not remove the convex glasses with which they are covered, are the worst. It seems that, light them how one will, there is sure to be a reflection. I have got over this trouble to a great extent by hanging tissue paper round the miniature; in fact, placing the same at the bottom of a tunnel of tissue paper; this softens the reflections a good deal. Of course the proper thing to use would be a Nicol prism, but these of reasonable size are not to be picked up every day.

For copying ordinary photographic prints a plate of medium rapidity should be used. Frequently faded prints are brought to be copied, and then we must have recourse to a blue screen. Very pale blue glass may be obtained, but it is easier to make a screen by staining a plate, as will be described hereafter, with methylene blue; only a very pale tint is wanted, and the depth of the screen can be easily varied if aniline dyes are used.

It is almost unnecessary to point out the necessity of insuring the even lighting of any subject to be copied. In a studio this is not difficult, but it is far more difficult in a private house, and it will frequently be found more advantageous to work out of doors. When we come to copy coloured objects, the question of the illuminant is far more important, and it may be considered as an axiom that the more brilliant the illumination the better will be the rendering of the colours, and therefore sunlight is to be chosen, if possible. For old masters, or those old paintings which have become mellowed by time into rich deep browns, sunlight is the only illuminant which will give a satisfactory rendering of the same, assuming, of course, that arc lamps are not to hand, as they usually are not in the majority of cases. For small pictures magnesium ribbon may be used, but for large and deep toned pictures the quantity required is considerable. For small pictures, whether in oil or water-colour, if of the modern schools, and thus brilliant in colouring, successful work may be done with two oil lamps or incandescent gas burners, placed one on each side of the picture, with a dark shade placed on that side of the lights next the camera. For such work I use the largest sheet of Bristol board folded in half, one side being left white to act as a reflector, the other being covered with black needle paper, so as not to reflect light into the lens. If lights are used in this way, whether oil, gas, or magnesium, they

must be placed one on each side of the picture, and as near as possible so as not to be included by the lens; if placed by the side of the lens, far more reflections are caused.

Of course one of the most important questions with regard to the copying of coloured subjects is the question of plates, and for the best rendering the so-called panchromatic plates are the best; these require rather careful handling in the dark room, as most of the ordinary dark room media will fog them.

Next to the plates comes the question of the screens for use with the same. Considerable diversity of opinion exists as to the best place for the screen, but if of optically worked glass it is not of much moment, nor is this important if very thin white patent plate be used, but focussing must be effected with the screen in position. A very convenient way of using the screen is in contact with the plate in the dark slide; if this is done, of course allowance must be made for this in focussing. It can also be placed in the camera back, and not in contact with the plate. If this plan is adopted the simplest way to prepare the screens is to use a useless negative, and remove the silver image by means of hypo and ferridcyanide. It is necessary, of course, to choose a negative on a piece of good glass.

If glass is to be coated with gelatine, a 10 per cent. solution should be made, and it is advisable to use a good emulsion gelatine, such as Heinrich's, Drescher's, or Stoess's; it is as well to add a little carbolic acid, xylol, or thymol to the solution to prevent it from spotting whilst drying. Fifteen minims should be allowed to each square inch, and the solution should be about 100deg. F. for coating. There is no difficulty in coating this quantity, proceeding just as with collodion. It is important to level the glasses for setting, and this can be readily done by placing on a larger slab, which has been levelled by three wedges. The gelatine coating must be allowed to dry completely before staining.

The stains to use may practically be considered as confined to the yellow aniline dyes, and brilliant yellow, uranine, naphthol yellow, auramine green, metanil yellow, acridine yellow, and possibly aurantia, may be chosen from; brilliant yellow will generally be sufficient for all ordinary work if a little erythrosine be obtained. It is immaterial what strength the solutions are, but 1 per cent. is convenient.

The main purpose of the screens is, as is well known, merely to cut the action of the blues, and therefore the deeper the colour of the yellow screen the longer we can expose without the blues being rendered too light. The solution of the dye should be filtered and used at a temperature of from 65deg. to 70deg. F., and the gelatinised glass should be placed in them, and air bubbles looked out for. It will be found that the depth of colouring will vary to some extent with the duration of soaking, but after about ten minutes there is no perceptible increase in tint, so that if a deeper yellow is required it will be advisable to use either two screens, or, what I prefer, to add to the yellow solution a few drops of erythrosine solution, which immediately deepens the colour, though too much must not be used, or the greens will be rendered too dark; this is the effect of orange. One method of working is to use a very deep red screen for, say, three-fourths of the exposure, and then to remove it and continue the exposure without it; but this is quite unnecessary with panchromatic plates, if a deep enough yellow or orange screen be used.

If it is required to cement two screens together, one may use either the thick Canada balsam or dilute it with benzole. Personally, I use ordinary Canada balsam, which has been baked for some time, so that it is quite thick, and then warm the screens well on a hot plate, and then apply the balsam, also warm, and then squeeze into contact. For large screens this is somewhat troublesome, but as long as they are well warmed and kept under pressure they will dry evenly without separating at the edges.

A. D. Preitzl.

ON THINGS IN GENERAL.

I have, at various periods of my life, come into close contact with many interesting persons and things, but in emulation of Oliver Twist I want more. It is too late to interview the Dodo, or the Great Auk, so that I dismiss them from my mind, with a lingering regret. I have talked with a King and a Queen, but I long to have a little conversation with a Shah or a Czar; I think I should prefer a Begum. My desires are not wholly in a regal or imperial direction, for I confess to a weakness in the direction of an expert pickpocket or a skilled burglar: it is evident such professionals do exist, though they do not usually exhibit a nameplate with their business qualifications on their door. In a photographic direction my longings are mainly confined to a being such as signs a letter "Justice"—Heaven save the mark—in this Journal for Aug. 8th. "Justice"—there must be such a being, or the Editors would not have put the letter in—was willing to give a month—four whole weeks—of his valuable services for anyone who would find him a suitable occupation, and he found, or believed he had found, someone who, in return for twenty pounds, would teach him his business, give him thirty shillings a week, and "turn him out a good average hand." A bricklayer will make that much, perhaps, on an average, but I do not think the most enthusiastic workman would expect to learn bricklaying in a month, or even a year. Indeed, when a man has spent years in learning a business, he often enough expects to make his first essay as a paid workman as an improver. Why, in the name of all the commonsense deities (there ought to be, if there is not, a commonsense deity), should photography differ from any other business in this direction passes my weak intellect to discover. Even a seampstress, who is passing rich on fourteen shillings a week, would scarcely go to the length of proposing to teach a girl ignorant of the use of needle and thread how to become a good average hand in a month's time. Mr. Editor, does such a person as "Justice" really exist? Do try to let me have a good view of him some time; I will promise not to snapshot him for Madame Tussaud's use.

To turn from these unsatisfied longings to surroundings of more ordinary life, it is refreshing to experience the lightsome touch of the writer who, over the signature of "Georges D'Armoric," plays with the connection between photography and palmistry. I am, however, not quite inclined to accept his dictum: "For, if the human hand may permit or give any reliable disclosure, it is only on condition that the lines, marks, and signs shown thereon, and not only therein, are read and considered subjunctively with the temperament, colour, and complexion, which in their synthetical sense are the key to the individuality, and a centre from which all other indications radiate." I would rather say, propounding the whole from the concrete rather than the abstract, thus viewing it from an objective, and not a subjective, standpoint. The question arises whether the indications are not concentric rather than radiatory, whereby and whereon the thesis is established, everything to the contrary notwithstanding—and if so, why not?

Bravo, J. W. Davidson, Consul! It is a long while since I read an "appreciation" to which I so fully gave in my adhesion as that Consul Davidson writes in the American Consular reports of that wonderful volume the British Journal of Photography Almanac. Interesting as is the reading matter—compact compendium of valuable original matter and condensed compilation of makers' and users' formulæ—the value of the Almanac as the practical man's *vade-mecum* and business directory is plainly and logically set forth. With regard to the latter part, the business and telegraphic address pages are

particularly useful. One is apt to forget for the moment the address or the telegraphic code of a firm one is writing to, and the ALMANAC tells us in a moment.

Early this month a querist asked about the use of liquid Indian ink, the Editors informing him that he might use it with safety for making marginal lines round prints in an album, without fear that it would in any way set off on other prints that might be brought into contact with it in closing the leaves. That is all right; but I should like to point out that there are liquid Indian inks and liquid Indian inks. A little while ago, having occasion to draw a series of diagrams, including many circles, I purchased a bottle of this liquid ink, with a first-class maker's name against it. After a while, I found my old dexterity with the use of mathematical instruments seemed deserting me. I could not make the compass pen to work—adjust the screw how I would, the circles were broken and imperfect. Several times this happened, and I could not diagnose the cause till it occurred to me to rub up a stick of ink—the work usually given to the youngest apprentice in an engineer's or an architect's office. This done, everything went on all right. So I would advise "E. B. P." not to put his trust in liquid inks, but to make fresh ink each time he desires to use it, monotonous and time-absorbing as it is.

I notice the publication of the Professional Photographers' Association's observations upon fire insurance policies. That the labours of the Committee have led to the offer of a particular company to take any insurer for twenty per cent. less than he now pays is a great step forward, for the rates that some photographers are charged are simply scandalous. Photography nowadays has not the accompanying risks of twenty or thirty years ago, with its collodion and guncotton, and varnish, alcohol, and ether. The risks are ever so much less, though the premiums in many instances remain unchanged. Photographers should know that in many offices nowadays premiums would be much lower if it were not for the negatives. In case of fire, so much damage could be very soon done by the water, not to speak of the bogus claims rendered easy for the unscrupulous, and such there are in every business or profession. It has been said that a fixed rate should be made for photographic studios and contents: but this is impossible, for several reasons. Before fixing the premium, regard must be had to the personality of the insurer, and this I can assure my readers is a very important factor. Then the question of position is important—whether the premises are detached, or abutting upon others, and whether in a sparsely or thickly built district. The proportion of value of negatives to general stock and the average value attached to them are governing factors in determining the rates to be fixed. Three shillings and sixpence per cent. all round is by no means an uncommon average rate. I may here remind my readers that they should always be careful in making alterations to get the insurance officials to examine them and endorse the policy, otherwise there is the possibility, in case of fire, of the office pleading the clause which causes the policy instantly to lapse if the insurer do anything to increase the fire risks. The introduction of the electric light is one of the things that the policy holder should ask to be examined by the insuring company's officer, as soon as the installation is completed, as he might decline to pass it if certain of their rules with regard to wiring, etc., were not carried out.

The professional photographers of the kingdom should take to heart the Editors' advice in the "We-do-the-rest" article of Aug. 15th. Amateur photography at the present time is a very big thing, and the amateurs get through an immense quantity of material of one sort or another. Why is not this trade secured by the "pro."? I suppose because in time gone by the local chemist was the main source of supply, and still usually continues to be, though everything has changed in apparatus and materials. No doubt many photographers consider it beneath their dignity to take up the selling of materials, yet why should they, when some of their leading brethren in London and the country now publicly advertise that they have opened photographic goods depôts in connection with their businesses? Following upon this, of course, would come the we-do-the-rest part of the business, which is, indeed, profitable enough. The sooner the uninitiated start dealing the better: someone may begin before him, if he do not, and thus cut the ground from under his feet. The professional photographer is now the proper man to supply photographic goods, whatever may have been the case in the past. It need not compromise his dignity in the slightest degree—besides, "there is money in it," which cannot be truly said of many of the purely photographic businesses in the country.

Some years ago the breeding of a popular strain of dogs was one of my hobbies, and shortly after I had started it a friend said, "Well, I always looked upon you as an honest man; but now I give you up." Is there not a grave risk of a similar pronouncement being applied to those who take up photography, especially from an amateur's standpoint? With regard to the number of good negatives obtained from, say, a hundred plates on a given expedition, the man with the big maximum may be looked upon as an innocent bragger, akin to the chartered libertine of the storytellers, the fish story man. It is not silly boasting of this sort that will bring the amateur photographer into disrepute; it is the lamentably low standard of ethics that so many of them act by. For example, how many cases has not one heard of where one of this stamp goes to a professional photographer, and asks whether he may change his plates in his dark-room, simply to get an entry into a place where he may pick up wrinkles? This, however, is almost venial in comparison with the particular moral obliquity that has of late forced itself into notice. I refer to the would-be private pirate of other people's work. There is rarely a month passes, but there is to be seen a reply to some such query as that on copyright in Aug. 15th, and a somewhat similar one on 1st. In the former case the inquirer writes for "a friend," who has utilised another man's brains by conveying his picture into a pamphlet. He appears to have bodily conveyed the photograph, without any reference to the producer, and now only writes to the Editors to ask if he is safe; when he is experiencing a fear of being sued by the producer of the picture in question. His standard of morals is so low that he evidently would not scruple to rob the author of the fruits of his brain if he could do it with impunity. In the other case, the writer seems actually to be aggrieved because he cannot get to know whether a certain picture is copyright or not, and so he cannot copy it with a mind free from anxiety as to possible legal damages. There is still another case more flagrant than all. There are certain well-known photographic copies of paintings in the National Gallery, which anyone with the most elementary knowledge of photography must be aware could only be produced at the expenditure of considerable time and labour. Yet an inquirer has the presumption to write to the JOURNAL, to ask whether, as the paintings themselves are not copyright, he could not copy these copies? This utter meanness is absolutely appalling—rather than pay a few coppers for another print to the man (or his representative) who has taken such trouble to reproduce some of

the nation's pictorial treasures, this individual would, if he could, by what might be termed a legal quirk, save a penny or twopence by making a copy himself. I can scarcely believe it possible that it is his intention to produce these copies in number for sale. That would be such an example of moral turpitude that would at first sight appear impossible.

FREE LANCE.

THE OPTO-TECHNICAL SECTION OF THE NORTHAMPTON INSTITUTE, CLERKENWELL.

[Abstracted from the Annual Volume of Educational Announcements. The Principal, Dr. R. Mullineux Walmsley, informs us that the evening courses and classes in all technological subjects will commence on Monday next, September 22nd.—Eds. B.J.P.]

OPTICAL AND SCIENTIFIC INSTRUMENTS.

THE lectures in this course are intended for opticians and optical instrument makers who have already had a good training in elementary optical theory. Those who have not had such a training should attend the course on Applied Optics, either simultaneously or as a preliminary course, and only those will be admitted to this more advanced course who can satisfy the head of the department that they are qualified to profit by the instruction.

Laboratory and Calculations Classes, which are an essential part of the course, have been arranged, and all students will be expected to attend them. In addition, instrument makers should attend one evening per week in the workshop.

(*a*) Measuring Instruments (Four Lectures, from 22nd September to 13th October, 1902).—Measuring machines, dividing engines, and comparators, their construction and use; standards of length; cathetometers; chemical and physical balances, their construction and testing; chronographs for accurate time measurements; compensation for temperature.

(*b*) Mathematical and Surveying Instruments (Five Lectures, from 20th October to 17th November, 1902).—Simple compasses and miners' dials; prismatic compasses; levels and clinometers; theodolites and sextants; adjustment and testing of surveying instruments; collimation.

(*c*) Optical Projection Apparatus (Four Lectures, from 24th November to 15th December, 1902).—Construction and mechanical details of various types of optical lanterns; condensers and front lenses; formation of the image; effects of spherical and chromatic aberration and their elimination; projection microscopes. Sources of light; oil, acetylene, oxy-hydrogen, electric, etc.

(*d*) Telescopes, Opera and Field Glasses (Four Lectures, from 22nd December, 1902, to 26th January, 1903).—Optical principles of terrestrial and astronomical telescopes; use of concave and erecting eye-pieces; object glasses; testing qualities of glass, design and construction of object glasses; centreing of lenses; Ramsden's and Huyghen's eye-pieces; micrometer eye-pieces, alt-azimuth and equatorial mountings; determination of the magnifying power of a telescope.

(*e*) Photographic Apparatus (Five Lectures, from 2nd February to 2nd March, 1903).—Construction of cameras and details of adjustments; single landscape lenses, their design and construction, use and calculation of stops; symmetrical, portrait, rectilinear, and anastigmatic lenses; calculation of lens curves; centreing of lenses. Testing of photographic lenses, focal length and depth of focus, covering power, distortion, chromatism, astigmatism, flare spot, etc. Types of diaphragms, Waterhouse, Iris, etc. Construction and testing of time and instantaneous shutters. Telephotography.

(*f*) Microscopes and Objectives (Six Lectures, from 9th March to 20th April, 1903).—Theory of the compound microscope; mechanical construction; English and Continental stands; rack-work and fine adjustments; simple and mechanical stages; sub-stage illuminators; construction and use of ordinary and sub-stage condensers, spot lenses, paraboloids, Lieberkuhns, etc.; binocular microscopes; camera lucida and other accessories; micrometers; objectives of low and high power; their design and construction; centreing; correction collars; water and homogeneous immersion objectives; interference and diffraction, and their influence on the resolving power of a lens; Abbe's diffraction theory; testing objectives.

(*g*) Spectrometers and Polarising Apparatus (Three Lectures, from 27th April to 11th May, 1903).—Construction of chemical spectroscopes; spectrometers and goniometers; direct vision and diffraction spectroscopes; testing and adjustment of spectroscopes; tourmalines; Iceland spar, Nical prisms, selenites; construction of microscope and projection polariscopes, and polarimeters; construction and testing of spar, selenites, and other crystals; cutting and mounting specimens, etc.

THE DESIGN OF OPTICAL INSTRUMENTS.

Lecturer: DR. C. V. DRYSDALE.

This course will be open to students who have already satisfactorily passed through the courses in Applied Optics and Optical Instruments, and who have also a thorough working knowledge of algebra and trigonometry. An acquaintance with the elementary principles of the differential and integral calculus will be required later in the course and may be obtained by simultaneous attendance at the class in Advanced Calculations. Other students will be admitted if they can show evidence of preparedness to profit by the course.

TUESDAYS, 7.30 TO 8.30 P.M.

Syllabus.—Theory of Image Formation.—General conditions for colinear relationship between object and image, coaxial systems, conjugate points; classification of optical systems; optical nomenclature and definitions.

Optical Systems.—First Approximation.—Reflection and refraction at a single spherical surface; conjugate positions; optical centre, focal and symmetrical planes, magnification; absolute and reduced distances and curvatures.

Refraction by single thick lens; conjugate positions; magnification; principal focal and symmetrical planes; Lisling's nodal points; position of Gauss points in special cases.

General theory of refracting and reflecting systems; determination of the position of the Gauss points in any system.

Chromatic Aberration.—Chromatic aberration of single thin lens; calculation of thin double and triple achromatic combinations; chromatic differences of focal length and magnification in lens systems; effects in optical instruments; apochromatic combinations.

The Five Aberrations.—Brief discussion of von-Seidel's theory; spherical aberration, coma, radial astigmatism, distortion and curvature of field; von-Seidel's and other expressions for the amount of these aberrations and conditions for removal; the sine law, anastigmatic flattening of chromatically corrected images, new achromats.

Path of Light through Refracting System.—Direct method of calculating the course of a ray through a system; application to photographic lenses and microscope objectives.

Aperture and Diffraction.—Definition of aperture effects on brightness of image; interference, calculation of width of bands, diffraction by slit, edge, etc.; diffraction patterns, cornu spiral, Babinet's principle; resolving power of grating; diffraction by circular aperture, limit of resolution of an optical system.

Telescope.—O.G.'s design of object glasses; double and triple combinations, compensation for chromatic and spherical aberration, and coma; mounting object glasses; effects of temperature, moisture, etc.; photo visual lenses.

Oculars.—Positive and negative forms, calculation of magnifying power; conditions for achromatism, etc.; erecting eye-pieces; erection by prisms; calculation of aperture of prismatic glasses; general design.

Photographic Lenses.—Design of simple achromatic and spherically compensated landscape lenses; use and position of stop; distortion, double objectives; principle of spherical correction of entrance and exit pupils; curvature of field condition for flattening, new achromats; anastigmats, Rudolph's principle, illustrations of modern lenses; convertible anastigmats and their design.

Microscope Objectives.—General principles of construction, short historical account of improvements; immersion objectives, aplanatic points of sphere, principle of Amico; resolving power dependence on aperture, Abbe's diffraction theory and recent developments; examples of modern objectives adjusting and testing.

Optical Workshop.

In conjunction with the course of lectures on Optical and Scientific Instruments, an optical workshop has been equipped for practical instruction in the construction of lenses for various purposes, and for giving students an opportunity of actually verifying the principles of lens design given in the lecture course. In optical matters, proof of the advantage of any special design of lens can only be obtained by actually constructing and testing it, and it is therefore hoped that all those who wish to become proficient in practical optics will attend this course. The instruction will be given by a trade glass worker, under the supervision of the Lecturer in Optics, and as soon as some degree of proficiency in lens working has been attained, the students will have opportunities of designing special forms of lenses, and of practically constructing and testing them. The workshop is already equipped with a number of lathes and tools for grinding spherical lenses of various curvatures, and arrangements are being made to instal special machines for lens grinding and polishing.

Tuesdays, 7.30 to 9.45 p.m.

Syllabus.—Roughing, turning, grinding, and polishing simple lenses for spectacles, etc.; centring, edging, and fitting spectacle lenses; grinding and polishing of plane and cylindrical lenses and prisms; determination of axes of cylinders and prisms, mounting of lenses.

Use and properties of the different kinds of crown, flint, and Jena glass; workshop tests of glass for uniformity and optical properties; construction of achromatic combinations, centring and cementing surfaces; making and gauging curves of grinding and polishing tools.

Composition and making of cements, polishing waxes, pitch tools, balsam, etc.; washing and grading emery; use of machinery in grinding and polishing plane, spherical, cylindrical, and sphero-cylindrical lenses.

Making the optical parts of various optical instruments, object glasses for telescopes, cameras, microscopes, etc.; positive and negative eye-pieces, micrometer eye-pieces, etc.

The workshop is primarily intended for those students who are simultaneously attending the lecture course, but if other applications are received from students who have had the necessary preliminary training, they will be favourably considered if there be room.

Classes in Technical Optics.—Applied Optics.

The following course is intended as an introduction to the previous course on Optical Instruments, and should be taken as preparatory to that course by all students who have had no previous training in scientific optics. In conjunction with the course on Visual Optics, it also covers the requirements of the full examination of the Spectacle Makers' Company for the Freedom and Diploma of the Company. Candidates for this examination should take the elementary portion of this course, and also the specific portion of Course No. 5 relating to the instrument they select for special study.

In connection with the lectures there is a course of laboratory work on Tuesday evenings, which it is essential that all students should take up, as, without doing so, they cannot hope to make much progress. Students who have no previous mathematical training should also attend the class on Technical Calculations on Friday evenings.

Mondays, 7.30 to 8.30 p.m.

Syllabus.—Nature of light, its velocity and mode of propagation; determination of velocity; formation of shadows; illumination and its laws; photometry and photometers; explanation of the reflection and refraction of light; reflection of plane waves at plane surfaces; theory of spherical waves and surfaces; measurement of curvature; use of the spherometer, dioptric system of measurement; reflection of plane and spherical waves at plane and curved surfaces; concave and convex mirrors; theory of conjugate foci.

Refraction and its laws, explanation by wave theory; refraction through parallel plates and prisms; definition and determination of the refractive index; determination of the angle and deviation of prisms, degree and dioptric measurement; refraction at spherical surfaces; use of lenses; conjugate foci; determination of the convergence and focal length of lenses; formation of images by lenses and magnification. Types of lenses:—Double, plane, and meniscus; convex and concave, spherical, cylindrical, and sphero-cylindrical lenses; determination of prismatic effects of lenses; axes of prisms and cylinders; optical centre; prismatic equivalent of a decentred lens.

Combinations of lenses in contact and separated; theory of thick lenses and systems of lenses; principal focal and symmetrical planes and nodal points; dispersion and achromatism, decomposition, and recomposition of light; index of dispersion, and its determination; spectrometry; achromatic prisms and lenses, and their forms; calculation of achromatic combinations; elementary theory of optical instruments, camera, telescope, microscope, etc.; spherical aberration and its effects; formation of focal lines; distortion; aplanatic surfaces and lenses and their calculation; focal surface and depth; interference of waves and its applications; production of interference bands by various methods; diffraction and its effects under various conditions; use of gratings.

Elementary theory of polarisation; production of polarised light by simple reflection and refraction; propagation of waves in crystalline media; ordinary and extraordinary refraction; behaviour of Iceland spar; optic and crystallographic axes; positive and negative, uniaxial and biaxial crystals; construction of Nicol's, Foucault's, and other prisms; interference of polarised light; formation of colours, rings, and brushes, etc.; polarising action of solutions and polarimetry; electro-magnetic theory of light; influence of magnets on polarised light, etc.

Throughout the course the practical applications of the subjects referred to will be specially kept in view, and the course is so arranged as to supply the theoretical knowledge required for the previous courses on optical instruments.

Visual Optics.

Lecturer: Dr. E. Claude Taylor, M.D., M.S.

In addition to the last-named course, those opticians who intend to present themselves at the examinations of the Spectacle Makers' Company should attend a course on Visual Optics, which will be given on Tuesday evenings at 7 p.m., and will continue throughout the session. The work of this course will be in accordance with the following official syllabus of the Spectacle Makers' Company:—

Tuesdays, 7 to 8 p.m.

Syllabus.—General anatomy of the human eye; the course of light passing through the media of the eye alone, and as modified by spherical and cylindrical lenses and prisms. Hypermetropia, myopia, astigmatism, presbyopia.

Instruments commonly used for determining the refraction of the eye; trial lenses, test types, astigmatic chart, the optometer. The principle of the ophthalmoscope; the principles of, and various forms of spectacles.

The whole of the practical work necessary for the examinations of the Spectacle Makers' Company will be given in this course, and in the Optical Laboratory in connection with course 75b.

Workshop Classes for Opticians.

Instructor: Mr. R. J. Gage.

The objects of this class are to give to opticians the necessary experience and manual dexterity to enable them to fit various lenses and alter and repair frames, and also to make up oculists' prescriptions and test the correctness of the work. Instruction will also be given in repairing simple optical instruments.

Wednesdays, 7.30 to 9.45 p.m.

Syllabus.—Centring, shanking, and edging simple spherical lenses.

Fitting lenses to frames.

Shaping bridges of frames to measurements and prescriptions. Adjustment of temples.

Repair of steel and gold frames. Soldering, brazing, and electro-plating. Finishing and burnishing frames.

Fitting and adjustment of *pinces-nez*, including ordinary, cylindrical spring, and spring placquet glasses.

Fixing of unrimmed glasses.

Adjustment of cylindrical, prismatic, and bifocal glasses.

Treatment of pebble lenses. Testing axis of pebbles by pebble tester, etc.

Workshop testing of completed glasses.

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Lectures on Applied Optics, Mondays, 7.30 to 8.30 p.m.; Optical Laboratory Work, Tuesdays, 8.30 to 9.45 p.m.; Visual Optics, Tuesdays, 7 to 8 p.m.; Optical Workshop, Wednesdays, 7.30 to 9.45 p.m.; Practical Calculations, Fridays, 8.30 to 9.45 p.m.

The following aniline colours are supplied by Messrs. Mawson and Swan, Mosley Street, Newcastle-on-Tyne, put up in small quantities, in corked phials, for the convenience of photographers:—Acridin, orange; alizarine, blue; aniline, blue; aniline, sulphate; auramine; aurantia; aurine; azo, blue; black (Diazo); chrysoidin; cœrulin, bisulphite; Congo, red; coralline, scarlet; coupier, blue; cyanin; cyanosin; diazo, black; echte rot (fast red); eosin; eosin, blue; eosin, yellow; erythrosin; fluorescin; fuschin; gentian, blue; gentian, violet; glycin, red; hœmatoxylin; Hoffman's violet; malachite, green; methylene, blue; methyl, green; methyl, orange; methyl, violet; nigrosin; orange I.; orange IV.; orange methyl; phenylene, blue; quinoline, red; red (Congo); red (glycin); fast red E., "Echte Rot"; Rose of Alps; rose, Bengal; rosoine; scarlet corallin; tartraisin; uranine; violet (gentian); violet (Hoffman); violet, methyl; yellow, acridin; yellow, brilliant; yellow, canary; yellow, eosin; yellow, Martin's; yellow, primrose.

THE BRITISH ASSOCIATION: ABSTRACT OF THE PRESIDENTIAL ADDRESS.

[Delivered at the Belfast Meeting on Wednesday, September 10th, 1902.]

I have thought it might be instructive, and perhaps not uninteresting, to trace briefly in broad outline the development of that branch of study with which my own labours have been recently more intimately connected—a study which I trust I am not too partial in thinking is as full of philosophical interest as of experimental difficulty. The nature of heat and cold must have engaged thinking men from the very earliest dawn of speculation upon the external world; but it will suffice for the present purpose if, disregarding ancient philosophers and even medieval alchemists, we take up the subject where it stood after the great revival of learning, and as it was regarded by the father of the inductive method. That this was an especially attractive subject to Bacon is evident from the frequency with which he recurs to it in his different works, always with lamentation over the inadequacy of the means at disposal for obtaining a considerable degree of cold. Thus in the chapter in the Natural History, "Sylva Sylvarum," entitled "Experiments in consort touching the production of cold," he says, "The production of cold is a thing very worthy of the inquisition both for the use and the disclosure of causes. For heat and cold are nature's two hands whereby she chiefly worketh, and heat we have in readiness in respect of the fire, but for cold we must stay till it cometh or seek it in deep caves or high mountains, and when all is done we cannot obtain it in any great degree, for furnaces of fire are far hotter than a summer sun, but vaults and hills are not much colder than a winter's frost." The great Robert Boyle was the first experimentalist who followed up Bacon's suggestions. In 1682 Boyle read a paper to the Royal Society on "New Experiments and Observations touching Cold, or an Experimental History of Cold," published two years later in a separate work. This is really a most complete history of everything known about cold up to that date, but its great merit is the inclusion of numerous experiments made by Boyle himself on frigorific mixtures, and the general effects of such upon matter. The whole elaborate investigation cost Boyle immense labour, and he confesses that he "never handled any part of natural philosophy that was so troublesome and full of hardships." After the masterly essay of Boyle, the attention of investigators was chiefly directed to improving thermometrical instruments. The old air thermometer of Galileo being inconvenient to use, the introduction of fluid thermometers greatly aided the inquiry into the action of heat and cold. For a time great difficulty was encountered in selecting proper fixed points on the scales of such instruments, and this stimulated men like Huygens, Newton, Hooke, and Amontons to suggest remedies and to conduct experiments. It must be confessed that great confusion and inaccuracy in temperature observations arose from the variety and crudeness of the instruments. This led Amontons in 1702-3 to contribute two papers to the French Academy which reveal great originality in the handling of the subject, and which, strange to say, are not generally known. The first discourse deals with some new properties of the air and the means of accurately ascertaining the temperature in any climate. He regarded heat as due to a movement of the particles of bodies, though he did not in any way specify the nature of the motion involved; and as the general cause of all terrestrial motion, so that in its absence the earth would be without movement in its smallest parts. In the following year Amontons contributed to the academy a further paper extending the scope of the inquiry. He there pointed out more explicitly that as the degrees of heat in his thermometer are registered by the height of a column of mercury, which the heat is able to sustain by the spring of the air, it follows that the extreme cold of the thermometer will be that which reduces the air to have no power of spring. This, he says, will be a much greater cold than what we call "ver- cold," because experiments have shown that if the spring of the air at boiling-point is 73in., the degree of heat which remains in the air when brought to the freezing-point of water is still very great, for it can still maintain the spring of 51½in. The greatest climatic cold on the scale of units adopted by Amontons is marked 50, and the greatest summer heat 58, the value for boiling water being 73, and the zero being 52 units below the freezing point. Thus Amontons was the first to recognise that the use of air as a thermometer substance led to the inference of the existence of a zero of temperature, and his scale is nothing else than the absolute one we are now so familiar with. It results from Amontons's experiments that the air would have no spring left if it were cooled below the freezing-point of water to about 2½ times the temperature range which separates the boiling-point and the freezing-point. In other words, if we adopt the usual centennial difference between these two points of temperature as 100 degrees, then the zero of Amontons's air thermometer is *minus* 240 degrees. This is a remarkable approximation to our modern value for the same point of *minus* 273 degrees. It is not till Lambert, in his work on "Pyrometrie," published in 1779, repeated Amontons's experiments and endorsed his results that we find any further reference to the absolute scale or the zero of temperature. Lambert's observations were made with the greatest care and refinement, and resulted in correcting the value of the zero of the air scale to *minus*

270 degrees as compared with Amontons's *minus* 240 degrees. Lambert points out that the degree of temperature which is equal to zero is what one may call absolute cold, and that at this temperature the volume of the air would be practically nothing. In other words, the particles of the air would fall together and touch each other and become dense like water; and from this it may be inferred that the gaseous condition is caused by heat. Lambert says that Amontons's discoveries had found few adherents because they were too beautiful and advanced for the time in which he lived. About this time a remarkable observation was made by Professor Braun at Moscow, who, during the severe winter of 1759, succeeded in freezing mercury by the use of a mixture of snow and nitric acid. When we remember that mercury was regarded as quite a peculiar substance possessed of the essential quality of fluidity, we can easily understand the universal interest created by the experiment of Braun. This was accentuated by the observations he made on the temperature given by the mercury thermometer, which appeared to record a temperature as low as *minus* 200deg. C. The experiments were soon repeated by Hutchins at Hudson's Bay, who conducted his work with the aid of suggestions given him by Cavendish and Black. The result of the new observations was to show that the freezing-point of mercury is only *minus* 40deg. C., the errors in former experiments having been due to the great contraction of the mercury in the thermometer in passing into the solid state. From this it followed that the enormous natural and artificial colds which had generally been believed in had no proved existence. Still the possible existence of a zero of temperature very different from that deduced from gas thermometry had the support of such distinguished names as those of Laplace and Lavoisier. In their great memoir on "Heat," after making what they consider reasonable hypotheses as to the relation between specific heat and total heat, they calculate values for the zero which range from 1,500deg. to 3,000deg. below melting ice. On the whole, they regard the absolute zero as being in any case 600deg. below the freezing-point. Lavoisier, in his "Elements of Chemistry," published in 1792, goes further in the direction of indefinitely lowering the zero of temperature when he says, "We are still very far from being able to produce the degree of absolute cold, or total deprivation of heat, being unacquainted with any degree of coldness which we cannot suppose capable of still further augmentation; hence it follows we are incapable of causing the ultimate particles of bodies to approach each other as near as possible, and thus these particles do not touch each other in any state hitherto known." Even as late as the beginning of the 19th century we find Dalton, in his new system of "Chemical Philosophy," giving ten calculations of this value, and adopting finally as the natural zero of temperature *minus* 3,000deg. C. In Black's lectures we find that he takes a very cautious view with regard to the zero of temperaure, but, as usual, is admirably clear with regard to its exposition. It is interesting to observe, however, that Black was evidently well acquainted with the work of Amontons, and strongly supports his inference as to the nature of air. The views that Black attributes to Amontons have been generally associated with the name of Lavoisier, who practically admitted similar possibilities as to the nature of air; but it is not likely that in such matters Black would commit any mistake as to the real author of a particular idea, especially in his own department of knowledge. Black's own special contribution to low-temperature studies was his explanation of the interaction of mixtures of ice with salts and acids by applying the doctrine of the latent heat of fluidity of ice to account for the frigorific effect. In a similar way Black explained the origin of the cold produced in Cullen's remarkable experiment of the evaporation of ether under the receiver of an air-pump by pointing out that the latent heat of vaporisation in this case necessitated such a result. Thus, by applying his own discoveries of latent heat, Black gave an intelligent explanation of the cause of all the low-temperature phenomena known in his day. After the gaseous laws had been definitely formulated by Gay-Lussac and Dalton, the question of the absolute zero of temperature, as deduced from the properties of gases, was revived by Clement and Desormes. These distinguished investigators presented a paper on the subject to the French Academy in 1812, which, it appears, was rejected by that body. The authors subsequently elected to publish it in 1819. Relying on what we know now to have been a faulty hypothesis, they deduced from observations on the heating of air rushing into a vacuum the temperature of *minus* 267deg. as that of the absolute zero. The whole question took an entirely new form when Lord Kelvin, in 1848, after the mechanical equivalent of heat had been determined by Joule, drew attention to the great principles underlying Carnot's work on the "Motive Power of Heat," and applied them to an absolute method of temperature measurement, which is completely independent of the properties of any particular substance. The principle was that for a difference of 1deg. on this scale, between the temperatures of the source and refrigerator, a perfect engine should give the same amount of work in every part of the scale. Taking the same fixed points as for the centrigrade scale, and making 100 of the new degrees cover that range, it was found that the degrees, not only within that range, but as far bevond as experimental *data* supplied the means of comparison, differed by only minute quantities from those of Regnault's air thermometer. The zero of the new scale had to be determined by the consideration that when the refrigerator was at the zero of temperature the perfect engine should give an amount of work equal to the full mechanical equivalent of the heat taken up. This led to a zero of 273deg. below the temperature of freezing water substantially the same as that deduced from a study of the gaseous state. It was a great advance to demonstrate by the application of the laws of thermodynamics not only that the zero of temperature is a reality, but that it must be located at 273deg. below the freezing-point of water. As no one has attempted to impugn the solid foundation of theory and experiment on which Lord Kelvin based his thermodynamic scale, the existence of a definite zero of temperature must be acknowledged as a fundamental scientific fact.

LIQUEFACTION OF GASES AND CONTINUITY OF STATE.

In these speculations, however, chemists were dealing theoretically with temperatures to which they could not make any but the most distant experimental approach. Cullen, the teacher of Black, had indeed shown how to lower temperature by the evaporation of volatile bodies, such as ether, by the aid of the air-pump, and the later experiments of Leslie and Wollaston extended the same principle. Davy and Faraday made the most of the means at command in liquefying the more condensable gases, while at the same time Davy pointed out that they in turn might be utilised to procure greater cold by their rapid reconversion into the aeriform state. Still the chemist was sorely hampered by the want of some powerful and accessible agent for the production of temperatures much lower than had ever been attained. That want was supplied by Thilorier, who in 1835 produced liquid carbonic acid in large quantities, and further made the fortunate discovery that the liquid could be frozen into a snow by its own evaporation. Faraday was prompt to take advantage of this new and potent agent. Under exhaustion he lowered his boiling-point from *minus* 78deg. C. to *minus* 110deg. C., and by combining this low temperature with pressure all the gases were liquefied by the year 1844, with the exception of the three elementary gases—hydrogen, nitrogen, and oxygen, and three compound gases—carbonate oxide, marsh gas, and nitric oxide; Andrews some 25 years after the work of Faraday attempted to induce change of state in the uncondensed gases by using much higher pressure than Faraday employed. A very important series of experiments was made by Joule and Kelvin "On the Thermal Effects of Fluids in Motion," about 1862, in which the thermometrical effects of passing gases under compression through porous plugs furnished important data for the study of the mutual action of the gas molecules. No one, however, had attempted to make a complete study of a liquefiable gas throughout wide ranges of temperature. This was accomplished by Andrews in 1869, and his Bakerian Lecture "On the Continuity of the Gaseous and Liquid States of Matter" will always be regarded as an epoch-making investigation. During the course of this research Andrews observed that liquid carbonic acid raised to a temperature of 31deg. C. lost the sharp concave surface of demarcation between the liquid and the gas, the space being now occupied by a homogeneous fluid which exhibited, when the pressure was suddenly diminished or the temperature slightly lowered, a peculiar appearance of moving or flickering striæ, due to great local alterations of density. At temperatures above 31deg. C. the separation into two distinct kinds of matter could not be effected even when the pressure reached 400 atmospheres. This limiting temperature of the change of state from gas to liquid Andrews called the critical temperature. He showed that this temperature is constant, and differs with each substance, and that it is always associated with a definite pressure peculiar to each body. Thus the two constants, critical temperature and pressure, which have been of the greatest importance in subsequent investigations, came to be defined, and a complete experimental proof was given that "the gaseous and liquid states are only distinct stages of the same condition of matter and are capable of passing into one another by a process of continuous change." In 1873 an essay "On the Continuity of the Gaseous and Liquid State," full of new and suggestive ideas, was published by van der Waals, who, recognising the value of Clausius' new conception of the Virial in Dynamics, for a long-continued series of motions, either oscillatory or changing exceedingly slowly with time, applied it to the consideration of the molecular movements of the particles of the gaseous substance, and after much refined investigation, and the fullest experimental calculation available at the time, devised his well-known Equation of Continuity. Its paramount merit is that it is based entirely on a mechanical foundation, and is in no sense empiric; we may therefore look upon it as having a secure foundation in fact, but as being capable of extension and improvement. James Thomson, realising that the straight-line breach of continuous curvature in the Andrews isothermals was untenable to the physical mind, propounded his emendation of the Andrews curves—namely, that they were continuous and of S form. We also owe to James Thomson the conception and execution of a three-dimensional model of Andrews results, which has been of the greatest service in exhibiting the three variables by means of a specific surface afterwards greatly extended and developed by Professor Willard Gibbs. The equation of continuity

developed by van der Waals involved the use of three constants instead of one, as in the old law of Boyle and Charles, the latter being only utilised to express the relation of temperature, pressure, and volume, when the gas is far removed from its point of liquefaction. Of the two new constants one represents the molecular pressure arising from the attraction between the molecules, the other four times the volume of the molecules. Given these constants of a gas, van der Waals showed that his equation not only fitted into the general characters of the isothermals, but also gave the values of the critical temperature, the critical pressure, and the critical volume. In the case of carbonic gas the theoretical results were found to be in remarkable agreement with the experimental values of Andrews. This gave chemists the means of ascertaining the critical constants, provided sufficiently accurate *data* derived from the study of a few properly distributed isothermals of the gaseous substance were available. Such important *data* came into the possession of chemists when Amagat published his valuable paper on "The Isothermals of Hydrogen, Nitrogen, Oxygen, Ethylene, etc.," in the year 1880. It now became possible to calculate the critical *data* with comparative accuracy for the so-called permanent gases oxygen and nitrogen, and this was done by Sarrau in 1882. In the meantime a great impulse had been given to a further attack upon the so-called permanent gases by the suggestive experiments made by Pictet and Cailletet. The static liquefaction of oxygen was effected by Wroblewski in 1883, and thereby the theoretical conclusions derived from van der Waals equation were substantially confirmed. The liquefaction of oxygen and air was achieved through the use of liquid ethylene as a cooling agent, which enabled a temperature of *minus* 140 degrees to be maintained by its steady evaporation *in vacuo*. From this time liquid oxygen and air came to be regarded as the potential cooling agents for future research, commanding, as they did, a temperature of 200 degrees below melting ice. The theoretical side of the question received at the hands of van der Waals a second contribution, which was even more important than his original essay, and that was his novel and ingenious development of what he calls "The Theory of Corresponding States." He defined the corresponding states of two substances as those in which the ratios of the temperature, pressure, and volume to the critical temperature, pressure, and volume respectively were the same for the two substances, and in corresponding states he showed that the three pairs of ratios all coincided. From this a series of remarkable propositions were developed, some new, some proving previous laws that were hitherto only empiric, and some completing and correcting faulty though approximate laws. The most suggestive advance in the improvement of the van der Waals equation has been made by a lady, Mme. Christine Meyer. The idea at the base of this new development may be understood from the following general statement:—Van der Waals brings the van der Waals surfaces for all substances into coincidence at the point where volume, pressure, and temperature are nothing, and then stretches or compresses all the surfaces parallel to the three axes of volume, pressure, and temperature, until their critical points coincide. But on this plan the surfaces do not quite coincide, because the points where the three variables are respectively nothing are not corresponding points. Mme. Meyer's plan is to bring all the critical points first into coincidence, and then to compress or extend all the representative surfaces parallel to the three axes of volume, pressure, and temperature, until the surfaces coincide. In this way, taking 29 different substances, she completely verifies from experiment van der Waal's law of correspondence. The theory of van der Waals has been one of the greatest importance in directing experimental investigation, and in attacking the difficult problems of the liquefaction of the most permanent gases. It is perhaps not too much to say that as a prolific source of knowledge in the department dealing with the continuity of state in matter, it would be necessary to go back to Carnot's cycle to find a proposition of greater importance than the theory of van der Waals and his development of the law of corresponding states. It will be apparent from what has just been said that, thanks to the labours of Andrews, van der Waals, and others, theory had again far outrun experiment. We could calculate the constants and predict some of the simple physical characteristics of liquid oxygen, hydrogen, or nitrogen, with a high degree of confidence long before any one of the three had been obtained in the static liquid condition permitting of the experimental verification of the theory. This was the more tantalising, because, with whatever confidence the chemist may anticipate the substantial corroboration of his theory, he also anticipates with almost equal conviction that, as he approaches more and more nearly to the zero of absolute temperature, he will encounter phenomena compelling modification, revision, and refinement of formulas which fairly covered the facts previously known. Just as nearly seventy years ago chemists were waiting for some means of getting a temperature of 100deg. below melting ice, so ten years ago they were casting about for the means of going 100deg. lower still. The problem was not so much how to produce intense cold as how to save it when produced from being immediately levelled up by the relatively superheated surroundings. It was while puzzling over this mechanical and manipulative difficulty in 1892 that it occurred to me that the principle of an arrangement used nearly twenty years before in some calorimetric experiments, which was based upon the work of Dulong and Petit on radiation, might be employed with advantage as well to protect cold substances from heat as hot ones from rapid cooling. I therefore tried the effect of keeping liquefied gases in vessels having a double wall, the annular space between being very highly exhausted. Experiments showed that liquid air evaporated at only one-fifth of the rate prevailing when it was placed in a similar unexhausted vessel, owing to the convective transference of heat by the gas particles being enormously reduced by the high vacuum. But, in addition, these vessels lend themselves to an arrangement by which radiant heat can also be cut off. It was found that when the inner walls were coated with a bright deposit of silver the influx of heat was diminished to one-sixth the amount entering without the metallic coating. The total effect of the high vacuum and the silvering is to reduce the ingoing heat to about 3 per cent. The efficiency of such vessels depends upon getting as high a vacuum as possible, and cold is one of the best means of effecting the desired exhaustion. All that is necessary is to fill completely the space that has to be exhausted with an easily condensible vapour, and then to freeze it out in a receptacle attached to the primary vessel that can be sealed off. The advantage of this method is that no air-pump is required, and that theoretically there is no limit to the degree of exhaustion that can be obtained. The action is rapid, provided liquid air is the cooling agent, and vapours like mercury, water, or benzol are employed. It is obvious that when we have to deal with such an exceptionally volatile liquid as hydrogen, the vapour filling may be omitted, because air itself is now an easily condensable vapour. In other words, liquid hydrogen, collected in such vessels with the annular space full of air, immediately solidifies the air, and thereby surrounds itself with a high vacuum. Many combinations of vacuum vessels can be arranged, and the lower the temperature at which we have to operate the more useful they become. Vessels of this kind are now in general use, and in them liquid air has crossed the American continent. Of the various forms, that variety is of special importance which has a spiral tube joining the bottom part of the walls, so that any liquid gas may be drawn off from the interior of such a vessel. In the working of regenerative coils such a device becomes all-important, and such special vessels cannot be dispensed with for the liquefaction of hydrogen. In the early experiments of Pictet and Cailletet, cooling was produced by the sudden expansion of the highly compressed gas preferably at a low temperature. Linde saw that the continuous use of a jet of highly compressed gas, combined with regenerative cooling, must lead to liquefaction on account of what is called the Kelvin-Joule effect; and he succeeded in making a machine, based on this principle, capable of producing liquid air for industrial purposes. These experimenters had proved that, owing to molecular attraction, compressed gases passing through a porous plug or small aperture were lowered in temperature by an amount depending on the difference of pressure and inversely as the square of the absolute temperature. This means that for a steady difference of pressure the cooling is greater, the lower the temperature. The only gas that did not show cooling under such conditions was hydrogen. Instead of being cooled it became actually hotter. The reason for this apparent anomaly in the Kelvin-Joule effect is that every gas has a thermometric point of inversion above which it is heated and below which it is cooled. This inversion point, according to van der Waals, is six and three-quarter times the critical point. The efficiency of the Linde process depends on working with highly compressed gas well below the inversion temperature, and in this respect this point may be said to take the place of the critical one, when in the ordinary way direct liquefaction is being effected by the use of specific liquid cooling agents. The success of both processes depends upon working within a certain temperature range, only the Linde method gives us a much wider range of temperature within which liquefaction can be effected. This is not the case if, instead of depending on getting cooling by the internal work done by the attraction of the gas molecules, we force the compressed gas to do external work as in the well-known air machines of Kirk and Coleman. Both these inventors have pointed out that there is no limit of temperature, short of liquefaction of the gas in use in the circuit, that such machines are not capable of giving. While it is theoretically clear that such machines ought to be capable of maintaining the lowest temperatures, and that with the least expenditure of power, it is a very different matter to overcome the practical difficulties of working such machines under the conditions. Coleman kept a machine delivering air at minus 83deg. for hours, but he did not carry his experiments any further. Recently, M. Claude, of Paris, has, however, succeeded in working a machine of this type so efficiently that he has managed to produce one litre of liquid air per horse power expended per hour in the running of the engine. This output is twice as good as that given by the Linde machine, and there is no reason to doubt that the yield will be still further improved. It is clear, therefore, that in the immediate future the production of liquid air and hydrogen will be effected most economically by the use of machines producing cold by the expenditure of mechanical work.

LIQUID HYDROGEN.

Hydrogen is an element of especial interest, because the study of

its properties and chemical relations led great chemists like Faraday, Dumas, Daniell, Graham, and Andrews to entertain the view that if it could ever be brought into the state of liquid or solid it would reveal metallic characters. The only chemist who adopted another view was my distinguished predecessor, Professor Odling. In his "Manual of Chemistry," published in 1861, he pointed out that hydrogen has chlorous as well as basic relations, and that they are as decided, important, and frequent as its other relations. From such considerations he arrived at the conclusion that hydrogen is essentially a neutral or intermediate body, and therefore we should not expect to find liquid or solid hydrogen possess the appearance of a metal. This extraordinary prevision, so characteristic of Odling, was proved to be correct some 37 years after it was made. Another curious anticipation was made by Dumas in a letter addressed to Pictet, in which he says that the metal analogous to hydrogen is magnesium, and that probably both elements have the same atomic volume, so that the density of hydrogen, for this reason, would be about the value elicited by subsequent experiments. Later on, in 1872, when Newlands began to arrange the elements in periodic groups, he regarded hydrogen as the lowest member of the chlorine family; but Mendeleef in his later classification placed hydrogen in the group of the alkaline metals; on the other hand, Dr. Johnstone Stoney classes hydrogen with the alkaline earth metals and magnesium. From this speculative divergency it is clear no definite conclusion could be reached regarding the physical properties of liquid or solid hydrogen, and the only way to arrive at the truth was to prosecute low temperature research until success attended the efforts to produce its liquefaction. This result I definitely obtained in 1898. The case of liquid hydrogen is, in fact, an excellent illustration of the truth already referred to, that no theoretical forecast, however apparently justified by analogy, can be finally accepted as true until confirmed by actual experiment. Liquid hydrogen is a colourless transparent body of extraordinary intrinsic interest. It has a clearly defined surface, is easily seen, drops well, in spite of the fact that its surface tension is only the 35th part of that of water, or about one-fifth that of liquid air, and can be poured easily from vessel to vessel. The liquid does not conduct electricity, and, if anything, is slightly diamagnetic. Compared with an equal volume of liquid air, it requires only one-fifth the quantity of heat for vaporization; on the other hand, its specific heat is ten times that of liquid air or five times that of water. The coefficient of expansion of the fluid is remarkable, being about ten times that of gas; it is by far the lightest liquid known to exist, its density being only one-fourteenth that of water; the lightest liquid previously known was liquid marsh gas, which is six times heavier. The only solid whch has so small density as to float upon its surface is a piece of pith wood. It is by far the coldest liquid known. At ordinary atmospheric pressure it boils at minus 252.5deg., or 20.5deg. absolute. The critical point of the liquid is about 29deg. absolute, and the critical pressure not more than 15 atmospheres. The vapour of the hydrogen arising from the liquid has nearly the density of air—that is, it is 14 times that of the gas at the ordinary temperature. Reduction of the pressure by an air-pump brings down the temperature to minus 258deg., when the liquid becomes a solid resembling frozen foam, and this by further exhaustion is cooled to minus 260deg., or 13deg. absolute, which is the lowest steady temperature that has been reached. The solid may also be got in the form of a clear transparent ice, melting at about 15deg. absolute, under a pressure of 55mm., possessing the unique density of one-eleventh that of water. Such cold involves the solidification of every gaseous substance but one that is at present definitely known to the chemist, and so liquid hydrogen introduces the investigator to a world of solid bodies.

THE ABSOLUTE ZERO.

By the evaporation of solid hydrogen under the air pump we can reach within 13deg. or 14deg. of the zero, but there or thereabouts our progress is barred. This gap of 13deg. might seem at first sight insignificant in comparison with the hundreds that have already been conquered. But to win one degree low down the scale is quite a different matter from doing so at higher temperatures; in fact, to annihilate these few remaining degrees would be a far greater achievement than any so far accomplished in low-temperature research. For the difficulty is two-fold, having to do partly with process and partly with material. The application of the methods used in the liquefaction of gases becomes continually harder and more troublesome as the working temperature is reduced; thus, to pass from liquid air to liquid hydrogen—a difference of 60deg.—is, from a thermodynamic point of view, as difficult as to bridge the gap of 150deg. that separates liquid chlorine and liquid air. By the use of a new liquid gas exceeding hydrogen in volatility to the same extent as hydrogen does nitrogen, the investigator might get to within 5deg. of the zero; but even a second hypothetical substance, again exceeding the first one in volatility to an equal extent, would not suffice to bring him quite to the point of his ambition. That the zero will ever be reached by man is extremely improbable. A thermometer introduced into regions outside the uttermost confines of the earth's atmosphere might approach the absolute zero, provided that its parts were highly transparent to all kinds of radiation, otherwise it would be affected by the radiation of the sun, and would therefore become heated. But supposing all difficulties to be overcome, and the experimenter to be able to reach within a few degrees of the zero, it is by no means certain that he would find the near approach of the death of matter sometimes pictured. Any forecast of the phenomena that would be seen must be based on the assumption that there is continuity between the processes studied at attainable temperatures and those which take place at still lower ones. Is such an assumption justified? It is true that many changes in the properties of substances have been found to vary steadily with the degree of cold to which they are exposed. But it would be rash to take for granted that the changes which have been traced in explored regions continue to the same extent and in the same direction in those which are as yet unexplored. Of such a breakdown low-temperature research has already yielded a direct proof at least in one case. A series of experiments with pure metals showed that their electrical resistance gradually decreases as they are cooled to lower and lower temperatures, in such ratio that it appeared probable that at the zero of absolute temperature they would have no resistance at all and would become perfect conductors of electricity. But with the advent of the more powerful refrigerant liquid hydrogen it became necessary to revise that conclusion. A discrepancy was first observed when a platinum resistance thermometer was used to ascertain the temperature of that liquid boiling under atmospheric and reduced pressure. All known liquids, when forced to evaporate quickly by being placed in the exhausted receiver of an air-pump, undergo a reduction in temperature, but when hydrogen was treated in this way it appeared to be an exception. The resistance thermometer showed no such reduction as was expected, and it became a question whether it was the hydrogen or the thermometer that was behaving abnormally. Ultimately, by the adoption of other thermometrical appliances, the temperature of the hydrogen was proved to be lowered by exhaustion as theory indicated. Hence it was the platinum thermometer which had broken down; in other words, the electrical resistance of the metal employed in its construction was not, at temperatures about minus 250deg. C., decreased by cold in the same proportion as at temperatures about minus 200deg. This being the case, there is no longer any reason to suppose that at the absolute zero platinum would become a perfect conductor of electricity; and in view of the similarity between the behaviour of platinum and that of other pure metals in respect of temperature and conductivity, the presumption is that the same is true of them also. At any rate, the knowledge that in the case of at least one property of matter we have succeeded in attaining a depth of cold sufficient to bring about unexpected change in the law expressing the variation of that property with temperature, is sufficient to show the necessity for extreme caution in extending our inferences regarding the properties of matter near the zero of temperature. A theoretical investigation on the relaxation of "electrions" and atoms has led him to suggest a hypothetical metal having the following remarkable properties—below 1deg. absolute it is a perfect insulator of electricity, at 2deg. it shows noticeable conductivity, and at 6deg. it possesses high conductivity. It may safely be predicted that liquid hydrogen will be the means by which many obscure problems of physics and chemistry will ultimately be solved, so that the liquefaction of the last of the old permanent gases is as pregnant now with future consequences of great scientific moment as was the liquefaction of chlorine in the early years of the last century. The next step towards the absolute zero is to find another gas more volatile than hydrogen, and that we possess in the gas occurring in clevite, identified by Ramsay as helium, a gas which is widely distributed, like hydrogen, in the sun, stars, and nebulæ. A specimen of this gas was subjected by Olszewski to liquid air temperatures, combined with compression and subsequent expansion, following the Cailletet method, and resulted in his being unable to discover any appearance of liquefaction, even in the form of mist. His experiments led him to infer that the boiling-point of the substance is probably below 9deg. absolute. After Lord Rayleigh had found a new source of helium in the gases which are derived from the Bath springs, and liquid hydrogen became available as a cooling agent, a specimen of helium cooled in liquid hydrogen showed the formation of fluid, but this turned out to be owing to the presence of an unknown admixture of other gases. As a matter of fact, a year before the date of this experiment I had recorded indications of the presence of unknown gases in the spectrum of helium derived from this source. When subsequently such condensable constituents were removed, the purified helium showed no signs of liquefaction, even when compressed to 80 atmospheres, while the tube containing it was surrounded with solid hydrogen. Further, on suddenly expanding, no instantaneous mist appeared. Thus helium was definitely proved to be a much more volatile substance than hydrogen in either the liquid or solid condition. The inference to be drawn from the adiabatic expansion effected under the circumstances is that helium must have touched a temperature of from 9deg. to 10deg. for a short time without showing any signs of liquefaction, and consequently that the

critical point must be still lower. This would force us to anticipate that the boiling-point of the liquid will be about 5deg. absolute, or liquid helium will be four times more volatile than liquid hydrogen, just as liquid hydrogen is four times more volatile than liquid air. Provided the critical point is not below 8deg. absolute, then, from the knowledge of the conditions that are successful in producing a change of state in hydrogen through the use of liquid air, we may safely predict that helium can be liquefied by following similar methods. If, however, the critical point is as low as 6deg. absolute, then it would be almost hopeless to anticipate success by adopting the process that works so well with hydrogen. The present anticipation is that the gas will succumb after being subjected to this process, only, instead of liquid air under exhaustion being used as the primary cooling agent, liquid hydrogen evaporating under similar circumstances must be employed. In this case the resulting liquid would require to be collected in a vacuum vessel, the outer walls of which are immersed in liquid hydrogen. The practical difficulties and the cost of the operation will be very great; but, on the other hand, the descent to a temperature within 5deg. of the zero would open out new vistas of scientific inquiry, which would add immensely to our knowledge of the properties of matter. To command in our laboratories a temperature which would be equivalent to that which a comet might reach at an infinite distance from the sun would, indeed, be a great triumph for science. If the present Royal Institution attack on helium should fail, then we must ultimately succeed by adopting a process based on the mechanical production of cold through the performance of external work. When a turbine can be worked by compressed helium, the whole of the mechanism and circuits being kept surrounded with liquid hydrogen, then we need hardly doubt that the liquefaction will be effected. In all probability gases other than helium will be discovered of greater volatility than hydrogen. It was at the British Association meeting in 1896 that I made the first suggestion of the probable existence of an unknown element which would be found to fill up the gap between argon and helium, and this anticipation was soon taken up by others and ultimately confirmed. Later, in the Bakerian lecture for 1901, I was led to infer that another member of the helium group might exist, having the atomic weight about 2, and this would give us a gas still more volatile, with which the absolute zero might be still more nearly approached. It is to be hoped that some such element or elements may yet be isolated and identified as coronium or nebulium. The chemists of the future will find ample scope for investigation within the apparently limited range of temperature which separates solid hydrogen from the zero. Indeed, great as is the sentimental interest attached to the liquefaction of these refractory gases, the importance of the achievement lies rather in the fact that it opens out new fields of research and enormously widens the horizon of physical science, enabling the natural philosopher to study the properties and behaviour of matter under entirely novel conditions.

THE UPPER AIR AND AURORAS.

The present liquid ocean, neglecting everything for the moment but the water, was at a previous period of the earth's history part of the atmosphere, and its condensation has been brought about by the gradual cooling of the earth's surface. This resulting ocean is subjected to the pressure of the remaining uncondensed gases, and as these are slightly soluble they dissolve to some extent in the fluid. The gases in solution can be taken out by distillation or by exhausting the water, and if we compare their volume with the volume of the water as steam, we should find about 1 volume of air in 60,000 volumes of steam. This would then be about the rough proportion of the relatively permanent gas to condensable gas which existed in the case of the vaporised ocean. Now let us assume the surface of the earth gradually cooled to some 200deg. below the freezing-point; then, after all the present ocean was frozen, and the climate became three times more intense than any arctic frost, a new ocean of liquid air would appear, covering the entire surface of the frozen globe about 35ft. deep. We may now apply the same reasoning to the liquid air ocean that we formerly did to the water one, and this would lead us to anticipate that it might contain in solution some gases that may be far less condensable than the chief constituents of the fluid. In order to separate them we must imitate the method of taking the gases out of water. Assume a sample of liquid air cooled to the low temperature that can be reached by its own evaporation, connected by a pipe to a condenser cooled in liquid hydrogen; then any volatile gases present in solution will distil over with the first portions of the air, and can be pumped off, being uncondensable at the temperature of the condenser. In this way, a gas mixture, containing, of the known gases, free hydrogen, helium, and neon, has been separated from liquid air. The spectroscopic examination of these gases throws new light upon the question of the aurora and the nature of the upper air. According to the old law of Dalton, supported by the modern dynamical theory of gases, each constituent of the atmosphere while acted upon by the force of gravity forms a separate atmosphere, completely independent, except as to temperature, of the others, and the relations between the common temperature and the pressure and altitude for each specific atmosphere can be definitely expressed. If we assume the altitude and temperature known, then the pressure can be ascertained for the same height in the case of each of the gaseous constituents, and in this way the percentage composition of the atmosphere at that place may be deduced. Suppose we start with a surface atmosphere having the composition of our air, only containing two ten-thousandths of hydrogen, then at 37 miles, if a sample could be procured for analysis, we believe that it would be found to contain 12 per cent. of hydrogen and only 10 per cent. of oxygen. The carbonic acid practically disappears; and by the time we reach 47 miles, where the temperature is minus 132deg., assuming a gradient of 3.2deg. per mile, the nitrogen and oxygen have so thinned out that the only constituent of the upper air which is left is hydrogen. If the gradient of temperature were doubled, the elimination of the nitrogen and oxygen would take place by the time 37 miles was reached, with a temperature of minus 220deg. The permanence of the composition of the air at the highest altitudes, as deduced from the basis of the dynamical theory of gases, has been discussed by Stoney, Bryan, and others. It would appear that there is a consensus of opinion that the rate at which gases like hydrogen and helium could escape from the earth's atmosphere would be excessively slow. Considering that to compensate any such loss the same gases are being supplied by actions taking place in the crust of the earth, we may safely regard them as necessarily permanent constituents of the upper air. The temperature at the elevations we have been discussing would not be sufficient to cause any liquefaction of the nitrogen and oxygen, the pressure being so low. If we assume the mean temperature as about the boiling point of oxygen at atmospheric pressure, then a considerable amount of the carbonic acid must solidify as a mist, if the air from a lower level be cooled to this temperature; and the same result might take place with other gases of relatively small volatility which occur in air. This would explain the clouds that have been seen at an elevation of 50 miles, without assuming the possibility of water vapour being carried up so high. The whole mass of the air above forty miles is not more than one seven-hundredth part of the total mass of the atmosphere, so that any rain or snow or liquid or solid air, if it did occur, would necessarily be of a very tenuous description. In any case, the dense gases tend to accumulate in the lower strata, and the lighter ones to predominate at the higher altitudes, always assuming that a steady state of equilibrium has been reached. It must be observed, however, that a sample of air taken at an elevation of nine miles has shown no difference in composition from that at the ground, whereas, according to our hypothesis, the oxygen ought to have diminished to 17 per cent., and the carbonic acid should also have become much less. This can only be explained by assuming that a large intermixture of different layers of the atmosphere is still taking place at this elevation. This is confirmed by a study of the motions of clouds about six miles high, which reveals an average velocity of the air currents of some seventy miles an hour; such violent winds must be the means of causing the intermingling of different atmospheric strata. Some clouds, however, during hot and thundery weather, have been seen to reach an elevation of seventeen miles, so that we have direct proof that on occasion the lower layers of atmosphere are carried to a great elevation. The existence of an atmosphere at more than 100 miles above the surface of the earth is revealed to us by the appearance of meteors and fireballs, and when we can take photographs of the spectrum of such apparitions we shall learn a great deal about the composition of the upper air. In the meantime, Pickering's solitary spectrum of a meteor reveals an atmosphere of hydrogen and helium, and so far this is corroborative of the doctrine we have been discussing. It has long been recognised that the aurora is the result of electric discharges within the limits of the earth's atmosphere, but it was difficult to understand why its spectrum should be so entirely different from anything which could be produced artificially by electric discharges through rarefied air at the surface of the earth. If we turn to the question what is the cause of the electric discharges which are generally believed to occasion auroras, but of which little more has hitherto been known than that they are connected with sun spots and solar eruptions, recent studies of electric discharges in high vacua, with which the names of Crookes, Röntgen, Lenard, and J. J. Thomson will always be associated, have opened the way for Arrhenius to suggest a definite and rational answer. He points out that the frequent disturbances which we know to occur in the sun must cause electric discharges in the sun's atmosphere far exceeding any that occur in that of the earth. These will be attended with an ionisation of the gases, and the negative ions will stream away through the outer atmosphere of the sun into the interplanetary space, becoming, as Wilson has shown, nuclei of aggregation of condensable vapours and cosmic dust. The liquid and solid particles thus formed will be of various sizes; the larger will gravitate back to the sun, while those with diameters less than one-and-a-half thousandths of a millimetre, but nevertheless greater than a wave length of light, will, in accordance with Clerk-Maxwell's electro-magnetic theory, be driven away from the sun by the incidence of the solar rays upon them, with velocities which may become enormous, until they meet other celestial bodies, or increase their dimensions by picking up more

›smic dust or diminish them by evaporation. The earth will catch s share of such particles on the side which is turned towards the sun, nd its upper atmosphere will thereby become negatively electrified ntil the potential of the charge reaches such a point that a discharge ccurs, which will be repeated as more charged particles reach the arth. This theory not only accounts for the auroral discharges, nd the coincidence of their times of greatest frequency with those f the *maxima* of sunspots, but also for the minor *maxima* and *inima*. The vernal and autumnal *maxima* occur when the line hrough the earth and sun has it greatest inclination to the solar quator, so that the earth is more directly exposed to the region of *naximum* of sunspots, while the 26 days' period corresponds closely vith the period of rotation of that part of the solar surface where eculæ are more abundant. J. J. Thomson has pointed out, as a consequence of the Richardson observations, that negative ions will be contantly streaming from the sun merely regarded as a hot body, but his is not inconsistent with the supposition that there will be an excess f this emission in eruptions, and from the regions of feculæ. Arrhenius's theory accounts also, in a way which seems the most satisfactory hitherto enunciated, for the appearances presented by comets. The solid parts of these objects absorb the sun's rays, and as they approach the sun become heated on the side turned towards him until the volatile substances frozen in or upon them are evaporated and diffused in the gaseous state in surrounding space, where they get cooled to the temperature of liquefaction and aggregated in drops about the negative ions. The larger of these drops gravitate towards the sun and form clouds of the coma about the head, while the smaller are driven by the incidence of the sun's light upon them away from the sun and form the tail. The curvature of the tail depends, as Bredichin has shown, on the rate at which the particles are driven, which in turn depends on the size and specific gravity of the particles, and these will vary with the density of the vapour from which they are formed and the frequency of the negative ions which collect them. In any case, Arrhenius's theory is a most suggestive one, not only with reference to auroras and comets, and the solar corona and chromosphere, but also as to the constitution of the photosphere itself.

PROFESSOR JAMES DEWAR, F.R.S.

Exhibition.

CAMBRIDGE.

A PHOTOGRAPHIC exhibition was opened at the Corn Exchange, Cambridge, last Wednesday in connection with the Cambridge and District Horticultural Society.

At the luncheon Mr. F. H. Sanderson, one of the judges, said he thought he might say that the Society were to be congratulated on the show of photographs. Last year the first effort in that direction was made, and he was delighted to know that it was sufficiently successful to warrant the attempt this year. He was pleased to note that two of last year's prize winners were medallists again this year; he was also pleased to see that an open class was inaugurated. If they wanted to encourage photography, his advice was, "Don't confine it to the town." The amateur in the town, he pointed out, was apt to follow the lead of the professionals in the town and be influenced by the show-cases. The professional had absolutely the last chance in the world of producing the best photography. They wanted men to give their whole soul and strength to producing the highest possible article, and they would find in the photographic world the professional did not produce the work of the highest standard, simply because he had to work at a price and gain a livelihood. By having the open class they would get work from all over the country, and they would instil into those who took up photography a love for the finest productions.

Compared with last year, the exhibition showed a great improvement in point of the number and the quality of works sent in. Last year the class for architecture was the smallest; this year it was the reverse, and some of the work was of the highest possible quality. The silver medal was awarded to the Rev. H. R. Campion, of Ely; he also took the cup, accompanied by another silver medal for a photograph of the entrance to Bishop West's Chapel, Ely, which was adjudged the best picture in classes 1 to 4. The bronze medal went to some very fine pictures of Canterbury Cathedral by Mr. T. J. Snowden. Miss E. M. Pope, of Sandy, was highly commended. In the class for portraits and figure studies (always a strong class for local workers) Mr. Alphonso Smith took the silver medal for a set of three pictures, entitled, "An Errand of Mercy," "Sen-Sen," and "The Cobbler." The last-named was decidedly the best of the three; the reason is obvious to one who knows Mr. Smith. Mr. William Moore, a rising and enthusiastic worker who takes particular interest in figure work, took the bronze medal for a picture entitled, "Wrinkles, Old and New," which represented an old man (well-known in the town) reading a contemporary. The posing and the expression were excellent. Mr. Moore is to be congratulated also on a set of pictures illustrating poaching, bird-nesting, etc. In this class Mr. J. Johnson was highly commended.

The landscape and seascape class was rather weak, and not nearly so good as last year. There were a few good pictures, but none of sufficient merit to warrant the silver medal award. A landscape and a seascape by Miss E. M. Pope gained the bronze medal. Mr. Alphonso Smith was highly commended for two pictures. Mr. A. G. Swannel was also commended.

In the juniors' class, first prize was awarded to Mr. H. S. Clayton for a picture of the May boat races. The second prize was withheld.

The open class was of great interest. Mr. C. E. Walmsley won the gold medal with three excellent studies. The Rev. F. W. Strong won the silver medal for two portraits, of which "Thoughts of Youth" was the finest. A Bristol worker, Mr. W. R. Lathbury, won the bronze medal. Highly commended Mr. F. M. Barkway, and Mr. W. Inston commended. Other good work was shown by William Shakespeare and W. Page.

Messrs. F. J. Stoakley and W. H. Hall were awarded a special silver medal for some Sanger Sheppeard colour slides.

The judging was in the capable hands of Messrs. W. B. Redfern and F. H. Sanderson. The duties of hon. sec. were undertaken by Mr. C. S. Addison, assisted by Messrs. A. J. Mouel and F. Stoakley, whose part in making the exhibition a success was very considerable.

PERSONAL PARS AND NEWS NOTES.

MANY as well as myself must have regretted the disappearance of the column of "Personal Paragraphs" that once used to ornament page 2 of each issue of a certain photographic weekly. Why, I ask, has this popular and truly twentieth-century feature vanished? Has "Lux" ceased to perambulate (note-book in hand) the apartment of Anderton's Hotel, in which certain of the faithful are wont to meet? Does he no longer haunt the purlieus of Tudor Street, Whitefriars, on Thursday nights; has he stopped lurking—a silent listener—in a corner of the smoke-room at 28, Charing Cross Road; can he never now be descried in the neighbourhood of Russell Square; in short, is he no more hunting for "copy" in those spots of the metropolis where camera folks most generally do congregate? If not, why not?

One reason, and one only, presents itself as being possibly the true secret. Lux may have become an editor, and is consequently too grand to deign to write mere pars. Such being the case, may I offer myself—Solomon Sage—as a humble substitute?

My idea is not to confine myself to sordid details of a man's ancestors, his researches into chemistry, and such-like dry information. On the contrary, I'd give chatty notes on personal appearance, dress, and habits, etc., with stories of incidents and *bon mots* scattered in between, to flavour the literary hash—I mean, dish. Further, my paragraphs would not be confined to people only.

But in order that you may more clearly grasp my meaning, I have jotted down a selection of sample pars., as follows:—

I saw Mr. Snowden Ward get off a 'bus outside the door of the "King Lud" the other day. It gratified me to observe that, instead of entering, he went to Slater's next door. He was wearing a brown lounge suit, with a charming green tie. His hat, as usual, was of the soft felt variety. I am in a position to deny the ridiculous *canard* which credits Mr. Ward with having stated that it was possible for amateurs to earn money by press photography.

Mrs. Cadby, I learn, has just placed a permanent order with Messrs. Straker for a large weekly supply of pen-nibs and paper. It is said that her articles on garden photography are all arranged for up to the spring of 1904.

Mr. Holland Day has returned to America. The price of white stock scarves has fallen perceptibly since his departure. Mr. Day took with him some fine '86 platinotype with which to replenish his cellars.

Another American visitor who recently quitted our shores was Mr. Yarnall Abbot. It is whispered that while in London he, conducted by one of our most prominent photographic lights, visited the Zoo, the R.P.S., Romano's, an A.B.C. shop, the Tivoli, Westminster Abbey, and other refined resorts of the metropolis. Mr. Abbot was overheard to pronounce the evening service at the Abbey "real bully," and although the meaning of this cryptic utterance may be somewhat obscure, everyone who met the speaker will agree that it was doubtless said in good part.

The statement that the Eastman Company have added to their enormities by turning pro-Boer is without foundation. P.K. stands

for pocket-kodak as well as the name of the (late) President of the Transvaal.

A good story is going the rounds at present in which the Rev. F. C. Lambert is the central figure. Mr. Lambert, it seems, called one afternoon at Effingham House, Arundel Street, and on the doorstep encountered Mr. Brown. They entered the lift (beg pardon, the elevator) together, and ascended towards the top floor of the mansion. The lift (realising, perhaps, that it had a clergyman on board), travelled very slowly and sedately. "I thought you advertised that this elevator was the fastest in London?" remarked Mr. Lambert. "*So it was,*" said Mr. Brown, who had had to stand the whole way up. The reverend gentleman's reply, if he made one, is unrecorded.

It is incorrect to suppose that the photographs of lightning exhibited in the Scientific Section at the recent New Gallery show were merely negative prints from certain tree and branch studies at the Salon.

A Parisian correspondent informs me that Mr. Edouard Steichen has organised a new artistic society in that city. The society is a delightfully informal one, holding its meetings (at which members' work is exhibited, criticised, and occasionally even admired) wherever it happens to find itself at the time. Mr. Steichen is, so far, the only member.

I hear a rumour that Dr. Grün is about to set up a portrait studio on each of the stations of the Underground Railway. The eminent optical worker's latest feat was to snapshot a negro in mourning walking through a mist at midnight. The likeness is excellent.

In view of the fact that several more meetings are soon to be held at the Royal Photographic Society's rooms, I am thankful to be able to announce that No. 66, Russell Square has at last been connected by private wire with the nearest ambulance station.

A story having been circulated in the Camera Club to the effect that the price of afternoon tea was to be raised to sixpence, several prominent members are reported to have stated emphatically that they would sooner drink whiskey than submit to such an extortion. The momentary storm has, however, subsided.

There! If those paragraphs won't do, I don't know what will. Should you decide to publish a series such as the above, kindly wire me at once in order that I may buy a suit of armour for street and evening wear. Also purchase fresh bales of paper to cope with the doubled circulation of your journal. Yes; Solomon Sage is your man!

SOLOMON SAGE.

Commercial & Legal Intelligence

PLATINUM Residues.—Messrs. Blundell and Sons, of 199, Wardour Street, Oxford Street, London, ask us to state they treat platinum residues very economically, and give clients best value for all parcels entrusted to them.

ALLEGED Bogus Photograph Company.—At the Westminster Police Court on Monday last Ernest Frewtrell Hopper, aged 27, of High Street, Plumstead, and Charles Davies, aged 46, of Darwin Street, Walworth, were charged on a warrant with conspiring together to obtain money by means of false pretences.—Detective Sergeant Baxter stated that the prisoners were arrested on a warrant granted in January of last year, the allegation being that they obtained various sums of money from domestic servants and others, for orders for photographs. When applications for the orders were made, the parties were told that the money had not been paid in. He arrested prisoner Hopper on Saturday evening, when the accused said: "I suppose you will have Davies." He afterwards added: "He is the instigator of this." The concern was called The International Photograph Company. The accused subsequently said: "I was employed by Davies at a salary of 10s. per week, 15 per cent. commission on all orders, and 7½ per cent. on collections. Davies has been my downfall. I was straight until I met him. Only a week or two ago, we got some money from different people for orders, and divided it equally. We afterwards spent the money. I am glad it has come to this, but for Davies I should not be standing here now. After this I shall get clear, and then start afresh. Davies is a scoundrel, and I shall have the satisfaction of seeing him punished as well as myself."—The Sergeant further stated that he got the prisoner Davies to attend the Rodney Road Police Station by a ruse on Sunday morning. When charged, he said: "It was a genuine business, but one can hardly earn a living at it now."—Davies now expressed astonishment at the action of the police, and said he had been residing at the same address for upwards of twelve years.—Eventually the prisoners were remanded.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Sept.	Name of Society.	Subject.
19	Croydon Natural History	*Tele-Photography.* E. Marriage
20	Ashton-under-Lyne Photo.	Ramble to Hartington. Leader, Mr. R. T. Marsland.
20	Brentford Photographic	Wraysbury to Windsor.
23	Birmingham Photographic	Members' Lantern Evening. Chairman Mr. R. Haines, M.A.
24	Borough Polytechnic	Annual General Meeting.
24	North Middlesex Photographic	Technical Meeting.
25	London and Provincial	*More Gems from Spain.* Mr. A. L. Henderson.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

SEPTEMBER 11TH.—Mr. W. E. Dunmore in the chair.

Mr. W. D. Welford asked whether the experiences of others confirmed what he himself had noticed in the process of intensifying a plate with mercury. If a plate be bleached with mercury and then blackened at once, a certain amount of intensification takes place; but if, after bleaching, the plate is allowed to dry and to remain in the light for a few days, and is then blackened, nearly double the first intensification is obtained. What was the action of the light on the bleached plate that brought about the increased density under the blackening agent.

Mr. A. Haddon suggested that to make the case quite clear and indisputable, a plate should be bleached and divided into three parts. One part should be treated with ammonia at once; another should be placed in the light; and the third should be kept in darkness. The two last might then be treated with the ammonia after a few days, to see, first of all, whether there was a difference between them and the first plate, and secondly whether the increased density was due to exposure to light or to effluxion of time, a point which would be settled by the relative conditions of the two last sections.

Mr. Welford said that he had kept half of a bleached plate covered up for three days while the rest was exposed to daylight, and he found that the latter was blackened more than the protected portion by the alkali.

The Chairman said that he had noticed that after intensification the gelatine of a film negative became quite hard, not brittle, but hard.

Mr. Haddon attributed this to the tanning action of the mercury on the gelatine.

The Chairman added that this phenomenon was peculiar to films so far as he was aware. It was also a fact that films intensified with mercury did not keep so long as glass negatives, and he found it advisable to take what prints he wanted very soon after intensification. The deterioration showed all over the emulsion, which often came quite away from the celluloid.

Mr. Welford said that it was a curious thing that if one did not wash the bleached film properly a deterioration, in which the blackened negative gradually reassumed its bleached form, set in. It was somewhat mysterious, however, that a film treated in exactly the same way as a plate lasted only for weeks, as against months in the case of the plate.

Mr. A. Mackie remarked that the fading of intensified images varied very much. He had come across negatives intensified in 1877 which were perfect, whereas there were plenty of cases of later intensifications which had gone quite wrong. He believed that the first thing to bear in mind was perfect fixing in the first place and to finish with a fresh solution of hyposulphite of soda, so that no silver salt could remain.

A discussion also took place on matters of minor importance, which call for no comment here.

FULHAM CAMERA CLUB.

WITH the object of inaugurating the session of 1902-3 in connection with the Fulham Camera Club, the President (Mr. Arthur C. Baldwin), Vice-President and Council held a successful "At Home" in the large hall of the Conservative Club, Shorrolds Road, on Wednesday evening last week. The programme arranged for the occasion included vocal and instrumental music, the presidential address, and a lantern exhibition.

The President said that it afforded him much pleasure on behalf of the Vice-President, Council, and himself to welcome them all in the name of the Fulham Camera Club. He had no doubt that they had noticed that on their syllabus was their motto, "Lux et umbra." Those of them acquainted with the classics knew exactly what it meant, but on this occasion he took the liberty of giving a more freer translation, and say its "lucky you brought your umbrellas." They had had a letter of regret from the Mayor of that important borough to say that a previous engagement prevented him from attending. He would now proceed to deliver what was set down in the programme as the presidential address, and he had called it "Photography in many lights." On a former occasion two years ago his subject was "shadows," and he would now deal with "lights," and they could take his remarks as "the idle thoughts of an idle photographer." The address proceeded:—

The former treatise that I made treated of photography under the title of "Shadows," and I justified my selection of that title by recourse to Nuttall's dictionary, and once more I appeal to it. I find that photography is "the art of producing pictures of objects on a chemically prepared ground by the action of light," and is derived from one Greek

ord Phos, which means "light," and another "grapho," "to write." shadow is sombre, but I do not recollect that my earlier screed was together of a sombre character, but as photography is a subject of ght, I trust that I may be pardoned if on this occasion I treat it in a ght manner. A photographer is somewhat of a butcher, because though e may not have much liver (alas! some of us have one too many and are ainfully conscious of it), yet he has plenty of lights. High lights, aby, canary, and day lights, electric, gas, and other artificial lights. t is therefore in several lights that I wish you to glance at photography nis evening. I have ascertained that there was a Mr. Maxwell Lyte ho figured somewhat prominently in the early days of the science we ollow more or less artistically, and he must have treated it in a "Lyte" nanner, and as his method was the instantaneous process I will endeaour to follow in his footsteps, and think of Noah and be brief. Dr. Diamond was a pioneer, and from his brilliant setting shed light and ustre on the subject. Photographers use diamonds, but I never heard hat the famous doctor ever made cutting remarks, and so I hope I hall not fall into that error either. People are never tired of saying hat photography is still in its infancy. I consider that if that is so, it s a very fully developed child. It is, however, sufficiently ancient as o possess the halation of a legendary period, and therefore we will look at it first in a legendary light. The Baplista Porta, who I have no doubt thought no small beer of himself, improved the camera obscura, and since then the camera has not been so obscure an object as it once was. The thin end of the wedge would have been driven in much earlier had the dissolving properties of hypo-sulphate of soda been more widely known during Wedgwood's life, but solutions are not always at hand when most wanted, which is especially felt on a hot day in a stuffy dark room, with the candle curling over towards the ruby glass, your best exposed plate under development—temperature at 80 degrees—and you suddenly remember that there is not a bit of alum in the place, and it is early closing day. Wedgwood was not aware that he could retain the images on his plates which he had coated with a silver solution by means of a fixing agent. There were many people travelling on many lines from different starting places, but it was reserved for Mr. Scott Archer to bring photography on an arrow gauge by his collodion process, and express speed was made in the progress of the art. Photography is like some one or two of our generals in the late war. It has its reverses, but no defeats. First there were wet plates, now there are dry. At one time we have negatives, and then we have positives, and I am positive that although (in speaking) two negatives can make one positive, in photography millions of positives can be made from one negative, which is very transparent, and can be appreciated by the densest among us. I would now consider our subject in a high light, and for that purpose must mount to a photographer's studio—and even here legends abound. When you are gibbeted in the chair, with all the photographer's furniture around you, your gaze is directed on a fixed point, and you see staring you in the face "Cash at time of sitting." The artist invites you to look pleasantly, and how can you, when you know for certain that the money for the fire insurance must be sacrificed to your vanity, and you recollect that your housemaid, in whose care you have left the home, has a mania for resuscitating the fire with the best white rose oil. Another moment and the operator (how suggestive of a surgery) says "moisten the lips please." Another favourite motto is "The eyes may be blinked." At one time it used to be "The eyes may be winked," which of course means the same, but seems to invite an air of sauciness or incredulity on the part of the subject, and so it was abandoned in favour of the former. The President went on to refer to people who aped the manners and habiliments of portrait painters, and converted humanity into graven images all stiff and unnatural, and said, therefore, the loss of them is our gain, for it must be confessed that portraiture of to-day in many well-known instances are triumphs of photography, and show an advancement in the art that brings us nearer to the possession of pictures of our relatives and selves than we could have done had we lived in the time of Kneller, Reynolds, and Gainsborough. It has always been a difficulty to say exactly what high art is, but if it means art in high places then it must be found in a photographer's studio. From high lights to twilights is an easy declension, and it is here that photography has its uses. There is a gradually waning demand for photographic albums, and I think it is due to the many and various sizes of photographs. At one time it used to be only C.D.V. Don't photographers envy the times now gone for ever when they demanded and received 10s. per dozen C.D.V. one positive only, and now some of them are glad to accept an order for 3s. 6d. dozen and a 12 by 10 enlargement thrown in. Then cabinets were introduced, and for many years albums as receptacles for these portraits enjoyed a large sale. Now every photographer has a special size of his own, and it is difficult to get an album to take all these sizes. It has, however, had the effect of adding a charm to room decoration, and increased the sale of frames. However, to return to the album and twilight. How poetic it must be in the soft waning light of early summer evening to sit on a garden seat with your best boy showing him the family portraits—something after this style. That's papa! that's mamma! and that's mamma before she was married. It really was a cabinet, but you see it has been made smaller because papa's rival had been taken with her, and when she became engaged she thought she would be like papa and cut him out too. The poet sang, "The shades of night were falling fast," and that reminds me of photography in a night light. A lady the other day had a small camera given her, and she went into a Southsea dealer's shop for a flash-light apparatus—cheap, of course—and thought she would be able to take the fleet at Spithead. It was a magnificent idea, and showed good "resolution," but I am afraid a victory would not have been gained.

In his further remarks the President went on to give an interesting and humorous sketch of a Photographic Society's meeting, and dealt in an amusing and witty manner with other features of photographic art. Speaking of photography in a poetic light, he said that poets and photographers had one thing in common, and that was that they gained their inspiration from, and spent some of their best efforts in the admiration of nature. At the conclusion of his address Mr. Baldwin was loudly applauded.

Mr. Lloyd moved a vote of thanks to Mr. Baldwin for his address, and this was carried by acclamation.

In responding, Mr. Baldwin said he might say without any shamefacedness that that meeting was held for a purpose. That club was now entering upon the third year of its existence, and the Council thought it would be a very good idea to lure them there to spend a pleasant evening, but that was only the pleasant side of the camera club. Its real object was to meet together to improve themselves in their own work, and to render mutual help to other members who were engaged in the art which they followed. He went on to speak of the objects of the club, and expressed their indebtedness to the committee of the Conservative Club for allowing them the use of the room for club meetings.

GOLDSMITHS' INSTITUTE CAMERA CLUB.

The annual general meeting was held on Tuesday evening, the 9th inst, and was well attended by the membership. The question of amalgamation with the Chemical Society, which has been raised by the Institute authorities, was of course discussed at considerable length, it being fully decided that the hon. secs. should lay the views of the members on the subject before the Governors, and on receipt of their reply, call a special general meeting to deal with the matter. It was also decided that the present executive remain in office at any rate until this business is finally disposed of.

The following report detailing the work of the club for the past year, and its present position, was submitted by the hon. secretaries:—

Annual Report for Year ending Sept. 30th, 1902.

It is to-night for the fourth time our pleasing duty to present our annual report to the members of this club, and to record to the best of our ability the events and progress of the session which has just departed.

The year 1901-2 has been a stirring one in our national history, the lights and shades of triumph and despondency, joy and sadness, alternating with startling and significant rapidity in the minds and hearts of the citizens of our world-wide Empire; and, on a smaller scale and in a more restricted sense the same may be said of the Goldsmiths' Institute Camera Club and its members. However, all's well that ends well, and though the shadows seemed to predominate in the early part of the session, yet we are happy to say that the natural balance has been amply restored, and we end the year with a largely increased membership and a record of much useful photographic work accomplished.

The lectures and demonstrations given during the winter months were most interesting, but we regret to say they were not well patronised by the membership. Indeed, so bad did the attendances become that we were obliged to call a special general meeting on the 16th December last, at which the whole question was fully discussed, and, among other things, a reduction in the number of public fixtures, and a consequent increase in quality agreed upon.

The re-introduction of the weekly meetings, which have been held in Room 42, has proved to the popular taste, at any rate sufficiently so to warrant their continuance in the future.

One of the most successful functions we have ever held as a club took the form of an "At Home" on February the 11th. This being quite a new departure it was embarked upon with some amount of fear and trembling, but we are pleased to be able to report that it went with a "snap" from start to finish, and with music, flashlights, refreshments, and a lantern exhibition, there was not a dull moment from reception to God Save the King. As far as we were able to ascertain the feelings of those present we feel that we may safely say that everyone was delighted, and that there is no doubt whatever that this ought to become an annual fixture.

On April the 16th the lady members, with some slight assistance from the sterner sex, gave an entertainment in the Ladies' Social Room which was much appreciated, and which might be repeated every twelve months, or oftener, with advantage.

The summer programme included a projected excursion to Leatherhead on June 14th, but on that day the rains came and the waters covered the face of the earth, so it was reluctantly decided to abandon the fixture. Several members, however, who had foregathered at the railway station in a hope of a clearance in the skies, organised on the spot an impromptu excursion to "America in London" at the Crystal Palace, where they had a first-rate time. We speak from personal experience. Those members who had purchased tickets but did not turn up received their money back, less a deduction for the actual out-of-pocket expenses of printing, etc.

With regard to finance, the revenue account shows a credit balance both in the prize and general funds, which in view of the increased expenditure necessitated by a larger membership and broader outlook, may, we think, be regarded as satisfactory. The advance in the amount received under the heading subscriptions is also very gratifying, in addition there was a welcome increase in the Governors' grant, which we hope will be continued.

Turning now to our membership-roll we have the pleasure to chronicle a further accession in strength. At this time last year the number of actual members was 39, this year it has reached the excellent total of 54, a net gain of 15, and 28 more than the year before.

If every member will bring the club prominently before their friends who are members of the Institute, or who can be persuaded to join, especially ladies, there is no reason at all why this total should not be vastly

improved, indeed considering the advantages offered by the club we look forward with hopeful expectation in this direction. As, however, there is always bound to be some slight falling off in membership at the close of each session, from various causes, a vigorous recruiting campaign is the only means of ensuring a permanent increase.

SOUTHAMPTON CAMERA CLUB.

The members of the above club met on the 15th inst. under the presidency of Mr. G. Vivian.

After ordinary preliminary business, the Chairman introduced Mr. W. A. Sims, representative of the Rotary Photographic Company, who gave an instructive demonstration, etc., on the use of the various printing and negative papers issued by the company. Exposures were made, and the prints developed and fixed in the presence of the members, and a large variety of specimen prints and paper negatives were passed round for inspection, including some very superior specimens of bromide prints toned with the hypo-alum bath.

News and Notes.

A Receiver and Manager Appointed.—In the Chancery Division of the High Court, before Mr. Justice Swinfen Eady, sitting as Vacation Judge, a motion was heard in which Messrs. Barclay and Co., Ltd., sought for the appointment of a receiver and manager of the Photographic Association, Limited.—Mr. Robertson, who appeared in support of the motion, said the plaintiffs were debenture holders, and they asked for the appointment of a receiver and manager. The motion had been adjourned for a fortnight, for the purpose of entering into negotiations for paying off the plaintiffs. The plaintiffs had not been paid off however, and the motion now came before the Court.—Mr. Vernon said he appeared on behalf of the company, and for second debenture holders. He was not in a position to oppose the motion, but he asked that the order should not be drawn up for ten days, as negotiations were still pending, and they still had hopes of settling with the petitioners.—On behalf of Mr. Parker, another debenture holder, it was stated that he did not oppose the petition. The debentures he held, although they purported to be second debentures, ranked as a matter of fact in priority to those of the plaintiffs. He suggested that a receiver and manager be appointed without prejudice to the claims to priority.—His Lordship asked whether the easiest way would not be to take judgment at once, and direct an inquiry as to priorities.—Mr. Vernon said that would be throwing additional expense upon his client. Eventually his lordship appointed the gentlemen mentioned in the notice of motion as receiver and manager.

Considerable attention has been given by the Borough Polytechnic Photographic Society for the last three or four years to the promotion of practical instruction in photography as applied to amateurs, and we understand that some 70 ladies and gentlemen were added to the Society last winter almost solely by these evenings. The appended list of subjects for the coming season will be sufficient to show the scope of these elementary lectures, which are held every Friday. Add to this the privilege of also attending a similar series of more advanced lectures on Wednesday evenings, as well as the advantage of using at all times a well-fitted darkroom with an efficient lighting apparatus, and it will be seen that the subscription of 5s. per annum is a very modest one. The winter session reopens on Wednesday, October 1st, and the first instruction evening will be held on Friday, October 3rd. A full syllabus and other information can be obtained from the hon. secretary, Mr. P. C. Cornford, 103, Borough Road, S.E.:—1902.—October 3, apparatus—the choice of a camera, the functions of a lens, value of stops, use of swing back and rising front, accessories; October 10th, development—in theory and practice; October 17th, printing and toning P.O.P.; October 24th, lantern slide making; October 31st, bromide printing; November 7th, enlarging on bromide paper; November 14th, defects in negatives—prevention and remedy; November 21st, developers—their use and abuse; November 28th, enlarged negatives; December 5th, lantern slides—for production of tones; December 12th, trimming, mounting, and framing; December 19th, miscellaneous hints and formulæ. 1903.—January 2nd exposure and development by factors; January 9th, gaslight bromide papers; January 16th, intensification and reduction; January 23rd, control in printing; January 30th, platinum papers—development for tones: February 6th, enlarging; February 13th, clouds—their production and printing in; February 20th, home portraiture; February 27th, optical lantern—its management and uses; March 6th, composition—elementary rules; March 13th, developing architectural negatives; March 20th, bromide prints—toning and redeveloping; March 27th, carbon printing.

In "Photography as a Fine Art," a handsomely-illustrated volume just issued by Mr. Grant Richards, Mr. Charles H. Caffin makes, as his title suggests, a bold claim for the camera. It is not a new one, but it is here urged with unusual insistence and complacency. That, other things being equal, the difference between a good photograph and a bad one depends, in the main, upon the skill of the operator is obvious—it is a matter of technical dexterity aided by good apparatus. But it is the sun and the chemist, reinforced by the optical-instrument maker, which, in the last resort, create the photograph. The essential difference, from the artistic point of view, between an artist's picture and a photographer's negative is that the one has been generated by the brain and the other recorded by the lens. Nevertheless, the photographer is all the better for having a touch of the artist in him. The camera does not, as a matter of course, see Nature quite as it is. It used to be said that photography could not lie; but the extreme sophistication of much modern work is the best answer to that ill-informed dictum. The lens distorts objects, confuses distances, destroys "values," and commits other sins against actuality. Its results, therefore, need correction, and, up to a reasonable point, the artistic taste and manipulative skill of the photographer are properly employed in smoothing out the crooked places. It is when this process is carried to extremes, as it not infrequently is, that what Mr. Caffin calls a "straight" photograph becomes a "fake." He draws a sharp line of division between the two; but it would appear from his own admissions that there are more ways than one of obtaining results which the camera could not achieve unaided. The operator who "touches" up a negative by taking out the high lights or deepening the shadows, is a clumsy practitioner beside his more expert rival, who procures undoubtedly artistic results in the course of developing and printing, by the aid of platinum paper, glycerine, and other ingenious expedients. We have no quarrel with these processes, since, after all, they are directed to replacing crudity by softness and gradation; but we must not call this kind of thing "fine art." It is very clever work, and there is no denying the beauty and charm of many of the pictures by American photographers with which Mr. Caffin's volume is adorned. To what extent the photographer is justified in modifying his picture, and whether it is ever allowable to alter it by pencil or brush, is a nice question, although, perhaps, one of no great importance in itself. It may, however, be said that the necessity for the "fake" is hardly established. It is often resorted to for the sake of producing some tour de force, which may be effective, but hardly carries conviction, and is certainly out of place in a craft which, not satisfied with being delicate and beautiful, aspires to be considered an art. Mr. Caffin gives a very good concrete instance of this. A model in scanty raiment was photographed in an attitude of slumber, lying upon a couch. By the use of brush and needle the sofa was converted into water; the young person appeared to be floating; and, with the title of "Nirvana," the trick was done. This is, of course, a more elaborate performance than the familiar device of removing on the negative a superfluity of waist, or a too great amplitude of arm. The book, we should mention, is of American origin, and deals almost exclusively with the work of such experts as Mr. Alfred Stieglitz and Mrs. Kasebier.—The "Standard."

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

MESSRS. NEWNES' LECTURES.

To the Editors.

Gentlemen,—You have been good enough in previous years to grant us space in your columns for the purpose of calling the attention of the public to our annual offer of lantern-slide lectures for the people. May we mention that we are loaning this year many new and interesting sets. Some of the old favourites, too, have been thoroughly revised and added to, and we feel sure will again prove acceptable to the general public. Anecdotes about famous folk, pretty pictures for all, gems of comic art, the beautiful homes of England, something about sailors, lecture lessons, etc., etc., may be enumerated as a few of the many subjects on loan.

To those of your readers who may be interested in this matter we shall be happy to forward full particulars by return, on receipt of their application.—Yours very faithfully,

George Newnes, Limited,
Lantern Lectures Department.
Counting House and Editorial Offices,
8, 9, 10, and 11, Southampton Street, Strand.

THE LONDON COUNTY COUNCIL SCHOOL OF PHOTO-ENGRAVING AND LITHOGRAPHY.

To the Editors.

Gentlemen,—I have pleasure in enclosing, for your information, a prospectus of this school, the work of which is particularly indentified with the printing craft. I shall be greatly obliged if you will assist our work by drawing attention in the columns of your journal to the fact that the eighth session will commence on Monday, September 29th, 1902.

The school is open to those who are genuinely engaged in business in any branch of the photo-mechanical, photographic, designing, illustrative, lithographic, engraving, and printing crafts, and no provision whatever is made for amateurs.

The courses of practical instruction are arranged to suit the following craftsmen:—

Photo Engravers.—Line and screen negative making, etching, proving, tri-colour work. Photogravure, and preparation of originals for reproduction.

Photo Lithographers.—Negative making, photo lithography, collotype (plate preparation, press and machine work), combinations of lithography and collotype.

Photographers.—Line and continuous tone negative making, printing, enlarging, transparency making.
Lithographers.—Lithography, map and plain drawing, transfer printing, drawing, design, lettering, photo-lithography.
Designers.—Design, drawing, lithography.
Draughtsmen.—Drawing, design, lettering.
The School is well equipped with the necessary appliances for study and practical work. It contains large studios for life and elementary drawing, design rooms, lithographic studio, lithographic press room, photographic studio, with electric light installation, dark rooms, collotype preparation and printing room (with three presses), etching rooms, lecture room, etc.
Only those engaged in the trade are admitted. The fee which admits a student to the classes is 3s. a term of three months, inclusive, or those in receipt of not more than 30s. a week. For those in receipt of more than this sum the fee is 7s. 6d. a term, or 15s. a session of three terms. The Photo Process Department is open for day instruction.—I am, dear sir, yours faithfully,

A. J. NEWTON,
Principal of the School.

6, Bolt Court, Fleet Street, E.C.,
September 1st, 1902.

PLATINOTYPE DEMONSTRATIONS.

To the Editors.

GENTLEMEN,—We beg to inform you that during the exhibition of the Royal Photo. Society at the New Gallery Mr. W. H. Smith will give demonstrations of the platinotype process, and of the working of the oxy-magnesium portrait lamp on Tuesday, Thursday, and Saturday evenings.—Yours faithfully,

THE PLATINOTYPE CO.

22, Bloomsbury Street, New Oxford Street,
London, W.C., September 16th, 1902.

ENLARGING BY ARTIFICIAL LIGHT.

To the Editors.

GENTLEMEN,—Enclosed we have pleasure in sending you copy of a small pamphlet on "Enlarging by Artificial Light," which, we venture to think, contains useful advice to the worker with apparatus of this kind. Many of the questions which are being constantly asked of the photographic dealer are answered in this little work. We think this pamphlet may be of sufficient interest to many of your readers to warrant the favour of a notice of its publication.—Thanking you in anticipation, we are, dear sirs, yours faithfully,

PERKEN, SON, AND CO., LTD.

99, Hatton Garden, London, E.C.,
September 15th, 1902.

COPYRIGHT.

To the Editors.

Gentlemen,—About the 24th June, 1901, a London firm wrote me that I was recommended to them as being an expert at out-door photography, and especially mountainous districts. The firm offered to compensate me well if I would undertake to take certain views, adding they had great difficulty in getting one they could rely on. I wrote them in reply, saying I would undertake their orders, promising attention, and guaranteed them good work, and stating that what was not good could be rejected. I received a very courteous reply and promise to send me on a list of subjects they required at the "earliest possible date." No list of any kind was received until the 24th August following. Immediately after that date the weather (which had been very suitable for out-door work) broke up, and consequently involved me in great difficulties, causing several fruitless journeys to the same place to be made before I could obtain the necessary class of negative.

In the firm's order, which was for nearly 40. 1-1 negatives, they said if I found out subjects which I thought would sell I had a free hand to take them—so in all I secured 68 negatives. To secure some involved me in walking over 15 miles carrying my 1-1 outfit. I spared neither time, effort, nor expense, but utterly failed to get the work done until November, owing entirely to the weather and the difficult subjects. In that month the representative of the firm called on me, and found me finishing the work. There were some few not mounted, so he took what I had ready for one district with him to obtain his orders, and then came back for some of another district.

When he was with me the first time he saw some photographs of one of the particular districts on the table, and one of which he admired very much. I told him that was from one of my old negatives. He asked me to let him have copies of that and six others he selected from prints from other old negatives. I lost no time, printed copies, and sent them on at once to the firm in London at his request. When with me the firm's representative said: "I see you have gone to great trouble and expense, and the work is good, except a few, but I found on my journey that some of the subjects were not selling subjects" (although these subjects were stipulated in the firm's list), and again: "I see you have had great difficulty on account of the weather, but there is no remedy; we must do our best to meet each other." He asked me to meet them in the best way I could, which I promised to do, although admitting no neglect on my part. He said he would get his firm to make me a liberal offer, and asked me in the meantime to reprint some few from the mountain negatives and shade them in certain places, and then they would be all right. I endeavoured to reprint them, but it being wet and dull weather every day, and fearing (as I had no particular instructions which to print first) I might keep them waiting too long, I got the 68 negatives together and sent them to London by train, and wrote to them explaining my reasons for so doing. I received no reply until about a month after, although I had written them three times, and I then received a telegram saying: "Negatives too late; writing." No fixed time was mentioned for my work to be finished, save that they would be wanted for publication in 1902. In course of a few days after the telegram I received a letter and enclosed therein a cheque for £2 10s., asking me to sign an enclosed receipt in full settlement of my claim, and saying they had selected 5 negatives out of 68, and would send for a few more if they required them, and that they were returning the 63 negatives, and that the £2 10s. was for the 5 negatives at 10s. each. I acknowledged this letter by postcard, and said I would write them later on, which I did, offering (without prejudice) to accept £50 in settlement, and failing their acceptance of that offer, I should charge them a guinea each negative and travelling expenses. Receiving no reply, I sent an invoice for 62 negatives, not charging them for the full number, as there were several negatives of the same district which might not come in. I did not in any way refer to the 7 prints before mentioned from my old negatives, which were registered. In due course my claim for the negatives and travelling expenses, £75, less the amount of their cheque, was tried, and I obtained a verdict for £50 and costs.

After the trial I found they had taken large orders and were producing postcards (coloured and plain) and coloured photos by the thousand from one of the 7 photos from my old negatives. My solicitor wrote them on the matter, and requesting them to stop producing any more copies, and reminding them they had not paid for them. To this their solicitor replied that they had paid for them, and held my receipt and my written permit to use them, which I emphatically denied, and instructed my solicitors to apply for an injunction restraining the company from producing and selling any more copies. This application came on in London, and was refused, and the respondents are now threatening to apply for my committal unless I deliver up the original negative of this particular photo, which were copyrighted by me and were not in any way included in my claim against the company in the assize action.

This seems to me a deliberate attempt on the part of a company by virtue of their capital to over-ride and exterminate the value of copyright in a private individual, and as that would be a most serious matter to the profession, I shall be pleased to have the opinion of members on the subject through the medium of your valuable paper.

Thanking you, Mr. Editor, for inserting the same in our Journal, and apologising for the length of my letter, permit me to remain, dear sir, yours very sincerely.

J. L.

*** NOTICE TO THE TRADE, WHOLESALE AGENTS AND BOOKSELLERS.—*A Contents Bill is issued with each number of the* JOURNAL, *and copies may be had on application to the Publishers.*

*** NOTICE TO ADVERTISERS.—*A Revised Tariff for advertisements in the* JOURNAL *is now in force. Blocks and copy are received subject to the approval of the Publishers, and advertisements are inserted absolutely without condition, expressed or implied as to what appears in the text portion of the paper.*

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Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY, 24, *Wellington-street, Strand, London, W.C.*" *Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

PHOTOGRAPHS REGISTERED:—

J. B. Starbuck, Chapel Street, Market Rasen. *Photograph of Members and Officers of Market Rasen Urban District Council.*

A. J. Ashbolt, 10, Exmoor Road, Southampton. *Photograph of T. Robertson.*

A. J. Ashbolt, 10, Exmoor Road, Southampton. *Photograph of J. Fraser.*

Mowll and Morrison, 45, Hardman Street, Liverpool. *Two Photographs of Liverpool Association Football Club.*

G. Stringer, 40, Friar Street, Reading. *Photograph of G. Smith.*

PIRACY.—C. Carlton writes: "A neighbour, who is a printer and publisher, persists in reproducing and publishing my photographs without consent and against my wishes. Can he be legally restrained from so doing? The pictures are not registered, but are my own personal work."—In reply: Unless you register the copyright, you have no remedy against anyone who copies your pictures.

POSTCARDS.—"TYNEMAN" asks: "Can you give me address of Continental firms who make a speciality of printing pictorial postcards for the trade?"—In reply: We do not know the addresses of foreign firms that do this class of work. Messrs. Wyndham, of Acton, will no doubt execute the work for you; so will any of the collotype printers.

POSTAGE STAMP CAMERAS.—GLADSTONE AND BARNARD say: "We shall esteem it a favour if you can give us the names of manufacturers or wholesale places where we can get postage stamp cameras. Messrs. James Lancaster and Son is the only firm we know."—In reply: Postage stamp cameras are supplied by Fallowfields, Houghton's, Marion's, or, indeed, by all the large dealers.

COPYING COPYRIGHT PICTURES.—"INTERESTED" wants to know whether he would be liable in copying a photograph that has no mention of copyright on either mount or picture, even if it is copyright, and whether the law allows a person making one copy of anything for himself?—In reply: Certainly he would. The penalty is for copying, whether for sale or not. It is not necessary that a copyright picture be marked as such.

TOUCHING UP PHOTOGRAPHS FOR COPYING.—"WORTH KNOWING" says: "Shall be pleased if you will inform me how to make up and how to apply a wash to paint out reflections, and make parts lighter in photographs previous to copying, as used by process workers?"—In reply: Ordinary water-colours are all that is necessary. The reflections may be subdued with a very light grey. The darker portions may be strengthened by going over them with a lighter colour.

CUTTING MACHINE.—CHANCELLOR AND SON write: "We shall be glad if you will kindly let us know if there are any agents in the three Kingdoms for guillotine machines made by Marshall, photo dealer, Boston? If so, we shall be much obliged if you will kindly give us the address of one."—In reply: So far as we are aware, there are not. Indeed, we have not heard of their machines. Possibly some of the large London dealers may know of them. Try such houses as Houghton and Son, Fallowfields, and the like.

LANTERN PLATES.—H. H. PORT writes: "On page 783 of your ALMANAC for 1896 you give a method of making dry collodion plates for stereoscopic transparencies. I wish to make some slides for lantern by this method. Kindly say what developer you recommend for this purpose?"—In reply: A good developer for the plates is an acid "pyro" one, say, pyrogallic acid three grains, acetic acid thirty minims, water one ounce. To this a few drops of a twenty-grain solution of nitrate of silver is added. After it has been flowed once or twice over the plate.

SPOILT FILMS.—"FIXED" says: "A few days ago I developed a roll of films from which I required prints urgently. Unthinkingly, I dried the same off with methylated spirit, with the result they are so coiled up it is impossible to print from them. I have tried soaking them in glycerine, but this has not given the desired effect. Can you advise me through your valuable paper what is the best to do in the above case?"—In reply: We expect the films are spoilt. The only thing we can suggest is that you again immerse them in spirit until the celluloid is lightly softened, then press them flat, and keep them so while drying.

STUDIO ASPECT.—J. J. RIDLEY says: "I am thinking of renting a fresh studio, but I cannot possibly have a north or east light. The only light available is the west. Of course, I am aware that I shall have a great amount of sun in the afternoon. What kind of glass would you recommend for studio? Can the sun be curtained out successfully, and yet give short exposures?"—In reply: A western aspect is not at all bad for a studio, though, of course, it is not quite so easy to work as one with a north light. The sun can be successfully curtained out without necessitating a long exposure. Thin "rolled plate" will be good for the roof, and ordinary glass for the sides. We do not undertake to answer correspondents by post.

SPIKE OIL OF LAVENDER.—"SPIKE OIL" writes: "Some years since we used to purchase at a neighbouring oil and colour shop and ironmongers, some spike or oil of lavender. It was a dark brown, thickish fluid, and very cheap—about 2s. a pint. In those days of experimental photogravure we used it to fix the dust on the plates by suspending the plate over a dishful. I sent to-day to a neighbouring chemist for some. He sent me an ounce of a turbid, white, watery liquid with a few oily globules in, and charged 4d. Can you tell me where I can obtain the genuine article?"—In reply: Spike oil of lavender may be had from any of the wholesale druggists—Messrs. Hopkin and Williams, Cross Street, Hatton Garden, for example.

LENS FOR SHORT STUDIO, ETC.—"SEASIDE" writes: "(1) I shall esteem it a favour if you will kindly advise me what lens to buy to take full-length pictures (cabinet size) in a small studio, only 13ft. from wall to wall. I have a set of three Ross's, and should like to have another of theirs, but do not know which to get. (2) I should like also to know where I can buy ready-cut circular P.O.P. paper?"—In reply: (1) We know of no cabinet portrait lens that will take a full-length picture in anything like so short a studio. A lens of the anastigmatic type might be obtained that would do it, but the perspective would then be so violent that the pictures would be most unsightly. (2) We do not think anyone stocks paper cut circular. Perhaps some of the makers would supply it so cut if you ordered it in sufficiently large quantities.

MARKED NEGATIVES AND GLAZING PRINTS.—"STAINS" says: "(1) I developed six plates, 1-1, the other day with pyro and ammonia. They, if anything, were about a third under-exposed on all of them. I found in some of the shadows streaky marks, just as though a snail had crawled over them. It shows a little in the printing. Can you tell me cause and cure? (2) What is the name of the material used to give mounted prints a gloss? I understand they are squeeged on and left to dry till they fall off. Is that correct?" In reply: (1) "Snail marks" were not uncommon in the early days of dry-plate making, but we have seen nothing of them of late years. If they are due to the plates, they can be seen before they are developed. We rather suspect they are due to something in the development. (2) Simply squeegee the prints, while wet, on a ferrotype plate, and allow them to dry on that.

OPINION WANTED.—"OLD HAND" says "that a business is offered me, stated as follows:—Takings, £626; cost materials, £100 (A); rent and taxes, £100; sundries, £20 (B); total outlay, £220; nett profit, £406; outlay and profit equalling £626. The vendor states this is done on eight sitters a week, and that he employs no hands at all but one apprentice. (1) Does this sound true to you? (2) Is "A" a fair proportion? (3) Is "B" a fair proportion? (4) Would you not think several hands necessary? (5) Is not the average per sitter far too high to be correct?"—In reply: We see no reason why, as only eight sitters per week are taken, that two persons cannot do all the work. With regard to the profits we can say nothing, as we know nothing of the prices charged for the portraits. If they averaged a guinea and a half each, it would make up the sum said to be taken.

CAMERA CONSTRUCTION.—C. EVENDEN says: "I have been thinking over cameras and fancy there is room for improvement, and I am writing for your opinion, if you think one with the following features would be a financial success: For glass plates (or film plates), magazine to hold six or more plates, collapsible into compressed shape, so that one for 5 x 4 plates would go in ordinary coat pocket. Daylight loading can be loaded or unloaded, or night, sunshine. The plates to be shut up in light, tight compartments, so that leakage in camera or light from the shutter cannot reach them. Simple in construction, the neatest and most portable camera on the market, and one of the cheapest to make."—In reply: The idea is good, but are there not several cameras on the market already that fulfil the conditions stated by our correspondent? If he has anything that will fulfil them better, we should certainly say there is an opening for it.

PERMANENCE OF COLLODIO-CHLORIDE PRINTS.—"OTHELLO" writes: "have have been working platinum toned (with gold also) C.C. paper for about twelve months, and although I constantly read of the alleged permanence of C.C. over gelatine papers, I cannot understand why in my hands C.C. does not seem to stand the test of time. My platinum-toned prints are a splendid black, and really beautiful to see when finished, and my customers will have them; but it seems that in a month or so (often less) they begin to show yellow spots, and the black tone changes to a muddy brown. I at first suspected the mounts, but find that various samples act alike. I have no difficulty with P.O.P. prints, and recently a copy of my work was brought in, to order more, at least ten years old, that was simply perfect. If the process is not reasonably permanent, I don't want it, but if I could have it proved that it is, and the fault only in manipulation, I would try to accomplish the result. I may say I follow the manufacturers' instructions to the letter, and am not in the habit of being careless at anything."—In reply: Theoretically, collodio-chloride prints should be the most permanent of all silver pictures. We have some that were produced quite thirty years ago that show no signs of changing. But they were toned with gold only. We have never heard of prints by this process behaving in the way you say that yours do. We should certainly charge it to something in the manipulation, or to something in the baryta coating on the paper before the emulsion is applied.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

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*** *The Editor can only be seen by appointment.*

*** *We do not undertake to answer letters by post.*

THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC FOR 1903.

Edited by Thomas Bedding, F.R.P.S.

The forty-second annual issue of The British Journal Photographic Almanac will be published early in December next. This year's Almanac reached a total of 1,560 pages, and the entire edition of 20,500 copies was sold out a fortnight before publication. Of no other photographic book ever issued can two such unique facts be recorded.

The edition for 1903 will be increased to 25,000 copies, a large number of which are already ordered.

The striking favour with which past Almanacs have been received is the surest proof that the lines upon which the publication is produced meet the requirements of its readers and supporters. Upon such lines we propose compiling the volume for 1903. At the same time, we shall be pleased to receive and consider suggestions for increasing the value of the Almanac in directions which may occur to our readers as susceptible of improvement.

The Almanac for 1903 will appeal to photographers all the world over as a daily reference guide in practical work. The standard matter and formulæ will be revised and added to where necessary, and the latest departures in theory and practice will be chronicled. The year's advances will be recorded, and wherever practicable new features of an informative nature will be added.

Secretaries of societies will oblige us by promptly forwarding lists of officers and other details for inclusion in the directory of photographic societies. We shall also be glad to receive any additions that may be made to the list of telegraphic addresses of the trade, etc. As usual, a section of the Almanac will be devoted to notices of the latest introductions in photographic apparatus, etc. Those firms who wish to take advantage of this feature should communicate with us not later than Ocober 31.

The publishers ask us to remind advertisers that many of the advertisement pages of the Almanac are already booked, and that, to ensure insertion and good positions, orders and copy should reach them without delay.

EX CATHEDRA.

Orthochromatic Screens. An article by Hans Schmidt in the "Photographische Mitteilungen," entitled "An Orthochromatic Lens without the Disadvantages of a Yellow Screen," illustrates the fact we so often meet with in photography, of the presentation of old ideas as new. As the writer is not a novice, but a skilled photographer, we are surprised that he should offer as a novel means of avoiding the inconveniences of a glass screen the old device of staining the balsam with which the components of a lens are cemented. Does the author believe he has made a discovery? If not, it would be preferable to write in such a manner that those who may read his communication should not infer that the idea is a new one. The staining of the balsam of a lens, so that the functions of a lens and a light filter may be combined in the same instrument, formed the subject of a patent by A. Buchett in the year 1893. Although the device avoids the slight loss of light by reflection, when the filter takes the form of a separate coloured or stained glass plate, there is a disadvantage, which is a very material one for the photographer of limited means. The rapidity of the lens is very considerably reduced, and it will be found necessary in practice to have two lenses, one for ordinary plates, for rapid work, and the other with the stained balsam for orthochromatic plates. There is, however, another way of converting the lens into a light filter, which was also recommended many years ago. This is by staining a structureless collodion with a suitable dye and coating the back surface of the lens with it. The collodion may be easily removed, but the optician must be called in if the balsam is to be stained. The article reads too much like a recommendation for a certain optician's wares.

The Sulphite Intensifier. We recently published the translation of a note by Dr. Hauberisser, of Munich, upon the composition of the image obtained by intensification with mercury and sulphite of soda, and the conclusion he came to was that it consisted of chloride of silver, with an undetermined compound of silver and mercury and sulphur. Now Professor Valenta, of Vienna has looked into the subject, and he has proved that Hauberisser was wrong. He comes to the conclusion that a silver image bleached with mercuric chloride consists of silver-mercurous chloride Hg Ag Cl_2, and that when treated with sodium sulphite no compound of silver and mercury with sulphite is formed; but that according to the strength and duration of action of the sulphite solution the image consists of varying quantities of silver chloride, metallic silver, and metallic mercury. If the sulphite is allowed to act for a long time, and is strong, the whole of the silver chloride is dissolved, and metallic silver and mercury alone are left to form the image.

* * *

Orthochromatic Plates. Last week we drew attention to a new plate manufactured by a German firm, in which the sensitiveness for blue is reduced almost to zero. We have not yet had an opportunity of trying these plates, but assuming the claims of the maker to be well founded, the manufacture of such a plate, for use without a colour screen, marks a distinct advance in orthochromatic photography. When we compare the orthochromatic plates of to-day with those of the early days of orthochromatic research, we are surprised that so little advance has been made. A very large number of sensitisers have been investigated, and much has been written upon the subject, yet to obtain orthochromatic effect, it is still necessary to use a light filter. The colour screen prolongs the exposure very much, and this loss of rapidity restricts very materially the scope of orthochromatic photography. In tele-photography this prolongation of the exposure is very marked. It would be a great boon to photographers if our manufacturers would turn their attention to the production of an orthochromatic plate giving correct values without the use of a screen. A rapid plate of this type would popularise orthochromatic photography, and we have no doubt it would soon command a very extensive sale. We do not think the risk of fog in development would be a serious obstacle.

* * *

The Progress of X-Ray Photography. It is nearly seven years since Professor Röntgen published an account of the astonishing discovery with which his name will ever be associated. Meanwhile important improvements have been made in the application of the process to practical purposes, and a contrast of the results obtained in the early days of skiagraphy with those which are now possible invests an address by Dr. Rosenthal at the Augsburg Technical Association with great interest. Dr. Rosenthal exhibited apparatus of his own design, which is described as being of more simple construction and easier to manipulate. In the early days a skiagraph of the thorax required about 20 minutes' exposure; now it may be obtained in less than a second. Although the Röntgen rays are of value in the treatment of eczema, psoriasis, and other skin diseases, their chief application has been for diagnosis. In illustration of this a series of skiagraphs of diseased conditions of the heart and lungs, as well as of calculi in the kidneys and foreign substances in the lungs, were exhibited. Two other small instruments were also shown; one, a punctograph, for exactly determining the position of a foreign substance in the human body, whilst the other, an orthodiagraph, is designed for the investigation of the exact form and position of the heart.

* * *

The Value of Red Light from a Therapeutical Standpoint. From time to time the possible injurious nature of continued exposure to the red light of the dark room has been so much insisted upon that it may be well to note other and more optimistic valuations of the effect. Frequently, during the recent small-pox epidemic, attention was drawn to the fact that patients treated in a room to which light of red colour only is permitted to reach recover more speedily than when treated in daylight, and do not pit after the eruption subsides. Indeed, a few months ago, an article in that popular magazine, "Chambers's Journal," was devoted entirely to this subject. And now the latest addition to the list of the good effects of red light is its usefulness in preventing sea-sickness, it being stated that if sufferers would retire to their cabin and cover the lights with some fabric which allowed only the red rays to pass they would not become sea-sick. If this were not too good to be true there is no doubt that the advent of the new system would be hailed with delight by a large number of people with whom *mal de mer* is inseparable from thoughts of sailing. After such pronounced evidence of the value of red light it is scarcely probable that we shall hear much more of the evil effects of the usual dark-room light.

* * *

Sunlight and Electricity. Professor Garbasso, of Turin, has been making a series of experiments in regard to the action of sunlight and the electric discharge, which would seem to suggest photographic possibilities. He finds, we read, that sunlight facilitates "the passage of the electric spark, the number of sparks which can be passed through the gap in darkness being doubled or trebled in the light, and the effect does instantly cease upon cutting off the light." By focussing the light on one or other electrode, especially the negative one, a continuous current is obtaned. Screens of mica, or glass, or alum solution check the action of the light, but plates of quartz or Iceland spar permit it to pass. This action of light upon the electrode would seem to point to the possibility of transferring a picture to a sensitive surface by such means. A negative being placed upon the ends of a series of insulated wires would cause the sunlight to have greater or less intensity of action upon the passage of the current, so that a film impregnated with a chemical decomposable into a dark substance by the current, and placed across the opposite ends of the wires, should be impressed upon the film. Professor Mannelli is of opinion that the heat rather than the ultra-violet rays of the spectrum is the cause of the action. This fact ought not to militate against the possible effect we refer to, seeing that if the graduated action were possible it would be quite immaterial which part of the spectrum caused it. All that would be necessary would be to see that the negative was upon a basis that would not be opaque to the heat rays.

* * *

How to Cure Over-Exposure. Whilst we have tables and exposure meters innumerable, it will always happen that occasionally the operator may meet with over-exposure, and if excessive the difficulty of overcoming its effects during development is by no means small. Many text-books strongly advise beginners to always err on the side of over-exposure, and trust to development to cure the ill. Many years ago the late W. K. Burton presented a paper to the Photographic Conven-

MISCELLANEOUS (continued).

WANTED, Roll Burnisher, 10 or 15 inch, Globe preferred; large developing dishes for enlargements, Enlarging Lantern, 8 or 10 inch Condenser; cheap for cash.—33 Heskey Street, Nottingham.

YATES Patent Printing Frame for Stamps and Victorias, cost 42s.; Ross Group Lens, 3,186, Carte Lens, 2 tripods (damaged), the lot 40s., or will exchange for Backgrounds (new or second-hand).—8 Peck Lane, Nottingham.

7-INCH Goerz Anastigmat Lenses, f/6.8, with focussing attachment; price £6.—Address Z. 2, 24 Wellington Street, Strand, London.

15IN. x 12in. Camera, by Lancaster, double slide fronts and carriers, large tripod, wants polishing only, the lot for £3; a bargain.—Fitzgibbon Forde, Photographer, Sunderland.

Miscellaneous Trades.

ARTISTIC Finishing.—Monochrome, semi-tint, water colours. Exceptional value. If you want the finest results obtainable from your negative send to Henry Ward, Belgrave Avenue, Leicester.

ARE you satisfied with your Enlargements? If not, it will pay you to send for my list. Sound work, reasonable prices.—Address Henry Ward, Trade Photographer, Belgrave Avenue, Leicester.

ARTHUR L. RICHARD produces Enlargements of the finest quality and undertakes every description of photographic work; list free.—40 Sparsholt Road, Crouch Hill, N.

A FEW Surplus Specimens in Oils, Water, and Black and White, framed complete, to be cleared cheap.—Apply Elite Portrait Co., 267 High Holborn, London, W.C.

A1 RETOUCHING at photographers' own prices lessons given; cash and postage with order.—H. D. Atkinson, 153 Duke Street, Liverpool.

A 12 x 10 STUDIO Camera, by Dallmeyer, double swing back, 1 slide, £4, cost £40; 12 x 10 Meagher Studio Camera and strong Studio Stand, built specially for same, price £7, cost £45.—Smedley's.

A VERY fine 12 x 10 Portable Camera, complete, with slide, 3-fold stand, and case, worth £20, price £10 10s.; finest quality throughout.—Smedley's.

A 1-1 PLATE Studio Camera, with repeating back, 1 slide, complete, 1-1-pl. Portrait Lens and Shutter, price £6 10s.; 1-1-pl. Studio Camera, by Middlemiss, real beauty, double swing and repeating back, price £4, equal new.—Smedley's.

A MAGNIFICENT 12 x 10 Studio Camera, by Ross, double swing and repeating back, inner frames, carriers, and slide, cost £14, equal new, price £9; 10 x 8 ditto, by Watson and Sons, cost £11, price £7 10s.; both equal new.—Smedley's.

A CHANCE in a Lifetime.—About 20 first-class Showcases for Sale, size about 30 x 16, all fitted with interchangeable backboards, covered plush, most excellently made, cost 30s. each, price 12s. 6d. each, or £3 3s. half-dozen; all equal new.—Smedley's.

A VERY fine 12 x 10 Studio Camera, by Scovill, double swing and repeating back, and complete with slide and carriers, equal new, price £6; great bargain.—Smedley's

AN opportunity which should not be missed.—½ Cantilever Enlarger, fitted with 8in. condenser, incandescent gas, price £5, stage carries 1-1 plate; Whole-plate ditto, with 10in. condenser, etc., etc., £7; will not be offered again at this price when season commences.—Smedley's.

A 24 x 18 STUDIO Camera, by Marion, has double swing back, also Studio Stand, cost £60, accept £15 lot; 15 x 12 Newmarket Studio Camera, merely shop soiled, sold at £25, price £18.—Smedley's.

A BELLOWS Studio Shutter, 4in., sold by other firms at 30s., price 20s.; 5½in., 25s.; 4½in. Thornton-Pickard, T. and I., cost £2, 18s.; 3 Thornton-Pickard Studio Shutters, 15s. each; 3in. Mertal, T. and I., 18s.; 1½in. T. and I., 10s.; 4in. Newman and Guardia Studio Shutter, 17s. 6d.; all to be cleared.—Smedley's, Blackburn.

A WHOLE-PLATE Outdoor Outfit, with 3 slides, R.R. lens, stand, and case, cost £16, price £6 10s.; 12 x 10 Outdoor Camera, 3 slides, magnificent specimen workmanship, well worth £20, accept £8; 15 x 12 ditto, £10 10s.—Smedley's.

A DALLMEYER'S 3 C. Cabinet Portrait Lens, absolutely as new; 2 C., 2 B., 3 D., 4 D., 5 D., Ross 3 A. C.D.V., No. 3 C.D.V., 3 A., No. 4, and No. 5 Portrait Lenses, all equal new, to clear, at ridiculously low prices; all perfect.—Smedley's.

A VISIT to see our Stock will not be lost, the experience will well repay you, and you will be doubly repaid if you make a purchase; we are now offering bargains never before heard of.—Smedley's.

A 12 x 10 UNIVERSAL Studio Camera, built to special order, swing and repeating back, complete, with slide carriers, inner frames, etc., cost £12 10s., price £7; simply shop soiled.—Smedley's.

A MAGNIFICENT 1-1-plate Studio Camera, over 3ft. extension, double swing and repeating back, 2 slides, 2 inner frames, etc., complete, with bellows, studio shutter, and a most elegant studio stand, the lot for £8; no firm could sell you this under double the price.—Smedley's, Blackburn.

A CHARMING 1-1 pl. complete Outfit, comprising camera, 3 slides, R.R. lens, stand, case, and shutter, £7 10s., cost £16; 12 x 10 Outfit, as above, £13; 15 x 12, £17 10s.; wonderful value; just half ordinary selling prices.—Smedley's.

A 12 x 10 COMPLETE Outdoor Outfit, very finest quality throughout, worth £30, price £13; 15 x 12 ditto, worth £40, price £17 10s.; hundreds of cheaper outfits if required.—Smedley's.

A VERY choice Inlaid Corner Chair, upholstered silk, 35s., cost £3 10s.; Inlaid Rosewood Settee, sold at £9, accept £4 10s.; Carved Oak Chair, 15s.; high-back Spinning Chair, 12s. 6d.; Head and Body Rest, 25s.; Imitation Stone Seat Accessory, only 35s., wonderful value; Sussex Seat Accessory, £4 10s.—Smedley's, Blackburn.

A CABINET Hot-rolling Press, both rollers nickelled, well finished rollers, 6½in., gas or spirit, 25s.; 10½in., £3.—Smedley's, Blackburn.

ABSOLUTELY the cheapest house in the world for all kinds of photo goods and material of every description; no inferior goods sent out; send for our bargain list.—Smedley's.

AN Optimus 1-1-plate Portrait Lens, £5; 3 B. ditto, £7; Dallmeyer 3 C., £9 10s., cost £27; Ross No. 4 Portrait Lens, cost £36, price £15; Ross No. 5, £20, cost £50; all equal new.—Smedley's.

A ½-PLATE Cantilever Enlarger, 8in. condenser, fitted for gas or oil, carriers down to ¼ plate, stage carries 1-1-plate negatives, price £5; ditto, fitted with 10in. condenser, price £7.—Smedley's.

A 15 x 12 Portable Camera of superb quality, 3 slides, R.R. lens, case, and stand, complete, well worth £40, price £17 10s.; similar outfit in 12 x 10 size, £13; scores cheaper if required.—Smedley's.

A CHOICE 12 x 12 Newmarket Camera and Stand, slightly shop-soiled through being on exhibition, the finest camera in the world at any price, and indispensable in up-to-date studio, price £19; 15 x 15 ditto, £22 10s.—Smedley's.

A WATSON 10 x 10 Universal Studio Camera, double swing and repeating back, inner frames, double slide, equal new, built special order, price £6; 12 x 12 ditto, same maker, exactly as above, most magnificent instrument, never again equalled, cost £14, price £8 10s., new.—Smedley's.

A DALLMEYER'S Series 2, No. 4, Stigmatic Lens, equal new, £7; Ross-Zeiss Convertible Anastigmat Lens, giving 4 foci, 9½in., 11½in., 14½in., 16½in., casket complete, cost about £20, price £10, quite new; Ross 13 x 11 Rapid Symmetrical Iris, as new, £8 10s.; Dallmeyer's 12 x 10 R.R., £6 10s.—Smedley's.

ARTISTIC Retouching by West-End Retoucher, used to high-class work only; specimen negative retouched and returned post free.—Charles Lewis, 10 Chichele Road, Cricklewood, London.

ALL kinds of Enlargements finished by experienced Artist at moderate charges; also Retouching done (first class); lessons given in both branches.—Terms from Oscar Arndt, 35 Priory Road, Kilburn, N.W.

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BROMIDE Enlargements.—Best results, prompt; postage extra: 8 x 6, 8d.; 10 x 8, 10d.; 12 x 10, 1s.; 15 x 12, 1s. 6d.; 18 x 15, 2s. 3d.; 20 x 16, 2s. 9d.; 24 x 20, 3s. 9d.—Crayon Art Co., 49B Brecknock Rd., N.

BROMIDE Enlargements.—Clean, sharp: 8½ x 6½ 8d., 10 x 8 10d., 12 x 10 1s., 15 x 12 1s. 4d., 18 x 15 2s. 3d., 20 x 16 2s. 9d.—F. W. King, 29 Osmaston Road, Derby.

BROMIDE Enlargements.—One quality only: the best.—8½ x 6½ 10d., 10 x 8 1s., 12 x 10 1s. 3d., 15 x 12 1s. 9d., 18 x 15 2s. 6d., 23 x 17, 3s. 6d.—Wilson Creighton, 402 St. Ann's Rd., Harringay, N.

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Continued on page VIII.

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Continued on Page XX.

tion, at its Plymouth meeting, in which he described his attempts to overcome over-exposure by increasing the quantity of pyro and bromide. This and the increase of the amount of bromide, with, in some cases, the lessening of the quantity of accelerator, has been the usual text-book axiom. Now Dr. Precht, of the Technische Hochschule, Hanover, has been experimenting, and discovers in acetone sulphite a means of obtaining fairly decent negatives with exposures ranging from 4,000 to 20,000 times the correct one. His results obtained with an over-exposure of 4,000 and 7,000 are reproduced in the "Photographisches Centralblatt," and certainly, whilst still showing over-exposure, they are quite presentable pictures. The developer used was the commercial edinol developer, and to this was added from 0.8 to 1.0 per cent. of the acetone sulphite. The image appears in from two to three minutes, and the total duration of development is about normal, but Dr. Precht prefers to develop only for ten or twelve minutes, when he states that a negative is obtained absolutely free from fog, and which can be readily intensified, but development can be carried on till sufficient density is obtained. Besides edinol, pyrophan seems to have been the only other developing agent tried, and this was successful. Pyrophan, by the bye, is stated to be a condensation product of pyro with an amido substance, and is made by the Bayer Company.

* * *

The Combined Toning and Fixing Bath.

MM. Lumière and Seyewitz have been studying the various chemical reactions which occur in the use of the combined toning and fixing bath, and have come to some conclusions which are directly opposed to the generally accepted statements on this subject. Their experiments were carried out with a gelatino-chloride emulsion spread on glass, thus eliminating any errors which might be introduced by the paper support. The most striking result of their researches is the fact that when a combined bath is used without lead the result is by no means satisfactory as regards the colour, and toning takes much longer, whereas the introduction of a lead salt causes quicker toning, and the colour is more satisfactory. Further than this, they prove that there is absolutely no lead in the final image, and that the lead salt plays the important part of causing the gold to be deposited, as the lead of the double hyposulphite of soda and lead displaces some of the metallic silver of the image, and is in turn displaced by the gold. It appears to be immaterial whether the nitrate, acetate, or chloride of lead be used, but the quantity should not exceed 0.4 or 0.5 parts in 1,000 parts of the bath. They also found that after four minutes' toning nearly 20 per cent. of the silver was replaced by gold, and that after forty-five minutes 39 per cent. of the image consisted of gold. Toning baths with acid gave rise to the formation of pentathionic acid, and if lead be present as well to the correspondng lead salt, but they have also proved that the tones given by these salts are not stable. The reasonable assumption is that the best way to make a combined toning and fixing bath is to use a small proportion of lead salt, chloride of gold, and hypo, and make it alkaline by the addition of some alkaline, earthy salt such as chalk, or magnesium carbonate.

* * *

New Illuminants.

The photographer away from the convenience of gas ought soon to be as well catered for as his city brethren, for there have appeared of late descriptions of a number of new illuminants which appear to possess the elements of success. The Bulletin No. 185 of the French Physical Society contains statistics by M. Denayrouze referring to the use of methylated spirit in the lamp which bears his name. The lamp consists essentially of a wick conducting the liquid by capillarity into a compartment where, by means of a copper bar heated by the flame itself, it is converted into vapour, which passes through a small channel into a sort of modified Bünsen burner which heats a mantle. M. Denayrouze estimates that his lamp would consume each hour 1.08 grams of pure alcohol or 0.64 grams of carburetted alcohol, and the cost would work out at about 0.0048 and 0.003 of a penny per candle power per hour. Petroleum for the same light, he calculates, would cost nearly five times as much—0.014. Then, again, ether is coming to the front for the same purpose. Photographers are familiar with the value of ether saturators for the optical lantern, and in what might be termed a popular modification of this air is saturated with ether vapour, and then carburetted with benzol vapour. In the new carburetter, made in France, the fibre of a palm-like tree, which is extremely porous and light, its specific gravity being between 0.11 and 0.12, is used as an absorbent, and will take up nine times its weight of ether. If ether air-gas is used alone it requires a mantle, as the flame is only pale blue, though ether vapour itself gives a white smoky flame. When the flame is required to be luminous benzol vapour is added, and the mixture keeps in the gaseous condition so long as it does not fall below 21deg. F. 40 or 50 grams of ether per cubic metre of ether-air gas gives a product resembling oil gas in stability. The latter only costs about half as much as the new gas, but this again has the advantage of simplicity in the plant required, and the rapidity with which a small installation can be put up. Ether-air gas, according to Langlois, gives a light of about $9\frac{1}{2}$ candles for every 6.7 grams of ether burnt.

* * *

A Photographic Atlas of the Moon.

In a communication to "La Société Française de Photographie," Monsieur Wallon gives an account of the method adopted by Messrs. Loewy and Puiseux, of the Paris Observatory, in making their atlas of the moon. This is a work upon which they have been engaged for some years, and it will be of great value to astronomers. The plates are being reproduced on an enlarged scale by photogravure from negatives taken with the large equatorial, which is the most powerful instrument of the Paris Observatory. The photographic objective of the great equatorial was made by Messrs. Henry, and is of 60 cm. aperture and 18 metres focus. Usually the lens is stopped down to 54 cm. aperture. The correction of the lens is for the chemical rays, and the adjustment of the focus is repeated each month photographically by trial and error. The image of the moon in the original negatives varies between 160 and 180 mm., according to the distance of the satellite from the earth. The exposures with Lumière, or Helios, extra rapid plates vary between $\frac{1}{2}$ and 4sec., according to the phase, and the clearness of the atmosphere. The lens remains stationary, but the plate is moved by a Foucault clock and cylindrical gearing. As the movement of the moon is variable, the problem is a complicated one, but 3,600 different rates of speed may be obtained by the mechanism, and it is therefore easy to make suitable adjustments. The shutter is a sheet of aluminium placed immediately in front of the plate. It slides in grooves, and is controlled by hand, by means of a rod and crank, so that the brightest parts of the moon's surface receive least exposure. A tubular sky-shade 1.50 m. in length is placed on the front of the lens when photographs are made during twilight. The plates are developed with amidol and anhydrous sulphite of soda to preserve the greatest trans-

parency in the deposit. The enlargements are made by electric arc light, and the lens used is a Lerebours and Secrétan single-achromatic meniscus of 310 mm. focus, with convex surface to the light, stopped down to 10 mm. This gives perfect definition of the grain of the negative over the entire surface of the enlargement 80 c. by 80 c. Various other lenses have been tried, but none have given such satisfactory results. Different methods of focussing have been tried, but the best criterion of definition has been found in the grain of the plate as seen in the image upon a white screen. A slight displacement of the lens removes the grain and gives a more agreeable visual image, but for exactness the grain is retained. To obtain equality of exposure and full detail in the shadows, the light is passed through a screen with a slit a few millimetres wide before it reaches the condenser. This screen is kept in motion, and can be used locally. The scale of enlargement varies between 10 and 16 times. The plates are backed with dextrine and red ochre. About 400 photographs have already been made, but a few difficult phases of the moon are still wanting to complete the atlas.

THE ALLEGED INSTABILITY OF COLLODIO-CHLORIDE PICTURES.

In our issue of last week we replied to a correspondent on a question that is, just now, of more than passing interest to users of collodio-chloride papers. We here give an extract from our correspondent's letter. He says:—"I constantly read of the alleged permanence of CC. over gelatine papers. I cannot understand why, in my hands, CC. does not seem to stand the test of time. My platinum-toned prints are a splendid black, and really beautiful to see when finished, and my customers will have no other; but it seems that in a month or so (often less) they begin to show spots, and the black tone changes to a muddy brown," etc. The above is by no means the first complaint we have heard of collodio-chloride prints becoming spotty, or changed, in some way or other, within a comparatively brief period, though, we may mention, never in so short a time as this writer says. It is a noteworthy fact that in all the instances of rapid change that have come under notice the prints have been toned with platinum subsequently to being partially toned with gold.

The opinion has more than once been expressed by us that the collodio-chloride process should be the most permanent of all silver processes, and practice has proved that prints made in the very earliest days of it are still as good as at first. Some we remember commenting upon, that were shown in the Victorian Exhibition at the Crystal Palace, in 1897, that were printed nearly thirty years before, and they showed not the slightest change; and we have some by us quite as old which are still in their pristine state. The prints shown at the Crystal Palace were on paper that was made in Germany; those we have are on paper of other preparation. But all were toned in the sulpho-cyanide bath—the one that has been universally employed in this process until the, comparatively, recent introduction of the gold-patinum method of toning.

It has just been mentioned that, theoretically, this process should be the most stable of all silver processes, and for this reason: Collodion, the medium carrying the silver salts, forms no compound with the free silver present in this, as in all printing-out papers. It is quite an inert vehicle. The case is different with albumen, and with gelatine, as with them an organic compound is formed which, in the case of albumen, at least, is not entirely removed in the fixing and the after-washing of the prints, and it is this so-called "albumenate of silver" which is usually said is the cause of so many albumen prints turning yellow with age. The same has been said with regard to gelatine, whether well founded or not, but with collodion no such compound is formed, and all the un-acted upon, by light, chloride is easily dissolved or rendered in a soluble condition in the washing waters, even when the fixing solution is comparatively weak.

It may be as well to point out here that there is an essential difference between the collodion papers of the present day and those that used to be made some thirty, or more, years ago, and that difference may have much to do with the present complaints of lack of permanence quite apart from the more modern system of the compound gold and platinum toning. When the process was first introduced (1864) the paper then employed was the same as that used for albumenising. It was simply prepared with a very thin coating of arrowroot before the emulsion was applied. The free nitrate of silver in the emulsion had little or no affinity for the preliminary coating, or for the paper below it; consequently nothing but the visible image, presumably, remained when the picture was finished. The case is different now. The commercial collodion papers have, instead of arrowroot, a pigmented coating said to be baryta. Now this coating, whatever it may be, has to be held to the paper by a cement of some kind or other, the nature of which we know nothing. It may be gelatine, starch, flour paste, or a mixture of them, together with something that will render it insoluble in water, for that it must be.

Now, it is quite conceivable that the free silver in the emulsion may, and probably does, form with this vehicle, or cement, an organic compound of silver which in the fixing of the prints is not dissolved or rendered sufficiently soluble to be removed in the subsequent washings. This is rendered the more probable by the fact that the fixing bath recommended by some of the makers of collodion papers—and the majority of them are made abroad—is very much weaker than those used either for albumen or gelatine. In the directions for a collodion paper now before us we are told to fix for about ten minutes in hypo one ounce, water twenty ounces. It will here be noted that this is less than half the strength that is generally employed with either albumen or gelatine papers, while the time of immersion is less. It is true that this strength of bath, and time of immersion, would be ample, provided we were dealing simply with the collodion film *per se*, say, if it were on a glass plate. But is that the case if, as may well be assumed, there is a silver compound in the pigmented coating beneath the collodion? If that is the case, it would seem that fixing in this strength of solution, and for this length of time, is quite inadequate, seeing that the collodion film is, to an extent, an impervious substance, and thus in a degree obstructs the free action of the fixing solution and the water from the compound beneath it.

We have on more than one occasion referred to the effect that this so-called "baryta coating" may have on the stability of gelatine prints that sometimes quickly show signs of deterioration; there, however, the conditions are somewhat different, inasmuch as, unlike collodion, gelatine is not an impervious material, for it is readily permeable both by the fixing solution and by the washing waters.

Having pointed out the difference between the conditions, both as regards the preparation of the paper and the method of toning, under which the collodio-chloride pictures that were made thirty, or more, years ago, which have so well withstood the test of time, and some of those produced now, which have proved so fugitive, we may fairly look for the cause rather in the direction of the preliminary coating of the paper than in that of the present method of toning first with gold and then with platinum.

NAPTHALI P. SALONIKER, ESQ., INTERVIEWED BY A PLAIN PHOTOGRAPHER.

He *did* live in an ordinary house—at least, as regards its outside appearance, it was just like other houses. I rather wondered at this. I somehow expected to see him domiciled in an edifice without a roof, or with a wall chopped off, or something equally eric. Anyhow, the house was the only ordinary thing about him. Everything else was—like his "work"—extraordinary, but not extraordinary in a flattering sense. At least, I know I should consider myself insulted if I was told I was extraordinary—after the manner in which one would apply the term to Saloniker. To begin with, his appearance was distinctly sloppy—slovenly, people who were not art critics might call it. I will not go into details of his attire—to my mind they are painful, and besides it were superfluous to do so, when they have been responsible for so many people's nightmares, after seeing his portrait (produced by kindred spirits) pervading the walls of the exhibitions. So I will content myself with remarking that his affectations of dress (or undress?) were quite in harmony with the impression his works created. Another extraordinary thing was the extraordinariness of the muddle and mess which appeared to be his inspiration. It was all one maze of muddles within messes, that room which he called his "studio." I told him I came as a learner. I could never pretend, I explained, to attain such lofty heights of misty mysteriousness as he had climbed (I hardly thought it wise to add I did not want to). But I had to confess that I was one of the contemptible remnant who was content to make an ordinary use of the camera and photographic materials in general, so, of course, had no claim to be called an artist; but, for all that, I was not above learning. Would he show me some of his pictures?—might I learn something, at least, of the mysteriousness of his methods? He was very kind. He brought forth for my edification something very weird indeed, and informed me he intended it for the exhibitions. "That's bound to score, you know," said he, as he held the thing up to my bewildered gaze. As I looked on it, I marvelled at the idea of framing—on a sea of mount—a sooty, ragged piece of paper, and honestly thought it must be an entry for some new craze, such as a "Waste paper basket" competition. Evidently, as I gazed on, Saloniker thought words failed me—so they did—therefore he explained. "It's the study of a nose," said he. "Clever, isn't it?" "Distinctly original in conception," I murmured. "So glad you like it," he replied. "Yes, I flatter myself it *is* a bit out of the common." ("Thank goodness for that!" I inwardly ejaculated.) What I saw was something which might have been anything or nothing—mostly nothing—hiding itself (as, after all, well it might) in a thick murkiness of ink or some such medium, the whole thing indefinite and splodgy (and evidently worked up with a flue brush), marring the surface of what *once* had been good paper. I thought, too, that it was a pity that, even if they had given him a long hunt, Saloniker had not found either the scissors or the knife before he mounted the defaced paper; the tears round the edges looked horribly untidy. I could have cut four mounts out of the amount of paper he used for one. Then, apparently, he had not a straight eye, for the "study" was pasted all out of the centre. But, perhaps, that was to give room for the proper announcement of the title. The "study" certainly did require explanation, and doubtless the surrounding erratic wanderings of his pen did duty for embellishments. Or, perhaps, they were only to fill up. There did not seem to be any frame at all at first sight, but afterwards I discovered it, and could not help wondering how the glass kept in it. After all these internal musings, I felt I was bound to say something, so I remarked that I supposed he had been influenced by reading of the Inquisition or French Revolution. "Don't see what that's got to do with photography," said Saloniker. Neither did I; but I said that I thought perhaps he was striving by his pictures to make people realise the horrors of the atrocities perpetrated upon the victims of these periods of terror. He laughed in a pitying, superior sort of way. "We have to teach the multitude that the governing principle in art is to subordinate everything to the central object of your picture. To this everything else must be subsidiary. That's why that nose is so strikingly clever. There's no counter attraction—nothing to cause the eye to wander from the beauty of its curves—no competitive ears, mouth, or eyes." I said it was quite right what he said about lack of attractions, and hazarded the remark that his views hardly found support amongst the works of any of the Old Masters, or, indeed, of any painters. They did not seem to care about illustrating amputations and other surgical operations. "Oh, no; you will find nothing like that little thing of mine amongst any of those old Johnnies," said Saloniker. "But, then, you can hardly blame them. No doubt they painted with all the light they had, but then, of course, art had not reached that pitch of perfection it has now attained." I inwardly mused as he talked about light, that he could not surely be taken too literally, as all his studies seemed to be made in the dark—if, indeed, not in the coalhole; but I only remarked, in reply to the foregoing, that I supposed in the brightest days of the Old Masters there were no Americans about. I might have learnt more of true art principles, but just at this point, Saloniker pulled out his watch, and said he had an appointment to keep with a girl of whose elbow he intended to create a picture, and he was sorry he could not prolong the interview. I said he need not apologise—I had had sufficient time to have my eyes opened. I did not tell him in what direction; but I do not mind telling you that I went away entirely convinced of the utter untenability of Saloniker's theories of art. But then people tell me I am "so English." I know I am, and why should I be ashamed of it? I have no objection to people admiring either the art of the Americans or the photographic productions of the Parisians, so what grounds have *they* for sneering at my liking for a clean English school of photography? As long as the latter is synoymous with sanity, so long may it flourish. It is at that rate bound to outlive mere eccentricity—a most inconstant quality. And some of us will not be sorry to say a long farewell to it. I know I will not.

"Enlarging by Artificial Light" (referred to in our correspondence columns last week) is a little pamphlet published by Messrs. Perken, Son, and Co., Limited, 99, Hatton Garden, E.C., which deals succinctly with the production of enlarged images on glass (paper) and by projection. A list of enlarging apparatus and accessories is appended. The pamphlet, which is obtainable free, is instructive and useful.

Leeds Technical School.—A class in the principles and practice of photography will be held during the session 1902-3. The class will meet on Mondays, from 7 to 8.30 p.m., in Room 11 (entrance from Rossington Street), commencing on September 29th, 1902. The teacher is Mr. S. E. Bottomley. The course is specially arranged to meet the requirements of both amateur and professional photographers, and is intended to give them a thorough knowledge of the principles underlying the theory and practice of pure photography. A syllabus has been compiled and includes:—The elements of photographic optics; the photographic camera—its adjuncts; the theory of light as applied to photography; the theory of the photographic image—development, fixing, printing, etc.; the practice and theory of gelatine dry plate process; composition and defects of dry plates—defects of gelatine negatives—causes and remedies; various methods of developing—a general knowledge of chemicals employed; printing processes—carbon, platinotype, gelatino-chloride, etc.; enlargements and lantern slides; applications of photography to scientific and technical purposes. Each lecture will be illustrated by practical demonstration; opportunity will also be given for the student to perform practical work. At the close of each lecture time has been arranged for the criticism of students' work, and the clearing up of any difficulties that may arise. Every encouragement will be given to students wishing to take the examinations in theoretical and practical photography, under the City and Guilds of London Institute.

LONDON COUNTY COUNCIL SCHOOL OF PHOTO-ENGRAVING AND LITHOGRAPHY.

[Abstracted from the Prospectus.]

The object of the school is to give instruction in the craft of producing surfaces for printing. Of the various classes held, some are concerned with the more artistic side of the work, others with the technical; there is, however, no real line of demarcation between the two, either in intention or practice, and the division is made solely for convenience of teaching. Instruction is given in the most important photo-mechanical processes, block proving, elementary photography, photographic copying, general lithography, map and plan drawing, transfer writing, design, lettering, and drawing.

The school is open to those who are genuinely engaged in business in any branch of the photo-mechanical, photographic, designing, lithographic, engraving, printing, and book illustrating crafts, and no provision whatever is made for amateurs. In some cases the classes are confined to those who are directly engaged in the particular branch taught. The Technical Education Board of the London County Council is open to consider applications from parents who intend placing their sons as apprentices to any of the above trades, and who may be desirous of giving them the advantage of a preparatory school training; but it is to be understood that such students must be duly apprenticed within some period to be arranged.

The practical instruction given is not intended to replace workshop training, but is preparatory or supplementary to it, and has also for its object the giving to those engaged in one particular department of a craft a knowledge of allied branches which, in the ordinary course of trade, they cannot obtain. The lecture courses are for the purpose of explaining more fully the technical principles and details of the various processes than is convenient during the conduct of the practical classes.

The school is excellently equipped with the necessary appliances for study and practical work. It contains a large photographic studio, with two cameras, and powerful electric light installation of the most modern pattern, two dark-rooms, sensitising room, glass cleaning and intensifying rooms, tri-colour dark-room, extensive etching and printing rooms—complete with electric light and all modern appliances—collotype preparation and printing rooms, with three presses and all necessary equipment, a photogravure room, and a reading room and museum of specimens and examples. There are also two large rooms for lithographic drawing, and a press room, as well as separate studios for design, antique, and life and costume drawing.

Attention is called to the following new classes:—Photogravure. Proving. Preparation of originals for reproduction.

Syllabus.—Evening Classes.—Photography.

The course of instruction deals with the production of negatives and positives required for the various photo-mechanical processes, and also for the reproduction of pictures, etc., by the usual photographic printing methods, as carbon, platinum, and silver. Beginners are required to join the elementary class, in which they receive instruction in the technology and practice of ordinary negative making and silver printing, and, later, in wet collodion photography as far as the making of line negatives from simple subjects. When they have mastered the technique of this class, which is elementary, they should take more difficult work in line negative making, as provided for in the advanced class, where, in addition, is taught the making of ordinary negatives (continuous tone) from originals in monotone, such as are required for the various light printing processes (carbon, platinum, silver), and for collotype, photogravure, etc. In this class both wet and dry plates are used, and instruction is also given in the preparation of collodion. For students who have passed through these courses, and who are sufficiently advanced, arrangements will be made for demonstrating the method of copying originals in colour by orthochromatic methods, using gelatine plates and collodion emulsion. The class in screen negative making is confined to those who have a good knowledge of photographic methods (including wet plate work); and as the number of students that can be dealt with is comparatively small, preference is always given to those who are engaged in branches of process work where a knowledge of screen negative making will be directly and practically useful. The work of the various classes will be progressive, but, in order to help those who join after the opening of the terms when the classes commence their work, demonstrations will be given of the various processes on the first class night in each month, after which students will be able to work by themselves under the teachers' guidance.

Line and continuous tone negative making.—Beginners.—Teacher: The Principal (*pro tem.*).—Camera manipulation. Preparation of necessary solutions. Making ordinary negatives on dry plates of drawings and objects in relief. Manipulations in lighting, exposure, development, and finishing. Printing from the negative. Principles of wet collodion photography. Preparation of the silver nitrate sensitising bath. Glass cleaning. Coating. Sensitising. Exposing and developing. Intensifying. Stripping negatives.

Advanced line and continuous tone negative making.—Teacher: The Principal.—This course will deal with the more difficult branches of line negative work and the making of ordinary negatives, such as are required for the various contact light printing processes, as carbon, platinum, and silver, and for enlarging and collotype. The work is principally copying, but as far as is practicable, objects in relief will be dealt with. Instruction is given also in the making of transparencies for negative reproduction and for photogravure, and in printing by the albumen, silver, platinum, and bromide processes. The processes employed are wet collodion, collodion emulsion, and gelatine plates. The students are required to show that they have sufficient knowledge to enable them to profit by the instruction given. The class is confined to eight students.

Screen negative making.—Teacher: The Principal.—This course deals with the making of negatives by means of ruled cross lines and irregular grain screens. The work is a special department of negative making, and the class will be confined to those who are engaged in branches of process work where a knowledge of these methods will be directly and practically useful. In order to give greater facility for practice, the class hours have been extended. As it is important that operators should possess a knowledge of the printing processes for which their negatives will be used, it is strongly urged that all who have not this qualification should endeavour to obtain it, and for this purpose they are advised to join the special classes.

Tri-colour Process Work and Colour Photography.

A scheme of instruction in the above subject has been arranged in conjunction with the Northampton Institute, Clerkenwell. The work will be divided into two portions: the first, which deals with the theoretical branches and the preparation of the colour filters, will be undertaken by the Northampton Institute; while the practical work of negative and block making will be carried on at Bolt Court. Although these courses are to a certain extent independent, it is hoped that students will endeavour to attend both. Very complete arrangements have been made at the Northampton Institute for demonstrating, in a strictly practical manner, the various

principles underlying tri-colour work, and excellent photographic equipment will be at the disposal of students.

Tri-colour block making.—The course will be confined to those who are practically engaged in business in process block work, either as screen negative makers, printers, or etchers. The practical work will consist of tri-colour screen negative making direct from the original, and also by the usual indirect method, transparency production, block making, finishing, and proving. Students who have no knowledge of etching are advised to join the enameline etching class, and those who cannot make screen negatives should join a negative making class. The class is limited to twelve students, and those who wish to join must make application in writing to the Principal.

The instruction will be given on Tuesday and Friday evenings, between 7 and 9.30. The following is the course of work, which extends over the whole session from September to June: Exp'anatory introduction to the process. The arrangement of apparatus. Preparation and testing of light filters. Making the negatives from a coloured original by the direct and indirect processes. Preparation of transparencies and screen negatives. Printing on metal. Etching and fine etching. Proving.

For the first part of the course, on Friday evenings, the tuition will be given at the Northampton Institute, where special arrangements for the work are made. Later, the Friday evenings will be devoted to work in the etching room at Bolt Court. On Tuesday evenings throughout the session the work will be carried on in the studio and dark-rooms at Bolt Court. Students joining the course after the commencement will be required to take up the work at the stage at which they find it. Each worker will, it is hoped, be able to complete at least one example, carrying out the various stages of the process himself.

Tri-colour process work.—A course of lecture demonstrations with practical work will be given on Friday evenings, at the Northampton Institute, commencing October 3rd. Tri-colour process work is now being rapidly taken up for colour illustrations, and its advantages in some respects are being realised. In order, however, to produce satisfactory results in an economical manner, great care is necessary in the preparation of the colour screens and the making of the negatives. Not only so, but due regard must be paid to the proper selection of the printing inks, and to the making of the blocks and printing therefrom. The object of the course is to give process workers a general account of the methods in use, and to point out the best conditions for obtaining correct colour representations with the minimum of hand work.

Colour measurement and photography and the theory of tri-colour.—Lecturers: Mr. A. J. Bull and Mr. Newton.—Syllabus.—Colour measurement.—Introduction. Nature of white and coloured light. Selective absorption. Primary pigment colours and primary colour sensations. Tri-colour theory of vision. Work of Young, Helmholtz, Maxwell, Koenig, and Abney. Colour patch apparatus. Methods of plotting colour luminosity curves and measuring colours.

Principles of colour photography.—Theories of the two classes of tri-colour methods. Explanation of Ives' and Joly's processes. Testing of colour filters. Explanation of Lumière's process and tri-colour printing; difficulties of correct rendering of colour by tri-colour half-tone, true printing colours, errors of registration, order of printing.

Practical work.—All students who wish to follow clearly the lecture course should attend the laboratory class held on the same evening. The laboratory work at the Northampton Institute will consist of the production and spectroscopic testing of the colour filters and pigments, and the arrangement of the camera and lighting and production of the continuous tone negative. Students should familiarise themselves with the use of the spectroscope, colour top, and tintometer, and will have an opportunity of measuring and comparing and specifying colours. At the Bolt Court School screen negatives and blocks are prepared, and the necessary finishing, mounting, and proving of the blocks will be carried on. The instruction, however, at this school is reserved for those who are engaged in the photo process trade.

Printing and Etching Processes.

In this section instruction is given in the most important photo-mechanical processes. The various workrooms are well-fitted and furnished with all the necessary appliances for practical work, and the students have full opportunity given to them for obtaining a good knowledge of any process included in the section to which they desire to devote their attention. As far as is practicable, students may practise in the etching rooms when they are not in use for class instruction. Application should be made to the Principal for permission.

Line blocks on zinc, brass, and copper.—Teacher: Mr. F. Lamb.—This course deals with the making of relief blocks on zinc by the "roller" and "powder" processes. Laying tints. Rush work. Relief blocks for bookbinders.

Tone blocks on zinc, brass, and copper.—Teacher: The Principal (*pro tem.*).—This course is for the purpose of giving instruction principally in the enameline (or "fish glue") process, and its application to the production of half-tone blocks in zinc, copper, and brass, but albumen, dry enamel, and other methods will also be shown. Each student is taught printing and etching, but those who require special instruction in fine etching should join the class held for this purpose.

Fine etching.—Teacher: Mr. J. M. Johnstone.—In this class instruction is given in fine etching and finishing half-tone blocks. Students may take this course by itself, or in addition to the other etching classes. It is strongly recommended to those who wish to learn fine etching that (if they have not already had some artistic training) they should devote some time to drawing. Each student is required to provide himself with brushes. Demonstrations for new students on the first Wednesday in each month. A section will be devoted to advanced students, and special attention given to vignetting.

Collotype and photo-lithography.—Teacher: Mr. J. T. Butterfield.—This class deals with the making of the collotype plate with printing from the same, and with the production of photo-lithographs by the direct and transfer processes. The class-rooms are fitted with all the necessary appliances for teaching the process, and the students have full opportunity for regularly practising the various operations. The class hours are from 7.30 to 9.30 on Tuesday evenings, but those who are able may also come for practice between 7 and 9.30 on Thursday evenings, by obtaining permission from the Principal. It is also required that all members of the class shall make themselves practically acquainted with the exposing of collotype plates, and for this purpose they may attend the school on Saturday afternoon or some other time during the day by arrangement. In addition to the work in the school, students will be given full opportunity of acquiring a knowledge by actual practical experience of the working of a collotype power machine. Upon such occasions the instruction will be given on Saturday afternoons, instead of Tuesday evenings.

Proving.—Teacher (to be appointed).—Demonstrations will be given, showing the conditions necessary for line and fine half-tone proving. The machinery required: Hand press,

machine presses; the ink, the paper. Underlaying, overlaying. Proving vignettes. Proving in colour.

Photogravure.—Teacher (to be appointed).—Principles of Intaglio etching. Making the negative. Sensitising the tissue. Making carbon transparency. Retouching. Graining the copper. Transferring to copper. Drying the film. Stopping out. Etching fluid. Etching the plate. Retouching copper after etching. Proving. Steelfacing.

The preparation of originals for reproduction.—Teacher (to be appointed).—Qualities required. The working-up of negatives, transparencies, silver prints. Bromide or black and white prints. "Half-tones" or engravings. Defective drawings. Catalogue illustrations. The use of the air brush.

Half-tone process work.—Lecturer: The Principal.—A course of six lecture demonstrations with practical work will be given on Friday evenings, from February 27th to April 3rd inclusive, from 8 to 9.30 p.m. This course will give the simplest possible exposition of the scientific principles underlying half-tone work, and also an account of the best practical methods and plant to be employed, the object being to give students engaged in merely one branch a knowledge of the process as a whole.

Lecture demonstrations.—Syllabus.—Object of breaking up continuous tone into line and dot for relief printing. Mechanical methods of converting bas-relief into line and dot. Use of V tool. Optical methods of breaking up. Use of cross-line screen. Conditions for securing true optical V. Influence of width of screen ruling. Shape of stop. Distance of screen and sensitiveness of plate on the result. Practical details concerning process cameras, lenses, and accessories. Lighting. Exposure and development. Preparation of blocks. Printing, etching, etc. Fine etching. Finishing blocks. Routing. Details of mounting and finishing machinery. Choice of paper and printing.

Time table of evening classes, L.C.C. School of Photo-engraving and Lithography.—Monday.—Screen negative making, 7 to 9.45; line blocks, 7 to 9.30; colour, 7 to 10. Tuesday.—Lithography, 7.15 to 9.15; tri-colour blocks, 7 to 9.30; collotype, 7.30 to 9.30; preparation of originals, 7 to 9.30. Wednesday.—Advanced line negative, 7 to 9; fine etching, 7 to 9.30; photogravure, 7 to 9.30. Thursday.—Lithography, 7.15 to 9.15; elementary line negative, 7 to 9.30; half-tone etching, 7 to 9.30; proving, 7 to 9.30. Friday.—Tri-colour lectures, 8 to 10; half-tone process lectures, 8 to 9.30. Saturday.—Colour, 2 to 4.30; the school is open from 2 to 4.30 for practice.

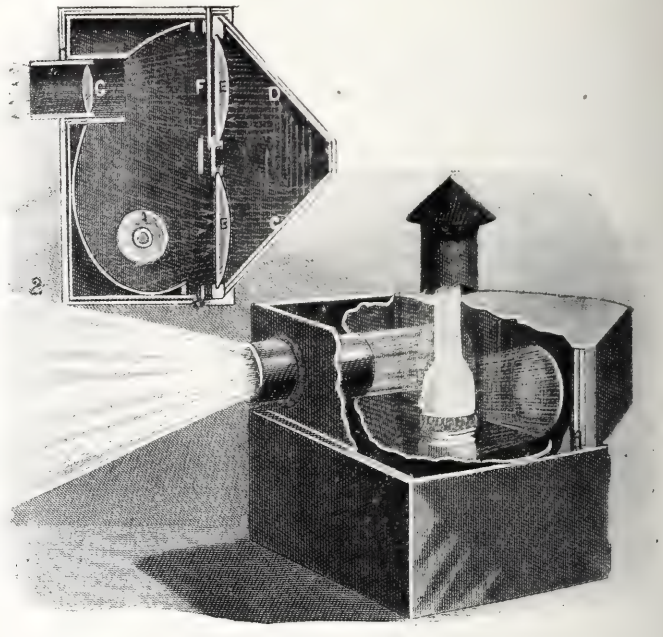
Poisoning by Potassium Cyanide.—Messrs. Burroughs, Wellcome, and Co., write to the "Pharmaceutical Journal":—"Referring to the case of poisoning by potassium cyanide, reported in the 'Pharmaceutical Journal' of September 13, page 289, column 1, we notice you write that a man 'was found dead on Hampstead Heath with some broken tabloids of potassium cyanide in his pocket.' It will, no doubt, be well known to the majority of your readers that we do not issue potassium cyanide tabloids, but as others may be misled we should be glad if you would give similar prominence to a statement that your report was inaccurate. On the authority of the coroner we are able to state that the potassium cyanide found on the man was in rough lumps, and that its resemblance to tabloids existed only in the imagination of the reporter."

In connection with the County Council of Northumberland's scheme of technical education, the local committee of the Hexham centre has arranged a course of twelve lectures upon Elementary Photography, which will be delivered by Mr. John Gibson, F.C.S., commencing Wednesday, October 1st, at 7.30 p.m., in the Guardians' Board Room, Town Hall Buildings, Hexham. The abridged syllabus is as follows:—Photography and its practical use in science, art, medicine, surgery, law, literature, agriculture, and commerce generally. Silver and other salts affected by light. The spectrum. Lenses and their construction, their use and misuse. The camera and its construction, and the principles and practices necessary in its use. Plates, films, and developers; negatives, good and bad. Causes of failure, and suggestions for improvement of imperfect negatives. Lantern slide making, and the use of the lantern in photography. Printing and toning of printing-out papers. Bromide, platinotype, carbon, and other printing and developing processes. Art in photography. Photography as applied to special subjects, with a brief outline of the same.

IMPROVED PICTURE PROJECTING APPARATUS.

[Reprinted from "The Scientific American."]

Heretofore magic lanterns have been devised either for projecting transparent pictures only, or for projecting opaque pictures only. Some transparency projectors, however, have been provided with an attachment whereby the same may be converted into a projector for opaque pictures. While this is suitable for certain classes of exhibition it nevertheless falls short of the requirements when it is desired to exhibit transparent and opaque pictures interchangeably; for considerable time is consumed, and trouble involved, in making proper adjustments necessary to effect the change from one class of picture to the other. Moreover, certain specially interesting pictures or objects—viz., those partly transparent and partly opaque—cannot be projected by such lanterns. With these conditions in mind Mr. George W. Smith, of Evanston, Ill., has recently produced and patented an apparatus which will project any class of picture or object without requiring any special adjustment. The invention is applicable to any kind of magic lantern, but more particularly to the form commonly known as the megascope.



As shown in our illustration, the invention comprises a lantern box, at the rear of which is hinged a reflection chamber having vertical walls arranged obliquely with respect to the front wall of the box. A light, A, for example a Welsbach light, is located at one side of the lantern box at one focus of an ellipsoidal reflector, the picture or object to be projected being inserted at the other focus. On the opposite side an opening is formed in the reflector for the admission of the objective tube. Rays from light, A, pass through a condensing lens, B, to one of the oblique walls of the reflector chamber. Reflectors, C and D, are provided on these walls and they act to reflect the rays back through a condensing lens, E. A transparent lantern slide, F, when placed before the lens, E, intercepts the rays and permits the proper gradations of light and shadow to be projected by lens, G, on to the screen. Such is the effect when a transparent slide is used. When an opaque slide is to be projected, the direct rays from lamp, A, and also the indirect rays concentrated by the ellipsoidal reflector, illuminate the front of the slide, and the proper image is thus reflected through lens, G, to the screen. If the slide be partly opaque and partly transparent or translucent, the lantern will operate simultaneously as a megascope and sciopticon combined, thus, with-

out any change, producing unique effects in a very simple, inexpensive and yet satisfactory manner.

The lantern should be very useful for scientific purposes for the reason that the same object may be projected by reflected light alone or by transmitted light alone, or by both simultaneously without removing the slide or changing the adjustment of the projector.

TELEPHOTOGRAPHY AND FLATNESS.

The telephotographic lens has now so far gained a recognised position in every well-appointed photographic kit that no apology is needed for bringing to notice what has been considered one of its weaknesses, and endeavouring to trace its cause or causes, and indicating the direction in which a cure may be wholly or partially found. A general flatness or want of contrast has long troubled the telephotographer, until he has in many cases come to consider it due to some inherent defect in the optical system itself, and to reluctantly put his telephoto lens on the shelf, considering it more as a scientific curiosity than as a valuable working tool. A little consideration will show, however, that the telephoto lens, as such, has little to do with the trouble, which arises almost entirely from disregard of the conditions under which telephotographs have necessarily to be taken. Let us, for a moment, examine a good photograph of an open view, with a foreground of rocks, trees, or houses, with a distant glimpse of cliffs, or, perhaps, the turrets and spires of a neighbouring city. Here we find everything in harmony, the shadows in the foreground being fairly strong, while those in the middle and far distance become softer and less pronounced, as they were farther removed from the camera; in fact, we find a perfect example of "aërial perspective." Now let us cut a small opening, say the size of a postage stamp, in a sheet of paper, and place this so as to act as a frame to the small building or portion of cliff, of which we desire to obtain a record with the telephoto lens, and we shall at once recognise that we have a miniature picture which is suffering from an excessive lack of contrast, and which, if enlarged, would present the appearance of a rather poorly-defined telephotograph. Why is this? In the first place, it is probably due to over-exposure. The user of a telephotographic lens is apt to forget, in his earlier exposures, at all events, that he has no near foreground shadows to consider, and blissfully multiplies the exposure necessary for an ordinary view by the "square of the magnification," with the result that he gets a flat, washed-out looking picture, which convinces him either that the telephoto lens is a failure, or that the rule for calculating exposures is hopelessly wrong. In the latter case there is hope for him, for his investigations may lead him to the table of exposures formulated by Mr. Howard Farmer, which deserves a place inside the camera case of every photographer who cannot find a place for it inside his head. It runs as follows:—

With lens aperture *f*.8, instantaneous plates, sun's altitude not less than 25 deg., and either blue sky or white clouds.

Distance of nearest important object, if sun is not shining; or nearest important shadow, if the sun be shining on portion of the subject only:—10ft., 1 second; 10ft. to 30ft., ½ second; 30ft. to 100ft., ¼ second; 100ft. to 100yds., ⅙ second; 100yds. to ¼ mile, 1-16 second; beyond ¼ mile, 1-30 second. Subjects entirely in sunlight, or with insignificant shadows only, 1-10 second, for very near, to 1-40 second for open subjects.

It must be remembered that the above is a table of comparative and not absolutely correct exposures, and that time of year, the hour of the day, and the speed of the plate in use will all take part in modifying the figures therein given; but it will, on the whole, be found to provide a good and safe starting point.

Atmospheric haze is a common cause of flatness, and although it is useless to expect any lens to penetrate a white mist, the effect of a blue haze may be in a great measure avoided by employing an isochromatic screen. If orthochromatic plates be used, any of the many forms of yellow screen or the liquid "ray filters" will be found to answer well, while with ordinary plates the green and amber screen invented by Mr. Burchett will be found very useful, without unduly prolonging the exposure. Heat haze or shimmer caused by currents of heated air rising from the earth will sometimes give trouble, but for this there is, of course, no remedy. As a general rule, telephotographs should be taken with a stronger or "harder" lighting than would be desirable for ordinary work, and many of the most successful pictures are to be obtained with early rays of sunrise or the oblique lighting of sunset.

Especial care should be taken to avoid reflections from the inside of the lens tube, which it is advisable to line with black velvet; the glasses of both positive and negative lens should be carefully cleaned immediately before use, for an amount of smokiness which would be negligible for ordinary work would seriously reduce the brilliancy of a telephotographic negative.

Telephotographic negatives require more patience and careful treatment in development than is usually accorded to them. Having avoided over-exposure, the next thing is to eschew under-development. A very interesting and profitable experiment is to make two identical exposures, and to withdraw one from the developing dish at the point at which you usually stop, allowing the other to develop for twenty minutes or even half-an-hour longer. This can easily be done by means of a vertical bath or mechanical rocker, while proceeding with other work. The difference in the printing quality of the negatives will be surprising, and in most cases the value of the additional development highly satisfactory.

Intensification may frequently be necessary, and an intensifier which does not tend to stain or block up the shadows is to be preferred. "Monckhoven's" cyanide of silver formula does well, and the single solution uranium intensifier is also suitable. The printing quality of a uranium intensified negative is, it should be remembered, much better than it appears. The ordinary mercury and ammonia intensifier has a tendency to "thicken" telephotographic negatives, or any others which in themselves lack contrasts, without giving the brilliancy to be obtained by the methods mentioned above.

It is hardly necessary to say that the plate used for telephotography should be one which will stand prolonged action of the developer without becoming veiled, and for this reason the most rapid brands should, as a rule, be avoided. Paradoxical as it may appear, it is nevertheless true that a slow plate may give a better result than a rapid one with the same exposure, for the former will stand "forcing" to obtain printing density, while the latter will begin to fog long before the high lights are sufficiently strong.

E. Clifton.

Traill-Taylor Memorial.—There will be a meeting of the committee at the White Swan Hotel, Tudor Street, E.C., on Thursday evening, the 25th September, at 7.30, with reference to this year's lectureship.

A special list of mounts, albums, frames; special papers and materials for mounting photographic and other prints have been sent us by Mr. Jonathan Fallowfield, of the Central Photographic Stores, 146, Charing Cross Road, London, W. The list occupies 74 pages and an enormous variety of designs, tints, sizes, and shapes are listed and illustrated.

THE ATOMIC THEORY WITHOUT HYPOTHESIS.

[Abstract of Presidential address in Section B of the British Association.]

CHEMISTRY NOT THE SCIENCE OF THE MINUTE.

If chemistry is a science which rests upon the atomic hypothesis, and, therefore, would cease to exist in the form into which it has developed, should matter prove to be continuous and not discrete, nothing can be said against the view that it is a science of the minute. But I am sure there can be no one ready to maintain that, if the hypothesis of the atomic constitution of substances were an unfounded one, the atomic theory would have been a discovery of no great importance; and Dalton himself, instead of being the founder of the chemistry of to-day, would have been little more than the discoverer of the law of multiple proportions. For if, indeed, the chemist often works upon comparatively small amounts of substances, and consequently with very sensitive balances, that is, as we all know, only for reasons of economy, of time, materials, and apparatus; otherwise he works on the largest possible scale, with the object of attaining to the highest degree of accuracy and perfection. It is therefore only as interpreted by the atomic hypothesis that chemistry can be said to deal with the minute. When the atomic theory is expounded in the usual way, it is commonly and correctly stated that, on the assumption that substances consist of minute indivisible particles having weights or masses bearing ratios of the combining numbers assigned to them, the laws of chemical combination by weight necessarily follow, and are thereby explained. But then the converse is not true—that because chemical combination obeys the well-known laws substances consist of discrete particles. Nor does the assumption of the truth of the atomic hypothesis afford any real explanation of the facts expressed by the laws of chemical combination, or more comprehensively by the atomic theory, when that theory is given non-hypothetical terms. It is just as difficult to see why the atoms should possess the weights on chemical grounds assigned to them, as to see why substances interact in the proportions that they do; that they do so is, in either case, an ultimate fact, for which no explanation has presented itself. The atomic hypothesis masks this ignorance and deadens inquisitiveness. But if, after all, chemistry does not deal with the minute, or, rather, if it has no concern with the magnitude of single bodies or their molecules; if the atomic hypothesis is not the foundation of, or necessary to, the atomic theory, then it is certainly most desirable and important that the theory of chemistry, which, with all its modern developments, I take to be indisputably the atomic theory of Dalton, should be held and expounded without any reference to the physical constitution of matter, in so far as that remains unknown. The opinion that chemical theory should be developed without reference to the atomic hypothesis has indeed all along been held by many eminent chemists; but then the dilemma appears to have presented itself to them, that either the atomic hypothesis must be granted, or the atomic theory must be dispensed with, since it falls with the hypothesis. That dilemma I do not recognise, and the practice of chemists shows beyond doubt it is always ignored. Investigators use the theory, whether they admit it or not; teachers of the science find it indispensable to their task, however much they may deprecate, and rightly so, unreserved acceptance of the atomic hypothesis as true. Chemists have thought from the first to escape the adoption of the atomic theory by putting Dalton's discovery into something like these words:—Numbers, called proportional or combining numbers, can be assigned to the chemical elements—one to each—which will express all the ratios of the weights or masses in which substances interact and combine together. Perhaps the atomic theory is here successfully set aside by expressing what is an actuality as an unaccounted-for possibility. But then those who use any such mode of expressing the facts, without reference to the theory, never fail also to adopt the doctrine of equivalents, and thus, by this double act, implicitly give in their adherence to the theory. Divested of all reference to the physical constitution of matter, the atomic theory is that the quantities of substances which interact in single chemical changes are equal to one another—as truly equal in one way as equal masses are in another — and therefore, that chemical interaction is a measure of quantity of unlike substances, distinct from and independent of dynamical or mass measurement. Dalton, indeed, did not express himself in any such terms, but it is clear enough that his theory was that of the existence of another order of equality between substances than that of weight. Up to his time, the weight or mass of every ultimate particle of any substance whatever appears to have been assumed to be the same, the atoms being alike in every way. That assumption is still made by many thinkers, chemists among them; we meet it, for example, in the different forms of the hypothesis that the elements are all, in some way, physically compounded of a universal and only true element, as in Prout's hypothesis. Dalton saw things differently, and recognised that, on the assumption of substances being constituted of particles which never subdivide, weight or mass cannot be the same for every such particle, except in the case of those of any one simple substance. Therefore, having given some numbers showing what he believed to be the respective weights of the atoms of several simple substances, taking that of hydrogen as of unit weight, he proceeded at once to invent symbols for these atoms to indicate, not only their distinctness in kind, but, above all things, their indivisibility and their equality, properties which the use of their atomic numbers would have inadvertently concealed or even apparently denied, and could never have expressed or connoted. It was only in this immediate invention and use of chemical symbols that Dalton's conception found clear expression; and, again, it is by the universal adoption of such symbols that chemists have shown their real acceptance of the atomic theory, even while displaying, not infrequently, their scepticism as to its truth. Now, evidently, what the character used as symbol shall be is, theoretically considered, but a petty detail; the vital point is what the character symbolises, and that is the atom. It may be said, indeed, to represent the atomic number, since it stands in place of it; but it is made to do so only in order that we may for the time forget this number and have in mind the integral character of the atom. It is not the 4,006 parts of sodium hydroxide and 8,097 parts of hydrobromic acid that we are to think of when the formulæ NaOH and HBr are before us, as we too often strive to do; it is not these, from a chemical point of view, meaningless numbers of parts, but quantities which are equal in the sense of chemistry, that are expressed as such by these symbolic formulæ. The real purpose of chemical formulation is not to abbreviate or replace language, but to facilitate, if not ensure, abstraction from a non-contemplation of gravimetric numbers. I have just passed from atomic symbols to the formulæ of molecules; but this was not without warrant. In the form in which I have enunciated the atomic theory, it relates to the chemical interaction of substances, whether compound or simple, and the equality of the quantities concerned is the equality of molecules, since these are the quantities of substances entering into or coming out from single chemical interactions. Were it not, therefore, for fear of confounding it with the mechanical theory of that name, the atomic theory should be called the molecular theory of chemistry.

CHEMICAL EQUALITY.

Molecules are equal in the sense that they are quantities of their substances, which are interdependent and co-ordinate in any and every single chemical change in which they take part together. It is a form of equality for which no close parallel can be found. To give an example; the molecule of ammonia is equal to that of aldehyde in that it combines with it and with it disappears, or ceases to exist as such. For the same reason it is equal to the molecule of hydrocyanic acid, and molecules of aldehyde and hydrocyanic acid equal to each other, because they, too, combine and disappear as such in doing so. But the molecule of ammonia again equals that of aldehyde in effecting transformation of hydrocyanic acid and its own self into something else. And lastly, chemically equal or molecular are the products of these combinations; aldehyde ammonia, ammonium cyanide, and aldehyde-cyanhydrine, not only among themselves, but also with the quantities of ammonia, aldehyde, and hydrocyanic acid, from which they come and into which they return in other chemical changes. But with all this quantitative equality in transforming power, the substances produced are unlike and, each to each, peculiar to one of the three acts of chemical combination; and on this account exception may be taken to the treatment of molecules as equal chemical quantities. Yet the equality of molecules here asserted is but an extension of what is meant by the equivalence of certain atoms and radicals, since the atom and the radical are, nowadays, "conceptions entirely dependent upon and derived from that of the molecule (apart, of course, from the atomic hypothesis); and this universally allowed equivalence admittedly does not extend to the identity of the products of the replacing activity of the atoms and radicals. Quantitative equality and equivalency, it is true, have not the same meaning, equivalence being used to denote qualified equality, equality in certain specified ways, of quantities not equal in all other ways and possibly in no other. Quantities of different substances cannot, strictly speaking, ever be equal, and can only be styled so in the sense of being equivalent; for were they equal in every way the substances would obviously be the same. But this fact, if it ever strikes one, is ignored by universal custom, and quantities of substances, however unlike—feathers, air, water, salt, and what not—are taken to be all equal, even by chemists as by the world at large, if only they have the same weight, notwithstanding the incongruities of the substances. No quantities of different substances can, as such, be commensurable throughout; and when compared and measured through some common property, such as the possession of mass, the equivalence or pseudo-equality found by this means is not the same as that found when some other common property is taken as the means of measurement. The contention that chemical equality must be regarded as of as clearly defined a nature as gravimetric equality becomes the more weighty when it is reflected that our very definite views concerning gravimetric equality are due solely to the law of conservation of mass, the evidence for and against which, I may remind you, is just now to be discussed by Lord Rayleigh before the Physical Section. The mass of one pound of sodium remains unchanged when the metal is converted into salt, washing soda, or borax; if this were not the case, gravimetric equality would be just as definite as it is now, but physicists

would have to argue for its general recognition in much the same way as I am doing now for the recognition of chemical equality. In teaching chemistry the point is kept too much in the background, if not altogether out of sight, that the chemical equality of quantities of different substances is independent of all other relations of equality between them, and that, therefore, its validity is not affected by the fact of its terms agreeing with some and not with other terms of equalities determined in other ways. "Molecule" is a term of relation; it stands for an equal quantity, not for any particular quantity; but at such it is as easy to understand and as indefinable as an equal volume or an equal weight of a substance. The theory of chemical molecules or equalities and their relations to the equalities between the weights and gaseous volumes of different substances were brought to light, not by Richter's law of chemical combining proportions, and not by Avogadro's hypothesis as to there being equal numbers of particles in the same volume of different gases, but in the first place by Dalton's atomic theory and Gay-Lussac's law of simply related gaseous volumes in chemical change; and then, much more fully in the middle of the last century, through the brilliant work of Gerhardt, Williamson, Laurent, Odling, Wurtz, and others, in the purely chemical field. Dalton gave us the conception of the molecule, though confused with that of the atom, as the unit of measure of chemical activity in place of the gravimetric unit; the work of the chemists of the last mid-century gave us a fuller conception of the molecule, along with the notion of chemical change as being substitution in the molecule effected by what became known as double composition.

CHEMICAL COMPOSITION AND DOUBLE DECOMPOSITION.

Up to that time chemistry had been treated only as the science of compounding and decompounding or reducing. Far from being the science of the composition of substances, chemistry might be defined as being the science of the non-composition of substances, where that composition might have been looked for from the antecedents. If salt is verily a compound of sodium and chlorine, and can be broken up into these, why have the fragments not the marks on them of that whole of which they formed a part? It is true that 5,850 parts of salt become 3,545 parts of chlorine and 2,305 parts of sodium, nothing being gained or lost in weight; but to account for that there is no need of chemistry, a science which takes cognisance of the phenomena of change, and not of those of unchanged properties. The use of the word "composition" in industry cannot be discarded now, and all that is necessary to make it unobjectionable is to see that the term is always qualified by the prefix "chemical," when there is a possibility of mistake about its significance, and that that significance is carefully explained, if not defined and fully illustrated, before it is given over to the beginner. With exclusive reference to such facts as these, the chemical composition of a substance will, I think, be found to be satisfactorily defined as its having the power, capacity, or property of being wholly producible from and wholly convertible into, directly or indirectly, those substances of which it is said to be composed. A simple substance differs from one that is compound only in not possessing the power of being by itself convertible into two others, or of being produced alone from any two others. Simple substances are not less varied or less complex in their physical properties than compound substances, while their chemical constitution is often more problematic than that of many which are compound. The term "simple," therefore, is as misleading in the language of chemistry as "compound," unless defined and qualified in use by the word "chemically." In the great reformation wrought by the chemists to whom I have referred, but by Gerhardt in particular, the new light set up in chemistry was the notion of what came to be called "double decomposition" in chemical change. Its introduction into chemistry marked the ascendancy of the idea of the molecule as the factor in chemical change whose interactions with other molecules were to be considered, instead of those additions which, as chemical phenomena, never take place. It led also to new conceptions of the nature of the atom and the compound radical as being the quantitative and qualitative expressions of the powers possessed by substances to change into others, and to the conception of the valency of atoms and radicals as expressing the nature of the connexion of successive chemical changes. The fundamental value of double decomposition consists in its displaying threads running through chemical transformations which can be followed up. When two substances change into two others, and only then, there can be found, in most cases, relations of resemblance, both physical and chemical, between the before and after of a chemical change. Instead of the striking unlikenesses shown by the substances formed by quasi-addition to those from which they are formed, there are here met with the similarities of the outcoming to the interacting substances, and the similarities between the products of different interactions in which the acting substances are similar.

RADICALS AND ATOMS.

The notions of radical and atom are so intimately related as to be often used indifferently, the one for the other. The radical, ethylene, is always an atom of ethylene, the radical nitrogen always an atom of nitrogen. Radical and atom are, in fact, the qualitative and quantitative aspects of the same thing. They are thus exactly parallel with substance and molecule. We can think of unquantified substance, and perhaps of an unquantified radical, but in chemistry we never really want such conceptions. In the interaction of double decomposition each substance by contact and union with the other develops and manifests a dual character by becoming distributed as the two new substances, with the consequence that each of these has certain properties the same as those of the one, and certain others the same as those of the second interacting substance. What is common in this way to one of the interacting and one of the resulting substances is a radical of these substances, of which there are evidently four in every double decomposition. These radicals of a single interaction are defined as whatever two parts of the powers of a substance to yield the simple substances of its chemical composition are, in certain interactions, continued separately from each other in the two new substances. But the pair of radicals developed in the various double decompositons of a substance being by no means always the same, one of the radicals of one pair must include in its composition part or all of one of those of another pair. To a limited extent and imperfectly, we can attach to a given radical certain of the properties common to its compounds; but it needs no greater insight than we have already to recognise that a substance cannot be what it is in one way without being in that way greatly affected by what it is in another. This is now a recognised but not sufficiently considered point, and I therefore welcome those publications of Professor Vorlaender, of Halle, in which he has been vigorously calling attention to the extent to which the properties of a substance, acid, basic, stable, and what not, depend as much as, if not more, upon the inter-relations of the radicals than upon the radicals themselves. One other thing I have to say about the radical; I plead for a return to the ending of the word radical with "al," now interdicted in the Journal of the Chemical Society.

IONS.

I have put off too long, perhaps, all reference to the properties of very dilute aqueous solutions of salts. The osmotic pressure and other dependent points which are particular in the behaviour of such solutions are in full accordance with the assumption that an electrolyte by dissolution in much water becomes a pair or a binary system of two interdiffused quasi-substances called "ions." These ions must differ from isolated substances in bearing equal and opposite quantities of electricity; in being each unknown apart from its fellow; and in having a composition not to be found in actual substances, though identical possibly with that which a radical would have were it a substance. The ions can indeed be separated from each other, but not to continue as themselves, since in the act of separating they form ordinary substances, either by uniting with other ions, or by two molecules of ion becoming one molecule of substance. In the former way of separation the ions of two salts interact on mixing their solutions; in the other way the ions become substances when their solution is placed in a galvanic circuit. The phenomena of ionisation, or, in other words, the particular properties of dilute solutions of salts, belong evidently to a change unlike all other chemical changes. It is a polarised chemical change, in which the equivalent and complemental products of the interaction appear apart and at remote surfaces of the mass of decomposing salt solution. Two points which call for notice in connection with my present subject are that an ion is one of a pair of quantities commensurate with the quantity of the salt itself, that is or would be in interaction; and that it is molecular in character, and therefore to be regarded as a relative and wholly variable quantity. Dalton's atoms were both the atoms and the molecules of present day chemistry, but much more the latter than the former. Although the chemical atom can now be no more than a dependency of the molecule, it is commonly set up as the starting point in chemical theory, and as having an independent existence as a quantity of the substance, while the molecule is represented as being a conjugation of atoms. But there cannot be two standards in reference to the same thing, and in molecular chemistry the atom must give way. The four radicals of a double decomposition are equal and chemically complementary. These chemically equal quantities of such radicals are atoms. The quantities of all other radicals are also atoms, but only those of proximate radicals, those of a single interaction, are equal. Similarly, the quantities of the four substances of a single interaction are all equal and are molecules, but the quantities of substances are not equal in other interactions. These others are treated as the simultaneous occurrence of two or more single interactions, which they can always be represented and sometimes demonstrated to be. Calcium hydroxide and hydrogen sulphide give calcium hydrosulphide and water by two single interactions together, which in this case can be easily distinguished, since the calcium hydroxide will also interact with only half as much hydrogen sulphide to form the insoluble crystalline calcium hydroxyhydrosulphide and half as much water as before; this calcium salt will then interact with as much more hydrogen sulphide as went to form it, and produce the very soluble crystalline calcium hydrosulphide. Therefore, and on other grounds, we say and know that one molecule of calcium hydroxide and two molecules of hydrogen sulphide give one molecule of calcium hydrosulphide and

two molecules of water. This is, of course, only the law of multiple proportions introduced into chemical interactions. The expression "two or more molecules of a substance" has a meaning only as indicating the number of simultaneous or successive single interactions which have led to the conversion of certain substances into others. Now, a similar but complementary state of things meets us in the case of radicals. Instead of the coefficients of molecules, necessitated by having to consider many chemical changes as being cases of two or more single interactions occurring together, there are the valency coefficients of the polyvalent radicals, called out also by such a compound interaction. Thus, in the above case, whilst the single interaction between hydrogen sulphide and calcium hydroxide shows calcium-hydroxl as one of the radicals, the succeeding interaction between the calcium hydroxyhydrosulphide and more hydrogen sulphide shows the radical calcium-hydrosulphuryl, and the common part of these two radicals is the bivalent radical, calcium. It will be evident that to give the atom of the calcium radical as bivalent is a statement reciprocal or complementary to that of giving two molecules of hydrogen sulphide as interacting with one of calcium hydroxide. Chemical equality remains still the measure of the atom, but that, in complex changes, whereas the number of molecules in one substance marks the number of single interactions, the valency number of the atom marks the same thing for the radical. It is a matter of valency, and not otherwise a matter of the atom. The radical calcium is never actively bivalent in a single interaction; in other words, it is never equal to two atoms of hydrogen. As a simple radical it does not take part in such an interaction; but it does do so as a radical of radicals, such as calcium-hydroxyl and calciumhydrosulphuryl, and then has the same measure as—is equal in exchange to—the atom of hydrogen, though carrying with it of necessity other radicals, a thing the hydrogen radical never does or can do. The quantity of the radical is the only proper and sufficient definition of the atom, whether the radical be that of a single interaction, or a radical of radicals, that is, a polyvalent radical. The atom is, therefore, the quantified power of a substance, as the compound of a radical, to produce other compounds of the radical, including its compound with itself, where that is possible. As with the molecule of a substance, so with the atom of the radical, it is of no fixed magnitude, and may weigh a kilogram just as well as only a milligram, or something much less. Being a relative quantity and nothing by itself, of its indivisibility there is nothing to be said outside its definition; whilst as to its being the smallest relative quantity interchanging in an interaction, it had only thus to be defined when there was uncertainty as to the molecule and the single interaction.

VALENCY AND FORMULÆ.

It has been impossible for me to discuss the nature of the radical and the atom without referring to valency, but it is itself a subject of such importance as to need special consideration. It does not seem right to me to say even the little I can say about valency without naming with the respect they deserve from us the distinguished chemists who laid the foundations of the doctrine and developed it; Williamson, Odling, Wurtz, Edward Frankland, and Kékulé. Valency presents itself as being the number of single interactions necessary in order to have a certain radical occur, first as that of one substance and then as that of another which has no other radical in common with the first substance. That ammonia possesses one atom of the radical nitrogen, and three atoms of the radical hydrogen, and that the nitrogen radical is tervalent and the hydrogen radical univalent are statements mutually based upon facts such as the following. Potassium nitrilosulphate, which contains nitrogen but no hydrogen, is converted by water into a sharply defined single interaction, into potassium hydrogen sulphate, and into potassium imidosulphate, a substance which contains all the nitrogen along now with hydrogen. This salt passes, also sharply and by a single interaction with water, into as much more sulphate along now with potassium amidosulphate, which latter substance contains all the nitrogen and twice as much hydrogen as belonged to the imidosulphate. Lastly, the amidosulphate interacting with water gives a third quantity of potassium sulphate, equal to the last, and also ammonia, having all the nitrogen of the nitrilosulphate started with, three times as much hydrogen as the imidosulphate, and nothing else. That is to say, the nitrilosulphate and the ammonia have no other radical than the nitrogen the same, while three single interactions have been necessary to separate in this way the nitrogen radical from the three atoms of the potassiumsulphonyl radical. Therefore, the nitrogen radical is tervalent and its quantity is the atom. Chemical formulæ are symbolisations of deductions from experimentally ascertained facts, and are independent of the interpretation, commonly given to them as referring to the minute differentiated structure of substances. What is symbolised by position formulæ, and indeed by the formulæ altogether, are the chemical activities and abilities of the substance, and its derivatives, and their analogies with those of other substances. When not in interaction, a substance has no constitution and no formula. It is certainly not on any experimental grounds that it can be regarded as some spatial arrangement of unlike parts.

PROFESSOR EDWARD DIVERS, M.D., F.R.S.

THE BECQUEREL RAYS.

ONE of the discourses of the meeting of the British Association was delivered by Professor J. J. Thomson, on "Becquerel Rays and Radio Activity." He described how Professor Becquerel, of Paris, took a quantity of salt of uranium and placed it near a photographic plate, protected from light by suitable screens, and kept the uranium in a state of phosphorescence by continued exposure to sunlight. On developing the plate after the experiment had lasted several hours he found a picture upon it, showing that something similar to Röntgen rays had been given out by the uranium. In all the earlier experiments the uranium was kept exposed to the sunlight, and was thus phosphorescing during the whole time of exposure. It happened, however, on one day that the sky clouded over during the experiment, and there was not light enough to make the uranium phosphoresce. Becquerel put his apparatus away and waited for better weather. The weather, however, did not improve, and Becquerel developed his plate, expecting to find a feeble picture. To his surprise, he found that the picture excelled all those he had previously taken, proving that the uranium emitted the rays even when it was not phosphorescing. This radiation was similar in penetrating power to that of the Röntgen rays, and Becquerel thought that at first that his rays, like ordinary light, were capable of being refracted, and that they could be polarised. This had been proved to be not the case. Becquerel rays were, in fact, a mixture of Röntgen and cathode rays. Evidence had been given to show that the cathode rays consisted of exceedingly small particles, called corpuscles, smaller than the atoms of any known substance, and moving at the rate of many thousand miles a second, the speed depending upon the extent to which the air had been removed from their path. Large as the velocity was, it was greatly exceeded by the velocity of the cathode rays given out by uranium, while another substance, radium, emitted rays moving at a still greater speed, velocities of over 120,000 miles a second having been recorded by Becquerel in this case. Among all the mysteries associated with matter, few, if any, were more startling than that afforded by these substances, in no way remarkable in appearance, which, without provocation and without intermission, emitted properties that travelled at a rate compared with which that of the fastest bullet was absolutely insignificant. If artificially prepared salts of uranium were examined, it was found that the activity was strictly proportional to the amount of uranium they contained. M. and Mme Curie found, however, that several native minerals, and especially pitch-blende, although only a fraction of their bulk, consisted of uranium, were much more active than pure uranium; one of these minerals, chalcolite, was prepared artificially, and the activity of the product was found to be normal—that is, proportional to the amount of uranium contained. It seemed probable, therefore, that these minerals contained some unknown substance much more active than uranium itself. M. and Mme. Cure applied themselves to the task of separating this suspected substance. They found that a very radio-active substance, which has been called polonium, was connected with the bismuth taken from the pitch-blende, and also another substance named radium. A third substance had since been obtained, which seemed closely to resemble thorium, and was known as actinium. The amount of these substances was exceedingly small, smaller than the quantity of gold in sea water. The property of producing electrical conductivity in gases afforded a most delicate test of the presence of a radio-active substance. By this means it was possible to detect quantities of the material millions of times less than could be detected by chemical analysis, and thousands of times less than could be shown by the spectroscope; indeed, of the three substances mentioned, radium was the only one that had been detected by chemical or spectroscopic means. By successive purification of the barium obtained from pitch-blende, radium had been obtained, which was more than 100,000 times more active than uranium, and which, when enclosed in lead one-quarter of an inch thick, could produce greater effects than uncovered uranium. The radium made a sensitive screen phosphoresce; it showed the bones in the hand, and was so vigorous in action that it had produced sores on the skin of those who had incautiously handled it; and it emitted negatively electrified particles with a velocity approaching that of light. This continual emission implied that the radium was losing mass and energy, but the loss of mass would amount to only about one thousandth of a milligramme in a million years for each square centimetre of surface. But the amount of energy radiated was quite appreciable, being sufficient, if converted into heat, to melt in a million years a layer of ice of the same area as the radium, if more than a quarter of a mile thick. Loss of energy has been going on, it might be, for millions of years, ever since the radium existed. There must have been, therefore, a very considerable store of energy at the outset, and a very interesting question was the nature of this energy and how it was stored. Professors Rutherford and Soddy had given a satisfactory answer to this question by their experiments on the substance thorium, from which they had been able to separate its active constituents, obtaining two products, one minute in quantity, but intensely active (thorium X), the other, which contained practically the whole of the thorium, almost inert. This arrangement, however, did not last long. Thorium X began to lose its activity, and the

nass of thorium to gain it. After a few days thorium X became quite inert, while the thorium regained its old activity, and afforded fresh supplies of the thorium X. Ordinary thorium was thus steadily being transformed into the active thorium X, while this is continually passing into some inactive form; what this inactive form was we did not know, and its elucidation offered a most interesting problem, rich in possibilities. Rutherford found that thorium, besides giving out Röntgen and cathode rays, gave out a radio-active gas, which he called the thorium emanation. The activity lasted only a few minutes, and was given out only from the thorium X, and not from thorium in its normal state. This emanation resembled the new gases argon and helium in its refusal to combine with any other element. It was remarkable that the minerals in which helium occurred invariably contained radio-active substances, and the idea naturally suggested itself that helium might be very closely connected with the gaseous emanation from thorium X. Radium gave off an emanation more permanent than that of thorium. Radio-activity could be induced. If the substance was negatively electrified while in contact with the emanation, the radio-activity induced in it was very much increased. The intensity of this induced radio-activity did not depend to any great extent on the nature of the substance. A piece of paper could be made as radio-active as a piece of metal, but the property was not permanent, lasting for a few hours only. Elster and Geitel had made the remarkable discovery that substances could be made radio-active without the aid of thorium or radium, all that was necessary being to hang them up in the open air, and charge them strongly with negative electricity. The earth itself was negatively electrified, and the natural electrification on pointed conductors connected with the earth was sufficient to make them radio-active. The pointed leaves and spines of trees were always radio-active, and Mr. C. T. R. Wilson had lately shown that freshly-fallen rain possessed this peculiarity and retained it for about half an hour. It had been suggested that this induced activity pointed to the presence of another undiscovered constituent in the atmosphere, but experiments were described which showed there was no necessity for this hypothesis. The production of radio-activity in all bodies might be thus explained. The air always contained small bodies called ions, some charged with positive, others with negative, electricity. When a negatively electrified body was placed in the air the positively electrified ions were attracted towards it. Some gave up their electric charge, but those that did not would accumulate close to the surface of the body, forming a layer of positive electricity round the body. This layer would attract the negative electricity in the body, and when the attraction was very great the negative electricity would be pulled so vigorously that it would shoot out from the body with great velocity, approaching that of the cathode rays, and hence would give out cathode rays and be radio-active. It was in this way that the leaves of trees, and the countless objects on the surface of the earth acquired radio-activity, and, becoming, in fact, cathodes, discharged those rays, which had only comparatively recently been discovered by the help of the most elaborate apparatus, and yet were in all probability so widely distributed and so frequent, that there was hardly a patch of ground on the earth's surface which did not contain a source of these rays.

Astronomical Photographs from the Lick Observatory.—The value to lecturers of the photographs taken with the great telescope and others of lesser size at this observatory does not need to be dilated upon by us, and the announcement of a recent departure by the authorities of the institution will be received with interest. The Bulletin No. 20 published by the Observatory contains the announcement by Professor Pickering that in consequence of the receipt by the authorities of so many legitimate requests for photographs of the moon, comets, nebulæ, etc., taken at the Observatory they will be prepared to furnish copies from their negatives in print or lantern slide form. Application is to be made to the Director, who will, on request by teachers, lecturers, etc., give details of prices and other particulars.

The British Association.—The meeting of the British Association at Belfast has been a fairly successful one. Many valuable papers were read, though there was no one, if we except Professor H. E. Armstrong's on technical education, of universal interest. There was a certain want, too, of what we may call "illuminating" papers, those which leave on the minds of the half-instructed a just impression that their knowledge and their opinions have been made at once wider and more definite. There has been a recoil of late years from such papers as too "popular," ending in a supply of lectures so technical that though they may inform those engrossed by their subjects, they are to the world—which the Association, it must be remembered, professes to address—simply unintelligible. The managers of the Association have, of course, many difficulties to contend with, every man who will contribute a paper worth hearing fighting for his independence; but a little more editing of a general kind would, we think, increase the utility of the Association without interfering too much with any idiosyncrasy. We have given up the old word "mystery," formerly considered necessary to describe any art or science, and the change marks at least a change in the general wish.—"The Spectator."

Exhibition.

THE PHOTOGRAPHIC SALON.

The tenth annual exhibition of the Photographic Salon, which was opened on the 19th inst. at the Dudley Gallery, Piccadilly, W., maintains the progress shown in the exhibitions of last year and the year before, and the collection of pictures is undoubtedly an interesting one; but, in contemplating it as an exhibition of photographs, one cannot avoid the impression that the majority of the exhibitors have treated photography less honestly than the compilers of the catalogue have treated the quotation which forms the "Forewords" to the catalogue, and which is avowedly "adapted from W. E. Henley, without permission." Without going into the question, either from the ethical or the art standpoint, of the legitimacy of combining two or more methods in the production of a picture, it is clearly desirable that, even if it is a legitimate practice, the productions should not be classed with results obtained by one method only. When a picture sent to an exhibition of paintings has been detected as a disguised photograph its author has justly been looked upon as having been guilty of a mean attempt at fraud, and, similarly, a picture, in the production of which photography has played a minor part, should not be allowed to masquerade as a photograph. It is unfair, both to artists who choose photography as their means of expression and to artists who rely upon the pencil or the brush.

The exhibition gallery appears in quite a new get up; a much less ambitious scheme of decoration than usual has been attempted, and the result is decidedly the most successful yet achieved. All direct light is obscured by a velarium or screen of thin white material, and with the light of a bright September day the effect is delightfully soft and particularly suitable for the display of photographs. What the effect will be when the London smoke has had its normal result on the white hangings and in the gloom of an autumn day remains to be seen; but, however, those responsible are to be congratulated upon the abandonment of the rag-bag style of decoration which was typical of the stage of art culture of the early days of the Salon.

In giving the opportunity of seeing what is being done outside our own country the Salon has always performed a useful function, and this year rather more than one-half of the exhibits are from abroad. It is, of course, difficult to generalise work proceeding from places geographically far distant from one another and subject to local influences which cannot be similar, but it is impossible not to recognise that there is a sentiment in natural British work which is characteristic, and which is entirely different from that of any other nation. It is a clean, healthy sentiment which finds no necessity for mythious suggestions, but it is not the fashion, and receives scant encouragement at the Salon. We do not for a moment wish it to be understood that we class all foreign work differently, but there is much of it in which there is very little to admire, still less to imitate, either in sentiment or in treatment. Photography is essentially the medium for realism, and to employ it when obscurity is necessary is to employ a medium for the work in hand which is far from the most suitable. In giving undue prominence to work which is of a character that does not appeal to our natural instincts there is a danger of discouraging efforts to perfect methods of work on our own natural lines. In some branches of painting we have no reason to be ashamed of native achievements, and in photography we have also a good record. To improve our system does not necessarily involve revolutionising it.

It is clear that the Salon has passed the period when it had to rely upon extravagance rather than merit for the notoriety necessary for its existence. If we except the comparatively small proportion of pictures which palpably owe their acceptance to considerations of policy or strategy, and those which there is reason to presume come into the same category, there is an almost entire absence of the commonplace stuff which used to form the padding of the exhibition. Most of those whose work we are accustomed to find here are represented, but we are prevented from attempting any comment on the numerous works which deserve notice by considerations of space. We understand the arrangement of the pictures on the walls was entrusted to Mr. F. H. Evans, and he has performed his task exceedingly well.

SALON "FOREWORDS."

(From the Catalogue.)

"Facts are not necessarily the end with them—they are only the means. They (these photographers) refrain from the vulgarity of full realisation, and essay no more than the pictorial expression of certain balanced and choice suggestions."

Adapted from W. E. HENLEY.
(Without permission.)

The Photographic Salon was first held in October, 1893. It was called into existence by a brotherhood or informal Society of Photographers called The Linked Ring, for the purpose of exhibiting only

those examples of contemporary photography which in their opinion give evidence of personal artistic feeling and motive, quite apart from purely scientific and technical considerations with which it was felt the pictorial possibilities of photography had too long been confused.

On these principles the Photographic Salon has since been annually organised and successfully maintained by The Linked Ring, the present Exhibition being, therefore, the Tenth of the series.

The Linked Ring, itself a democratic and cosmopolitan body, encourages everyone to send in examples of their photography, which are submitted to the adjudication of a Selection Committee on an equal footing with the works of the members themselves, so that as far as possible each exhibition shall represent the best pictorial photography of its year.

PHOTOGRAPHY IN A POETICAL LIGHT.

Poets and photographers have one thing in common, and that is, they gain their inspiration from, and spend some of their best efforts in, the admiration of nature. The sea, whose restless bosom, now placid and now roused to fury, is a never-ending source of delight to both. "The lowing herd that winds slowly o'er the lea"; "The wintry flood, in which the moon sees her unwrinkled face reflected bright"; "The stag at eve, that drinks his fill" "The tranquil convent's hushed repose and the splendours of a throne"; all these form subjects for pen and camera. A poet is as big a sun worshipper as a photographer, as many an "ode to the sun" can testify. There may be many poets who have owed to their cameras lasting memories of "pleasant haunts, clear springs, and shady groves," but I have not found a poem in praise of a sun-catcher. I have therefore had the temerity to supply that want. A man was once asked the meaning of a plagiarist, and his definition was—a playwright. Of course, plagiarism is a horrible crime if, according to the Spartan theory anent stealing, it is found out. It is, however, considered commendable to appropriate a man's ideas, though you must not appropriate his words. A nice distinction! This doctrine, not being on the Index Expurgatorius, I number myself among those who do such things. On a former occasion I drew inspiration from the great Bard, born and buried at Stratford, and (h)av(e)on this occasion done the same.

All the world's a field,
And all the men and women are photographers.
They have their cameras and their tripods.
And an amateur in his time has many fits,
Which are in seven stages. At first the ———,
Trembling and shaking in an infant's hands
Then the ———, with its daylight film,
Carried by schoolboy, dallying on his way
To take some snapshots as he goes to school.
And then the ———, wielded by a lover,
Trying portraiture, makes a woful picture
Of his mistress without an eyebrow. Then the ———,
Seeking to rival one of wider fame,
Excellent in workmanship, can be taken to the field of battle,
And successful pictures made, even in the cannon's mouth.
And then the ———, in nice brown case
With good velvet lined; full of cut films
And great contrivances. The sixth stage shifts
Into the ———, handle on top and finder on the side;
The lens well mounted and angle wide enough
To take the world. And the joyful owner,
Turning again towards the view, snaps,
And rejoices in his work. Last camera of all,
That ends this wondrous catalogue,
Is the ———, with plates of ——— ———,
Plus Bausch and Lomb, plus rigid front, plus Zeiss, plus everything.

—A. C. B.

Photographic Optics in South London.—"Clicker," in the photographic columns of the "South London Observer," gives the following remarkable piece of information to a correspondent:—"Meniscus" is not the name of a lens. It is a term applied to a "plano-convex" lens, and without such, photography would be well-nigh impossible. Rays of light passing through an ordinary lens continue their oblique path. Consequently, as the corner of the plate is farther from the centre of the lens than the middle of the plate, it follows that one of the two would always be out of focus. A meniscus lens, by correcting the rays of light, passes them through parallel to each other.

New Apparatus, &c.

The Planiscope Lenses. Sold by J. J. Griffin and Sons, Ltd., 20-26, Sardinia Street, Lincoln's Inn Fields, W.C.

In drawing our attention to their new series of Planiscope lenses, Messrs. Griffin furnish the following details:—"These lenses are now made of superior glass, and consist of two optically-finished combinations. They are corrected for achromatism and are each of tested focus. We would particularly point out that the Planiscope lenses are not merely magnifiers, nor are they spectacle glasses. They may be used with confidence with any of the most expensive lenses on the market.



"We would also point out that we have improved the mounts by which considerably more latitude is given in the size of the hood to be used without any danger of the metal bruising by the strain. The lenses are made in four kinds: wide-angle, for increasing the range of the lens; tele-photo, for magnifying the image; copying, for taking pictures, flowers, objets d'art, etc.; portrait, for making large heads in portraiture and increasing softness." Fuller particulars are in a circular obtainable from Messrs. Griffin.

The Kodak Developing Machine. Manufactured and sold by Kodak, Limited, 43, Clerkenwell Road, E.C.

"Daylight development" and the "abolition of the dark room" were once common subjects of discussion in these pages, and many are the devices we have examined whose object was to enable the photographer himself to attack the latent image from the pleasant envelopment of the whole of the spectrum rays instead of, as Robert Ball might say, in the miserable fraction of one-sixth or seventh. But the dark room still exists, an apparently permanent photographic institution. The ingenious and simple little machine before us should satisfy two aspirations common among the very large class of amateur film workers for whom the manufacturers are now catering; it is a film developing device *per se*, and may be so wholly regarded and used by those who do not object to the dark room; or, on the other hand, it enables the latter to be dispensed with. It is in the former aspect that the machine appeals to us, who, after twenty years' experience of dark rooms, do not at all object to them, and do not include amongst our photographic impedimenta a simple film-developing machine. Confining our references, however, to the daylight uses of the instrument, few words of ours are needed to describe its functions, which are entirely obvious. Once you pressed the button and allowed somebody else to do the rest for you; with this machine you can do the rest—or part of it—yourself. You wind your exposed film through your developing solution, fix, and wash all in the one closed receptacle.

The following illustrations and condensed description show how the instrument is manipulated up to the point when the developer is poured into the machine and the cover is replaced upon it.

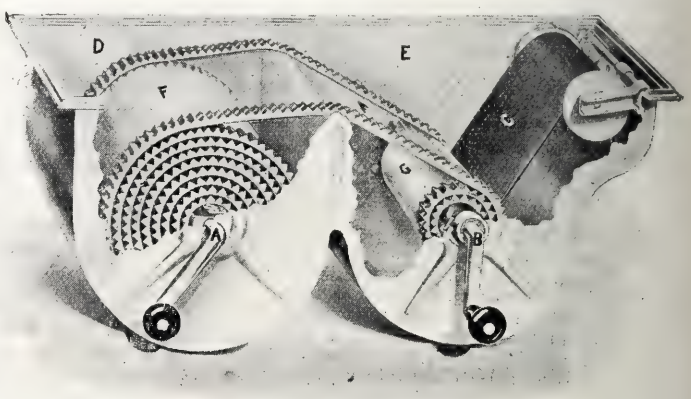


Fig. 1.

The celluloid Apron F F, Fig. 1, should be rolled back and forth several times between Arbors A and B (that you may understand its workings) bearing in mind when you are turning the cranks that A is always to be turned to the left, and that B is always to be turned to the right. Before development the Apron (F F) is all rolled on to Arbor A and will be entirely in compartment D. The spool of exposed

ilm is then placed in the carrier at opposite end of machine, and the nd of black paper is fastened under the wire guard on Arbor B, and he crank turned to the right until the word "Stop" appears. We now ook the apron to Arbor B and pour developer into compartment E, ut on cover of machine, and continue turning slowly to the right until levelopment is complete. A moment's study of the machine and cut will show that as the apron is rolled on to Arbor B the black paper winds with it, and that the film lies next to the black paper, face up see G), while the corrugated rubber bands at each edge of apron allow free access of the developer to the face of film and leave a sufficient space between the film and the next layer of the apron to allow the leveloper to flow freely and openly.

To use: Attach one end of celluloid apron to Arbor A by means of he two hooks, slipping them over the lugs on arbor. (Fig. 2.)



Fig. 2.

II. Turn to the left on crank attached to Arbor A and wind entire apron into compartment D, maintaining a slight tension on apron in so doing, by resting one hand upon it. (Fig. 3.)

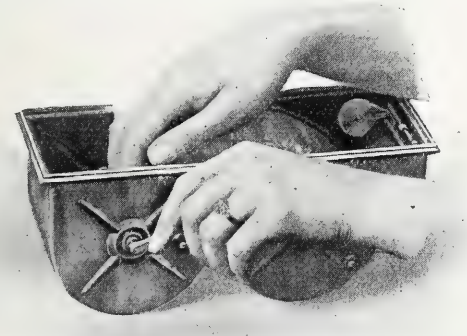


Fig. 3.

III. Throw back spool carrier by lifting it up from underneath.

IV. Adjust the bearing to take the cartridge which you intend to develop. There are four notches in the arm which supports the spool carrier. The first (giving shortest length) is for Pocket Kodak and No. O Folding Pocket Kodak, the second for No. 1 Folding Pocket Kodak and No. 1 Panoram Kodak, the third for No. 1 or No. 2 Brownie, and the fourth for No. 1A Folding Pocket Kodak. Slide the carrier along until the lug engages the proper notch. (Fig. 4.)

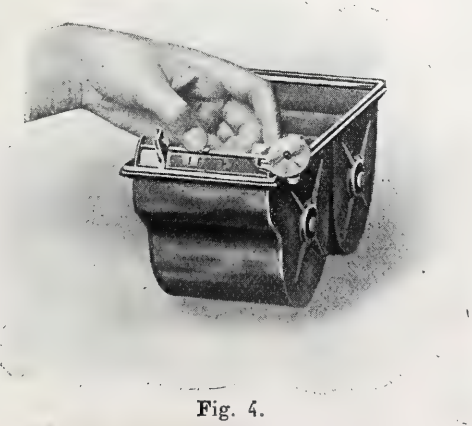


Fig. 4.

V. Place spool in carrier so that the black paper will lead from top as shown in Fig. 5, and then push carrier back into place in machine so that it occupies position shown in Fig. 1.

VI. Prepare developer and fixing solutions.

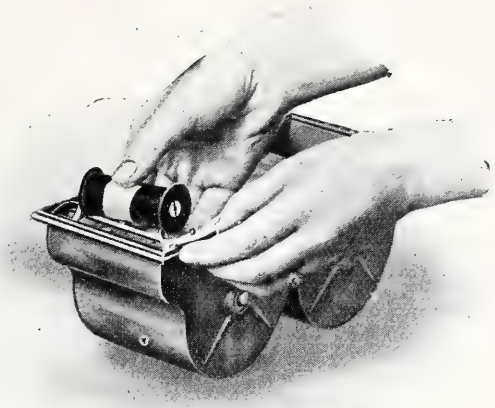


Fig. 5.

VII. Break the gummed slip that holds down the end of black paper, thread the paper underneath wire guard on Arbor B (Fig. 6), and turn slowly to right until word "Stop" appears on black paper.

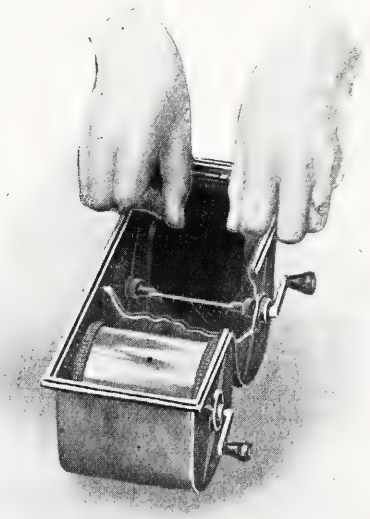


Fig. 6.

As a guidance in practical work the Kodak Company publish the following development table:—

Snap-shots.—Temperature 60 to 65deg. Fahr., 5min.; 70deg. Fahr., 4min.; 45deg. Fahr., 8min.

Time Exposures.—Temperature 60 to 65deg. Fahr., 4min.; 70deg. Fahr., 3min.; 45deg. Fahr., 5min.

(Use developer at 60 to 65deg., if possible.)

(Never use developer above 70deg.)

When there are both snapshots and time exposures on the same roll, develop for the snapshots, but in such cases be careful in making your time exposures not to over-expose them.

Used with care and thought, this clever device has the capability of rendering itself distinctly serviceable to the user of roll films.

The Crossed Swords Platino Matt P.O.P. Agents: Charles Zimmermann and Co., 9 and 10, St. Mary at Hill, London, E.C.

The distinctive features of this new claimant for photographic favour are that it is coated on an extra stout support; tones to a variety of colours, and gives a "platinum black" deposit by the use of a combined platinum toning and fixing bath, supplied by Messrs. Zimmermann for that purpose. Three specimen prints of excellent quality, of differently coloured deposits, are before us; and we have ourselves made practical trial of the paper, and succeeded in obtaining rich black images by the aid of the special bath referred to. Physically the behaviour of the surface is all that could be desired; the paper appears exceedingly simple to work, and the command over the colour (or tone) of the image seems to be wide and certain. We append the official directions for use, and are of

opinion that the Crossed Swords Platino Matt P.O.P. is a useful and pleasing variation in collodio-chloride printing:—

Carefully read the instructions for various tones before printing. Observe scrupulous cleanliness both in dishes and hands. Do not finger the surface of the paper. Always blot off surface water to assist drying.

To obtain platinum black tones with combined toning and fixing bath.—This can only be done with the bath sold specially for the purpose, of which 3½ozs. added to 3½ozs. of water will tone a 1s. packet of the paper.

Printing.—This need not be carried too far, only until the prints are fairly dark, not bronzed.

Toning.—The prints must be placed, one by one, quickly, in our special toning and fixing bath, without previous washing. (The bath, as sold, being diluted with an equal quantity of water.) The bath must be kept, during the toning process, at a temperature of 65 degrees to 70 degrees Fahrenheit, and on no account must it be allowed to go colder or warmer. When the bath is cold brown tones will be obtained. When the bath is hotter it will spoil and give greenish whites. To keep the bath at an even temperature in cool weather it is a good plan to stand the dish, containing the solution, in a larger dish containing warm water. Toning and fixing will take 15 minutes. After the first eight minutes the prints may be removed if they have reached a desired colour. Toning being finished, swab the print over with cotton wool, and then wash for 30 minutes.

Dry by pressing between blotting paper and then expose to the air. Drying should not take more than 30 minutes, or the print may lose the deep black tone.

The following tones may also be obtained by carefully following the directions:—Carbon red tones.—Toning bath: Water, 13 ozs.; borax, 40 grains; chloride of gold, 1 grain. Print about as for black tones, not too deeply; wash in three changes of water, immerse in water 20 ozs. salt 2 drams, until the print has turned yellow. Rinse and then tone. When a very slightly lighter colour than desired is obtained replace in the salt solution for five minutes, rinse and fix in hypo 2 ozs., water 40 ozs., freshly made. Carbon purple and violet tones.—Toning bath: water, 9 ozs.; acid hydrochloric, 3 ozs.; gold chloride, 3 grains. Print very deeply, wash thoroughly and tone until desired colour is reached. Wash again and fix in hypo 2 ozs., water 40 ozs. Less acid gives bluish violet. More acid gives red violet—purple. Toning may be stopped at any stage. Carbon sepia tones.—Toning bath: Water, 18 ozs.; pot. chlor. platinate, 7½ grains; acid phosphoric, sp. g. 1120, 1 dram. Print as for black tones, wash in three changes plain water and three washings of ammonia 880 1 oz., water 100 ozs., or until the prints become lemon yellow, wash again thoroughly and then tone. Wash and fix. Hypo, 2 ozs.; water, 40 ozs.

The paper can also be toned in any bath, combined or separate; the following single toning platinum bath giving excellent results in black tones: Water, 20 ozs.; pot. chloro. plate, 15 grains; acid phosphoric 1120, 2½ drams. Print not too deeply, and wash well in three or four changes. Tone until the picture is blue black, wash very thoroughly and fix in hypo 2 ozs., water 40 ozs.

Commercial & Legal Intelligence

Messrs. Elliott and Sons, Ltd., of Barnet, have sent us a sample set of their new season's show cards and specimens. Prints on the firm's various papers are mounted on tastefully designed supports, in monochrome and colour. Each card is very artistic, attractive, and striking. Dealers may have a supply of the cards gratis on application.

Mr. W. E. Dunmore, of the New Auction Mart, 33, Gerrard Street, Shaftesbury Avenue, W., informs us that he has received instructions to offer by auction the stock of a wholesale photographic dealer. The stock includes N. and G., Shew, Adams' de Luxe, Reflex, Nydia, Kodak, Tella, and Klito cameras; a large number of all makes of stand cameras; Ross, Cooke, Dallmeyer, and other lenses; backgrounds, enlargers, lanterns, cinematographs, phonographs, and optical goods. The sale takes place at 5 p.m. on October 1st.

The "P.P.A." and Fire Insurance.—Many members of the Professional Photographers' Association, while desirous of taking advantage of the facilities offered by the Association for securing a reduction in their fire insurance policies, having expressed a preference for treating direct with the Fine Art Insurance Company, the following notice has been issued:—"Professional Photographers' Association. Re fire insurance. Dear Sir,—I beg to inform you that the committee have arranged that members can send their policies direct to the Fine Art Insurance Company, if they apply to Mr. Alfred Ellis, Hon. Sec., 51, Baker Street, W., for a signed proposal form.—Yours faithfully, Alfred Ellis, Hon. Sec." The committee had not foreseen the possibility of objection to effecting insurances through the executive of the Association, and have taken the earliest opportunity of meeting the wishes of members in the matter.

The Warwick Competitions.—The following is the list of awards of the Warwick Competition for the current month:—£1 prize: E. Collingwood Pitt-Johnson, 4, Lambridge, Bath, "A Village Home"; £1 prize: Wm. Henderson, 43, Church Street, Chepstow, Mon., "Chepstow Castle"; £1 prize: Russell Hiron, 33, New Buildings, Grosvenor Road, London, S.W., "Canadian Arch, Illuminated"; £1 prize: A. J. Jepling, 2, Hyverlog Street, Cardiff, "In the Mer de Glace"; £1 prize: T. T. Mathias, 2, Priory Street, Cardigan, "Paddling"; £1 prize: Charles Medhurst, 29, Park Place, Cardiff, "Bunch of Grapes"; £1 prize: Alfred Shaw, 296, Stamford Street, Ashton-under-Lyne, "The Woodman"; £1 prize: Reginald A. Silk, Royal Naval Sick Quarters, Portland, "X-ray Photograph of needle in finger"; £1 prize: Miss A. M. Walters, Forthampton Vicarage, Tewkesbury, "Harvest"; £1 prize: J. A. Wilson, Knowlhead, Ballymena, "A Dog Jumping."

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Sept.	Name of Society	Subject.
23	Croydon Natural History	*Rotograph Papers.* Mr. Sims.
29	Southampton Camera Club	Ramble Print Competition and presentation of Medals and Certificates by the President.
Oct. 2	London and Provincial	Discussion upon the Fading of Albumized Paper.
2	Liverpool Amateur	*Enlarged Negative Making.* Mr. Anyon.

ROYAL PHOTOGRAPHIC SOCIETY.

[From the "R.P.S. Journal."]

Notices.

Saturday, September 27th.—There will be a private view of the Forty Seventh Annual Exhibition at the New Gallery, 121, Regent Street from 11 a.m. to 4 p.m., and in the evening commencing at eight o'clock a conversazione at which members, exhibitors, and their friends will be received by the President and Council.

Monday, September 29th.—The exhibition will be opened to the public. Members will require their cards of membership to secure admission. The doors will be open daily from 10 a.m. to 6 p.m. until Tuesday, November 4th, and on Monday, Thursday, and Saturday evenings from 7 to 10 o'clock.

The Society's dinner takes place at the Cafe Royal, Regent Street, at 7 o'clock. Applications for tickets (half a guinea) should be promptly addressed to the secretary.

Tuesday, October 7th.—First informal meeting at 66, Russell Square at 8 p.m.

Tuesday, October 14th.—Ordinary meeting, at 66, Russell Square.—At this the first ordinary meeting of the session, the President, Mr. Thomas R. Dallmeyer, F.R.A.S., will deliver his annual address and present the medals awarded by the judges at the forthcoming exhibition.

Tuesday, October 28th.—Technical meeting, at 66, Russell Square.

Lockers.

For the convenience of those members who make frequent use of the dark rooms and enlarging room, and consequently desire to have their chemicals upon the premises, the Council have installed a number of lockers capable of enclosing bottles, materials, and apparatus of large size. These lockers will be let to members who make application to the secretary at the nominal annual rental of 2s. 6d., payable in advance. In this connection it should be stated that the Society will not be responsible for material left upon the shelves or about the rooms, a practice which the House Committee intend to discourage as much as possible. Those who find it convenient to leave their chemicals, etc., behind will therefore do well to engage the lockers that have been provided.

CAMERA CLUB.

The following extracts are taken from "The Journal of the Camera Club" for September:—

"It is with great regret that we have to announce the loss through death of two of our members. Mr. James William Groves was Professor of Botany at King's College, and will be recollected by many members by the interesting and graphic lecture he gave us upon 'Japan.' Although not well known to the generality of members, owing to his infrequent visits, being a country member, those who had the pleasure of his acquaintance highly appreciated him as being a well-informed, well-travelled, and most pleasant companion. Our other member, Mr. Arthur Kennedy, was drowned while bathing at Bacton. He was a Fellow of the Royal Astronomical Society, and a frequent attendant at the club, especially when the subject of the lecture was the one in which he was deeply interested, and we have frequently been indebted to him for the assistance he gave in the discussions by his able and lucid remarks.—It will interest our members, and especially his numerous friends in the club, to hear that, on July 14th, at St. James's Palace, H.R.H. the Prince of Wales (Grand Prior of the Order of St. John of Jerusalem) presented Colonel Richard Holbeche (who is a Knight, and the Librarian of the Order) with a special South African medal for conspicuous services to the ambulance department in connection with the mobilisation of the detachments of the St. John Ambulance Brigade who proceeded on active service to South Africa, and with the despatch of ambulance material and medical comforts for the sick and wounded troops at the seat of war. Colonel Holbeche has been for many years a member of the committee of the club, but has felt obliged to resign, as he finds that his duties as Librarian of the Order, and his recent election upon the committee of the Army and Navy Club, of which he has been a member for more than twenty years, will not allow him to devote the time that he would wish to the affairs of our club. He assures us, however, that he will continue to do all that he can to assist in promoting the *bon camaraderie* and prosperity of our club in the future as he has so cordially done in the past.—We have pleasure in announcing that during the forthcoming season a new attraction will be added to the Camera Club for those of its members who care for a serious game of whist. A year ago some old whist players who, owing to the invasion of 'Bridge,' found difficulty in getting a table at their clubs resolved to make an effort to preserve the old game by founding a club, limited in numbers, from which 'Bridge' should be excluded. The success which met their efforts shows that their action filled a want, and 'The Ferry Club' is now an established institution. It has arranged to play on

Wednesdays in our club house from 5 p.m., and it is hoped that many of our members who are qualified players will take the opportunity of joining. Mr. Henry E. Davis, the treasurer of the Ferry Club, will gladly furnish inquiring members of the Camera Club with further particulars.—The influence of the club is far reaching, and there is hardly any branch of abstract or applied science, physics, or mechanics in which some one of our members does not play a prominent part. In our last number we had the pleasure of recording that our most popular member, Mr. Gamble, the second officer of the London Fire Brigade, had received the Order of the Red Cross from the German Emperor. Mr. Gamble, however, is not our only fireman. The chairman of our committee, Mr. H. Thomson-Lyon, who was over last week at the French National Fire Brigade Competition at Caen, has received from the Maire of Moret-sur-Loing a warm letter of thanks for the assistance he had rendered to the Company of Sapeurs Pompiers of that town. Although Moret possesses but 2,000 inhabitants, its fire brigade is one of the best organised in France, and at the Caen trials it carried off the three principal prizes. Moret lies about 1½ hours south of Paris, is within a couple of miles of Fontainebleau, and those of our members who seek a picturesque situation, combined with good and economic living, might do worse than spend a week there.—One of our oldest members is Mr. S. L. Hinde, who is now Assistant Commissioner in the East African Protectorate. Popular as he is, and deservedly so, among all who know him in his various capacities, as a surgeon, a soldier (for he was in the service of the Congo Free State and retired as captain after several years of hardship and hard fighting), as the author of 'The Fall of the Congo Arabs' and 'The Last of the Masai,' as a sportsman who has contributed some of the finest specimens of large game to the Natural History Museum, and lastly, but not least, in our estimation, as a most enthusiastic supporter of our club, it gave his friends a sort of melancholy satisfaction to be able to entertain him as their guest on the eve of his departure for a further period of duty abroad. The other guest of the evening was Mr. Routledge, who has been for some time a most energetic and useful member of the committee, and who has resisted the charms of India, and even the Vale of Cashmere, in order to place himself under the auspices of Mr. Hinde, in hope that he will be able to prove himself as great a *shikari* and return with the *spolia opima* of a true sportsman, and also of a skilled photographer."

BRECHIN.

The members of the Brechin Photographic Association held their annual meeting on Wednesday evening, Mr. J. Kirk, President, presiding over a large attendance. The treasurer's report showed a considerable balance at the credit of the Society. The secretary in his report stated that the outstanding feature in the year's work was the large increase of the membership, which clearly proved that during the year a practical resuscitation had taken place. Last year there were 25 members, compared with 55 ordinary and 11 honorary members at present, showing a gain of 41 for the year. It was also stated that a stimulating and instructive feature had been introduced in the form of a circulating portfolio. All the present office-bearers were re-elected, and Messrs. D. Watt, J. Steele, G. Douglas, and W. Dunn were added to the Council. Mr. Ross moved that it was desirable for the purposes of mutual help to form a union of the local societies, and that the secretary be instructed to communicate with the Dundee and East of Scotland Association as the senior body, asking them to take the first steps. This was unanimously agreed to.

NORTH MIDDLESEX PHOTOGRAPHIC SOCIETY.

September 17th.—

Mr. F. A. Haylett gave a practical demonstration on "Enlarging."

He passed round samples of negatives which he considered of the right density for the process. Those which were too thin for printing in any other process were eminently suitable for enlarging, provided they were full of detail. Hard negatives would not give good enlargements.

He used an optimus lantern, and the illuminant was acetylene gas, the generator being home-made. The exposure for the bromide paper was gauged by exposing a strip in sections for 10, 20, 30 seconds; 25 seconds was considered correct for the negative used, enlarging from ¼-plate to 15 x 12. Rodinal was the developer used, ½oz. to 12oz. of water. The resulting enlargement was successful.

He also exhibited a sketch showing how an optical lantern was not necessary, provided one had a condenser and camera. It showed a large box to contain the illuminant; in one side the condenser was fitted, and the camera with negative in place of the ground-glass screen was placed on a support outside, against the condenser. The same lens used for taking the negative could be used, if it was of a rapid type.

New Books.

"Photographic Faults and Failures: Their Cause and Cure." Price 2d. With 24 illustrations. Compiled and arranged by Rev. F. C. Lambert, M.A., Ashstead, Surrey. Published by Cadett and Neall, Ltd.

A veritable multum-in-parvo, and worth a good many twopences. The author seems to have set himself the task of discovering every possible way in which the photographer can blunder in his work up to the stage of the finished negative, and provides a remedy for every ill to which the plate or film is heir. The illustrations are exceedingly instructive, and the booklet is undoubtedly a useful compilation.

"Photography as a Fine Art." By Charles H. Caffin. 192 p.p., illustrated. Price 10s. 6d. London: Published by Grant Richards, 48, Leicester Square.

The title of this book is not well chosen. Properly it should be: "An Appreciation of the value of some American photographers and one Scotchman." The latter is Mr. J. Craig Annan; the former, Mr. Steiglitz, Mr. Keiley, Mrs. Kasebier, Mr. Clarence White, Mr. Steichen, and one or two others. An author who undertakes to examine the claims of photography to be considered as a fine art should give evidence of being qualified for his task. First of all he should know the history of his subject. Mr. Caffin does not; or, if he does, he is guilty of some unpardonable omissions. Has he never heard of the work of Hill and Adamson, Reylander, Robinson, Adam Salomon, Julia Margaret Cameron, P. H. Emerson? These were eminent students and professors of pictorial photography before the advent of a handful of ebullient Americans. Again, the historian should be accurate. Mr. Caffin gives an entirely erroneous account of how the Photographic Salon came to be formed; and repeats the tiresome fable that the R.P.S. showed itself inimical to progressive pictorial work. The evidence is conclusively against Mr. Caffin and others of his kind. We fear that our author has only very perfunctorily gone over the ground he so daringly set himself to traverse. He writes pleasingly of the photographers whose work he illustrates, and perhaps ascribes too great an influence to the work of Mr. Craig Annan, whose fine photographic qualities, which are partly referable to the nature of his environment, we nevertheless freely recognise the book as a whole gives us the impression of having been undertaken in a moment of unreflective enthusiasm, for the treatment of the subjects is quite casual, and unscientific. Boiled down it would make a passable magazine article; but in professing to examine a question that has exercised men's minds for at least half a century, it falls enormously short of its possibilities. Finally, for Mr. Caffin's special edification, we may say that there no longer exists the smallest necessity for such a book—at any rate in Europe, where, according, it appears to us, every intelligent photographer has long since satisfied himself that it is absurd to claim for any kind of photography whatsoever the distinction of being a "fine art." The book is well produced; the illustrations are good, if unrepresentative; but we cannot resist the conclusion that it is a misfit in photographic literature.

"The Leeds Camera Club Syllabus and Exposure Note Book."

The preface to this useful little book is as follows:—"In bringing out this Exposure Note Book and Syllabus for the second time in its present form, it is hoped it will be of the same use and interest as the former one. Colour photography may appear to receive more than its due proportion in the syllabus, but at the present it is in such a form, both with regard to ease and cost of working, that more of our members might take up the study and practice with interest to themselves and fellow-members. The Infallible Meter Company and the Watkins Meter Company have again given us permission to use their latest tables, for which we heartily thank them; at the same time the officers and committee desire to thank all those who have in any way given their assistance in the compilation of this booklet." The quotation modestly outlines the scope of a production which does its compilers and the Leeds Camera Club a very great deal of credit. It is a decidedly useful pocket-book, full of sound information likely to help the photographer in his camera work. We congratulate the L.C.C. on doing something more for its members than opportunities for sitting and talking.

News and Notes.

It is with very great regret that we have to announce the death of Mr. John Birtles, who was formerly associated with the business management of this Journal and its "Almanac." The deceased gentleman, who died at Stapleford Abbots, Essex, on the 18th instant, in his 66th year, retired from business about four years ago. His connection with the Journal dated back to the year 1861, when the paper was published at Liverpool by the late Mr. Henry Greenwood. The funeral of Mr. Birtles, who leaves a son and two daughters (to whom we tender our sincere sympathies in their bereavement) took place at Havering, Essex, on Tuesday last.

Report of the Paris Observatory for 1901.—As usual, the annual report of M. Loewy contains much to interest the astronomer, both professional and amateur. It begins with reference to the determination of the solar parallax by means of observations of the planet Eros, in which our neighbours on the other side of the Channel have taken a prominent part among the fifty observatories in various parts of the world which have been engaged in this most important research. So far, it would seem that the details of the observations made in various parts of the globe have been published in a tabular form, and the meridian observations of stars of reference have been reduced, and the results issued in the shape of circulars from the French National Observatory. Paris seems to have been fortunate in obtaining a large number of photographs of the planet and its surroundings. No hint is given as to the final results deduced or deducible from the discussion of the great mass of observations so far as it has proceeded. The second item of interest in the report deals with the redetermination of the difference of longitude between Greenwich and Paris, the operations in connection with which would seem to have been zealously carried on; but here again we must await the publication of the final results. Incidentally there is a description of a very ingenious modification of the ordinary mercurial reflecting bath, by the aid of which a meridian instrument may be levelled, the nadir point determined, etc., which, originally invented by M. Hamy,

would seem to have been brought to perfection by M. Gautier. Then we learn that the last volume of the "Catalogue de l'Observatoire de Paris" is finished, embodying the results of 387,474 observations, and that 31 maps have been added to the Stellar Atlas of the observatory. After this the report goes on to speak of the photographic atlas of the moon of MM. Lœwy and Puiseux, of which several parts have appeared. It is only a week before writing these lines that I had my first opportunity of seeing this monumental work. For beauty and accuracy it has never been surpassed, nor, as far as I know, equalled. To the selenographer it must be simply invaluable. As I remarked last year, one misses the exquisite lunar heliogravure which used to form such a charming frontispiece to the Report. Of the mere routine meridian work, the photographic chart of the heavens, with its concomitant measures of the plates, of the Meteorological Department, the distribution of time, etc., I will not say more than that they show a perennial activity which must tend to preserve the position of the Paris Observatory among the chief and most efficient of those institutions. The Report well repays perusal.—A Fellow of the Royal Astronomical Society in "The English Mechanic."

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

THE AMSTERDAM EXHIBITION.

To the Editors

Gentlemen,—We are pleased to inform you that we received information to-day that we have obtained the highest award (Diplome d'Honneur) at the Photographic Exhibition, which is held in Amsterdam, and we shall be greatly obliged if you can find space in your valuable JOURNAL to announce this.—Thanking you in anticipation, We are, yours faithfully,

THOMAS ILLINGWORTH AND CO., LTD.

Willesden Junction, London, N.W.,
September 22nd, 1902.

THE LEEDS CAMERA CLUB.

To the Editors.

Gentlemen,—Herewith I enclose you an advance copy of the "Syllabus and Exposure Note Book" of the Leeds Camera Club for the session 1902-3.

I may also mention that anyone desirous of joining the L.C.C. can do so now at a reduced subscription of 3s. 6d, available for the rest of 1902, thus enabling them to attend all the lectures from the opening of the session.

I shall be glad to supply nomination forms and any other information to applicants.—Thanking you in anticipation, I am, dear sirs, yours faithfully,

F. G. ISSOTT,
Honorary Secretary.

62, Compton Road, Harehills, Leeds,
September 18th, 1902.

CIRCULAR P.O.P.

To the Editors.

GENTLEMEN,—We notice in this week's issue of your valuable journal an inquiry for circular P.O.P. We beg to say we can supply either P.O.P. or bromide paper cut to any size, for professionals or amateurs, in circles.—Thanking you in anticipation, we remain, yours obediently,

EDMEADS AND CO.

30, Burchell Road, Peckham, S.E.,
September 22nd, 1902.

[Messrs. H. and W. Green, of The Crown Photographic Manufactory, Rotherham, and other correspondents, write to the same effect.—EDS. B.J.P.]

PHOTOGRAPHY AS A FINE ART.

To the Editors.

GENTLEMEN,—Herewith I forward you a cutting from the "Daily Mail." I think it is a pity that people that know nothing whatever of our profession should run it down as they do. I have read Mr. Caffin's book, "Photography as a Fine Art," and to my mind he has proved beyond a doubt that photography *is* an art. I was arguing with somebody to-day, and they said, "Where does the art come in? It is all mechanical work," but I say, "No. It is not all mechanical. Is posing, is lighting, is retouching mechanical? No, certainly not." When he retorts, "You have a prepared surface on which to place your image, and chemicals to bring it out." "Yes," said I, "quite true, but the painter has his canvass, his palate, his paints, the image, whatever it be, is put there by his brain; so is the image we photograph." Now, my motive in addressing you is to ask if you cannot do something through the medium of your valued B.J.P. to uphold the name photography holds, and, to my mind, is entitled to. Gentlemen, I hope you will not consider I am presuming in writing thus to you, but I love my profession, and, if I can help it, will not see it run down.—I am, gentlemen, respectfully yours,

F. V. C.

September 15th, 1902.

"The American invasion of our London photographic exhibitions has been promptly followed up by a bulky and pretentious attempt at justification of their methods in the shape of a volume by Charles H. Caffin, entitled 'Photography as a Fine Art' (Grant Richards.

"We have heard much of 'art photographers,' but the 'Fine Art Photographer' is entirely an American invention. It is useless to try to convince these manipulators of the camera that a 'faked' photograph is, at the best, only a very inferior imitation of a work of art, and that a photograph can only be artistic when it is frankly mechanical—an apparent paradox the truth of which has, however, been admitted by many of our best photographers. The American attempts at photographing the 'soul' of the sitter, and of scratching upon photographic prints to make them look like etchings, or crayon drawings, or anything rather than what they are, are nothing short of ridiculous.

"The examples chosen as illustrations for the book include many attempts of this kind, though the most extreme cases have been carefully omitted. M. Robert de la Sizeranne has tried in vain to prove that photography is an art, and Mr. Caffin had an even more hopeless task in trying to convince us that it is a 'fine art.'

THE PLATINOTYPE DEMONSTRATIONS.

To the Editors.

Gentlemen,—Referring to the notice which you kindly inserted in last week's JOURNAL *re* demonstrations of our process, and of the working of our oxy-magnesium lamp during the exhibition of the Royal Photographic Society at the New Gallery by Mr. W. H. Smith, we shall be glad if you will kindly correct same, substituting "Monday" for Tuesday, the evenings on which these demonstrations will be given being Monday, Thursday, and Saturday.—Thanking you in anticipation, we are, dear sirs, yours faithfully,

THE PLATINOTYPE COMPANY.

22, Bloomsbury Street, New Oxford Street, London, W.C.
September 23rd, 1902.

A LOST CAMERA.

To the Editors.

Gentlemen,—A tourist, a week since, had the misfortune to be robbed of all his luggage at Perth, and among other things of a 5 x 4 Goerz-Anschutz folding camera fitted with the Goerz double anastigmat, series III., No. 1, No. 108,779. May I ask you to kindly publish this note in your next issue, in order that any dealer or photographer having this camera offered to him may communicate either with the Perth police or myself.—Yours faithfully,

C. P. GOERZ.

4 and 5, Holborn Circus, London, E.C.,
September 23rd, 1902.

THE R.P.S. DINNER.

To the Editors.

GENTLEMEN,—I shall be glad if you will allow me, through your columns, to remind our members and friends that the Society's dinner is fixed for Monday, September 29th, at the Café Royal, Regent Street, at 7 o'clock, and to ask those who intend to take part, but have not yet signified their intention, to let me know at the earliest possible moment.—I am, dear Sirs, yours faithfully,

A. W. W. BARTLETT,
Secretary.

66, Russell Square, London W.C.,
September 20th, 1902.

DARK-ROOM BENCHES.

To the Editors.

GENTLEMEN,—We can testify to the efficacy of the treatment of dark-room benches with the special solutions referred to in your notes on this subject in a recent number of BRITISH JOURNAL.

Our chemical laboratory benches have been coated with these same

1902.

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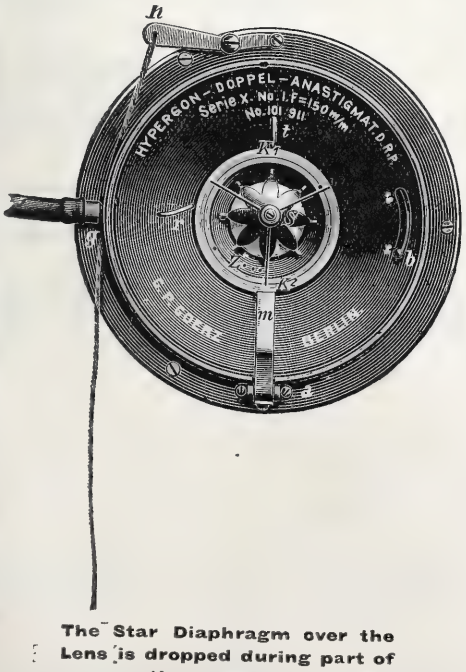
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The Star Diaphragm over the Lens is dropped during part of the exposure.

SPECIAL LENS

for wide-angle interiors, architecture, landscapes, panoramic views, etc. The angle of this new lens (135°) entirely surpasses that of every other special wide-angle lens. The circle of illumination is extremely large, a plate is covered by the HYPERGON DOUBLE ANASTIGMAT of a focus equal to one-fifth of the plate's diagonal, or one-fourth of its base. With all other special wide-angle lenses, under the most favourable circumstances, the base of the plate is only equal to twice the focus.

Astigmatism and curvature are, over the whole of the angle, entirely removed; the sharpness even to the corners of the plate is consequently excellent.

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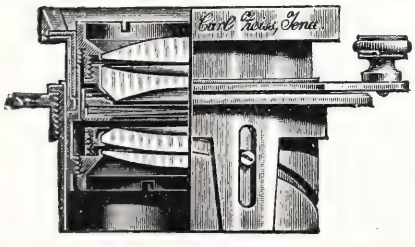
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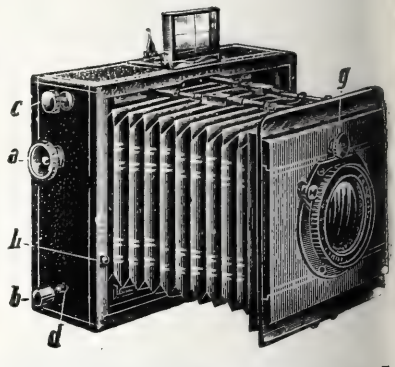
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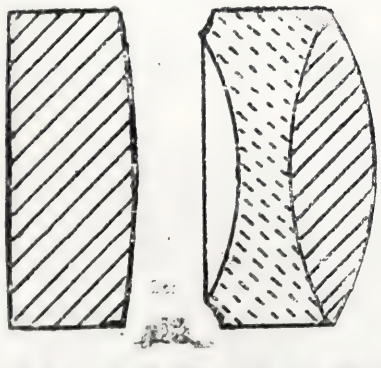
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Amateur Photographer, May 22nd, 1902.—"The definition . . . is telescopic even at full aperture $f/6$."

British Journal of Photography, May 9th, 1902.—"If we take the three essentials for a good hand camera lens—rapidity, fine definition, and covering power—the lens will commend itself as a satisfactory compromise."

ALDIS BROS., 13, Old Grange Road, Sparkhill, Birmingham.

olutions for the last seven years, and have proved most satisfactory.
-Yours faithfully,

ELLIOTT AND SONS, LTD.

September 12th, 1902

THE "TEB" COMPETITION.

To the Editors.

GENTLEMEN,—By same post we are sending you a box of our Teb" competition photo Christmas cards, together with particulars f the competition, and hope that you will be able to notice them the next issue of your valuable journal.

Thanking you in anticipation, and for past favours.—Yours ithfully,

CHARLES TYLER AND ENGLAND BROS., LTD.

79, Copenhagen Street, Caledonian Road, King's Cross,
London, N., September 18th, 1902.

Ve append particulars and rules of the competition.—ED., B.J.P.]

LIST OF PRIZES.

Half-plate.—First, £5 5s.; second, £3 3s.; third, £2 2s.; and venty of 21s., £21.

Cabinet.—First, £5 5s.; second, £3 3s.; third, £2 2s.; and venty of 21s., £21.

Five by Four.—First, £3 3s.; second, £2 2s.; and fifteen of ls., £15 15s.

Bullet or 3½ by 3½.—First, £3 3s.; second, £2 2s.; third, £1 10s.; nd fifteen of 21s., £15 15s.

Quarter-plate.—First, £5 5s.; second, £3 3s.; third, £2 2s.; and hirty of 21s., £31 10s.

C.-de-V., Nipper 2, or 3½ by 2½.—First, £3 3s.; second, £2 2s.; nd fifteen of 21s., £15 15s.

Scout 2, F.P.K., Memo Frena, 3¼ by 2¼, or Brownie 2.—First, 3 3s.; second, £2 2s.; and fifteen of 21s., £15 15s.

Scout 1, Brownie, or 2¼ by 2¼.—First, £2 2s.; second, £1 1s.; and venty of 10s. 6d., £10 10s.

Nipper 1, Bantum, or Pocket Kodak.—First, £2 2s.; second, 1 1s.; and twenty of 10s. 6d., £10 10s.

Midget.—First, £2 2s.; second, £1 1s.; and twenty of 10s. 6d., 10 10s.

Making a total of £231 9s.

RULES.

1.—The "Teb" photo Christmas card competition is free to all hotographers, amateur or professional. Prints by any process may e submitted, and the subjects can be of any description, as each class f subject will be judged on its merits.

2.—All prints must be mounted on or in one of our "Teb" hoto Christmas cards taken from box purchased.

3.—Prints which have been entered for competitions before and ave won prizes will not be eligible for this competition.

4.—A coupon will be included in each box of cards, which must e filled in and forwarded with the print. It must be quite under-ood that only one print can be submitted with each coupon. If the ount is of a paste-on-type, the coupon must be pasted on the back f the mount. If a slip-in mount is used, the coupon must be pasted n the back of the print and inserted together in the mount.

5.—For prints which are required to be returned, there will be ound a space on the coupon in which to mention same, and a amped addressed envelope with the number of the coupon and size f print distinctly marked on the outside, must be enclosed with the rint to ensure the return of the correct print without delay.

6.—In all cases the decision of the judges shall be regarded as final nd without appeal.

7.—Any number of prints can be submitted by each competitor, but ach print must bear a coupon. Competitors cannot obtain more than ne prize for any one size print, but may compete for prizes in ach size.

8.—All winning prints become the property of Messrs. Charles yler and England Brothers, Limited, together with the right to re-roduce them, but none will be returned unless stamped addressed nvelopes are sent.—(See Rule 5.)

9.—Prints must be received by Messrs. Charles Tyler and England Brothers, Limited, 79, Copenhagen Street, King's Cross, London, N., ot later than December 24th, 1902, and the small label attached to oupon must be pasted on the outside of wrapper.

10.—The result of the competition will be published during the first ourteen days in January, 1903, in the "Amateur Photographer," BRITISH JOURNAL OF PHOTOGRAPHY, "Photography," and "The Photographic Dealer."

JUDGES.

R. Child Bayley, Esq., Editor of "Photography"; Thomas Bedding, Esq., Editor of THE BRITISH JOURNAL OF PHOTOGRAPHY; Arthur C. Brookes, Esq., Editor of "The Photographic Dealer"; A. Horsley Hinton, Esq., Editor of "The Amateur Photographer."

C.C. PAPER.

To the Editors.

GENTLEMEN,—The troubles with C.C. paper which your correspondent, "Othello," puts before you in the JOURNAL, September 19th, are very real and perplexing. I have used a well-known brand of paper for some time, and succeed in obtaining some beautiful results, both red and black; but at times things go wrong, and spots appear upon mounted and finished prints only.

Only lately I sent home a batch of pictures, quite free from surface blemish when they left my studio, but, the family being away for holiday, the parcel remained unopened for about three weeks. A few days after the return to town of my customers the pictures were returned to me, covered in spots (as per sample of the packet enclosed), with the request that I would furnish some explanation.

One remedy for this complaint is, thoroughly wash between each operation, and let the pictures be perfectly dry before packing.

There may be other remedies, and I, with "Othello," should be glad to know them; but I have found this a cure in some cases.—Very truly yours,

LANG SIMS.

437, Brixton Road, London, S.W.,
September 22, 1902.

PHOTOGRAPHIC FETISHES.

To the Editors.

GENTLEMEN,—In an article entitled, "On Some Photographic Fetishes" in your issue of September 19th, it is stated: "If there be an absolutely inexpugnable statement in photographic technics, it is that depth is not a function of any particular form or material of construction of a lens, but is solely governed by the relation of effective aperture to focus." As a matter of fact, this "inexpugnable statement" is itself an obsolete fetish, for, in addition to effective aperture and focal length, the position of the stop relative to the nodes of the lens is now known to be a factor governing depth. As a consequence, lenses of the same focal length and aperture may give different depth; thus, a telephoto lens has greater depth than a rectilinear of equivalent aperture and power, while a rectilinear has greater depth than a similarly equivalent lens of "single landscape" construction. In the latter case the differences are extremely small, excepting with very near objects; but, nevertheless, they exist.

Another factor affecting depth is the quality of the definition, which also depends on constructional features. Depth formulæ are all based on the hypothesis that a lens produces a perfect point image from a point object; but no lens does this. At the best, the image of a point is a disc, the size of which depends on the degree of correction attained, and the larger the disc the less is the available depth, assuming that depth is limited by a certain amount of permissible confusion of focus. For example, if we take 1-100th of an inch as the diameter of the largest allowable circle of confusion and the lens is so poor as to be incapable of producing a smaller disc, it is obvious that there can be no available depth at all.

The characteristic feature of a modern high-class lens is good marginal definition, and, as depth is a matter of importance principally in the case of objects near the margin, it stands to reason that a good lens will give a more serviceable amount of depth than a poor lens. Depth in the centre of the plate is not a matter of any great consequence, but with an indifferent lens the centre is the only spot in which any appreciable amount of depth is likely to exist with a fair-sized aperture.

With reference to the use of single lenses for architectural work, I quite fail to see that a belief in the utility of rectilinear lenses is of the nature of a fetish at all, and only wish that absolutely rectilinear lenses were more generally available. The curvature of a straight line is evidence of distorted proportions, but the effect of curvature is not always apparent until the distortion is considerable. The simple fact that little or no curvature is evident in a result produced by a single lens does not by any means prove that the photograph is satisfactory as an architectural record. Architects generally have small faith in the accurate drawing of trade photographs, and their little faith is not likely to be increased if they are encouraged to believe that photographers do not as a rule take all reasonable precautions to guard against distortion.—Yours, etc.,

C. WELBORNE PIPER.

September 20th, 1902.

*** NOTICE TO THE TRADE, WHOLESALE AGENTS AND BOOKSELLERS.—*A Contents Bill is issued with each number of the* JOURNAL, *and copies may be had on application to the Publishers.*

*** NOTICE TO ADVERTISERS.—*A Revised Tariff for advertisements in the* JOURNAL *is now in force. Blocks and copy are received subject to the approval of the Publishers, and advertisements are inserted absolutely without condition, expressed or implied as to what appears in the text portion of the paper.*

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY, 24, *Wellington-street, Strand, London, W.C." Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

PHOTOGRAPHS REGISTERED :—

H. W. Hood, The Willows, Linthorpe, Middlesbrough. *Photograph of a baby at a typewriter.*

E. Gray, 39, Wide Bargate, Boston, Lincs. *Photograph of St. Botolph's Church, Boston.*

H. R. Mehew, Lynn Road, Wisbech. *Photograph of E. Miles.*

SITUATION WANTED.—J. W. B. writes: "I wish to obtain a situation in Germany as retoucher. Will you kindly give me the name of the best German paper to advertise in for same?"—In reply: A list of the principal German papers is given in our ALMANAC.

SPOTS ON PRINTS AND NEGATIVES.—"PERPLEXED."—We can add nothing to what we told you in the previous reply. It is clear that, as some negatives out of the same batch of plates turn out spotty while others are free from defects, the spots are due to the manipulation, and not to the plates. Did you try filtering the water through flannel, as we suggested?

BROWN POSTCARDS.—A. C. Z. says: "Will you kindly give the formula for sensitising "vandyke brown" postcards, such as are sold in packets (Mallandain's)?"—In reply: We do not know the formula by which Mr. Mallandain prepares his postcards, as he has not published it, and it is not very likely that he will do so. Possibly, for a good fee, he would supply you with it.

DARK VIGNETTES.—"VIGNETTE" asks: "Will you kindly inform me if a special vignette frame is required to procure photos as enclosed? If so, will you please state how they are done?"—In reply: There are different ways of producing dark vignettes. They may be vignetted in the camera, or done by double printing. If you refer to page 163 of our volume for 1901, you will find an article on the subject.

INSURING NEGATIVES.—H. SYMONDS says: "I want to have some valuable negatives enlarged. There is great danger in their being broken in transit, or in the enlarger's hands. Is there any way of insuring them?"—In reply: The railway company will insure the negatives during transit. Possibly some of the insurance companies will grant a "floating policy" on them that will cover the risk while in the enlarger's hands, but we are a little doubtful.

"AMICUS."—The only thing we can suggest is that your friend's daughter apprentices herself to a good photographer to learn the business, or such part of it as she desires to follow. If no premium is paid services must be rendered in lieu of it. We should say that probably a couple of years would be expected at, perhaps, a very small salary. Better consult the advertisement columns of the JOURNAL. We may as well tell you, as you will see from them, the labour market is already overstocked with lady assistants.

VARNISHING PRINTS.—H. MANDSELL says: "A customer of mine recently asked me if I would varnish an album of photos, which were taken in India, and were beginning to fade. He had been told in the letter accompanying the photos that if he took them to a photographer and had them varnished it would preserve them. I have never heard of such a process. Can you advise?"—In reply: The prints may be varnished with a varnish such as is employed for maps and the like. It may be obtained from most artists' colourmen. But we may tell you that it will have but little effect in arresting the fading of the pictures.

SPOTTY PRINTS.—"SPOTS" writes: "I enclose a couple of pieces of P.O.P. paper, and you will notice some spots, of which I have had a good many lately, and can't discover the cause. I use the sulphc-cyanide toning bath, usual formula. If you could give me any idea of the likely cause of them, should be awfully obliged. They seem to start in the toning bath."—In reply: The spots are caused by particles of matter that have come in contact with the prints while they are wet, and so reduced the silver. It rather looks as if there were particles of iron rust in the water in which the prints were washed prior to toning.

EBURNEUM.—"MINIATURE" asks: "Will you be kind enough to inform me by what process is the little miniature (now enclosed) made? And do you know of any firm doing this class of work, and what would be about cost? I have an order for a dozen from two prints, and my clients want something better than the bromide enamelled process."—In reply: The picture is by the eburneum process, introduced many years ago by the late Mr. Burgess, of Norwich. It is a collodion positive (taken from a negative), backed with a mixture of gelatine and zinc white, and when dry stripped from the glass. The picture has been returned, as desired.

PURCHASE OF BUSINESS.—"ARTHUR" says: "I am anxious of opening a studio, and think it best to purchase a going concern. Would you be good enough to let me know what amount of capital it would be advisable to sink to purchase a business showing net profits about £150 to £200 a year? I should do my own operating and retouching, and want to do a good-class business; cabinets 21s. or 15s. a dozen."—In reply: If you consult our advertisement columns you will be able to gather the market price of such a business as you require. On page 585 ante you will find an article "Some Points in Connection with Goodwill," that will give you useful information.

SPIRIT PHOTOGRAPHY.—J. W. P. says: "(1) I enclose a cutting from the "Two Worlds" about the photographing of a spirit. I am rather interested in it, if it is possible. I understand that Sir Wm. Crookes has successfully experimented. It is hard to believe such things are possible. I don't mean an imitation of a spirit, but a reality. A reply to this will be greatly acknowledged as a favour. (2) What is the meaning of lenses named as 1B, 2B, 1A, 3D, etc.?"—In reply: (1) It is the first time we have heard that Sir Wm. Crookes has been successful in taking spirit photographs, and we very much doubt its correctness. We have seen many so-called "spirit photographs," but all we have seen we have put down as frauds, and most of them very clumsy ones too. (2) The terms are those used by Mr. Dallmeyer to designate the different kinds of his lenses. They are merely trade terms.

PHOTOGRAPHY AT NIGHT.—S. A. C. says: "I should be glad if you could give me some idea as to the best illuminant for taking an instantaneous photograph of a large concert room with audience and performers? I have the opportunity of taking such a group, but am a little in the dark as to whether it can be done successfully without expensive apparatus, not having touched this side of photography. It would be a good advertisement if successful; but as I have but recently started in business, would rather keep out of it if it was likely to be a failure."—In reply: If electric arc lights are not available, you must employ flash lights—rightly distributed. If you have had no experience in this direction, you must not be too sanguine of success in the first attempt. Better make some preliminary trials the night before the picture has to be taken. We do not undertake to answer correspondents by post.

AN UNSATISFACTORY TRANSACTION.—M. O'GORMAN writes: "Could you inform me what redress I have against ——— and Co., of ———, to whom I sent a number of stereoscopic films for development? Half the negatives were returned to me ruined by being cut through (one of the stereoscopic pictures being in each case cut in half). Some of the negatives which were not cut were spattered with mud. The delay in execution has lasted now for many months. The negatives were important, and I had to put the matter in the hands of a solicitor. When the negatives were sent they were spoilt, as described."—In reply: As you have already placed the matter in the hands of a solicitor, he, knowing all the circumstances of the case, can advise you better than we can. On the price lists of those who work for the trade there is usually a notification that they will not hold themselves responsible for any accidents that may happen to negatives while the work is being executed.

STUDIO BUILDING.—"STUDIO LENGTH" says: "I am about to open another studio in connection with my own here, and have selected excellent premises, but am met with the usual difficulty of studio building. The only place possible to convert into a studio is a room on the first floor, and I feel very uncertain about it, as I cannot get the top light. It is my intention of glazing the greater portion of the length by removing two windows and carrying the whole two feet forward, as I will try to define by sketch. I would like to know if in your opinion it will be at all satisfactory? I have been accustomed to surmount difficulties in lighting in the studio, having worked in some difficult ones. But my own here is very convenient, having had it built to my own liking, and I have a length of 42 feet. In the new one I would only be able to get 20. Do you think this enough for general work? I am afraid I will take rather badly to it now; but, then, one has to make the best of circumstances."—In reply: So far as we can judge from the sketch (though the height, and aspect, of the proposed studio is not given), we should say that good portraits could be taken in it; particularly as you say you have already had to surmount difficulties in lighting. Twenty feet is certainly short for a studio for professional work. If you could possibly increase the length it would be a great advantage.

The British Journal of Photography.

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THE BRITISH JOURNAL OF PHOTOGRAPHY.

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*** *The Editor can only be seen by appointment.*

*** *We do not undertake to answer letters by post.*

THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC FOR 1903.

Edited by Thomas Bedding, F.R.P.S.

The forty-second annual issue of The British Journal Photographic Almanac will be published early in December next. This year's Almanac reached a total of 1,560 pages, and the entire edition of 20,500 copies was sold out a fortnight before publication. Of no other photographic book ever issued can two such unique facts be recorded.

The edition for 1903 will be increased to 25,000 copies, a large number of which are already ordered.

The striking favour with which past Almanacs have been received is the surest proof that the lines upon which the publication is produced meet the requirements of its readers and supporters. Upon such lines we propose compiling the volume for 1903. At the same time, we shall be pleased to receive and consider suggestions for increasing the value of the Almanac in directions which may occur to our readers as susceptible of improvement.

The Almanac for 1903 will appeal to photographers all the world over as a daily reference guide in practical work. The standard matter and formulæ will be revised and added to where necessary, and the latest departures in theory and practice will be chronicled. The year's advances will be recorded, and wherever practicable new features of an informative nature will be added.

Secretaries of societies will oblige us by promptly forwarding lists of officers and other details for inclusion in the directory of photographic societies. We shall also be glad to receive any additions that may be made to the list of telegraphic addresses of the trade, etc. As usual, a section of the Almanac will be devoted to notices of the latest introductions in photographic apparatus, etc. Those firms who wish to take advantage of this feature should communicate with us not later than Ocober 31.

The publishers ask us to remind advertisers that many of the advertisement pages of the Almanac are already booked, and that, to ensure insertion and good positions, orders and copy should reach them without delay.

EX CATHEDRA.

Protective Colouring. It is curious to note how constantly man, with all his boastful powers, is obliged to hark back to the ways of Dame Nature, and humbly plagiarise her works. The adoption of kharki as the right colour for military uniforms on the veldt of South Africa is simply a copy of what Nature has been doing ever since the world began. She has given the animals, both beasts and birds, whose lives were passed on the desert sands of Egypt, a sand-coloured clothing of fur and feather, while in the Arctic regions their uniforms are white as snow. This protective colouring in mimicry of their surroundings is a well recognised trait of animal life. The naval lords have now determined to give all the battleships a coat of grey paint, in protective mimicry of sky and sea, and this certainly is a move in the right direction. But, as all photographers know, much will depend upon the natural lighting of those warships whether the coat of paint prove really effective for the end in view. With a bright sky at their back they will look, under certain conditions, quite black; while, should the sky be murky and the light full upon them, they will stand out almost white in tone. Nature has arranged matters very cleverly in the case of various sea birds, who are grey above and white underneath when their bodies only receive the lesser reflective light from the water, so that they will often appear of a colour so like their surroundings that they are all but invisible. On grey days our grey warships will be pretty safe, but their new coat of paint will not suit other climatic conditions much better than did their old colouring.

* * *

Fakements. Much misdirected ingenuity has been expended upon the business of making the product of a photographic negative as unlike a photograph as possible.

Recently we culled another fake from the pages of that excellent journal, "The Scientific American." The article to which we refer is entitled, "Some Modifications of the Normal Photograph," and directions are given by which a sharply focussed image may be blurred, and tiresome detail eliminated. In the first place, the double back of the camera should be of the American pattern in which the shutter slides right out of its grooves. This operation having taken place, and while the cap is yet on the lens, a translucent shutter made of dulled celluloid is slid in front of the sensitive plate. A piece of round glass will answer the same purpose, which is to produce a negative such as one would obtain by shifting the lens out of focus. It is also recommended that this translucent screen may be placed at different distances from the plate, according to the effect desired, finer details being eliminated, and breadth secured. Another effect is obtained by placing over the sensitive plate a thickness of fine, thin muslin, stretched over a frame of common tin, or thin brass plate, the frame being placed in the holder along with the plate. We are further told that a lantern slide produced from such a negative, and well coloured, appears on the screen more like a painting than a photograph. We feel that we must protest against this recommendation to sophisticate the photographic negative. If a sharp image is objected to, the celluloid, ground glass, or muslin can be interposed between negative and paper in the printing frame, leaving the beauties of the original image unimpaired. If detail in pictures is really so detrimental to artistic effect, the beauty of detail with which Dame Nature has adorned every tree and shrub must be equally so, and we ought all of us to wear spectacles, the glasses of which are covered with fine muslin or rendered semi-translucent by some other means, in order to correct her faulty handiwork.

* * *

Processes in the R.P.S. Exhibition and their Nomenclature.

It is interesting to note, year by year, the different processes by which the pictures passed by the Committee of Selection and shown at the Royal Photographic Society's Exhibitions are produced, more particularly in the pictorial section. For some years past the carbon and the platinotype processes have prevailed. This year carbon takes the palm, as there are, out of the 290 pictures shown in this section, 93 by this process, as against 85 by the platinotype process, with but 54 by the bromide. The "Gum" process shows an increase this year, as there are 25 by that, one of which is described as being "Pouncy's process." This leads one to ask if these are not all "gum," and "gum-bichromate" prints by Pouncy's process, though he gets but little credit for it by its present workers? This, in great measure, is due to the majority of them not knowing who was the real inventor of the gum process. Photographers in the Colonies who read these statistics must not assume that the processes represented at this Exhibition bear any relation to those by which the majority of the commercial work in the old country is produced, for it does not—therefore to them it might be misleading. According to the catalogue there are but four pictures described as being in silver, yet there is no question that there are very many times the number of silver prints produced in everyday work than there are by all the other processes put together. How many times this number may be it is of course impossible to say, but amongst professionals and amateurs it must be hundreds of times as many. The term "silver" applied to the four pictures that are shown under that name is somewhat vague. Are not "bromides," "chlorides," "albumen," "platinum-toned," etc., all silver pictures? Again, are not all "gum," "gum-bichromate," etc., pictures in carbon? The first carbon process was a gum process—the same as that now worked. Future historians, taking up the catalogue of the Exhibition of this year, for example, might assume from it that silver printing was, at this period, almost obsolete, while, indeed, it is possibly in its zenith, at least for commercial work.

* * *

Anomalies of Artistic Copyright.

One day last week there was an article in the "Standard" under the above heading, on a treatise, recently published (Murray) by Mr. E. J. Macgillivray. The article gives extracts from the book, and is of such interest to photographers that we give it on another page, as it shows the anomalies that exist under the present laws with regard to copyright, more especially in our colonies, under the International Copyright Act. In a letter in our contemporary a few days later Mr. John F. E. Grundy, hon. sec. of the Society for the Protection of the British Fine Art Copyright in the Colonies, the president of which is the president of the Royal Academy, further points out these anomalies. In his letter Mr. Grundy calls attention to the fact, from a case that was taken through various Canadian courts, that while Canada is a party to the Berne Convention, and Canadian owners of copyright have full protection in Great Britain and elsewhere, the British owner, by reason of the Canadian local *status*, has no such protection in Canada. Thus, while this colony has every advantage under the Berne Convention, she gives nothing in return. In his letter Mr. Grundy points out that this decision will probably be taken advantage of by other colonies, and may very materially affect the value of copyrights, and the British export of reproduced art, which is increasing in proportion as the colonies expand in population and wealth. As the law now stands, a Canadian photographer, under the Berne Convention, has perfect protection of his copyrights here and elsewhere, but the British photographer, as we pointed out a short time ago, has no protection against the piracy of his work in Canada, though it is one of our own colonies, yet he has in France, Germany, most Continental countries, and even in Japan. The object of the above Society is to remedy this state of things if possible.

* * *

Seizure of Pirated Copyright Works.

It must be patent to everyone that publishers of copyright music, particularly that of the most popular type, must of late have suffered severely by the piracy of their work. This is evidenced by the sale of copies by street hawkers for less pence per copy than the publishers price is shillings; and still more galling to them is the fact that these pirated editions are sold as copyright music. The printers of it, and those who vend it to the hawkers, are difficult to discover, and if they are discovered they are men of straw, from whom no substantial damages can be recovered. A short time ago an association was formed by the publishers to protect their rights, and this they did to an extent by taking the law into their own hands—by employing men to seize by force the pirated copies found in the possession of the hawkers. Several cases have come before the police courts as a result. In the majority of cases the magistrates were in sympathy with the publishers, but still the business flourishes. Last week a caution to the following effect to hawkers and pedlars of pirated copyright music, under the Musical (Summary Proceedings) Copyright Act of 1902, was issued by the Metropolitan Police. This empowers any constable to seize without warrant, on the

request in writing of the apparent owner of the copyright, or his agent, any pirated copy. On seizure the piracies shall be conveyed before a Court of Summary Jurisdiction, and, on proof that they are infringements of copyright, shall be destroyed, or otherwise dealt with as the Court may think fit. There is no such law with regard to pirated photographs. Some years ago hawkers used to carry large stocks of pirated copies of portraits of celebrities, but of late this business seems to have died out. At the time to which we refer photographic piracies of engravings of large size (about 15 by 12), were very common, they being hawked outside railway stations and public-houses, but the same difficulty was then experienced by the owners of the copyright as that now experienced by the music publishers, namely, getting at those who actually produced the piracies. If, perchance, they were got at, they were but "men of straw," and nothing could be got beyond the confiscation of the negatives, and such prints that might be found. The greatest piracy that photographers now suffer from is from the illustrated press, and the publishers of local views in cheap albums. But here they always have a substantial redress, that is, if they have taken the precaution to register the copyrights in their work. This they too often neglect to do, and then complain loudly if it is pirated.

* * *

Thunderbolts and Meteorites. It is astonishing that the tradition of the thunderbolt, meaning a solid mass of matter which is ejected from the clouds during a thunderstorm, should have survived so long as it has. Every season brings its quota of stories of these remarkable occurrences, and during the past few weeks we have heard of one or two more. Only the other day a correspondent of the "Times" described how he and others distinctly saw something strike the ground, raising steam at a particular spot. Unfortunately, he adds, "we had not time to go and verify the spot, where the bolt, if it were such, was seen to fall." A few years ago, at an exhibition held by the Meteorological Society, if we remember rightly, a few alleged thunderbolts, with most circumstantial notes by persons who have seen them fall, were on view. One was a lump of coal, and another was a delapidated brick, but they were picked up near the place where a flash of lightning was seen to strike, and, of course, they passed as thunderbolts. We can easily imagine how the idea of a thunderbolt first arose, in the difficulty of the ignorant mind understanding how a deadly blow could be struck otherwise than by something of a solid description. And the mythical bolt has become associated with the meteorite, and as several of these can be seen in our national museum, one weighing many hundreds of pounds, careless visitors are apt to mix up two things which have little relation to one another. A photograph of a thunderbolt ought to have come to hand before now, considering the many alleged instances of their occurrence, but we have never yet heard of such a picture. Meteorites are far from common, for most of those which we see as "shooting stars" are dissipated into dust in the act of becoming visible. It is almost a pity that they are so rarely found, for they are very valuable. The chief of the Natural History Museum, at Berlin, was reported as having recently paid as much as a sovereign per gramme for one, a statement which at once aroused the cupidity of certain evil-disposed but ingenious persons, who thereupon set up a meteorite manufactory! These counterfeiters must have done their work in a very clumsy manner, for the fraud was quickly detected and they were arrested. The method by which they produced their fictitious meteorites was then made known. After possessing themselves of a piece of rock, they burnt the stone so as to induce the formation on its surface of a black crust, which they made shiny with a coating of lampblack and molten sulphur. As a real meteorite is mostly composed of metallic iron, its specific gravity would be very different to that of any kind of stone, but the forgers were doubtless ignorant of this method of testing the true from the false.

* * *

Platinum. Those chemists who were fortunate enough to possess themselves of basins and other receptacles of platinum, say, thirty years ago, before the price went up, are now congratulating themselves on the circumstance that these vessels are in value equal to those of pure gold. At that time platinum had little employment except in the chemists' laboratory, and that only because of its acid resisting qualities. Soon afterwards the demand suddenly increased. The metal was wanted for photography, but still more urgently for the electric glow lamp. Each of those little glass bulbs has a couple of fine platinum wires fused into its foot, so that the necessary connections may be made to carry the current to the carbon filament within. Other metals have been tried for the same purpose, but platinum is better than any. The amount of metal in each lamp is very little, for the price of the complete article is now less than one shilling, but so many millions of these lamps are now in use that the aggregate amount of platinum which they consume must be very great. The supply of the metal is not equal to the demand, and hence the rise in price. Hitherto the chief source of supply has been the Ural mountains, and the total yearly amount mined there hardly exceeds six tons. No wonder is it, then, that, as an American would put it, "there is not enough to go round." But possibly it is reserved to America to find the remedy for this state of things. According to the "New York Sun" a supply of the valuable metal has been discovered in two places in Washington, near Princeton, and at the Olympia mine on Kennedy Mountain. The ore from one of these districts has been assayed, and the verdict is that it contains platinum in commercial quantities. It seems that it is impossible as yet, owing to the presence of deep snow, to ascertain the extent of the platinum bearing rock, but the ground has been staked, and the matter will be thoroughly investigated in the spring. We also learn from the same source that the Canadian Government sent an expert to Klondike in December last to report on the alleged discoveries of the heavy white metal in that region. It seems that a Government metallurgist had stated that certain consignments of gold which had reached him from the gold workings there contained considerable quantities of platinum, and that he believed that the miners were, in their ignorance, throwing platinum nuggets away to the tune of thousands of dollars' worth daily. We are not told whether the expert returned and made his report upon this important matter, but possibly we shall hear more later. It would seem, then, that there is a likelihood of the world's platinum supply being enriched by contributions from both America and Canada, and should these anticipations be realised the price of the metal will, of course, go down. Photographers will, with many others, reap the benefit of this, and the beautiful printing process which depends upon platinum as its mainstay will find fresh adherents.

* * *

Dressmaking by Photography. Although this summer has, by reason of its unseasonable character, been the worst for the practice of photography for many years, more attention has been given by the

daily Press to the camera and its works than we have yet known. It is good for all engaged in the business of photography, whether they be studio workers, or dealers, or manufacturers, that this should be the case, for it means advertisement of the best kind at a very cheap rate. The other day appeared an illustrated article in the "Daily Mail," for example, which gave an interesting account of the manner in which Parisian costumiers are utilising photography in the carrying out of their business, and possibly by the perusal of such an article photographers in this country may see a new opening for their talents, although for some reason or other the enterprise seems to be rather difficult of realisation in the absence of French models. We all know what the ordinary fashion plate is like, a picture in which an impossible human form—impossible because a figure so constructed could not exist—is clothed with the latest devices of the fashionable milliner. Now it seems that the big dressmakers have not been wholly satisfied with these artistic creations, although those of London and New York were careful to get the best work by sending over each season capable draughtsmen to the gay capital. So that something better is being attempted, and the notion originated in Paris itself, where a Madame de Boutrelles conceived the idea of gathering round her a collection of beautiful damsels, whose business it should be to dress as models for being photographed. These girls, selected from the smaller Paris theatres and music halls for their figures and faces, the figure being, perhaps, the more important of the two, are dressed in the latest creations of the best dressmakers, who send in dresses six months before the opening of the season. And the word "dresses" comprises hats, boots, and even umbrellas. Then these young women are photographed in different positions by two of the best photographers, and the pictures are sent out broadcast, and are sold at good prices to expectant dressmakers all the world over. A single photograph, we are told, accompanied by a working description of the garments shown, will cost from £8 to £10. The pay of the models ranges from four to five shillings for the morning's work, about three hours, and the girls are only too glad to add in this way to their scanty salaries. Moreover, they like it. What woman is there who would not enjoy a constant change of attire, even if the plumes be but borrowed? Then occasionally the damsels come in for a perquisite in the shape of a soiled gown, and they also have a few copies of the photographs presented to them. But not all young women are built in the particular way which is required for this work. The conventional idea, as embodied in the fashion plate of old, clings to the new system. They must have small heads and small hips. The ordinary English woman is too clumsy in make. "Dainty, slender little feet, too, combined with a tall, slim figure, are almost a monopoly of Parisian girls." Of course, we do not believe this, and fancy that it would be far more easy to find girls with the necessary "points" in our own country than in any other. We think that the system could well be started over here, and would flourish well in competent hands.

* * *

Chemists Combine. The recent reprint in the JOURNAL (page 726) of Mr. Jones's able résumé of "The Law Relating to the Sale of Poisons" is interesting to photographers generally, and, as many of our readers are pharmacists, was no doubt appreciated by them also. The present unsatisfactory position of the chemist or pharmacist is, judging by the correspondence columns of the drug Press, greatly agitating the rank and file of the qualified pharmaceutical body. The main point of discussion is apparently in relation to the "title." Briefly put, the case stands thus: The Pharmaceutical Society (a chartered body) elaborates a scheme of education, appoints examiners, and conducts examinations which, judging by the proportion of rejected, are stiff enough to satisfy an exacting critic. As a reward for the time and mental labour expended, the successful candidate is entitled to call himself a chemist and druggist, or pharmaceutical chemist, as the case may be—a title conserved to him, as most people imagined, by the Pharmacy Act of 1868. Meanwhile, there have sprung up various drug companies, who, as limited liability combinations, arrogate to themselves the title of chemist, while being, as a fact, aggregates of men with no qualification whatever. The person, therefore, who in all good faith serves his apprenticeship, studies the usual subjects, takes the courses at one or other of the schools, and finally, by good luck, passes his examinations, finds himself at the finish, when prepared to practise the profession for which he has qualified himself, confronted by a company composed of unqualified persons, who, by some mystic virtue of incorporation, are allowed to use the same designation without let or hindrance. What one person may *not* do under divers severe pains and penalties, seven unqualified men may do with impunity! The subject is interesting to every one of us, for at the least we may be parents or guardians, with sons or wards to introduce to a profession, and it is well to go into such matters with eyes wide open to the possibilities and results. From the purely photographic point of view the branch of the subject most closely concerning ourselves is that of the poisons, such of them, that is, that may be required for purposes of photography. It is not so long ago that we had frequent complaints of the restrictions placed on the sale of certain scheduled poisons required for business purposes by members of our craft, and the difficulties placed in the way of their purchase. There were many, no doubt, who viewed the multiplication of certain drug stores with comparative equanimity, under the impression that the restraint to trade (more apparent than real, perhaps), owing to the difficulty referred to above, might be thereby greatly modified, but on the contrary we have not, we are bound to say, found mercuric chloride, for example, any easier to get at the drug store than the more orthodox pharmacy, and the reason is probably that the manager of the store, himself, may be, a qualified man, has no personal interest in the concern. His only interest so far as relates to poisons is—knowing the usual risks, regulations, restrictions, and liabilities—in the main to save himself by letting them severely alone, and, when one thinks of it, there is no reason why he, having, as we have said, no personal interest in the matter, should take the risk. As a matter of fact, the store manager has to reckon with two forces instead of the one which overpowers the legitimate and single-handed pharmacist. Whereas in case of error or other mishap the latter has to fear the vagaries of a coroner, the former has, in addition, his company to square with, for, although the seller is the mulcted party, it is the company or proprietor who is expected to pay the piper. The "Pharmaceutical Journal" implies that a future amended Pharmacy Bill would most probably deal with the matter of titles in a manner different to that anticipated, *e.g.*, the profession of analytical chemists undoubtedly requires consideration. The minor examination certificate of the Pharmaceutical Society is clearly insufficient evidence of skill in the important branch of pure chemistry—it is not intended to be—but it confers the abbreviated title of chemist to which the owner thereof may tack on at will the analytical adjective. Clearly the Institute of Chemistry is entitled to consideration. As a

matter of common justice all round, the whole position deserves settlement on the fairest lines alike to the pharmacist and the chemist, while the unqualified contingent, with designs on conserved titles and professions, should be individually and collectively made to understand that the only honest and straightforward course thereto is through the examination room.

LANDSCAPE ACCORDING TO SEASON.

THERE is an expression which we have occasionally heard applied to a certain class of workers, which, although not to be found in any dictionary, is like a few other words of base coinage rich in forceful meaning. The word is "groovy," and it is rightly applied to those men who allow the same wheel to traverse the same rut, month after month and year after year. There are not a few of these men to be found among photographers; workers who are content to do things exactly as their fathers did before them, and who take little heed to make themselves acquainted with the advances which are being continually made, and with the trend of photographic affairs generally.

A photographer must be judged by his work, just as a tree is known by its fruit, and we can readily pick out the "groovy" man by examining his show case, or the album of specimens which lies on his reception room table. His portraiture is all of the old shoppy kind, with the ancient form of background, with its wretched pillar and curtain, or the familiar balustrade, and the pictures are filled up by old-fashioned accessories which resemble nothing found in an ordinary habitable room. But it is to his landscapes that we would wish just now to call attention, and more particularly to those pictures of the surrounding scenery which form such an important part of the work of those who are fortunate enough to have pitched their tents in districts haunted by tourists.

There are always some noted spots of which the tourist is likely to require a picture, and as a rule the tourist is content with what is offered him provided that the view is sharply focussed, that it is black and white in tone, and that it is well mounted. He knows, as a rule, nothing about values, nor does he concern himself about atmosphere or any of the finer pictorial features which would appeal to a competent judge at a photographic exhibition. He requires only a faithful transcript of the view to which he has taken a fancy, and he gets it. The local photographer has, of course, learnt the best time of day to get that view properly lighted, and in taking the negative he generally concerns himself about nothing else. He will rightly count upon so many dozens of prints from that negative selling in a favourable season, and that is sufficient for him. The same wheel runs in the same rut year after year, and he sticks to his groove.

Has it ever occurred to him that he might increase the number of his clients by paying a little more attention to the aspect of Nature according to the different seasons? Let him, for example, take one of the stock views, such as the High Tor at Matlock, Friars Crag at Derwentwater, or Stybarrow Crag at Ullswater, in its spring, summer, autumn, and even wintry aspects, making a careful study of each exposure, and turning out faultless and suitably toned prints from his negatives. Some of the groovy men would doubtless laugh at such a proposal, and would say that such work would not possibly pay. Or "we must leave that kind of thing to the amateurs," forgetful that the line of demarcation between the amateur—using the word in its true sense—and the professional is so narrow that it is difficult to define. We remember the time when the gelatine plate was said to be "all very well for amateurs," and when the bulk of the profession held that view. They were too "groovy," and it cost some of them a painful effort to get out of the old (wet) rut.

Another objection to landscape according to season would be urged by those who have not kept themselves abreast of modern advances in photography. We should be told that there would be little difference in the aspect of a landscape taken in either spring, summer, and autumn because photographs are dead to colour effects, and the result must in all three cases be variations of black and grey. This is true in one sense, but let the experiment be fairly tried, and the man who is not too rigidly bound to the old groove will quickly see that he has a new power in his hands. Let him first carefully examine his stock pictures, and ask himself if the funereal aspect of the grass and trees is really true to Nature? A fair way of putting it is this: Would an accomplished engraver, who, like the photographer, has to translate colour into what is technically known as tint—would he represent the same trees and grass with these inky tones?

That such false rendering can be altogether avoided is well known to all up-to-date photographers. But what is not so generally known is that in the case of mixed foliages, where greens of many different hues appear in one picture, there is an enormous advantage in working in the early spring, that is, so soon as the branches are well clothed. With an ordinary plate, preferably one of the slow kind, and without the help of any colour screen, foliage may at this time of the year be most beautifully rendered. The light is at its best, the foliage is new, and it will be found that the various tones of green are differentiated on the plate in a manner which is quite impossible later on in the year, when the sun has ripened the leaves to a more or less non-actinic condition. We are convinced that the sable tint of the foliage in many photographs is due to the fact that the taking of the negative has been delayed until too late in the year.

Then, with regard to autumn photography. If what we have written be true, the foliage must by this time be so seasoned with the heat of summer that its power of reflecting light into the camera must have almost disappeared. And this is certainly the case with most years, the present one being quite abnormal in its paucity of sunshine. But let us not be in a hurry. In a very short time the leaves will give up their green livery and will array themselves in red, russet, orange, and gold. Black as ink these tints will photograph if we used the plates we recommended for spring work, but with an orthochromatic plate and a screen, used with that mixture of brains which has been recommended as one of the necessary constituents of a good developer, we can change all that gloom, as if with a rub of Aladdin's lamp, into a scene of life and beauty.

Again we seem to hear the voice of the groovy one pleading that, if the old type of picture sells, his end is gained, and that, although there may be some advantage in using colour sensitive plates, it is more or less of a fad, and would cause difficulties in the dark room which he does not care to face. If the public is satisfied what more can be wanted?

To this we would reply: "Is there no satisfaction in endeavouring to educate the common taste, which is confessedly at a low ebb, in favour of better things?" And if this should not appeal to our groovy friend, we might hint at the possibility of someone seeing the force of what we have been advancing, and become a serious competitor in the same field.

We need not point out the advantage of using colour-

sensitive plates in the winter time, for most photographers know how they clear up mist and give a wonderful delicacy to the tender shadows on snow. We have only to look at some of the wondrous alpine scenes produced by good workers to see what can be done under wintry conditions. We have no mountains, it is true, but we have waterfalls, which are splendid objects when gripped by the frost, and we have plenty of landscape which assumes a new beauty under the influence of hoar frost or snow. Nature is almost as fond of changing her dress as is a fashionable beauty, and she does so without running up a milliner's bill.

TRIBULATIONS OF A PRESS PHOTOGRAPHER.

"Why not take up press photography?" Jones suggested, when I said that I wanted a little easy work to add to my income. The idea sounded, on the face of it, an excellent one. I bought a book about the subject and read therein a glowing account of the profits of the profession. It seemed a grand idea to go and take an old tombstone, or a railway accident, or a football match, or something of that sort, and get ten-and-sixpence for your trouble.. The work was congenial, and at least five pounds a week ought to be forthcoming. With high hopes I sallied forth and purchased a camera and the necessary materials.

The camera rejoiced in the title of the Guinea Snappy, and (so the shopman assured me) was the best and cheapest on the market. His enthusiasm, I fancy, ran away with him. If the Snappy is the cheapest piece of photo apparatus, then all I can say is, the average button-presser must be a millionaire. But I am anticipating.

I didn't know much about photography, so decided to try my hand on something easy first. I therefore put in a roll of film, and (the day being a sunny one) went to Downing Street. The *Morning Post* had said there was to be a Cabinet meeting, and I thought it would be a good plan to obtain snap-shots of Mr. Chamberlain and Mr. Balfour.

When I arrived at Downing Street, a large crowd had already gathered, and, to my annoyance, I couldn't get anywhere near the front. The opposite pavement was empty, except for a group of privileged individuals in rather shabby suits and soft hats. They were Press-men, I heard somebody say. Encouraged by this, I asked a policeman to allow me to pass across. "Journalist?" he asked. "Yes," I answered, boldly. "Wot piper?" he inquired, and methought I detected a suspicious glint in his eye. "'Tuppenny Pictorial,'" I hazarded "Um," he commented, rudely; "I've just passed the 'Tuppenny Pictorial' man. 'E's over there. Do you want to speak to 'im?" I hastily disclaimed any such desire, and withdrew.

At that moment there was a stir in the crowd, and a hansom drove swiftly up. It passed nearer to me than I had expected, and I had a glimpse of an orchid and an eyeglass. Wildly I pointed the Guinea Snappy, but it was too late. Joe had escaped scatheless.

Some of the onlookers departed, and I was able to force my way into the front row. I waited patiently, trying to look unconcerned beneath a fire of vulgar chaff from some unpleasant people behind, who insisted on inviting me to take their "likenesses," and when I refused, facetiously inquired whether I'd got the camera on the "'ire purchis systim."

Finally, another hansom approached. Inside was Mr. Balfour. Carefully aiming, I caught him (as I supposed) full in the middle of my film. Click! went the shutter. This time, at any rate, I was successful.

The Press-men still stayed on, so I stopped, too. Other notabilities came now and then, but I knew none of them, and didn't want to waste more films than seemed necessary. The Pressmen, however, recognised each, and made notes as they passed. In the end a very important-looking personage drove up and ponderously alighted. The pompous way he walked convinced me that he was a minister at the very least, and I obtained a perfect snap of him. As I was contentedly winding off the film, I saw some of the Pressmen smiling. The vigilance of the constable having now relaxed, I crossed and asked who the fat man was who had just passed. "Did you get a good picture of him?" one of the soft-hatted folk inquired. "Yes, a grand one," I replied. "That's good," he remarked, "because he's the Foreign Office butler."

No; I can't say that I was very happy that morning. Snapshotting Cabinet ministers was harder work than I had supposed. However, I went home to develop my films, hoping for the best. Even now, I believe some of them might have been good, but for unforeseen accidents. I had no dark room, so utilised the bath-room. Just as I started developing someone thumped on the door. It was my brother, who said he wanted to have a bath. Of course, I refused this very unreasonable demand. But he wouldn't go away, and kept rattling the handle. This somewhat flurried me, and in my nervousness I upset one of the dishes and got the roll of film coiled round my right leg. My trousers show the mark of the chemicals to this day, in a curious spiral strip. My brother departed at last, seeing that the lock of the door would not give way, and I finished off the films. Frankly, the results were disappointing. Even the butler seemed blurred. Somebody must have jogged my elbow when I pressed the button. As for Mr. Balfour —well, my aim was slightly incorrect. I obtained a splendid picture of the ear and part of the head of his cab horse. In the distance are some chimney pots. They are beautifully clear. But I am afraid no editor wants a photo of half a horse's head and a group of chimney-pots. That's the worst of editors. They're so conservative.

What annoyed me most was to find in the following week's papers two faultless snap-shots of Mr. Chamberlain and Mr. Balfour. In the background, amongst the crowd, my own figure is distinctly visible, flourishing the Guinea Snappy. One of the soft-felt hattites had evidently taken the picture.

I spent quite a month trying Press photography. I photographed Royal processions, prize givings, athletic sports, yacht races, and dozens of other events. Once I nearly got a grand view of the King, but a six-foot square Union Jack fell down and wholly enveloped me and my Guinea Snappy at the exciting moment. On another occasion I took two splendid photos of Madame Bernhardt entering her carriage at the door of the Garrick; but both were on one strip of film, and the divine Sarah's smile stretches for nearly a yard across the picture. Nevertheless, I sold it as a curiosity to a magazine, and duly received a cheque for half a guinea.

That ten-and-sixpence is all I ever made by Press photography. My expenses came to £8 11s. 7½d. Which proves that, even with a Guinea Snappy, the game is an expensive one.

My brother now owns the Guinea Snappy. He bought it from me for a shilling, and at present keeps a tame white mouse in it. I have banked the shilling as a necleus of a fund for purchasing a new pair of trousers and re-painting the bath-room floor.

ANOMALIES OF ARTISTIC COPYRIGHT.

[Reprinted from the "Standard."]

his Treatise upon the Law of Copyright, recently published (Murray), Mr. E. J. Macgillivray remarks that the present law is bad, both in substance and form. Those who have ything to do with literary or artistic property are encouraged the observation that they should comprehend it, in so far as is comprehensible, and reminded that there are probably ore pitfalls for the unwary in dealing with copyright than with y other branch of the law. The reasons for this are many. itself, the subject is naturally complex, but more than anying, the defects are due to the bad drafting of a great number very old Statutes. The Literary Copyright Act was passed xty years ago. Engravings are protected by an Act made in 34, and last amended in 1836. The Sculptors Act dates from 13. Dramatic and musical work comes under an Act of 1833 nd the Literary Copyright Act together. The most recent of hem all, the so-called Fine Arts Act, was passed in 1862 for he protection of paintings, drawings, and photographs. One f the anomalies of the subject must certainly be considered he fact that engravings had been protected one hundred and wenty-eight years before the pictures from which engravings ad been made were protected. A painter had no remedy after is picture was published against an engraver, but the engraver had a remedy for the reproduction of his engraving. The eneral principle of all the Acts is to give protection to any riginal work after it is published. Before publication, the rotection an author or artist has for his work is not under the opyright Acts, but under the Common Law. He might get amages, or an injunction, or both, before he publishes, but ot under the Acts. What amounts to originality or to publiation is, "mutatis mutandis," generally applicable to all varieies of work. Publication is the act by which the public are iven the opportunity of viewing the object, but payment to view s not necessary. After the work is published, then the right o make copies for certain definite periods belongs to the author, r some one representing him by licence or assignment, exlusively of the rest of the world. This right is copyright; but o action can be brought for infringement unless certain ormalities prescribed by the Acts have been observed. One of these formalities is registration at Stationers' Hall. It is required for books and for paintings, sketches and photographs, but not for engravings and sculpture. The must have placed on them before they are published the proprietor's name and the date of publication. Why should there be this difference? Mr. Macgillivray describes registration as a mere useless and troublesome technicality. If there has been an infringement of literary copyright, as there may be even before registration, the proprietor cannot sue until he has registered, but he may register on the day he issues his writ. In the other case, where registration is required, he cannot sue for infringements that have taken place before registry. In America things are more simple. Registry is applicable to all cases of copyright. "There is no common law right after publication, and therefore if a work is published without the proper formalities having been observed, it becomes *publici juris*, and anyone may make what use of it he pleases."

There must be originality for any work to be protected by the Copyright Acts, but there need not be artistic merit. Literary and artistic copyright, in the meaning of literature or art, are irrelevant epithets. There must be individual workmanship, either in methods or design, but the Courts will not inquire into the artistic merits of the result. In photography the English Courts will protect almost anything as original that is not a professed copy of some existing picture, or sculpture, or photograph. If it consists in the representation of some object, however coarse and commonplace, or however mechanical the reproduction may be, a photograph may be original. Americans have resented giving protection to photographs which in execution and design are often infinitesimal in their "originality," and they require some evidence that by the choice of subject, of arrangement or otherwise, an artistic effect has been produced. How little originality implies artistic individuality appears from the fact that under the term engraving are included prints taken by lithography or any other mechanical process by which prints or impressions of drawings or designs are capable of being multiplied indefinitely. Maps, charts, and plans used to be included under artistic copyright, but they are now subject to the law relating to literary copyright. But it is still uncertain whether they must be registered or have the name and date only put on, as in the case of engravings. There is a curious diversity in the terms for which the protection against copying is given, and they are evidently quite arbitrary. Literary copyright is for the author's life and seven years afterwards, or for forty-two years; engravings are protected for twenty-eight, sculpture for fourteen years, and another term of fourteen if the author is then alive and retains the copyright; paintings, drawings, and photographs for the author's life and seven years. Contrast this with the simplicity of the American provisions applicable to all kinds of work. Copyrights are granted for twenty-eight years, and the author, inventor, or designer, if he be still living, or his widow and children if he be dead, may have the exclusive right continued for a further term of fourteen years on taking certain steps. One great advantage of a similar simplification would be the easier working of the International Copyright Acts, which give the protection of our Statutes to works published in certain foreign countries—for example, the countries under the Berne Convention, which enjoy our copyright by the International Copyright Act of 1886.

Another equally senseless set of provisions are those which relate to the place where the subject-matter of the copyright is made or published. It is not certain whether engravings must be made within the British Dominions; but they must be first published there. Sculpture need not be made, but it must be published there. It was intended by the Act of 1862 that engravings, pictures, and photographs should be independent of either the place of making or publication; but, as often happens in English law, another Act which was not suspected of having any effect on the Act of 1862, made first publication in the British Dominions necessary. There is no restriction as to the nationality of the artist in regard to engravings; it is extremely doubtful whether a sculptor must not be a British subject or resident within the British Dominions. A painter, or sketcher, or photographer must have these qualifications or his work will not be protected; but whether he must possess them at the time the work is produced, or when he seeks the aid of the law against infringement, is uncertain. But there is a more striking anomaly still. An artistic work of any kind produced in the British Dominions is only protected in the United Kingdom. If it were a book it would be protected throughout the Empire. Mr. Macgillivray explains the matter thus:—"It was evidently intended that artistic works should be placed on the same footing, but unfortunately the distinction between the literary and artistic Acts was overlooked. None of the artistic Copyright Acts extend their protection beyond the United Kingdom. The result is that artistic works are only protected in the Colonies and Dependencies under local legislation." Such

Acts are, of course, not inconsistent with the Imperial legislation; and, moreover, every British possession can make its own law extending or curtailing the Imperial Acts for its own territory, so far as regards works which have their origin in that particular Possession. The monopoly of news in foreign telegrams given by some Colonies is an example of this kind of protection which is not to be found in any Act passed by the British Parliament.

The question who is the owner of the copyright is often not at all easy to answer. The author or artist is not always the person who is the proprietor at the date of publication. An engraver who does a work on his own behalf is the first owner. Also if he does it for another if it be entirely his own production. But if he is so employed, and his engraving is taken from another work of art, or if he does it with a design or invention, or material and instructions belonging or supplied to him by the employer, then the copyright belongs to the employer, and not to the engraver. If the relation of master and servant exists, probably as in the case of literary copyright, the copyright belongs to the master. Assuming the common sense of this rule, why in the case of sculpture should there be this difference—that the employer of a sculptor is the owner without any assignment of the copyright which becomes his, though he may take no part in the invention or design of the work? Suppose that at the request of a friend a sculptor makes, gratuitously, a bust or statue for a charitable bazaar, the copyright would probably belong to the friend and not to the sculptor. But we get another distinction when the work is a painting, a sketch, or a photograph. Such a work done gratuitously for another person by the author would give the right of multiplying copies to the author alone. In the case of a customer who gives good or valuable consideration—pays money or gives a benefit in some form or another—the copyright vests in the customer and persons to whom he may assign the right. The right may be reserved to the author, however, by agreement in writing. Thus the copyright of an ordinary photograph belongs to the customer. If it is taken for the photographer's benefit, that he may print and sell copies of a popular character whom he has induced to sit, then it is taken for and on behalf of himself and not his sitter, and the copyright will belong to him. But the sitter may demand that negatives may be taken for his own use, or that he may have copies at a reduced price. What is the result? Quite inconsistent decisions have been given. In one case the copyright was held to be the sitter's, and the photographer could not prevent reproduction by another person to whom the sitter had granted permission. In another, it was held to be the photographer's, and probably that is the true view, though it is safer to put the terms into writing. The right to restrain a photographer from distributing prints of a photograph of a person who has been taken by surprise or without permission does not depend on copyright law. The subject has on other grounds the right of preventing such a liberty being taken with his personality.

Infringement by copying gives rise to very curious questions. The copyright in engravings and sculpture is not so extensive as it is in paintings, drawings, and photographs. It is doubtful whether the copyright in an engraving or a piece of sculpture can be infringed, except by some process which reproduces the characteristic qualities of the execution. A photograph may be a breach of copyright of an engraving as a reproduction of the engraver's work; but unless a print of any kind should so reproduce this, it will not be a breach of copyright. Even if the design and invention are the engraver's own, and not taken from a drawing or painting, it may be that it cannot be protected as part of the engraving, but must be registered under the Literary Copyright Act, or as a painting or sketch under the Fine Arts Act. As to sculpture, it is doubtful whether it must not be reproduced by a process imitative of the sculptor's art, and whether merely copying it in picture, sketch, engraving, or photograph as a design would be a breach of copyright. Copyright in paintings, drawings, and photographs is larger. Any method whereby copies are made of them may constitute an infringement, whether the design or the process of execution is reproduced. Thus the copyright in a photograph of an Old Master might be infringed by another photograph repeating the method of execution. But forming *tableaux vivants* would not be a reproduction of a picture, nor a sketch in a newspaper of the *tableaux vivants* themselves. Rough sketches of individual portraits taken from a copyright photographic group was held not to be an infringement.

Evidently we are here amongst the niceties of copyright law; and it is not much assistance to say that the general idea of subject matter and treatment may be taken from a work of art without infringement of copyright. What is and what is not infringement in such cases depends, as Lord Herschell said, on the effect produced on the mind by a study of the picture, and of that which is alleged to be a copy of it. The little less or the little more is not only an artistic question, but one of fact for the jury, as lawyers say, though judges have to decide it. These are obscurities which cannot fairly be said to belong to the law, but are due to the intrinsic nature of the subject. Many others are unnecessary difficulties arising from the chaotic state of a congeries of old-fashioned Statutes. We have only dealt with a few of the points raised by a limited department of copyright law, and, in regard to infringement, have only spoken of the infringement by actual making of copies. There are other infringements, such as importing copies or exposing copies for sale, in which various innocent persons may find themselves involved; and in such matters as these the law is confused, because it is badly stated. Why do we always seem to have been on the eve, as Mr. Macgillivray says, of a general codification and amendment of the Law of Copyright since the Royal Commission on Copyright was appointed twenty-eight years ago, and yet without anything having been done? Mr. Macgillivray's answer is that it is owing to dissensions among those interested in copyrght, failure to come to a satisfactory arrangement with the Colonies, and want of time in Parliament. Which of these is the most potent cause he does not explain.

BACTERIOLOGICAL PHOTOGRAPHY.

The ubiquitous bacterium, like the poor and the weather, is always with us, commanding our attention in one way or another, sometimes asserting its power a little too vehemently, and altogether knocking us out of time. It is very wonderful when one considers the insignificant size of bacteria, what an important part they play in our daily life; how absolutely essential are some forms to our well-being, while others swiftly and certainly destroy us! Thirty years ago comparatively little was known of their wide reaching, all embracing influence in the world; but to-day the study of bacteria has become an important science, and the literature on the subject is fast assuming unwieldly proportions.

Bacteriological photography may be divided into two sections, the first dealing with the photography of the entire growing colonies of bacteria in culture tubes and dishes, and the second dealing with the photography of the individual bacterium, forming the most difficult and exacting work in photo-micrography.

Cultivations of bacteria are grown in various media, enclosed in test tubes and petri dishes. To photograph these cultivations an ordinary camera and R.R. lens can be employed, but special care must be given to the lighting and position of the tube or plate, as the case may be, so as to obtain an undistorted and truthful rendering of the colonies of bacteria within. As some species of bacteria only grow in liquids, and others again liquefy the media on which they are growing, it becomes necessary to keep these cultivations level, and to invert the camera over them while taking the photograph. For this purpose, an intelligent blacksmith or mechanic will, for two or three shillings, make a very useful piece of apparatus. This consists of a species of giant retort stand, the iron upright rod measuring about 3ft. in length, and certainly not less than ½in. in diameter. The base to which this upright is attached may be either a large heavy horseshoe, or heavy three-cornered piece of iron, to form a stand. A clamping eyelet that will travel smoothly up and down the iron rod, and has a screw drawn out from one side to screw into the bush on the bottom of the camera, must also be supplied. This simple piece of apparatus, if properly made with a stout iron rod, and solid base, so as to be perfectly rigid and free from top-heaviness or vibration when the camera is attached, will form a most useful adjunct, and can be used also as an upright photographic camera, which will be found very convenient for many purposes.

In photographing culture tubes and plates, a dead black background should be used, as it throws up into strong relief the growing colonies of bacteria. The photographs may be taken by either daylight or artificial light; and a couple of incandescent gas burners screwed in such a way as to direct the rays of light upon the culture tubes or plates will be found very useful for night work. Very handy screens can be made at home from old round tobacco tine and the funnel-shaped tops of a couple of half-gallon paraffin cans; a round hole, 2in. in diameter, being cut in the side of a bottomless tobacco tin, the funnel-shaped top is cut off the paraffin tin (the neck having been cut away so that there is an opening 2in. in diameter), and soldered into the opening in the tobacco tin. The two screened lights should be placed to right and left of the camera, and in such a position that the whole culture tube is evenly illuminated without any bright reflections on the glass surface. The best results will be obtained with a maximum exposure, and fairly rapid development, good bold contrasts being aimed at as much as possible. A thin sheet of tissue paper, or very fine ground glass, placed in front of the source of illumination, will be found very useful in getting rid of troublesome bright points of reflected light on the surface of the culture tube. On the whole, petri dish cultivations will be found easier to photograph than tubes, particularly if a vertical stand such as I have briefly described is employed.

In the second section of bacteriological photography, success can only be obtained by the exercise of the greatest perseverance and care, coupled with the employment of the best microscopic objectives. The microscope stand itself must be as firm and rigid as possible; it must possess for focussing the usual rack and pinion coarse adjustment; and a very accurate fine adjustment; it must also have a centreing and focussing substage. If a great deal of high power work is to be done, a good graduated mechanical stage will be found a boon and a blessing. Most of our representative manufacturing opticians now turn out microscopes specially adapted for high power and critical photo-micrographic work, at varying prices. A really high-class instrument at a very moderate price is turned out now by Messrs. R. and J. Beck., Ltd., of 68, Cornhill; it is called the "London." I have had one of the large models in daily use for a year, and it has given me the greatest satisfaction, and produced first-class results. Messrs. W. Watson and Sons' magnificent "Van Heurck" microscope, and Messrs. C. Bakers' "Nelson Model" are most splendid instruments, well worth the high price charged; but the price is unfortunately beyond the purse of most English scientific men, and consequently many an earnest worker must be content with the somewhat inferior German microscopes which have found their way into too many of our colleges and laboratories. I sincerely hope that Messrs. Beck's example will be followed by the other British microscope makers, and that in time we shall see nothing but good English instruments in use.

The objectives required are ⅙th, ⅛th, and 1/12th oil immersion, with three good eye-pieces. And here again, whether we work with apochromatic objectives and compensating eye-pieces, or with achromatic objectives and Huyghenian eye-pieces, must depend upon the length of our purse. If we can only afford achromatics, then buy the best English make. A good substage condenser is absolutely essential, and either an apochromatic or achromatic should be employed; the Abbé chromatic illuminator cannot be recommended for critical high power work. For illumination either oil, gas, mixed jet, or electric arc can be employed. Personally, I prefer either the mixed jet or a good oil microscope lamp, such as Beck or Watson will sell for photographic work, with a condenser attached.

The great difference in price between apochromatic and achromatic objectives is a very serious matter for most people who are taking up this branch of microscopy, and for this reason I have during the past year worked solely with a set of achromatic objectives supplied to me by Messrs. Beck., Ltd., in my scientific research work, and in making the photographic records thereof. The result has been most satisfactory—I may say far in excess of my most sanguine expectations. In all my work, I make it a rule to use a screen made of a saturated solution of acetate of copper, between the source of illumination and the substage condenser, held in a glass cell ¾in. thick, 4in. deep, and 3in. broad. This screen, in conjunction with a three-quarters cone method of illumination, gives the very best results obtainable.

Slides of bacteria from which photo-micrographs are to be made should be much more deeply stained than is usual for ordinary microscopic examination. Some attention must also be paid to the stains used, the best results generally being obtained from specimens stained with carbol-fuchsin or gentian-violet.

Before the final focussing and exposure are made, the whole apparatus must be allowed to become thoroughly warmed, so that there may be no fear of expansion and alteration of focus during exposure.

Isochromatic plates must, of course, be used, and, personally, I pin my faith on Messrs. B. J. Edwards' series. Great contrast must be aimed at in development, which must be carried much farther than in medium power work.

Lastly, be patient and determined to reach the highest standard you can set; let every failure be an object lesson in what to avoid, and your efforts will be crowned with the success they deserve.

F. Martin Duncan.

The Emperor of Germany has, through the German Ambassador, accepted from Mr. Richard N. Speaight, for his private library, a copy of "Children's Portraits," which he lately compiled with the object of raising £1,000 towards the funds of the Children's Hospital, Great Ormond Street. The copy was specially bound in vellum and Russia leather similar to the one presented to the Queen. Messrs. F. and R. Speaight still have a few copies left, which may be obtained for half-a-guinea each on application at their studio, 178, Regent Street.

THE CONVERSAZIONE OF THE R.P.S.

[By a Visitor.]

THE purposes for which the many members of the Royal Photographic Society attend the annual conversazione are doubtless somewhat varied, but to us the benefits of the private view of the exhibition have always been secondary to the more congenial social opportunities it affords. Indeed, it would be difficult to choose a more unsuitable occasion to study the exhibition than the night of the conversazione, and so we wended our way to the New Gallery, anticipating the pleasure of meeting old comrades and shaking the hands of friends who only on such occasions come across our horizon.

Once inside the entrance, and while depositing our coats and hats, a glance round shows many familiar faces, and not half the width of Fountain Court had been crossed before our friend Mr. Sanger-Shepherd greeted us, and took us along to his charming exhibition. The photographic world owes a deep debt to Mr. Shepherd for his energetic work in connection with trichromatic photography, and we were informed that great progress had been made recently with this process, as by means of a specially designed camera the three exposures were made simultaneously, and by this means, and with a lens working at *f*.4, breaking waves had been successfully photographed.

Mr. Shepherd showed us this camera, which is a marvel of elegant design and workmanship, and also introduced us to his new light measuring instrument and new hand-fed arc lamp, both of which are beautifully made and worthy of high praise.

We were just leaving Mr. Shepherd when Miss Acland joined us, and showed us her most interesting specimen of three-colour superposed work on paper. The work is all the more creditable as in one case it is enlarged work. There are, we fear, few ladies who would care to so thoroughly go into this delightful process as Miss Acland.

Going back again to Fountain Court, we were announced to the President, and heartily greeted by our old friend; private conversation was, alas, not possible, so we hastened to glance at the Pictorial Section ere more friends claimed our attention.

Somehow or other we felt that the work was ordinary—there did not seem to be anything standing out about the others; but there is much good work exhibited nevertheless. Had we to make a selection, we should favour Nos. 30, 51, 62, 131, 149, 157, 277, and 283. No. 277, "Across the Presbytery," by H. R. Campion, is especially charming, and is a fine piece of delicate handling, and we were not surprised to hear that a visitor had purchased it. Why this failed for the medal as against No. 281 is a conundrum more than one of our friends have asked us. However, this section will be fully treated elsewhere, so we must away.

Probably the two things we heard most discussed were the Kodak patent developing machine and Mattos paper. This latter is a printing-out paper which seems capable of giving wonderfully fine, rich effects, and resembles platinum in many respects. The company who are selling make an interesting exhibit in the South Room, but we cannot congratulate them very much on the excellence of the subjects chosen for illustration.

Alongside we find pictures by Mr. Furley Lewis, among which we noticed Mr. A. Haddon's, Dr. Fincham's, and Mr. P. Everitt's portraits. These are all excellent, but, alas, the portrait of Dr. Fincham served to call up sorrowful thoughts on our poor friend's sad illness. Few have worked so strenuously for the reform of the Society as this gentleman, and many were the kind and sympathetic words we heard spoken of him during the evening.

The professional sections are well represented, and much excellent portrait work is exhibited. Mr. Ives' parallax slide and Mr. Senior's fine Lippmann colour photograph of the spectrum of an arc lamp were particularly interesting exhibits, and we noticed some very creditable three-colour work on paper and spectrum and microscopic work. Many old friends were there, and many were chatted with, and many others we knew we caught a glimpse of now and then.

The band played pleasant tunes in Fountain Court, everyone seemed happy, and altogether a most enjoyable evening was spent. We trust that we may be spared to attend the forty-eighth exhibition, and heartily tender our congratulations to all parties responsible for the arrangements at the New Gallery.

THE CITY OF MANCHESTER MUNICIPAL SCHOOL OF TECHNOLOGY.

PROSPECTUS OF THE DEPARTMENT OF PHOTOGRAPHY AND THE PRINTING CRAFTS.

THIS department deals so far as is practicable with the most important requirements of the photographic and printing industries.

The work of the department is divided into the following sections:—Photography, lithography, printing, drawing and design, and bookbinding.

Photography.—Under the head of photography it is proposed to deal with the subject as a whole, because it is only by a knowledge of the fundamental principles underlying the craft that its special applications can be properly understood.

The photo-mechanical processes which represent an important industrial application of photography will be very fully dealt with, and will form the most important section of this branch of the work of the department.

In general photography particular attention will be paid to the art and technology of negative making, and more especially to the optical and physical principles which underlie the various methods of procedure, an understanding of which is necessary on the part of those who desire to become good craftsmen, while due consideration will be given to light printing processes, and chiefly to those which may be regarded as types, and which are of importance in the industry.

In lithography the work will be divided into two portions, the one dealing with the production of the printing surface and the other with the printing from the same surface. It is hoped that those who have chosen this branch of work as a calling will not neglect to pay attention to the photo-mechanical processes, having regard to the probable effect, as in the case of wood-engraving, which the advance in these processes is likely to have in modifying methods of picture production.

The letterpress branch comprises composing, press, and machine work, electrotyping and stereotyping. The various branches of compositor's work will be dealt with as fully as is practicable, especial attention being paid to the cultivation of a simple and good style in display work, and to tabular and technical matter, and the arrangement of catalogue text. As well as general press and machine work the printer will have every facility given to him to study the printing of process blocks. For the electrotyper the careful reproduction of process blocks offers a field of study for which full convenience exists, and it is proper to remark that this branch of work, judging by the results daily seen in practice, has not received that amount of intelligent attention which it deserves.

The binding of editions of books and magazines in one and the same style required for the publication of large editions, is

work which can only be undertaken satisfactorily in the workshop, for it is principally a question of the proper use of special machinery. But there is a large and important branch of the binder's business which deals with the book as an individual item—the work of the ordinary hand binder. For such work there must always be a good demand, and it is the purpose of this section of the department to deal with those who are engaged in such craft. Regarding a book primarily as an object of utility, that which makes such object lasting and convenient to use should receive the first attention of a good workman. The final ornamentation which a book may receive enhances its value if made with good taste and judgment, but properly considered, it is only an excellence when accompanied by sound construction. The department will concern itself with teaching the best and soundest methods of forwarding as the first object of importance.

In drawing and design the classes will be arranged to suit the particular needs of those who are engaged in the crafts with which the department deals. In many branches of the industry knowledge and skill in drawing is essential to success. Such knowledge and skill can only come by continual observation and sustained practical study, and it is hoped that students will recognise such methods as the only road to success in this as in any other branch of work. Every effort will be made to make the work interesting, particularly in the training of the observation so as to understand the nature and characteristics of the object to be depicted, which is the essential condition to good and thoughtful draughtsmanship. The work which comes under the head of Design, will be such as is required for the methods of reproduction employed in the printing crafts. It should, however, be recognised that to become a good designer requires the possession of natural qualities, which cannot be given by class teaching though they may be developed by such. But what is possible is that a student may become properly acquainted with the methods employed in the craft for which he essays to design. Dealing only with reproduction work there are in every process limitations, some inherent, others only imposed because of economic reasons, without a knowledge of which a man cannot succeed in his work. Such knowledge constitutes a part of the designer's stock-in-trade. The faculty of being able to put this knowledge and the skill acquired to successful use, to be able to produce beautiful and appropriate designs, is, however, an endowment of Nature.

Equipment.—The department contains the following:—Photographic studio, with three dark rooms, photographic enlarging room, etching and collotype preparation room, block mounting workshop with router, power saw, guillotine, bevel planes, etc., lithographic printing room, with machine and four presses, composing room, machine and press room, with two cylinder machines and two platen machines, electrotyping and stereotyping rooms, lithographic drawing and design studio, and bindery. The plant and apparatus constituting the equipment are thus very complete, and have been selected for the purpose of giving sound practical instruction in the principles, technique, and practice of the various crafts concerned. Particular attention has been paid to the general arrangements for work in the various sections. The scheme of instruction includes lecture, class demonstrations, laboratory, and workshop practice. The classes will be held both during the day and evening. The day classes will extend from September 22nd to July 31st, and the evening classes will run from September 29th to the month of May. Short courses of lectures will be given on certain evenings in the week during the summer.

Certain courses of day instruction will be arranged over periods varying from two to three years which will have for their object the preliminary training of those who desire to enter the various crafts concerned, and such a training may be regarded as preparatory to apprenticeship in a business house.

The department is under the direction of Mr. Charles W. Gamble.

New Books.

"Photographische Bibliothek." Vol. I. "Das Photographische Pigment Verfahren." Vogel-Hanneke. Verlag von Gustav Schmidt, Berlin.

The work, originally written by the late Dr. H. W. Vogel, has entered upon its fourth edition, and the revision of the text, with supplementary chapters upon Gum Bichromate, Artigue, and Ozotype processes has been undertaken by Herr Hannecke, the present editor of the "Photographische Mitteilungen." The volume gives a short history of the carbon process, and full directions for working it in the various applications to which it has been put. The chapters upon Gum Bichromate, the Artigue and Manly process, will be welcome to those who wish to study more recent developments in bichromate printing.

"The Royal Borough of Kingston-on-Thames." 145 pp. illustrated. Price 1s. Published by the Homeland Association, Limited, St. Bride's House, 24, Bride Lane, Fleet Street, London, E.C.

The latest addition to the Homeland series has been written by Dr. W. E. St. L. Finny, Mayor of Kingston-upon-Thames. The book is published locally, by Messrs. Phillipson, of Kingston, and Messrs. Bull and Son, Surbiton. We are informed that the King has been pleased to accept a copy of the volume. Chapters are devoted to the Parish Church, the Coronation Stone, Richmond Park, Kingston as a Boating and Angling Resort, Hampton Court and its Surroundings, Ham, the Dittons and Esher. The book is illustrated by photographs by Mr. W. F. J. Hodgson, and drawings by Mr. E. E. Bristow. It also includes an Ordnance Survey map on the one-inch scale. Dr. Finny has compiled a volume full of fascination and interest which we are glad to possess. We are sorry, however, that so sympathetic an author is not better treated by the photographer and the process engraver.

The Edinburgh Photographic Society's annual exhibition of photographs will be held in the Society's Hall, at 38, Castle Street, Edinburgh, from Saturday, November 22nd to Saturday, December 6th, 1902. The judges will be Messrs. G. Ogilvy Reid, R.S.A., Edinburgh; Harold Baker, Photographer, Birmingham; Charles Sweet, photographer, Rothesay. Entries close on Saturday, November 8th, 1902. For any further information, or entry forms, application should be made to the hon. secretary of the Society, Mr. J. S. M'Culloch, W.S., 3a, North St. David Street, Edinburgh.

Educational Science.—At the meeting of the British Association Prof. Henry E. Armstrong deplored the British indifference to Science, and the result—the outstripping of British trade and commerce by Americans and Germans. "If," said he, "we reflect on the bareness of the life lived by the majority—on the debasing conditions under which very many are placed—on the terrible evils consequent on indulgence in drink—surely we must agree with Tyndall that the essential point is to raise life to a higher level, to elevate the general tone of thought, and that it is our duty to consider more seriously than we have done hitherto what use can be made of the forces at our disposal for the purpose. If we will but picture to ourselves how most of our difficulties, and especially our slow advance, are consequences of lack of imaginative power, or, perhaps, rather of failure to exert the power which, though latent in most of us, is not sufficiently called into being by practice; if we will but consider how much of our success has been due to the exercise of imaginative power, we may be led to propound a fruitful theory of education—a theoretical basis on which a sound educational structure may be reared. It has been well said by Carlyle 'that all that man does and brings to pass is the vesture of a thought.' In fact, the illustrations which may be given of the value of theoretical conceptions, of imaginative power, are innumerable. Taking recent events, if we consider the success achieved by the late Mr. Rhodes, the narrow-sighted will say he was a practical man; a man who did things, and led others to do. Those with broader views recognise that at heart Mr. Rhodes was a theorist, an idealist, a man of imagination, and hence his success. And men such as Lord Roberts and Lord Kitchener, whose immense services to the nation have been so universally admitted of late, are not merely practical soldiers of experience, but men gifted with powers of insight and imagination; men able to apply theory to practice. Some of those who were unsuccessful in the late campaign are concurrently reported to have gone out to South Africa openly deriding science, and it will be well if th lesson taught by their failure be not disregarded by their colleagues. The importance of the part played by theory in science cannot be exaggerated. We have only to think of the influence exercised by the Newtonian theory of gravitation, by the Daltonian theory of atoms, by Faraday's conception of lines of force, by the wave theory in its varied applications, by the Darwinian theory of evolution; we have only to

think of the way in which the reflections of one weak man indited at his study-table in a secluded Kentish village have changed the tone of thought of the civilised world. Such theories are the very foundations of science; whilst facts are the building stones, theories furnish the designs, and it is the interpretation of facts in the light of theory, and the considered application of theory to practice, that constitute true science. The marvellous development of scientific activity during the past century has been consequent on the establishment of fruitful theories. If teachers generally would pay more attention to theory, their teaching would doubtless be more fruitful of results; facts they know in plenty, but they lack training in the considered use of facts."

Exhibition.

THE ROYAL PHOTOGRAPHIC SOCIETY'S EXHIBITION.

[First Notice.]

It was hardly to be expected that the forty-seventh annual exhibition of the Royal Photographic Society, which was opened to the public on Monday last, at the New Gallery, Regent Street, W., would disclose any startling innovations, in spite of the fact that the notice "under entirely new management" might have been displayed at the entrance. As a matter of fact, the galleries present the old familiar appearance; and it is only in unimportant matters of detail that any change has been made. The general arrangements are as before; the west room is devoted to selected pictorial exhibits, the north and south rooms to displays by professional and trade photographers, the balconies to scientific, technical, and photo-mechanical exhibits, and the Fountain Court to the stalls of opticians, apparatus manufacturers, photographic dealers, etc.

The most noticeable change is in the room devoted to pictorial photography. We commented last year upon the somewhat gloomy appearance the dark colouring of the walls produced, and we understood that the then acting hanging committee had decided upon lining the walls if their services were again called into requisition. This decision this year's committee has wisely adopted, and the result is that a very great improvement has been effected. The work, perhaps, has not been carried out with quite ideal taste, as far as the decorative effect is concerned, but the undyed canvas employed is admirably suited for displaying the pictures.

We regret to find that in pictorial photography the steady progression that has for many years marked each successive year's exhibition has not been maintained. We understand that nearly 1,700 pictures were submitted to the selecting committee. The number hung is 290. In spite of the fact that about 60 less than last year were deemed worthy of a place on the walls, the average quality is distinctly behind that of last year's exhibition. Unfortunately, no compensating improvement is to be found in the section devoted to technical and scientific photography. In the rooms devoted to professional and trade photography, where each exhibitor decorates and arranges the space allotted to him, according to his own taste, there is certainly an improvement in the get-up of the exhibits, and the general effect naturally gains by the absence of the crude colours which in former years have been chosen by some of the exhibitors in their attempts at decoration.

PROFESSIONAL AND TRADE PHOTOGRAPHY.

Perhaps the most striking professional photographer's exhibit is that of Wm. Crooke, of Edinburgh. The space, the entire wall facing the door in the south room, is that occupied by Mr. Crooke the year before last, and he has adopted the same tasteful scheme of decoration. The number of pictures exhibited is only 17, and it should be a valuable lesson to those who have to get up exhibits of a similar kind to observe the impressive effect produced by restricting the works in number and using the utmost discrimination in the selection. With one exception, all are portraits, the exception, "The Edinburgh Town Council in Session," commands attention for the success achieved in the treatment of a subject extremely difficult to render by photography in an acceptable manner. The portraits, naturally, have Mr. Crooke's easily recognisable individuality.

T. C. Turner, of Hull, and 17, Upper Street, Islington, N., has arranged his space with considerable eye to effect. His pictures deserve to be closely studied by photographers who desire to turn out work of the highest perfection, following the ordinary lines of studio portraiture. The cabinet portraits, though possibly not possessing the qualities that would secure acceptance by the selecting committee of the pictorial section, are almost really perfect specimens of work of their kind. Two enlargements of an exceedingly refined type, having all the delicacy of a pencil drawing, will undoubtedly meet with general approbation.

Miss Lena Connell, of 50, Grove End Road, St. John's Wood, N.W., shows a very marked improvement over last year's exhibit, both in the quality of her work and in the get up of her exhibit. She has covered her wall space with canvas of a very suitable tint, and all her pictures are uniformly framed and printed in carbon of the same colour. Paradoxically, the exhibit is conspicuous from its quietness. The effect is exceedingly good.

Purley Lewis, of Stratford Studios, Kensington, again gives a very favourable impression of his work. Several of his portraits are of well known figures in London photographic circles, and an opportunity is therefore afforded of recognising his skill in preserving the characteristic personality of his sitters. He has chosen a wall covering of a pleasing warm tint, and his exhibit, as a whole, is tasteful and effective.

Miss Catherine Edmonds, of the Abingdon Studio, 118, Westbourne Grove, W., has among her studies many which are exceedingly good. Some of the portraits of children are delightful in their daintiness of treatment, but her display distinctly loses by being somewhat overcrowded, and by being carried too high. Considering the size of the frames, a few of the pictures could have been omitted with advantage, not only to the exhibit as a display, but on account of their not reaching the general standard of excellence. The background is quiet and pleasant in tint, and on the whole the exhibit is of good effect.

W. Hofler, of 26A, Soho Square, W., shows a series of Alpine studies, taken in Austria and Bavaria.

In the north room, Samuel J. Beckett, of 20, Baker Street, Portman Square, W., again falls into the error of showing too much, but the general effect of his exhibit is certainly better than that of last year. A carbon enlargement of large size forms the principal piece, and is a passable piece of work; but, in this case, it was rather a mistake to show a print from the original negative. Though every picture will bear inspection, taken individually, the collection, for the reason we have given, does not give the favourable impression that it ought to.

Johnson and Hoffmann, of 31, Devonshire Street, Portland Place, W., and Calcutta, make a large display, principally of portraiture. As the firm is essentially an Indian one, most of the subjects show a connection with our Eastern empire, many of them being native Indian princes. There are some good photographs of Indian temples, etc. The exhibit is an imposing one, but the decorative scheme is not beyond criticism.

Reinhold Thiele and Co., of 66, Chancery Lane, W.C., have a number of enlarged portraits of well known people, many of them in the theatrical profession. They are good specimens of professional photography of the ordinary kind.

Martin Jacolette, 38, 40, and 42, Harrington Road, South Kensington, S.W., exhibits three portrait studies, which are highly finished and effective.

Window and Grove, of 63A, Baker Street, W., have some interesting portraits. Miss L. Caswell Smith, of 305, Oxford Street, W., shows that she aptly follows in her late brother's footsteps. W. Bates and Son, of Chertsey, have three portraits in carbon. Alfred W. Goodman, of Belvedere, Kent, has three pictorial subjects; and James B. Hawke, of Plymouth, has a large composition group, containing, perhaps, some hundreds of heads. It is an exceedingly clever piece of work of its kind.

Among the exhibits of trade photographers, the Autotype Company, of 74, New Oxford Street, W., make an imposing show; they occupy the whole of the end wall in the north room, and have judiciously avoided overcrowding their space. Their exhibit includes enlargements in carbon from negatives, by Alfred Ellis and Walery, Henry Spink, C. Reid, Madame Lallie Charles, Langfier, W. J. Byrne, and other well-known photographers; also autotype reproductions of paintings and specimens illustrating the effects in carbon of various colours.

Thomas Illingworth and Co., Ltd., the Photo Works, Willesden Junction, N.W., make an effective display of work in carbon tissue of their manufacture, which evidently produces most satisfactory results, and, as regards range of colours, surely there is something to suit everyone. The winning prints in the recent Illingworth competition are also exhibited.

J. N. Gotz, of 215, Shaftesbury Avenue, occupies his space with specimens of printing in "Chromatype," which will appeal to admirers of gum-bichromate printing. Some of the specimens of printing in two different coloured pigments are interesting.

The Rotary Photographic Company, of 14, New Union Street, Moorfields, E.C., exhibit specimen prints on Rotograph bromide and Rotokon gaslight papers, samples of photo-mechanical printing, for advertising and other purposes on Rotograph paper, and produced by their patented automatic machinery; also specimens of the publications of the company.

The Berlin Photographic Company, of 133, New Bond Street, W., have a large display of reproductions of paintings. They are principally in photogravure. The work is admirable, and the collection forms quite a picture gallery in itself.

H. E. Bullen, of 18, Shornecombe Road, East Dulwich, S.E., shows a frame of prints from negatives by Hana, made on Bos ready sensitised albumenised paper.

In the south room the Rotophot Company, of Berlin, of 20, Castle Street, Falcon Square, E.C., fill an entire wall with examples of bromide printing by electric light, with machinery, which automatically exposes the paper and develops, fixes, washes and dries the print. Endless rolls of paper are used, and the surface may be either mat or glazed.

The Mattos Photo-Chemical Company, of 33, Rydal Gardens, Streatham, S.W., show a collection of photographs by various photographers, printed on the several grades of Mattos printing-out paper.

There was the usual large gathering of ladies and gentlemen—members, exhibitors, and friends—on Saturday evening, at the New Gallery, when the president and Council attended to receive the society's guests. With Mr. Dallmeyer were his predecessor, the Earl of Crawford, Professor Unwin, Mr. C. H. Bothamley, Mr. A. Haddon, Mr. T. E. Freshwater, Dr. Lindsay Johnson, Mr. J. C. S. Mummery, Mr. Sanger Shepherd, etc., as members of Council, and the large galleries were full of well known members of the photographic world. The string band of the Royal Artillery again rendered an excellent programme of music in the Fountain Court, and light refreshments were a prominent feature of the West Room. That the society's annual soirée is fully appreciated, the very large attendance amply demonstrates. It is an occasion when not only are old acquaintances brought together again, but one which makes many new friends, and it is no exaggeration to say that it is the event *par excellence* of the photographic calendar.

THE ROYAL PHOTOGRAPHIC SOCIETY'S DINNER.

Several years have slipped by since the members of the Royal Photographic Society indulged in the pleasant function of an official dinner. The very enjoyable feast which took place on Monday last may, indeed, be regarded as the first of the R.P.S. dinners, since those which have preceded it occurred before the dignity of "Royal" had been conferred upon the Photographic Society of Great Britain, apart from the fact that the dinners that were occasionally held ten and more years ago were in conjunction with another body of which no trace is now left.

Some eighty members and friends of the Society sat down at the Café Royal on Monday, September 29th, with the President, Mr. Thomas R. Dallmeyer, in the chair, to partake of the excellent menu which is here given:—

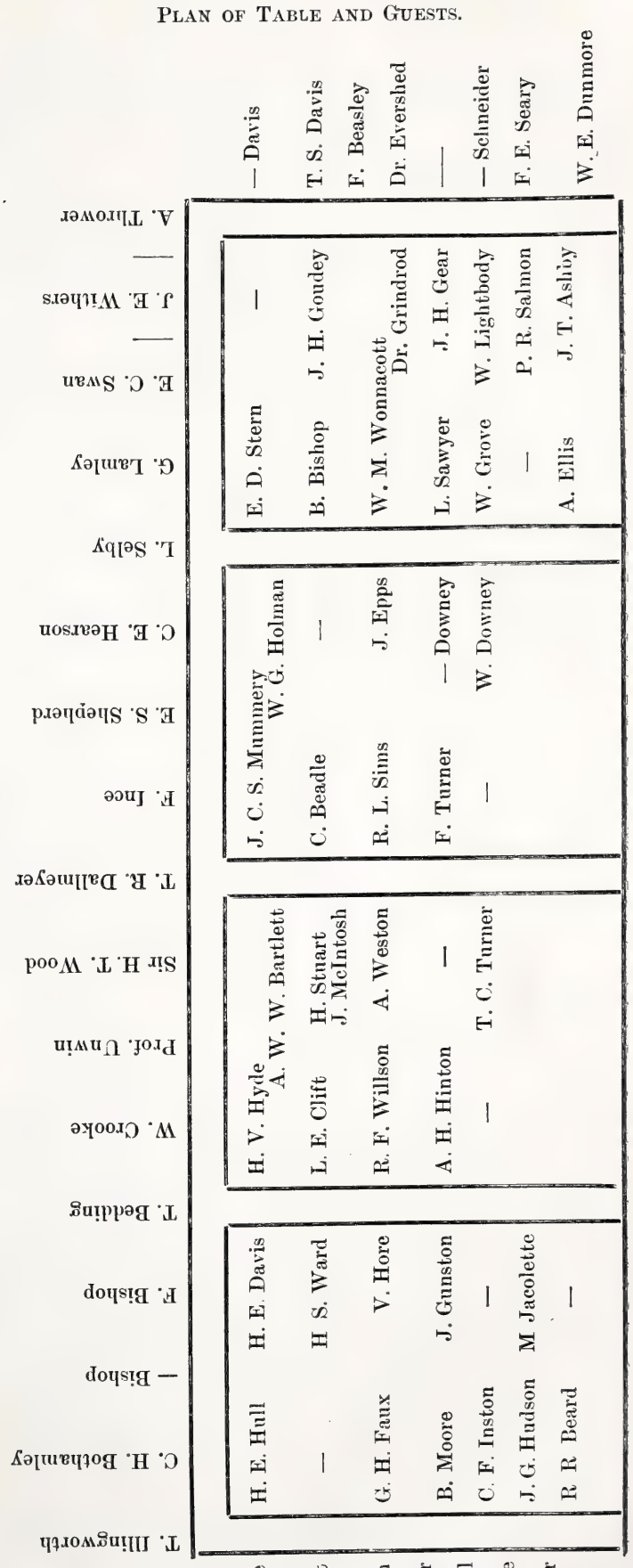
Hors d'œuvre.
Consommé Sarah Bernhardt.
Potage à la Fernande.
Suprême de sole à la Dieffoise.
Blanchailles.
Terrine de Volaille Portugaise.
Selle de Pré Salé Parmentier.
Epinards au Jus.
Sorbet au Kirsch.
Grouse Rôtie.
Salade.
Bombe Glacé Royale.
Friandises.
Bonne Bouche.
Dessert.
Café.

The meal ended, the President, in a few well-chosen words, gave the toast of the King, patron of the Society since the death of his esteemed father, the late Prince Consort, who also was a patron. The President's feeling allusion to His Majesty's Coronation, after a happy recovery from the serious illness that so disturbed the nation, was particularly appropriate, and the toast was honoured with every manifestation of loyalty.

The National Anthem having been sung, the President proposed the toast of Her Majesty the Queen and the Royal Family, expressing pleasure at the fact that the Queen was also a patron, and that since the completion of their tour over the British Dominions the Prince and Princess of Wales had been pleased to become vice-patrons of the Society. This toast was well received, and then commenced a delightful sequence of toasts, songs, recitations, and duets, the musical programme, under the direction of Mr. James Kift, coming in for an approval that was fully deserved.

The President, in charge of the toast of the Royal Photographic

Plan of Table and Guests.



Society, referred to the year 1902 as memorable in two respects. It was the centenary of the discovery of photography by Wedgwood, and it saw the completion of fifty years of life of what is now the R.P.S. The first President, Sir Charles Eastlake, was also President of the Royal Academy. In those days photography was an infant—a new arrival in which artists took a deep interest. That interest he thought had never been lost, and, although the fact was not so much acknowledged as it was fifty years ago, there was no doubt whatever that photography had been and was still of much real value to the artist. Succeeding the first President came Sir Frederick Pollock, the Lord Chief Baron, an able man in every way, who saw the Society increase its usefulness and strength to a large degree. He was followed by Mr. James Glaisher, a distinguished man of science, who, the President was glad to say, was still in good health and a respected Honorary Fellow of the Society. The next President was Mr. John Spiller, who had always shown, and still maintained, a warm interest in the Society's affairs, and following him that pillar of strength in photographic work, Sir William Abney, who had done so much for the science and theory of the process. To Sir Trueman Wood, the next President, the Society owed a deep debt of gratitude for his influence in securing for it Royal recognition. The President's immediate predecessor, the Earl of Crawford, followed Sir Henry in the chair, and was instrumental in acquiring the present exhibition accommodation at the New Gallery, and the spacious premises at 66, Russell Square, a step which it required some courage to take. The President believed that through the efforts and influence of his predecessors the Society was now firmly established and engaged in good work. It gave what he considered to be the best guinea's worth that any unendowed Society offered, but it was most essential that the membership should be largely increased. It was finance alone which prevented the proper display of the museum, the improvement of the accommodation, and so forth, but he hoped that at no distant date any trouble on that score would be dispelled by a large acquisition of new members. So far as his policy of efficiency had been carried out, he begged to thank those around him for their help, and for the good-will which had been so generally extended towards him. He coupled with the toast the name of Sir Trueman Wood, and the toast being honoured in the usual way, Sir Trueman Wood made reply in a speech relieved by several humorous touches. He had always taken an interest in the Society, perhaps because it sprang from one with which he was still more intimately connected. It was at a meeting of the Society of Arts that the suggestion was made that a Photographic Society should be formed, and it was very gratifying to find that the Society was now in so flourishing a condition. He saw no reason why the Royal Photographic Society should not rank with any other scientific society in the Kingdom (although, perhaps, it had not in the past), especially when one considered the exceptional position in which photography stood. Photography, in his own recollection, had been sneered at at places where now no meeting was complete without some photographic contribution.

The toast of the officers, council, and committees gave Dr. Evershed an opportunity of eulogising these gentlemen's work during the present year, and of making allusion to the pathetic circumstances which prevented the attendance of Dr. Fincham, to whom the idea of the dinner had occurred.

Professor Unwin acknowledged the kindly way in which the last toast had been proposed and received. He felt that he had been chosen to respond because he was one of the most irregular attendants at the meetings. He could, however, with the more modesty accept the praises offered in the toast. For his apparent neglect of the society he must offer the excuse that a society having much older claims upon him met on the same day and at the same time as the R.P.S. In the words, however, of the Dutch proverb, "The man on the bank sees best," he could say that he had seen that much time had been spent in carrying on the society's work. He hoped that the changes through which the society had passed would result in still greater progress being made. He thought that no scientific pursuit had a greater power than photography of leading one into pleasant employment, society, and friendship, and he looked in the near future to an effort on the part of the members to persuade still more of their friends to join the society.

Mr. Francis Ince, speaking to the toast of "The Visitors," assured them that it gave the society much pleasure to receive visitors on these festive occasions and at gatherings at Russell Square. The society was formed, however, for research, as well as pleasure, and with a desire to raise photography in the scale of the sciences and arts. He was sure every member would do all he could to advance the society and the science and art of photography. Photography was walking hand in hand with the X rays, and rendering great services in conjunction with other studies and pursuits. He only hoped that many of the visitors would see the force of his remarks and become valued associates and members.

Mr. Wm. Crooke, of Edinburgh, responded, and thanked the society for the welcome extended to him and his co-visitors. Taking the proposer at his word, he expressed his willingness to come within the ranks of the society, and called upon those for whom he was replying to raise their hands and undertake in the near future to offer themselves as recruits. Mr. Crooke's action was followed by cheers, and the raising of seven or eight signals of assent.

Mr. J. T. Ashby, in an excellent speech, gave the toast of "The Press," extolling their virtues, and generally making them pleased with their achievements.

Mr. Thomas Bedding, who responded, reminded the members that through the dark ages the Journal of which he had the honour to be the editor had been a strong and consistent supporter of the R.P.S., and assured the company that it was his aspiration that the BRITISH JOURNAL OF PHOTOGRAPHY should continue to suport the society. In the ordinary course of events, the president, Mr. Dallmeyer, would vacate his office in February next. He, the speaker, believed it might be taken for granted that Mr. Dallmeyer's successor in the presidential chair would be the society's old and staunch friend, Sir William Abney.

Mr. T. C. Turner, of Hull, proposed the toast of "The President." At no period of the society's history, he said, was it more necessary that the president should be a gentleman of culture and capable of showing sympathy with the varying aspirations of photography. The president, he knew, sympathised with all, and would help to dispose of the view that the society was merely a scientific society. As a professional photographer, he had been most pleased to see that the society intended to give to him and his colleagues some of the attention that was their due. The professional photographer, by his work, formed the idea of photography as an art, which the public at present entertained. The amateur work of photography was seen by comparatively few. Now, around these tables were men of very opposite views, but evidently perfectly happy together. Surely this betokened that the time had come when all bitterness could be sunk and a happy amalgamation of everything in photography brought about. He had much pleasure in proposing the toast of "The President of the Society," whose first duty should be to bring about this most desirable united front.

The President briefly replied, and passed on to the Earl of Crawford the credit for the initial move that had resulted in greater attention being given to the professional and wider interests of photography in recent years. He thought that whatever was best in photography would survive, whether in scientific, artistic, or professional circles. He hoped to see the time when all differences should cease and when the society had become *the* channel through which everything that was effected or attempted in photography should pass. Finally, he asked the members to give their hearty thanks to Mr. Ellis, the Dinner Committee, and the stewards for all that they had done to make a success of this dinner.

Commercial & Legal Intelligence

GAGGED and Robbed.—Mrs. Beales, owner of an extensive photography business at George Street, Croydon, was alarmed by seeing in her bedroom a man, who quickly stuffed a piece of rag in her mouth to prevent her arousing the household. When she recovered at daylight yesterday morning, an examination resulted in the discovery that the place had been forcibly entered, ransacked, and money and property to the extent of about £200 stolen.—"Evening News."

RE Frederick Thomas James Morris, photographer, late 137, White Ladies Road, Bristol.—The above-named debtor appeared for his public examination at the Bristol Bankruptcy Court, on Friday last, before Mr. Registrar Harley. Replying to questions put by the Official Receiver, debtor stated that his statement of affairs showed liabilities amounting to £232, due to unsecured creditors, and his deficiency he estimated at £2 7s. 11d. The examination was ordered to be adjourned for a month.

LIVERPOOL Amateur Photographic Association.—The winter session of the above Association was opened on Thursday week, when a large attendance of members assembled at the rooms in Eberle Street to hear a lecture by Mr. E. R. Dibdin, entitled "The Pre-Raphaelite Movement and Its Relation to Photography." The lecturer traced the history of the movement from its inception by Rossetti, Holman Hunt, and Millais, and dwelt upon its influence on British art as evidenced by the work of J. S. Burton, Maddox Brown, Burne Jones, Byam Shaw, and others. The lecture was illustrated by a large number of slides, including examples by Turner, Mulready, Millais, Hunt, Rossetti, Constable, Burne Jones, and Byam Shaw. Dealing with the relation of the movement to photography, Mr. Dibdin showed, by means of slides, the great amount of detail in the pictures of the brotherhood, the result being in many instances almost photographic in effect.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Oct.	Name of Society.	Subject.
3	Leicester Literary	*My Cruise amongst the Fjords of Norway.* Col. Barrington Baker. Short address by the President.
6	Oxford Camera Club	
8	Leeds Camera Club	*Lumière Process of Colour Photography.* Mr. T. K. Grant.
8	Croydon Camera Club	*The Practice and Profit of Photographic Surveying.* Mr. George Scamell, F.R.P.S.
8	North Middlesex Photographic	*Through the English Lake District with a Camera.* Mr. J. A. Hodges, F.R.P.S.
9	London and Provincial	*The Carbon Process.* Mr. Thomas Illingworth.

NORTH MIDDLESEX PHOTOGRAPHIC SOCIETY.

SEPTEMBER 24TH.—Mr. J. R. Gotz gave a demonstration on "Chromotype." It is a carbon process, but, unlike the usual process, it gives direct prints without reversal. It is, in fact, "gum bichromate," but the results are finer and detail better rendered than in the average gum bichromate print. In this it more resembles the Artigue carbon paper.

Paper coated with pigment and a binding material is sensitised in a bath of 5 per cent. solution of potass bichromate and 1 per cent. ammonia, or a 4½ per cent. solution of the bichromate, with a certain proportion of potass chlorate added. The first bath requires less exposure, while the second gives more brilliant prints.

Exposures are gauged by actinometer.

The development is carried out by soaking the print in warm water for half-an-hour, and then it is supported upon a board set on end in a large metal bath of water kept at 100deg. to 110deg. by means of a gas-jet underneath. The water is dashed all over it as in ordinary carbon work. Fine sawdust (pine or box wood) in the water hastens development. The paper should have a margin of about an inch all round the print to prevent damage during development. No safe-edge is necessary. High lights can be strengthened by means of a soft brush, taking care to work with the print under water.

It is most suitable for large work, but some small prints shown had very fine quality.

MARPLE AND DISTRICT PHOTOGRAPHIC SOCIETY.

ON Thursday week a lantern lecture was given by Mr. C. J. Atkinson, in the Society's Rooms at the Marple Recreation Club. The slides were chiefly views in and about Hexham Abbey Church and Carlisle Cathedral. The lecturer made his descriptions very interesting, and concurrently communicated many useful devices by means of which he had overcome most of the familiar but inherent difficulties of interior photography. An instance of this kind, worthy of notice, was the altar-tomb of Queen Etheldreda in Hexham Abbey. Upon the flat stone which lies over the top there is incised a design of a cross with vine-leaves and fruit. This extends along its full length, and ordinarily would be looked upon as impossible for a direct photograph. Mr. Atkinson, however, secured a rubbing and copied this in the camera. The resulting slide showed the design in white upon a black ground, and probably no other means would have better translated its exceptional beauty. Another slide showed the crypt taken by flashlight. This is the oldest portion of the building, said to go back 1,300 years. The view thrown upon the screen showed the interesting tool-marks in the masonry apparently as distinct as on the day they were made. There was also shown a very good reproduction of the East window in Carlisle Cathedral.

The average merit of the slides was excellent. The subjects were selected mainly for their historical associations or for some other educational signification; but in every instance the point of view and the tone and masking of the slide preserved their best pictorial effects. The quality of relief or modelling in some cases was surprisingly realistic.

Mr. Atkinson epitomised some of the most important conditions of success in the photography of architecture, for example:—Always use backed plates. Don't have the light coming from a point directly in front or behind the camera. Shield the lens from side light as much as possible. Expose for the shadows. Select a dull day for interiors, and a bright day for exteriors.

BLAIRGOWRIE.

THE monthly meeting was held in the club rooms on the 23rd ult. The secretary was instructed to arrange for one of the R.P.S. lectures for next month. A debate took place on, "Should classes be abolished in exhibitions?" The theme was heartily discussed pro and con, but the large majority of those present were in favour of classes being retained.

BOROUGH POLYTECHNIC PHOTOGRAPHIC SOCIETY.

HON SECRETARY'S SEVENTH ANNUAL REPORT—1901-1902.

I HAVE again the pleasure of presenting a report of the society's work for another year.

The following summary will at once show the growth of our membership during the past three years:—

	Ordinary Members.	Patrons.	Total.
1899-1900	37	9	46
1900-1901	83	9	92
1901-1902	108	10	118

The average registered attendances at the various meetings of the society for the same periods are as under:—

WINTER SESSION.

	Ordinary Meetings.	Instruction Evenings.	Total Weekly Attendance.
1899-1900	17	20	37
1900-1901	28	30	58
1901-1902	45	38	83

SUMMER SESSION.

	Ordinary Meetings.	Summer Outings.
1899-1900	14	10
1900-1901	23	15
1901-1902	38	17

The monthly lantern slide competitions have now been in vogue for three seasons, and the following table will indicate the support they have received in that time:—

	No. of Slides.	No. of Competitors.
1899-1900	116	10
1900-1901	129	13

	Junr. Div.	Senr. Div.	Junr. Div.	Senr. Div.
1901-1902	153	81	20	9

From these figures it may be taken that the division into junior and senior classes has proved highly satisfactory.

The seventh annual exhibition compares very favourably with its predecessors, as will be gleaned from the following statistics of members' work:—

	Framed Prints.	Lantern Slides.	No. of Exhibitors.
1899-1900	110	76	19
1900-1901	190	104	25
1901-1902	171	120	33

It was hoped that a second collection of members' slides would have been formed during the year, but only about half the required number was received. The committee again appeal to the members to assist them in completing this second collection at an early date.

The enlarging apparatus was inaugurated on November 1st, 1901, and since that time the register shows that it has been used on 157 occasions by 35 members.

The half-yearly print competitions, which have been held under Rule 12, have not met with that support which would warrant their continuance during the coming year, only the minimum entry of three in both the junior and senior divisions having been received in each case.

The monthly print competitions in connection with the summer outings, although not largely supported, have proved their usefulness in affording some interesting criticisms by the judges.

It is pleasing to record that in spite of a small deficit on the late exhibition, the finances of the society are still in a very satisfactory state, and the committee have been enabled during the past year to purchase a thoroughly up-to-date optical lantern and jet, in addition to replacing some old dark-room gear by more useful apparatus.

Your committee desire to record their grateful thanks to the following gentlemen for their generous donations towards our funds in the year just closed:—Edric Bayley, Esq., L.C.C.; Sir E. Durning Lawrence, Bart, M.P.; E. Lloyd, Esq., J.P.; Albert T. Harris, Esq.

It will be observed that I have merely recorded the progress of the society in a few facts and figures, and have made no attempt to enlarge on the many more or less important events which have occurred from time to time throughout the year.

I think the society may well be congratulated on the work it has accomplished during the past twelve months, as well as on the very prosperous condition in which it finds itself at the close of its seventh year.

News and Notes.

PHOTOGRAPHIC Classes.—Those desirous of obtaining tuition in pictorial and general photography cannot do better than attend one or both of the classes at the Cripplegate Institute, in Golden Lane, Cripplegate, E.C., which are under the direction of Mr. John H. Gear, F.R.P.S. There will be held, we gather from the syllabus, every Tuesday evening, at 6.30, commencing on Tuesday, October 21st next, a practical class for bromide and carbon enlarging, enlarged negatives and lantern slides, also transparencies, in a process of colour photography, and at 8 o'clock every Tuesday evening there will be a lecture and demonstrating course upon general photography. These classes are sure to be very popular, and as the numbers admitted must necessarily be rather limited, early application should be made. They are open to amateurs and professionals of both sexes. A well-appointed class and dark room has been recently provided, which will contain the most modern apparatus for the use of the students.

NOTTINGHAM Mechanics' Institute Camera Club.—At the annual meeting, held September 23rd, the Secretary reported that fifteen meetings and a very successful exhibition had been held and six excursions organised. The membership had increased sixteen on the year, now standing at 107. The finances showed a balance in hand of £3 17s. 7d. The following were elected officers of the Club for the ensuing year:—President: The Duke of Newcastle. Vice-Presidents: Lord Henry Bentinck, M.P., Edward Bond, Esq., M.P., J. H. Yoxall, Esq., M.P., Colonel Sir Chas. Seeley, and Messrs. W. J. Abel, S. Bourne, A. Brown, F. N. Ellis, A. Pyatt, G. H. Wallis, C. B. Wright, and H. Tolley. Hon. Secretary and Treasurer: W. Ward, 14, Stratford Terrace, Nottingham. Committee: Messrs. A. W. Flowerdew, T. Wright, T. K. Gordon, A. Black, J. Anderson, W. R. Anderson, P. W. Crane, and E. H. Atkin. Album and Slide Secretary: Mr. A. R. Hartley. Curator of Survey Prints: Mr. J. T. Radford.

VOLCANIC Eruptions and Sky Effects.—"The discovery of an order of luminous night clouds at a height above the earth so greatly exceeding anything which had ever been observed, even of the lightest cirrus," says Mr. E. W. Maunder, in "Knowledge," "was remarkable enough. More remarkable still were their variations; for they were not by any means a permanent phenomenon, and diminished in frequency of appearance from the time of their first discovery. From 1885 to 1889 they were seen before midnight; later they could only be detected in the morning hours. Their movements were more interesting still, and were such as might be caused, if, though travelling with the earth, they were but lightly subject to its attraction, and experienced some retardation as they travelled with it. From any point of view, the existence of these clouds must be regarded as most remarkable. That clouds could exist at all at a height greater than the highest stratum to which we owe twilight, and that so existing they should be an occasional and variable phenomenon are entirely unexpected discoveries, and still remain unexplained. Can it be that they are one of the by-products of the great volcanic eruption of Krakatoa in 1883? If so, they may be looked for after any great series of volcanic outbursts, such as that which commenced with the destruction of St. Pierre in Martinique in May, 1902, even though these eruptions cannot compare in violence with that of Krakatoa. Three striking sky effects followed that great eruption of 1883. The first was comparatively restricted both as to area and time, and took the form of a remarkable colouration of both sun and moon. At Batavia, in Ceylon, at various places in India, the sun was seen to be blue or green; blue when at the zenith, changing through green and yellow to total obscuration near the horizon. A much more lasting effect was that which received the name of 'Bishop's Ring,' having been first reported from Honolulu by the Rev. S. E. Bishop. This ring was a remarkable species of halo to be seen on every fine day surrounding the sun from its rise to its setting, and even occasionally round the moon. During the day the sun is invariably surrounded by an intense silvery brightness slightly tinged with green, and at a distance of about 20deg. from the sun this tint sometimes changes gradually into a pink or pale violet, and fades away at about 45deg. . . . . an orange-tinted haze extending about 45deg. from the moon was also seen on several nights. The third result of the eruption of Krakatoa was the occurrence of 'Afterglows' at sunset and 'Foreglows' at sunrise. The regularity of their colouring was particularly striking. Four colours in particular have been noticeable in these afterglows, and in a fixed order of time and place—orange, lowest and nearest the sundown; above this, and broader, green; above this, broader still, a variable red, ending in being crimson; above this, a faint lilac. The lilac disappears; the green deepens, spreads, and encroaches on the orange; and the red deepens, spreads, and encroaches on the green, till at last one red, varying downwards from crimson to scarlet, or orange, fills the west and south. These magnificent afterglows reappeared, but on a diminished scale, after the Martinique eruption of May, 1902." Prof. Herschel described the afterglow of June 26th. "The sun set about 8h. 25m., and a quarter of an hour later a long, low belt of sky in the N.W. had grown orange-yellow, whilst the ruddiness of the sky in the east had by the same time risen nearly to the zenith. Between the two there lay a white tract about 30deg. in width, which was gradually invaded and at last quite occupied by the advancing ruddy colour from the east. About 8h. 55m. from the zenith down to 30deg. above the place of sunset, and for 40deg. or 50deg. on either side of the vertical line through it, was a broad expanse of rich, rose-coloured, lake-red light. This red glow sank rather rapidly in height, and by 9 p.m. it had subsided into a brighter glow near the horizon."—"Knowledge."

MALLEABLE Glass.—It has long been the effort of the glass-makers to produce a glass that would have all the clearness and beauty of ordinary glass, and at the same time possess a toughness which would render it as little liable to fracture as many of the other manufactured articles of use and beauty. It is well known that the ancients discovered and made use of a process of manufacturing malleable glass; and in the glass-making world, it has naturally been expected that it would be in the old world that the process would sooner or later be reinvented. It is to an American, however, says "The Scientific American," that the credit of having discovered the method of making malleable glass is due. Mr. Louis Kauffeld, of Matthews, Ind., has succeeded after many years of endeavour in producing a glass which will withstand extremely rough usage without breaking. Although the process is not known to anyone except the inventor, he has stated that the lime and lead which are used in the manufacture of ordinary glass do not enter into the composition of his malleable ware. The secret lies principally in the chemicals which are used and the proportion of ingredients which form the compound, although the furnaces and crucibles play an important part in the process. The two chief things to be avoided in connection with the crucible are intense and prolonged heat from without and the corrosion of the raw materials within—two dangers of which nearly every glass-maker knows the ruinous effect. The effect of corrosion is readily proved by heating for a long time in a small crucible such substances as borax, red lead, or potassic or sodic carbonate. After a crucible has been in constant use for several months, and especially if it has contained flint or lead glass, the back and body will be found to be covered with innumerable small dents, which have undoubtedly been formed by corrosion. The complaint so commonly heard of specky glass arises from the presence in the glass of white particles of an infusible aluminate formed by the combination of the alkaline or metallic ingredients of the glass with the alumina of the crucible. If the corrosion becomes concentrated at one point and prolonged for a considerable period a breach is formed, through which the molten glass escapes into the furnace. Knowing the dangers that have to be encountered in this way, Mr. Kauffeld is extremely careful in the selection and preparation of the clay as well as in the construction of the crucibles. The finely sifted raw clay, on its arrival at his manufactory, is mixed with a proportion of burnt clay considerably coarser in grain, varying in amount from one-ninth to one-fifth of its weight. The coarser particles tend to bind the clay and render the finished crucible less liable to crack from variation of temperature. Only those who have lost in this manner a valuable compound can appreciate what an important part the crucible plays in the glass-maker's success. The tests which the inventor will make for anyone who cares to visit him in his shop in Matthews are certainly conclusive. For instance, a chimney was placed in a pail of ice water, and after having remained a sufficient length of time to become as cold as the water, was taken out and immediately placed on a lamp with the blaze turned as high as possible. The blaze on the wick was turned so as to flow directly on the chimney, and the smoke which collected on the chimney ran down with the water without injuring the chimney. Next a chimney was placed over a small gas stove containing clay bricks used in heating such stoves. The fire was turned on full, the chimney remaining on the bricks. The fire finally brought the temperature to such a stage that one side of the chimney was drawn in and dropped down, and no crack was shown in the glass; but for a slight roughness on the outside, the glass was as clear as when placed in the fire. Another test which was made was to place cold water in the chimney and hold the same over a fire until the water boiled. A large bulb was blown from the glass and filled with about one pint of water. It was then placed over the fire and allowed to remain there until it had boiled dry without apparent effect on the glass. Four chimneys were taken from the packing room and dropped one by one into a pail of boiling water. The chimneys were then hastily shifted into a pail of cold water that had just been drawn from a well, and the glass was not broken A further test was made by nailing up a box containing glassware, every nail being driven in by hitting it with a chimney. The most remarkable feat of all was the making of a perfect lamp chimney by using a chimney as a mold and blowing hot glass into the same. Both the new chimney and the mould came through the test perfectly whole, uncracked and unscarred. In appearance this malleable glass is much like the common product; it is, if anything, a little clearer than the glass now in use and in its molten state is much more elastic. It can be made of the thickness of a sheet of paper or as heavy as any in use, but in every instance it is tough—a dainty table glass could be handled as roughly as a skylight and no harm result. The advantages conferred by this toughness, in the wide variety of glass utensils for domestic use, are very numerous.

As You Were.—The volume is no longer found in the best circles, but there was a time when no home was complete without it. Its production was the first mark of confidence paid to a new visitor (sometimes it was the last), and it proved especially useful in filling up the dreary waste that came when the wells of conversation gave out. It was generally stuffed with contents to the point of repletion, so that the clasps never would embrace each other, and the head of the family used to say, despairingly, that something would certainly have to be done to it, speaking darkly of the necessity of tearing up poor Uncle Herbert (in view of the way he left those houses away from the family), and hinting that those with whom engagements had been broken off should be burnt. "We ought really," the head would say, "to keep it to the family. There's no room for outsiders, unless it's the dear

ld Queen." "But," someone would argue pathetically, "you wouldn't urely tear up Mr. Barkinson? It wasn't his fault that he went and ecame engaged to someone else. Besides, he looks gentlemanly in is photograph, at any rate." The degree of friendliness on which one tood with a home circle could always be ascertained by one's position n the book. If you came immediately after the sedate members of he family (father and mother in one picture, with father resting his and lightly on mother's shoulder, and mother wearing her chain of ffice, which was generally illuminated in gold; Helen, the eldest laughter, with thoughtful expression as one confronted with difficulty n finding a rhyme; and Jennie, taken on a winter day apparently, for he artist had caught her in a snowstorm; the boys in a group and houldering themselves into a good position), if, I say, you came imme- liately after these, then you were in the first flight, and it was safe to rop into tea almost any afternoon. If, later on, you found yourself ransferred to a part of the album where portraits of Captain Matthew Webb and Lady Dudley were sprinkled, it meant that your popularity vas waning and that you ran a great risk of being left out of the party given on New Year's Eve; if eventually you were buried, two deep, nder coloured photographs of ferns at the very end of the book, then t was fair to assume that friendship had gone with the snows of vester-year, and that when you did pay the infrequent visit your portrait had to be dug out with a paper-knife and cleaned up with bread. The family album was an inconvenient book when the family had advanced notably in the world. Relations had become strained and had to be kept away, so that sometimes a fraudulent system was arranged of keeping a double set of books, one called the Best Album and the other the Second Best; and the Second Best was a skeleton in the cupboard, brought out furtively on evenings when superior children had gone to bed, and the parents wanted to think of old times when they were hard-up and happy. Men in the Second Best had unfashionable whis- kers which went round underneath the chin; they wore a black cloth coat with an unaccustomed air; a flat-brimmed silk hat generally stood on the floor by their side, much as though it were a valued family relic —which, indeed, it was. Ladies were costumed in silk gowns, the train standing out stiffly; a cameo brooch at their throats; their hair in a net, and an aggressive smile which they appeared to have pinned on their faces at the express command of the photographer. Also in the Second Best were young couples with arms around each other's necks in a terribly plebeian fashion, and the parents who had achieved success would sit and look at one of these—"You were a good-looking girl, my dear, then." "You head of hair was quite black James, at that time"—and would wonder whether, after all, money was able to buy everything. The ages of man found themselves set out frankly in the family album; juvenile portraits of the girls were generally extracted by them and put away somewhere, lest the pigtails with scarlet bows, the leghorn hat and the elastic side boots should betray their age or raise the injudicious smile. But a thoughtful man could see his life set out there from the age of one, when a mother's hand held him to prevent disaster to the picture, and his baby waist (not otherwise to be distinguished from the rest of the small body) was indicated by a broad pale blue sash; an astonished look on the face suggested that something of a startling nature of being done with a toy by the specious artist. Later, he was a knickerbockered lad with a toy gun and carefully-smoothed hair, a look of haughty patriotism on his face. The next came at eighteen years, when his hair was still smooth, excepting for a single erect spike that never would keep down, daring pomatum and brushes to do their best and worst; he wore a flower in his coat; a suspicion of a moustache, which was only a suspicion, had been deepened into assurance by the aid of a black pencil. All these things showed that he was one who hoped the other sex could be allured by the tricks of personal adornment. There was a long gap after this, and in the next he was in a family group, if you please, with little ones around—little ones who had not in every case become big ones, for some had gone to sleep quite early in their lives and had never awakened to tell of their happy dreams. And reviewing these milestones in life, many a one must have thought how pure and clean he was when the journey began, and what a dusty, smirched and tired-out traveller he had somehow managed to become.—W. Pett Ridge, in "The Christian World."

A Photographic Society for Cambridge.—In consequence of the bril- liant success attained by the Photographic Exhibition recently held in the Corn Exchange in connection with the annual show of the Cambridge and District United Horticultural Society, there has been a general out- cry in the town for a local camera club. In response to the wishes of many persons interested in photography, Mr. C. S. Addison convened an informal meeting at the Llandaff Chambers, Regent Street, on Wednes- day evening last week, in order that the advisability of forming such a club in Cambridge might be thoroughly considered and discussed. It was attended by about fifty enthusiastic photographers—both ladies and gentlemen—the gathering including Dr. W. H. Bansall (Downing Grove), Mr. and Mrs. C. S. Addison, Mr. and Mrs. Charlton, Messrs. F. H. Sander- son, H. A. Chapman, D. J. Scott, F. S. Stoakley, T. J. Sowdon, A. Bar- rett, Alphonso Smith, J. H. Leech, G. H. Tyndall (Ely), A. J. Mouel, E. S. Peck, G. E. Hardwick, W. Atkinson, H. J. West-Knights, A. G. Swannell, W. R. Billing (Elsworth), R. P. Benham, J. Winship, jun., W. H. Hall, and W. C. Squires. Dr. Bansall, who was unanimously voted to the chair, said, in opening, that they had had a photographic convention there, and the photographic convention had given them a lead and stirred them up, and they all thought they ought to have a camera club in Cambridge. It seemed to him an absolute disgrace for a place like Cambridge, an old historic University town—only Oxford can hold a candle to them in the whole world—not to have such a club. There they were, with boundless subjects in all directions, and yet they had no camera club. He thought they ought to do their level best to see if they could not form one—not only a mere "flicker," but one that was going to last. Bury St. Edmund's, with a population of only 17,000, had a flourishing camera club, and he hoped the want of one would not be long felt in Cambridge. There was a camera club there, he believed, some long time ago, and he would ask one of the members of that defunct club to speak. Mr. Sanderson said there was not the slightest doubt that in a town like Cambridge there ought to be a well- established photographic club. They had at one period a club in the town, but unfortunately it went the way of many clubs that had been started in Cambridge, and it died from what he considered the very worst of all diseases—lack of interest and want of enthusiasm among the members. Prior to that—in the early eighties—there was a similar club in existence in connection with the University, but that shared the same fate. They had subsequently had a club formed by a fair number of members in connection with the Y.M.C.A. They recognised the club —he had been closely connected with it several years in judging work at their little exhibitions—but what they wanted was a club that was unsectarian—and he thought it ought to be social to a large extent, but not political. In forming a club they must have a good membership; they must be very enthusiastic, and every member should feel that the success of the club depended upon his own exertions, or it would be a failure. If they fell in with that, he fancied there would be a possibility of running a club successfully, but it meant that there must be a stick- ing to it. Mr. Addison thought Cambridge had exceptional advantages and facilities for those interested in photography. He was very sorry to see that in the last exhibition some of the exhibitors had not made that progress since the previous year that one would have expected. Some of the gentlemen who attended considered it was due to the want of a society. Those who were working in the town were not able to see what others were doing, and he considered, if not a camera club, a portfolio club should be started. Since then several gentlemen had expressed to him a wish that there should be a camera club, and asked him to convene a meeting. If they decided to form a society, there were several things to bear in mind, namely, whether they would have a room of their own, how many members they were likely to get, what sort of club they would make it, and the question of officers. He would suggest that the club be made as social as possible, and he would like to see a large membership, because then they could do so much more. He was sorry to say that some were waiting to see what sort of a club it would be before they became members. Really, it would be what they made it. If they could not get many members, they would have to be content with a room once a week or once a fortnight for occasional meetings and lectures, but if they got a larger number, say 200 or 250 —they ought to get quite 200—they would have a lot of help from out- lying districts. He had promises from a gentleman at Ely, and from several in villages round Cambridge, so that everything bade fair for the formation of a good society, and one with plenty of members. A question that wanted a deal of debating was whether they would admit undergraduates; there were many pros and cons. He had had promises from several resident members of the University who would be pleased to support the club if it was formed, but, as to undergraduates, it seemed to be the feeling of several people that he had spoken to that they should leave them to form a club of their own. Another question for consideration was whether it would be desirable to have a dark- room, studio, or lecture lantern for the club. Upon the members depended what the size of the club would be, what the subscription would be, and whether any entrance fee would be charged. It had been put forward that if a club was formed, a subscription of 5s. or 7s. 6d. would meet the requirements. Mr. G. H. Tyndall said he would like to see a club formed, because in Ely one had to work alone, and did not get criticised, and one got conceited until one was taken down. He thought he could find nine or ten members. Mr. Chapman thought that unless they could get sufficient members to insure practically the success of the club, they must adjourn the meeting. Mr. Addison ought to feel certain about what number of members was likely to join the club, as on the number depended the subscription, and the two combined would settle whether they had a meeting once a week or once a fortnight or permanent rooms. Mr. Addison said he had not taken any names of members because there was nothing tangible to work upon. Mr. Sowdon said, as far as he knew, the members of the Y.M.C.A. Camera Club did not look upon that proposal as any opposition, and from what he could make out there would be a certain amount of support received from them if there was a club formed. Mr. Stoakley, in order to set the thing going, moved that a club be formed, with a subscription of 5s. or 7s. 6d. This was carried nem. con., and at the suggestion of Mr. Sanderson, the chairman asked all who would pledge themselves to become members to show their hands. Almost everyone did so, and after papers had been handed round for intending members to give in their names and addresses, Dr. Bansall announced that they had got fifty members, and expressed the opinion that if they meant any- thing the ship ought to float. Some discussion took place as to the title of the new club. Three suggestions were made, namely, "Cam- bridge and District Camera Club," "Cambridge Camera Club," and "Cambridge and District Photographic Society," and eventually the last-mentioned title was chosen by a large majority. Dr. Bansall was unanimously chosen president, and Mr. F. H. Sanderson vice-president. No one could be found to take the secretarial duties on, and Mr. C. S. Addison undertook to fill the office pro tem. Mr. J. H. Leech was elected hon. treasurer; Mrs. Charlton, Mrs. Addison, and Messrs. Chap- man, Scott, and Stoakley were appointed to form the committee, with power to add to their number, and it was left to them to draw up a scheme for the working of the club and to formulate rules.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

THE SUBSTRATUM IN GELATINE AND COLLODION PRINTS.

To the Editors.

Gentlemen,—With reference to your remarks on the probable effects of the substratum in gelatino and collodio-chloride prints, may I point out that if the gelatine or collodion film is stripped from a finished print an image is found on the substratum, and this fact appears to indicate very positively that there is combination between the silver and the emulsion and the vehicle of the substratum.

I enclose a specimen of a stripped gelatino-chloride print, showing a distinct, though faint, image on the substratum. The upper portion of the divided print has been exposed to sunlight for five hours, to see if any change took place, but with no result.

Evidently the lower image requires to be as perfectly fixed and washed as the upper one, if the result is to be permanent. I cannot supply a similar specimen from a collodion paper, as the stripping operation is not easily carried out without rubbing out the lower image. If, however, you take a very deeply printed image, and, with a pad of wool dipped in spirit, gently rub off the film, in some spot where there is a violent contrast of light and shade, the substratum image can be seen pretty clearly.—Yours, etc., C. Welborne Piper.

September 26th, 1902.

PHOTOGRAPHY AS A FINE ART.

To the Editors.

Gentlemen,—The question introduced into the current number of your Journal by "F. V. C." is one of interest to me. My sympathies extend in the same direction as "F. V. C.'s"; still, I am not convinced. I write unbiassed, and I am open to conviction, but it appears to me that all known methods of producing photographic prints are mechanical processes.

It is true that artists working in photography so far subjugate their processes to their artistic ideas as to produce very poetic results. But does that make the means they employ an art? Let us imagine, firstly, a painter sitting before an empty canvas. He calls into his brain the vision of a subject he desires to paint. With dexterous and careful touches of his brush, inspired by his genius and by his knowledge, he creates upon the canvas the image he has in his mind. The colour is laid thinly here and loaded "impasto" there, according to the prompting of his inventive mind and as to the necessities of his subject. The painter is an artist; he has created a work of art. The means whereby he created it is an art, because the very existence of the feeling and sentiment contained in the picture depends upon the inspired technique. This technique (or handling of the colours and brushes), cannot be imitated, perhaps not even reproduced perfectly, by the artist himself. It is tolerably common knowledge that a painter does not achieve the same success in a replica as in the original work.

It is possible that "F. V. C." may not realise the full truth of my meaning, unless he has studied the painter's art. I refer to the individuality of handling which enables one to distinguish between the work of one artist and that of another. It is sufficient for my purpose to name Sir J. E. Millais, J. S. Sargent, and G. F. Watts. No one could mistake the technique of either of these painters, if he understood technique at all. I could, of course, name all the great artists with equal truth. An expert can proclaim a picture to be an original work or a copy by this individuality in the technique.

In painting from landscape nature the process by which an artist evolves a picture is the same. He conceives his subject, makes it his own, and treats it accordingly. The technique of Turner, Constable, and Crome differs as much as the sentiment conveyed in the subjects they treated. The technique is a part of the inspiration, and that which will suit one picture will not do for another. If we could assume it possible to exchange the handling of one picture for that of another the sentiment of the work would be destroyed.

Secondly, let us suppose the artist-photographer, who is anxious to produce a work of art by photography. He conceives a subject. At the outset he finds there are so many things in the way of securing his desire that he has to give up one idea after another as impossible. At last he hits upon one he thinks will succeed as to lighting, background, exposure, and so on. We will suppose he has a fairly practicable poetic idea—say, a figure subject. He arranges his background, poses his model, or models, and takes infinite pains to get everything, as far as he can, just right. He knows, however, that his sensitive plate is so unsympathetic that it will make the details he wishes to keep subordinate appear of even greater importance than they are in nature. That is the consequence of an inartistic process. The artist has to content himself with the knowledge that by sundry mechanical contrivances, dodges of development, and retouching tricks of printing, ozotype, etc., he may be able to achieve the result he is aiming at. The exposure made, he developes his plate, restraining some parts of the subject and accelerating others. Having done all that can be done in development, he retouches. Now, the very fact of having to retouch a negative proves that the previous processes are in themselves inartistic, or the artist would not have to correct the mechanical errors committed by his sensitive plate. But even here the work put upon a negative is very mechanical, spotting out holes, scraping down blotches, subduing the hardness of outlines and the like, floating on matt-varnish, and scraping parts of it off again. When the negative is prepared, the printing process (if in pigment) perhaps more nearly approaches an art than any other part of photography. I fail to see any art in printing in P.O.P., bromide, or platinum. Pigment processes lend themselves to some amount of artistic treatment, but is it not the subjection of mechanical means to the artistic sensibilities?

Anyone with poetic instinct will produce in photography, or by any other means, a work of more artistic merit than one without that instinct. Also, the person not endowed with the true æsthetic feeling cannot create a work of art in oils or water colours. I have a great admiration for some of the photographs in the Salon, but the artist-photographers, whose work they are, were artists first and photographers afterwards.—I am, gentlemen, your obedient servant,

C. W. C.

September 26th, 1902.

ON VARIOUS SUBJECTS.

To the Editors.

Gentlemen,—Some time ago a correspondent asked about something to take out the plates from developing dish, so as to save the fingers from contact with it and prevent their staining. I am using for development, dishes which are so exact in size that I could not take the plates out if I had not arranged a small and useful contrivance as follows:—I take a piece of brass ribbon, thin, but strong enough, which I bend round the edge of dish and along the side, and bend again to go under the plate about half way the length of it. With this I lift the plate out of developer to look at it, and save my fingers very much, and this exact size of dish allows me a great saving of developer, the plate laying almost flat at the bottom; the whole of it is used on top of the plate.

You gave also a way to make a dish, which is not eaten up by waste water and chemicals, but I found this a rather complicated affair however, said to be very simple. I use simply a suitable box, with a hole at one corner, for the wastes to run off. This box is lined with lead, and, so as not to use it up too rapidly or scratch it, I stand my dishes on two strips of wood. I have used the same box or large dish, as it looks like, for nine years, and it is as good as new.—I remain, yours very truly, Albert Levy.

Asnières (Seine).

September 27th, 1902.

THE GRÜN LENS.

To the Editors.

Gentlemen,—I was very much amused at the humorous paragraph in your Journal this week, but that feat would have been an easy one, compared to what I did last night. When I tell you that I succeeded in taking a three-colour negative of Alhambra ballet you may open your eyes; but it is true for all that, and I could make a coloured lantern slide from my last night's negative, but I trust, with the experience I have gained, to be able to have some better lantern slides made from three-colour negatives, taken at the Alhambra, to show at the Croydon Camera Club meeting on the 15th of October. It is curious to relate, but I have found it so, in photographing the illuminations, etc., that the red lights are apparently more actinic than the blue by night. Of course, I suppose that there is proportionately much more red than blue in artificial light, but apparently there is more difficulty in getting good exposure for blues and yellows by night than for the reds. Your article on depth of focus for lenses interested me, and

ou always miss one fact—that is, that, although your statement is rue in theory, it is not so in practice. You will admit that the infinite oint of a very short focus lens is much nearer at hand than that f a long focus lens, therefore objects much nearer to hand are within he infinity point. This alone gives a greater practical depth of focus, o you must qualify your statement, and say that if the lenses have the ame focus they will have equal depth at equal apertures; but, again, a lens has a very flat field, like the planar, it will not have so much epth of focus, as if it has a slightly curved field, because practically, or practice, you can choose your picture, so that the curvature of the eld enables you to bring your objects at the side of the field into ocus if they are standing further back, at the same time as your entral figure standing nearer to you, because the more distant objects, ecessarily having a shorter focus, and the curvature of field making he focus at the edges shorter, the two foci coincide, and so you et a sort of artificial depth, which in practice is decidedly useful.—elieve me, dear Sirs, sincerely yours,

The Hall, Southwick, Brighton.
September 26th, 1902.

EDW. F. GRUN.

P.S.—I enclose one or two of my last photos of Alhambra ballet.

THE LOST GOERZ CAMERA.

To the Editors.

Gentlemen,—In reference to my letter of the 23rd, I am pleased to nform you that the gentleman whose luggage was stolen from him has ince recovered the same.—I am, dear Sirs, yours faithfully,

C. P. GOERZ.

4 and 5, Holborn Circus, London, E.C
September 27th, 1902.

A STEREOSCOPIC AGENCY.

To the Editors.

Gentlemen,—I have pleasure in advising you that I have been ap-ointed sole British agent to the house of Levy et ses Fils, of Paris, for he sale of their well-known series of lantern slides and stereoscopic iews on glass. All communications, therefore, concerning these goods hould be addressed direct to me here in order to avoid delay. All ccounts will likewise be rendered and received by me. It is safe o say that Messieurs Levy's enormous collection of lantern slides is he largest in the world, whilst the quality and technical excellence f a "Levy" slide are so well known among lantern experts as to ender further comment unnecessary. A number of operators are con-inually travelling the globe, increasing and renewing this vast col-ection, so that the views shall be quite up to date. I shall at all times e willing to wait upon you with specimens or collections for selection, nd am confident that business will result, as we are now enabled to lace before the trade slides of a higher quality and at a cheaper rate han has hitherto been known.—Yours faithfully,

SAMUEL J. BECKETT.

20, Baker Street, London, W.
September 27th, 1902.

C.C. PAPER.

To the Editors.

Gentlemen,—Apropos of your interesting article on the alleged nstability of collodio-chloride papers, I have had some experience vhich I may perhaps mention. I used C.C. paper of English make or several years, and do not remember having seen a faded print. found one a few days ago, which had been made half-a-dozen years, nd was perfectly fresh and not yellowed in the whites. I abandoned he paper, however, because the print surface was so very easily lamaged. In inserting a print in a frame or an album, a customer requently scratched it very badly. About six years ago a professional riend made me a batch of matt C.C. prints, toning them with gold nd then platinum. Half-a-dozen of this batch are before me as I vrite, and are as fresh as when made. Some other prints of the same atch, however, which were exposed in a show-case, rapidly yellowed, nd the image lost its black, and turned a pale, dirty brown, not more han a tenth as strong as the original print.

I have also some prints on Blanchard's paper, toned with platinum. hese have been slowly fading for ten years, and now the spotting hows as distinctly darker markings. The paper has not yellowed, owever. The firm with whom I was, at once abandoned the use of his process, when they feared its instability, and it is to be regretted hat so many professionals of to-day are to be found issuing from their tudios, as platinotypes, or "platinos," prints which have not the repu-ation for permanence of the true platinotype processes. This, persisted n, must eventually bring the public to doubt the permanence of any rinting process.

Platinotype will give as excellent results as any platinum toning process, if the right kind of negative is obtained. It is, however, to be feared that the use of P.O.P. and other similar papers has gradually produced indifference as to the quality of portrait negatives, and some experience of photographers' negatives leads me to the conclusion that a very general idea obtains that almost any sort of negative may be printed from, by keeping in use, half-a-dozen papers of varying characteristics. This "mixing" has the obvious disadvantage that it prevents the printer acquiring a perfect knowledge of each process, unless he be an exceptionally able man. More care in negative making and a steady adherence to one or two mastered processes would cause many printing troubles to vanish.—I am, yours, affectionately,

C. H. HEWITT.

The Rembrandt Studio, Gateshead-on-Tyne.
September 30th, 1902.

INTENSIFICATION.

To the Editors.

Gentlemen,—Happening to notice a report of the meeting of the London and Provincial Photo Association, in your issue of the 19th inst., in which Mr. Welford introduced a problem anent effects produced relating to mercurial intensification, which no one present seemed able to explain, it came as a surprise to me to note how little some leading photographers study the chemistry of photography. Mr. Welford asked why it was that when a negative had been bleached with mercuric chloride and allowed to dry, and then exposed to daylight for a considerable time, nearly double the intensification was produced on its being blackened than would be the case if the negative were blackened immediately after bleaching. It is only necessary to have an elementary knowledge of analytical chemistry for one to give the reason. The explanation is, that before the reactions mentioned the negative consists of metallic silver in a fine state of division, embedded in gelatine. On submitting this to the action of mercuric chloride the silver robs the mercuric chloride of some of its chlorine and reduces it to mercurious chloride (a white insoluble substance), and the silver becomes silver chloride. If the bleached negative is immediately treated with ammonium hydrate, the silver chloride is dissolved out, and the mercurious chloride is blackened; but if the bleached negative is allowed to dry and submitted to the action of daylight for some days, the silver chloride also blackens through chemical change, by the liberation of chlorine, and becomes insoluble in ammonium hydrate, which accounts for the increased density. Some of your readers may feel interested to know what chemical reactions take place when intensifying negatives by the bleaching and blackening process.

(Ag	$+ Hg Cl_2$	$= Ag Cl$	$+ Hg Cl$
silver	mercuric chloride	silver chloride	mercurous chloride

(usually written $Hg_2 Cl_2$)

—Yours, etc.,

W. GUTTENBERG.

September 30th, 1902.

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Answers to Correspondents.

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*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

PHOTOGRAPHS REGISTERED:—

R. Baxter. 22, Curzon Street, Maryport. *Photograph of the late A. Hine.*

P. W. Morehen, 8, Shakespeare Road, New Brompton. *Photograph of New Brompton Football team.*

A. J. Ashbolt, 10, Exmoor Road, Southampton. *Photograph of T. Fitchett.*

A. J. Ashbolt, 10, Exmoor Road, Southampton. *Photograph of T. Barlow.*

J, Norris, 221, St. Helens Road, Bolton. *Photograph of Bolton Town Hall with Coronation decorations.*

H. Moyse, 34, High Street, Putney. *Photograph of High Street, Putney, showing Coronation decorations.*

C. H. F. Mawer, 7, Grovenor Crescent, Grimsby. *Photograph of 3 children on bullock's back.*

J. H. Platt, 6, Cowhill Lane, Market Street, Ashton-under-Lyne. *Photograph of Ashton-under-Lyne Cricket Club.*

W. O. TAYLOR AND H. IRVING.—Not suitable for publication.

OPINION WANTED.—"PYRO" says: "I enclose a few prints to show average quality of my operating and retouching. Would you kindly give me your opinion on same; also what salary I could ask, as I wish to apply for a situation?"—In reply: We are sorry we cannot speak very highly either of the photography or the retouching. We should advise you to improve yourself both in photography and in retouching before you apply for a situation; you will then be less likely to meet with disappointment.

BOOK ON THE STUDIO.—W. H. B. asks: "Can you inform me if there are any books published relating to the studio, as to the manner of commencing a photographic business; also giving hints regarding same?"—In reply: "The Studio, and What to Do in It," by H. P. Robinson, and "The Lighting in Photographic Studios," by P. C. Duchochois, are good works, but they do not give any information about commencing a business, and there is no book published on that subject. The books named may be had through any of the dealers.

URANIUM INTENSIFYING.—BURNISHING.—A. STANLEY asks: "(1) Would you kindly tell me how to make up a good uranium intensifier—one that you can redevelop after? (2) Also what is the best method to adopt with a twin-roller burnisher to obtain high polish on print?"—In reply: (1) Uranium nitrate, 12 grains; potassium ferricyanide, 15 grains; water, 4 ounces. (2) Heat the rollers and pass the prints through with good pressure on them; but first lubricate the prints with a solution of Castille soap—1 grain of soap in 1 ounce of alcohol.

STEREOSCOPIC PORTRAITURE.—"AMATEUR" says: "Kindly tell me (1) which is the most perfect class of lens to use in stereoscopic camera for taking portraits (stereoscopically). (2) Would a pair of single lenses be preferable to R.R.? (3) What focus would be best for this purpose, 6 inches? (4) Also what would be the best focus and type of lens to use with stereoscopic camera for interiors, such as ordinary rooms?"—In reply: (1) A pair of R.R.'s, or a pair of the anastigmatic type, or a pair of portrait lenses. (2) No. (3) Yes, six inches for portraiture. (4) Four inches, as they will include a fairly wide angle. They should be either R.R.'s or anastigmats.

SPOTS ON COLLODIO-CHLORIDE PRINTS.—"MATT PAPER" says: "I was very interested in 'Othello's' letter in your last issue respecting the permanency of Collodion Matte Paper. I have taken the liberty of sending you a few prints which have the appearance of the same trouble, namely, fading marks. These spots are only noticed in the matte paper. The manipulation of paper is exactly as laid down in the formulæ. I have never found this trouble with the Glossy C.C. Can you give me any idea what the cause may be?"—In reply: In last week's issue there is a leading article on the subject. We presume the prints sent were toned first with gold and afterwards with platinum. It is important with this method that the prints be tolerably well washed between the two tonings: was this done?

VEILED LANTERN SLIDES.—"OXALATE" writes: "I have been using the Ferrous-Oxalate Developer for Lantern Slides, but find that, notwithstanding the use of an acetic acid clearing-bath immediately after development, there is a slight bluish milky deposit on the finished slide. This is very slight, and would be of no consequence in a negative. I believe that there is a special clearing-bath (for use after fixing) to remove this, but have mislaid formula. I should be much obliged if you could let me have this at your early convenience."—In reply: The deposit is, no doubt, oxalate of lime, owing to the water used containing lime. It may be removed by immersing the slides, after the final washing, in water slightly acidified with hydrochloric acid, say five or six drops to each ounce of water.

TRICHROMATICS.—C. S. A. writes: "I should feel much obliged if you could give me any information on the following points:—(a) Where can Hoffman's trichromatic carbon tissues be obtained? (b) Where can I find any details of Dr. Miethe's investigations and results in trichromatic photography? (c) Can you give me the name of any sound work dealing with the theory of three-colour work, that is to say, going into details from the spectroscopical point of view?"—In reply: The firm that sold the tissues has gone into liquidation, but you might try Herr Hoffman, Cardinal Film Gesellschaft, Coln a Nippes, Germany; or Romain Talbot, Berlin. (b) No details have been published beyond those given in our paragraphs. (c) "Photography in Natural Colours," published by Marion, is the only English work; but, in German, Hübl's "Der Dreifarben-photographie," published by Knapp, of Halle, is the best.

PRICE OF NEGATIVES.—"LOCHIEL" says: "In a certain country district in which I have been residing for some time past I spent much of my spare time taking half-plate views of villages and local features of interest. These having turned out rather well, a local dealer, with the intention of publishing an album of local views, has offered to buy my negatives. As there is no other of the same place on the market, I think there is a good field for such a production. As I have several dozen negatives at my disposal, I fancy the views he would publish would be altogether reproductions from them. Would you be kind enough to say what you would consider a fair price for me to ask per negative?"—In reply: So much must depend upon the quality of the negatives and the interest attached to them, that we can scarcely appraise their value; but we should say that from half-a-guinea to fifteen shillings each would be a fair price. All such things are a matter of mutual arrangement. This, we imagine, would be about the price the publisher could get the views retaken for.

SEPIATYPE PAPER.—H. SHIMWELL says: "In last year's Almanac' there is an article on making sepiatype paper, the instructions of which I have followed out exactly as far as I know. It states that a small quantity of gum arabic solution is to be added to the ammonia ferric oxalate to keep the image on surface of paper, and also to prevent precipitation of the silver when the silver citrate solution is added. All seemed to go well till this citrate solution was added to the ferric oxalate, when apparently the whole of the silver was precipitated, leaving a muddy-looking liquid, with most of the silver, I should say, at the bottom. Could you say what has gone wrong, and whether I can rectify matters, or, at any rate, get back the silver from the solution?"—In reply: We are sorry to say we cannot tell what has gone wrong, unless sufficient gum was not added. If the silver is precipitated, the supernatant liquor may be decanted and the precipitate added to the stock of residues, which, we presume, you save, as most professionals do.

COPYRIGHT.—A. W. JOHNSTONE says: "On Royal Oak Day in 1900 or the previous year a man took a photograph of two ladies. In August, 1900, one of the two died, and this being the only known photograph of the lady, the man was approached on the matter, and he, being a working-man 'amateur'—one of the sort who sell cabinets at about sixpence each—offered to do some from the one he had. He copied—or had copied for him, I should suppose more likely—a cabinet bust from the small photo whereon the two ladies were together. The work is disgraceful, and I have been asked by the family if I can do B. and W. enlargements for them, but he has printed 'Copyright' on the photos he has done. He has put no number of copyright on the prints, and refuses any information, neither will he give permission for anyone to make a negative. Can you tell me how I stand in the matter, and whether, say, by making alterations in the dress in an enlargement, I should be justified in undertaking the work? And, again, can a photograph which is a copy of part only of another one (a group in this case) be copyrighted?"—In reply: If the picture has been made copyright, it would certainly be illegal for you to reproduce it or any portion of it. The mere altering of the dress would not protect you at all. Perhaps, after all, the picture is not copyright, but that you can only ascertain by searching the register at Stationers' Hall.

STUDIO BUILDING.—R. W. writes: "In your Answers to Correspondents last week I see a letter from 'Studio Length,' which, I think, I could reply to better than most photographers, and possibly give you a hint for the future. My studio is on the 'single slant' principle; it is on the first floor, has no top lights of any kind, and is 24ft. odd inches long. By taking out part of the floor above I got a window 14ft. high, and the width I made about 11ft. In addition to that I have on either side a window which was part of the original building. In practice, I find, firstly, I seldom or never work with the large window open lower than about 7ft. from the ground, and I don't think I ever uncover the side windows at all. I have blinds on the large window, running both up and down. In less than half a minute I can put the entire studio in total darkness or flood it with light. I've now had three-and-a-half years' experience of this kind of studio, and find no difficulty either in lighting or exposure, nor would I go back to skylights on any consideration. Apart from the lighting, a side light has many other obvious advantages. You can have a studio on any floor you like, which widens the range of suitable premises. If your studio is not on the roof, it is cool in summer, and can be easily warmed in winter. You are also safe from leaks, and have less dust or soot. 'Studio Length' can rest assured a very few weeks will convince him a high side light is the best, but I can't say I would care for a studio only 20ft. long—if I could, I would have mine about 30ft."

*** Owing to pressure, several articles, letters, answers to correspondents, and other items are unavoidably held over.

THE BRITISH JOURNAL OF PHOTOGRAPHY.

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*** *The Editor can only be seen by appointment.*

*** *We do not undertake to answer letters by post.*

THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC FOR 1903.

Edited by Thomas Bedding, F.R.P.S.

The forty-second annual issue of The British Journal Photographic Almanac will be published early in December next. This year's Almanac reached a total of 1,560 pages, and the entire edition of 20,500 copies was sold out a fortnight before publication. Of no other photographic book ever issued can two such unique facts be recorded.

The edition for 1903 will be increased to 25,000 copies, a large number of which are already ordered.

The striking favour with which past Almanacs have been received is the surest proof that the lines upon which the publication is produced meet the requirements of its readers and supporters. Upon such lines we propose compiling the volume for 1903. At the same time, we shall be pleased to receive and consider suggestions for increasing the value of the Almanac in directions which may occur to our readers as susceptible of improvement.

The Almanac for 1903 will appeal to photographers all the world over as a daily reference guide in practical work. The standard matter and formulæ will be revised and added to where necessary, and the latest departures in theory and practice will be chronicled. The year's advances will be recorded, and wherever practicable new features of an informative nature will be added.

Secretaries of societies will oblige us by promptly forwarding lists of officers and other details for inclusion in the directory of photographic societies. We shall also be glad to receive any additions that may be made to the list of telegraphic addresses of the trade, etc. As usual, a section of the Almanac will be devoted to notices of the latest introductions in photographic apparatus, etc. Those firms who wish to take advantage of this feature should communicate with us not later than Ocober 31.

The publishers ask us to remind advertisers that many of the advertisement pages of the Almanac are already booked, and that, to ensure insertion and good positions, orders and copy should reach them without delay.

EX CATHEDRA.

The Focal Plane Shutter. We see that a patent has been granted in Germany to the firm of R. Huttig and Fohn for a new variety of focal plane shutter. Usually the width of the slit is regulated by reducing the length of the chain, or cord, connecting the margins of the aperture in the blind. The new method, forming the subject of the present patent, provides a number of slits of different widths in the blind. The slits are separated from each other by a sufficient amount of material to completely cover the plate. This permits of the apertures, which are not in use, being wound upon the rollers. The advantage, of course, lies in the facility with which the aperture in the blind may be changed by simply revolving one of the rollers. On the other hand, the length of the roller blind is considerably increased.

* * *

Extra Rapid Lenses. A letter from M. E. Krauss, of Paris, to the "Bulletin" of the Association Belge de Photographie, places in a very clear and concise manner before the reader, the disadvantages which are inseparable from the large aperture of a lens. M. Krauss is the licensee of the Carl Zeiss Optical Works, and in writing of such rapid lenses as the Planar and Unar truly says that their large aperture should be regarded as one which may, rather than must, be used. The distance beyond which all objects appear to be sharp depends upon the focus of the lens, the relative aperture, and the permissible circle of confusion. It may be deduced from the formula:—$P = F^2 \frac{x}{n} d$, in which P represents the distance of apparently sharp objects; F, the principal focus of the lens; d, the relative aperture; n, the co-efficient of definition; n is variable, being often taken as one-tenth millimetre and sometimes as one-hundredth of an inch. From this equation it will be seen that to increase the depth of focus, either the principal focus, or the aperture, must be diminished. We have frequently expressed surprise that

amateurs should insist upon having lenses of the most rapid type for hand camera work, when plates of the highest sensitiveness are to be had at popular prices. The lenses are usually stopped down, for there are very few opportunities when the requisite depth of focus can be obtained with a large aperture.

* * *

Stereoscopic Photography. The stereoscope appears to be receiving far more attention in France than in this country at the present moment. Dainty cameras for the purpose are being manufactured by various firms, and they are remarkable for their lightness and compactness. In this country the most popular size for stereoscopic work is $6\frac{1}{2}$ x $4\frac{1}{4}$in., but the French are using smaller sizes. M. Pilleux, for instance, recently placed upon the market a stereoscopic camera called the "Six-treize," $2\frac{3}{8}$ x $5\frac{1}{8}$in. It is made of metal, and the plates are carried in dark slides. Another camera, called the Altostéréo Quart, made by C. A. Steinheil fils, of Paris, has some novel features. The plate is 9 x 12c. ($3\frac{1}{2}$ x $4\frac{3}{4}$in.). Three lenses are provided; two of $8\frac{1}{2}$cm. focus for stereoscopic purposes, and one of 13cm., placed centrally, for taking single pictures on the whole-plate. One shutter serves for the three lenses, and the stereoscopic pair may be used by capping the ordinary lens, or vice versa. By interchanging the components of the lenses, or using the separate halves, a great variety of foci may be obtained. A special stereoscope is also supplied, with eye-pieces of short focus corresponding to the photographic lens. The stereoscopic views are thus seen in precisely the same manner as the photographer saw them from the spot where the camera stood. With a transparency the effect is quite realistic. A square 5 x 4 camera could easily be altered for similar use.

* * *

The Gum-Platinum Process. Some members of the school of mucid photography have at last seized upon the beautiful platinum process to help themselves out of their difficulties in obtaining a satisfactory range of gradation. This new departure forms the subject of an article in the "Photo-Gazette" by M. Ch. Sollet, who states that M. Herbert Silberer was the first to exhibit prints by this combined process at the Camera Club, Vienna. Mr. Holland Day also exhibited a print by the process at the Paris Salon. We are familiar with the laboured efforts of some of the school to strengthen their prints by repeated applications of pigmented gum, supplementary exposure, and development. We are, therefore, not surprised that they should turn to platinum to obtain delicate half-tone or deep shadows. The combined process is recommended for either purpose, and as it is said the platinum print gives facilities in both directions, we fail to understand why bichomated gum should be combined with it, unless the photographer is compelled to help out an unsatisfactory negative. Development may, of course, be controlled with the brush! As the pigmented gum process is not purely photographic but largely dependent upon the brush, why should these people give themselves so much trouble with double printing, development, and other fake? Why not apply the colour direct with the brush, instead of juggling with photography? Is it necessary that there should be a scapegoat to bear the burden of their sins?

* * *

The Advancement of Chemical Industry in Germany. We read, from a source we have no reason to doubt, that the number of trained chemists employed in German factories was, in 1885, something like 1,700, and now is no less than 4,500. We are also told that nine big dye stuff works have from nine to over one hundred chemists each employed. Th is not altogether pleasant reading, seeing that the coal-t colour industry had its origin in England, and within few miles of the metropolis. Now this business is almos if not quite, extinct in this country. What makes th matter still more unpleasant reading is the fact that th supply of much of the material used in the manufacture the colours is drawn from Great Britain. When we la passed the extensive works at Greenford, now a few yea ago, where the coal-tar colours were first made, we notice they were in ruins, and the ground was "to let." On may very naturally ask why this very profitable industr has slipped out of our hands? Is it due to superior chem cal knowledge or to a certain lack of British enterprise We are rather inclined to the opinion that the latter i the main reason. Where is the British factory tha employs over a hundred skilled chemists, or anything lik half that number, devoted to making improvements in an manufactures? It is noteworthy that all the new develop ing agents used in photography have their origin abroad At one time all of our old friend "pyro" was made ir England, and now we question if any at all is made in thi country.

* * *

Nature of Metallic Radiations. The series of articles by Professor Rutherford and Mr. Soddy, on the radio-activity of thorium compounds, which has lately been appearing in the "Chemical News," and which we have before referred to, is now concluded, and the last portion contains a most interesting résumé of the various aspects of the work done, and their indications as to the theory of the radiations. It is pointed out that all the most prominent workers in the subject agree in considering radio-activity to be an atomic phenomenon, that is that the radiation is not so much what the popular conception of the word implies as the effect of almost infinitely small particles. "In each case the radio-activity appeared as the manifestaton of a special kind of matter, in minute amount. The emanation behaved in all respects like a gas, and the excited radio-activity it produces as an invisible deposit of a highly active material.' . . . The position is thus arrived at that radio-activity is at once an atomic phenomenon, and the accompaniment of a chemical change in which new kinds of matter are produced. . . . The idea of the chemical atom in certain cases spontaneously breaking up is not of itself contrary to anything that is known of the nature of atoms." The fact that these material particles are so minute that, although they are constantly being evolved and detached from the mass that emits them, the latter appears to become no lighter in the balance is referred to as follows:—"The changes brought to knowledge by radio-activity, although undeniably material and chemical in nature, are of a different order of magnitude from any that have before been dealt with in chemistry. The course of the production of new matter, which can be recognised by the electrometer by means of the property of radio-activity after the course of a few hours, or even minutes, might possibly require geological epoch to attain the quantities recognised by the balance."

* * *

Vulgarisation of X-Ray Work. As the very opposite of the scale of grandeur of conception comes the latest news regarding the progress of X-ray work, and this is neither more nor less than a penny-in-the-slot machine invented by an American. The appearance of the machine is similar to that of the now familiar kinematograph machines to be seen at the railway stations.

enny is put in the slot, you move a lever, put your hand, whatever you wish to examine, into a box without sides, and look down at it through a fluorescent en, which forms the top of the box. The coin on being rted closes the primary circuit of an induction coil ked by a few dry cells, and the vacuum tube is in posi- immediately below the object to be observed. A ular scientific contemporary says:—"All that is now ired is the penny-in-the-slot dentist." It appears to rather, that all that is now needed is a penny-in-the-slot tographic machine attached so that the observer can his skiagraph away with him.

* * *

eet ncers. The snapshotting fraternity who are always on the look-out for humorous incents in our busy streets, would do well to keep an eye n for what may possibly happen on the route of the y electric tramways at such time that the current is ned on for the first time. More especially should they t their expectant attention on that line which is now proaching completion, and which finds its terminus at Tooting, for the system there adopted is the underground duit system, which has vagaries of its own. They have h a tram system in Paris, and the inhabitants of one of streets through which the rails pass had recently quite ew experience of its ways. The pedestrians on the ement were astonished to see the people in the roadway denly beginning to caper and dance as though possed. The dancers did not seem to be enjoying the pase in any way, for their faces showed anxiety rather than ilaration, and when they saw that their fellows on the vement were not participating in their antics, they pped on to the higher ground, and immediately their ers ceased. What could be the reason for this saltatory rcise? The performers hurriedly explained that they been dancing against their will. That as they walked ng a sudden tingling sensation had attacked them in the s, and that they had had no alternative but to lift their t high from the roadway. One victim said that the sation was the same as that which he had experienced an electric bath. This statement gave the key to the stery. Something had gone wrong with the underund electric cable, and the current had been short circted through the damp wood pavement. The thoroughe was at once cleared, and the current was cut off. We y hope that someone turned a camera towards the ange scene when this unique al fresco dancing academy s in full swing. As we have already indicated, there y possibly be opportunities in London for witnessing d photographing a similar performance.

* * *

utumn and utumn ctures. "Chill October"—with an extra chill at the time of writing—is now with us, and the summer, or such summer as we have d, is over. Still there is plenty of work for the camera, r at no time of the year, not excepting "glorious spring," e such a variety of tints on the foliage to be seen, when e sun is shining, as in the early autumn. Unfortunately, otography, in monochrome, cannot do full justice to em, and photography in "natural colours" is not sufficntly advanced to be of much practical value in this rection. Still much may be done. It may not be nerally known to many of our younger readers that the eater number of the late Mr. Vernon Heath's best works re taken in the autumn, and that was his favourite time r working by reason of the long shadows cast on the breadth of effect he could then obtain. Burnham Beeches was his happy bunting ground at this time of year, and we all know the artistic pictures he produced in this neighbourhood. Indeed, it is said that his pictures of the beeches was largely instrumental in inducing the City Corporation to secure them for the use of the public. All the early pictures of Mr. Heath were taken by the wet collodion process, and the later ones by the gelatine process, but all these were taken before orthochromatic photography was in vogue. Had he had that power at command there is no question but that his results, excellent as they were, would have been still better; yet they are still unsurpassed either for technical or artistic qualities. Many enlarged pictures about 30 x 24 are to be seen at the entrance to the Guildhall library, and they well illustrate what was accomplished in the wet collodion days, alike artistically and technically. At the present time photographers have a greater power at command in the shape of isochromatic plates. With those specially sensitised for the purpose, even if used without a colour screen, much may be done in the truly rendering the various and gorgeous colour tints than was possible till recently. We would therefore advise our readers who desire to secure autumn pictures with all their glory to embrace the opportunity while it lasts.

* * *

Pictures in Newspapers. We are all more or less students of the daily Press, and it must have occurred to the more thoughtful of newspaper readers that the custom of inserting occasional pictures is on the increase. The question naturally arises: Are all journals destined in time to become illustrated journals? There is no doubt at all that the first illustrated newspaper, "The Illustrated London News," was founded because many journals were in the habit of giving their readers occasionally pictures of some particularly interesting occurrence, and the readers seemed to appreciate the attention. Even the stately "Times" did not disdain to do this. But of late years it has become a common thing to see illustrations in newspapers which have hitherto refrained from anything of the kind. In Coronation week the "Times" published a full-page drawing of the interior of Westminster Abbey as arranged for the great ceremonial. Since then it has devoted a half-page to a plan of the naval review at Portsmouth, and on a more recent date it has given its readers a plan of the proposed dais and amphitheatre at Delhi for the Coronation durbar. The "Daily Chronicle" a year or two back gave its readers some line drawings of very fine quality, and the other dailies have more than once flirted with art. As to the halfpenny dailies, they give illustrations of some kind or other in every issue, some of which, considering the difficulties of quick printing, are highly creditable to their producers. The evening papers are also to the front with pictures, some of them publishing political cartoons which are generally of a milk-and-watery nature. The weekly journals, which have more time for preparation, are also indulging in illustrations of a very sketchy kind. As to the cheap comic sheets, they are all pictures, and if their humour is somewhat strange, and a little bit vulgar, there is no harm done, and they find many admirers. Of course, this surfeit of illustrations is due to the introduction of the photographic process method of block production. They are necessarily of a rough description, for the speed at which a daily newspaper is printed is incompatible with fine work and careful execution. We should hardly think that ephemeral work of this kind can be much valued by newspaper readers generally, a large proportion of whom glance at the journal and leave it

behind them in the railway carriage which brings them to town. But the production of these pictures must bring employment to many thousands of workers, and in this way the art of photography, without which they would have been impossible, has brought a fresh boon to mankind.

* * *

Malleable Glass. This dream of the inventor would seem according to published accounts to be actually realised, for, as we noted last week, the "Scientific American" gives chapter and verse to prove it. Mr. Louis Kauffeld, of Matthews, Ind., U.S.A., is the inventor, and on the authority of that journal we here recapitulate the tests he will make, or has made. "A chimney was placed in a pail of ice-water, and after having remained a sufficient length of time to become as cold as the water was taken out and immediately placed on a lamp with the blaze turned as high as possible. The blaze on the wick was turned so as to flow directly on the chimney, and the smoke which collected on the chimney ran down with the water without injuring the chimney. Next a chimney was placed over a small gas stove containing clay bricks used in heating such stoves. The fire was turned on full, the chimney remaining on the bricks. The fire finally brought the temperature to such a stage that the side of the chimney was drawn in and dropped down, and no crack was shown in the glass; but for a slight roughness on the outside the glass was as clear as when placed in the fire. Another test which was made was to place cold water in the chimney and hold the same over a fire until the water boiled. A large bulb was blown from the glass and filled with about a pint of water. It was then placed over the fire and allowed to remain there until it had boiled dry without apparent effect on the glass. Four chimneys were taken from the packing room and dropped one by one into a pail of boiling water. The chimneys were then hastily shifted into a pail of cold water that had just been drawn from a well, and the glass was not broken. A further test was made by nailing up a box containing glassware, every mail being driven in by hitting it in with a chimney. The most remarkable feat of all was the making of a perfect lamp chimney by using a chimney as a mould and blowing hot glass into the same. Both the new chimney and the mould came through the test perfectly whole, uncracked, and unscarred." All this reads like a fairy tale, and we feel that judgment should be reserved till a sample of this wonderful glass is to be seen in this country; it is so easy to invest a simple phenomenon with an air of the marvellous. As an example, let us suppose that if the "Scientific American" had stated, water was boiled in an ordinary glass tumbler over a naked glass flame, it would have appeared extraordinary, yet this was done in the early days of Fletcher's gas stoves, only in his case it was to show the excellence of the gas and not the glass. Then, again, we are inclined to say about that packing case that it must have been a very tiny one, or the glass chimney a sort of weapon we are not familiar with here under the designation. What such glass might mean to photographers if unbreakable lenses could be made with it, need not be here dilated upon. We await developments.

* * *

Oil Lamps and Lanterns. With the advent of long evenings lanterns that have lain dormant from last season are now being unearthed, not perhaps so much for immediate use for displays as for preliminary trials of slides made from negatives taken during the summer season. In very many instances the lamps, when first used, prove nothing less than a positive nuisance to the household as well as to the owner of the apparatus. were forcibly reminded of this when calling on an amat friend the other evening. We found him trying sc slides he had made the night before in a lantern that being used for the first time for many months, and he complaining loudly of the smoke and "stink" the la was giving off. We need not have had our attention cal to that, as we were perfectly cognisant of it directly entered the house. His case was similar to many oth —the lamp had been left at rest with the wicks in it, with some oil left in the reservoir. The wicks r had merely been trimmed and fresh oil added, with result just mentioned. The lamp, we were told, had not b emptied and the wicks removed for the reason that the l tern might be wanted again before the season quite clos so it was left and forgotten. Now it is more than proba that this is by no means an isolated case, even by hu dreds, therefore a few hints may be of use to some who situated as our friend was. In the first place, the stale should be emptied out, the wicks removed and thro away. The reservoir should be rinsed out with fre paraffin, or, better, with benzoline, and the outside al cleaned with benzoline. The burners should next be tak in hand, and all incrustation carefully scraped off, and t racks carefully brushed out with benzoline. The whc should then be put out in the sun to sweeten. We ha now, practically, our old lamp converted into a new on that is supposing the burners and racks are in good conc tion. If they are not they must be repaired. New wicl must be obtained, and care should be taken that th exactly fit the burners. Before the wicks are put in it a good plan to bake them in the kitchen oven or lay the in front of the fire for half an hour or so, so as to drive o all traces of moisture. When this is done the lamp wi be found to yield a better light, and the wicks will la much longer. One set of wicks should last an entir season if care is taken at the starting. It may as well b pointed out to those who may purchase lanterns and us them without previous experience, that when they ar found to give off unpleasant fumes the cause must b sought for not in the construction of the lamp, but rathe in its cleanliness, *i.e.*, the fumes arise from the vapourisa tion of the stale oil on the outside of the reservoir, or fron that on the outside of the burners. The outside of th lamp and the burners should always be carefully wipe with a dry duster before the lamp is lighted. If this wer always attended to there would be few complaints of wel constructed lamps smelling.

* * *

The Old and the New. If anyone were to take the pains t search through our columns for the few past years, he would find much evidence of that constant battle which is going on between advocates of the old and picturesque and upholders of the new and utilitarian. Our readers have been again and again advised to photograph such and such an old building because it is doomed to destruction, and something ugly and more useful will presently take its place. This reconstruction, which is too often but another name for vandalism, is not peculiar to London, but is rife all over the country, and in other countries as well, and lovers of the picturesque must be constantly on their guard against it, and do what little they can to stem the advance of the destroyer. The latest example of this aggressive attempt to destroy that which is old and venerable is seen in the decision of the Oxfordshire County Council to take down the wooden bridges at Sonning, on the Thames, and replace them by structures of iron piles and steel girders. The wooden bridges are per-

bs not especially beautiful in themselves, but they harnise with their lovely surroundings in a manner which sel girders will certainly not do. A bridge is an erection vich may be made extremely elegant, and a great ornant to the landscape, or very ugly, according to the abil of its designer. We have plenty of examples of both kds on the Thames already, and for comparison's sake we y cite Waterloo Bridge as a specimen of beautiful structe, and that strange construction of ironwork known as mbeth Bridge, as a fearful example of unmitigated uglirss. The tendency to replace stone, brick, and wood by n and steel is, unfortunately, rampant just now, one of e chief reasons being that many of the old bridges will t bear the weight and stress of the modern traction gine with its train of springless trucks. These monstrosies belong to those who very often have the power to fluence the local authorities in whose hands the fate of a dge may rest. In this way the beautiful is sacrificed to e useful, and the bridge which has been a delight to many nerations is pulled down and made into road material, hile the awfully straight steel girder takes its place. hat is going on in Sonning to-day will, we may feel sure, repeated in many another place to-morrow, unless some dy like the Antiquarian, or the Society for the Protection Old Buildings, bestir themselves. And a bridge is peculrly public property, for it gives a distinctive character a place which without its presence would be colourless the extreme. We are not so unreasonable as to suppose at a bridge can stand for ever without need of reconruction, but what we do maintain is that a beautiful ject, be it a bridge or any other building and an object hich has long been a delight to those who dwell near it, to visitors to its neighbourhood, should not be ruthlessly stroyed, or so altered in appearance that its best friends nnot recognise it. Photographers can, perhaps, do more an most persons in bringing influence to bear on this estion of vandalism, for they have it in their power to ow the picturesque side of things. It would be servicele just now to exhibit some good pictures of old Sonning idges, in juxtaposition with photographs of some of the eel girder erections which, unfortunately, can be found ithout any difficulty.

SOME PHOTOGRAPHIC FETISHES.

is unfortunate that Mr. Welborne Piper should have nt the communication which we recently printed, as it ill have a tendency to perpetuate some of the erroneous leas which it was our purpose to endeavour to remove. Ir. Piper must, for example, in the course of his expeence, have met numerous instances of the man with the ns of such "splendid depth of focus," and, again, others ithout number who, wanting a very quick lens, reject all ffered to them because "they have no depth." It would e idle to explain to them the relation of the lens pupils depth, or the faint differences entirely negligible in ractical work that would be brought about by varying the istances of their diaphragms from one or other Gauss oint. The depth they can appreciate is simply that rought about by varying the effective aperture, and we sist in the strongest manner that their, and the usual, ppreciation of, depth is a fetish which ought to be estroyed. For logical accuracy we might have excepted e telephoto lenses, though they are virtually a combinaon of two instruments that would not be sought in such survey as we made. Mr. Piper's remarks about marginal epth are entirely gratuitous. When making the comarison between a first-class rectilinear lens and a cheap simple lens we expressly limited it to the area of sharp definition of the latter, and in view of further misapprehension we might say that we should not deem such a lens as a railway lamp bull's-eye to come within the scope of our remarks. The lens manufacturers' advertisement to which we objected did not refer to what is generally known as the anastigmatic type, and a comparison of marginal definition between the latter and the old rectilinear type cannot be made, as there is no definition with the latter at an angle of aperture which with the former would result in sharp definition.

Mr. Piper says that "depth in the centre of the plate is not a matter of any great consequence." This is quite erroneous, for, apart from the fact that with a very quick portrait lens the central region is the only part where there is good definition, and that when a photographer does compare lenses for depth he looks at where the image is sharpest to make the comparison, if we take, for example, the portrait photographer's work, the centre of his field is of the highest importance, and he would be willing to give a very high price for a quick lens that would give him depth in that part when taking such subjects as two heads or two figures on a plate, or even a figure group. The belief that such a lens is obtainable by the use of some unknown construction and some special glass is a fetish to be destroyed. With regard to single lenses for architectural subjects we never questioned, as readers of Mr. Piper's letter would think, the utility of "rectilinear lenses," nor did we advise their general disuse; we pointed out that a landscape type of lens was capable under certain restrictions of taking negatives of buildings or architectural structures in which no deviation from rectilinearity would be noted, or that would require a rule or compass to detect any. We repeat that the belief in the necessity for a rectilinear type of lens for all architectural work is a fetish to be abolished, and one whose existence has a tendency to prevent many a photographer from undertaking architectural work well within the limits of his instrument.

As to architects having small faith in the accurate drawing of trade photographs, we have to say that our experience of trade photographs of architectural objects is that the majority of them are wonderfully good, especially so when the surrounding conditions are taken into consideration. Those who undertake that class of work are usually provided with high-class lenses to meet every contingency, but that does not interfere with the fact that, within the restricted limits as described by us, a landscape type of lens would be available, and if of anastigmatic construction its range would be less restricted.

WHY is the sky blue? Tyndall answered a generation ago, "Because there is a predominance of the smaller waves of light, which are blue, reflected from the minute corpuscles in the atmosphere." The air is not blue; otherwise pure white light would not come as it does through a blue medium. In his graphic style Tyndall observed, "A broad cliff reflects the Atlantic roller as easily as the ripple produced by the sea-bird's wing." So a cloud reflects all rays, and looks white; its corpuscles of vapour are large enough to throw back light-waves of all sizes. But in the upper regions of the air there predominate infinite numbers of particles so small that they do not throw back the larger red, yellow, and green waves, but only the smaller that are blue, and thus blue is the predominant though not the exclusive colour of the sky. At the annual congress of the Swiss Society of Natural Sciences, M. Spring has called this accepted theory in question. He reports that "he has experimented with luminous rays under almost all conceivable conditions, injecting them into agitated solutions"; but although he could obtain red, yellow, violet, and the rest, "under no conditions could he obtain blue until, by the aid of electricity, he secured a pure atmosphere, in which blue was clearly discernible." Here M. Spring comes to the conclusion, whatever it may mean, that "the blue of the sky is purely chemical in origin, and is an essential quality of the air."—"The English Mechanic."

FILMS AND OTHER FOIBLES.

By an Amateur Optician.

I have had my holiday, in a blaze of sunshine interspersed with a couple of days' drenching rain. I took with me a hand camera and six dozen celluloid films, and a stand camera of larger growth. Theoretically, films are a heaven-sent boon to the weary tourist; practically, give me plates, and I will put up with the weight; theoretically, films are extremely easy to work, and sensitive—six dozen will go into a quarter-plate box; practically, I would rather take a dozen good plates and be certain of my results. I have sung the praises of films to my customers times innumerable, but it must be noted that films require careful usage and humouring; films are like babies who can't walk and want everything done for them; plates are stronger, and will stand alone, and in a sense are more reliable. I like to back my films up (in the carriers) with something thick and fairly heavy, and in the development of them it is almost imperative to make use of all the little sundries which have been devised by practical workers for the purpose of facilitating their after treatment; film holders for use during development are almost a *sine qua non*. The washing operation may, however, be carried out in the ordinary trough, if the film be on a fairly tough support, as is usually the case. In the drying of the film the amateur frequently finds himself handicapped; after many years of intermittent film work I prefer my own method of drying, the particulars of which are as follows:—Procure a stout pulp board from a mount dealer, cut out of it three or four pieces 15 x 12 or 18 x 16, or other convenient size; by means of broad tape and thin glue (or brass hinges may be used) form these boards into a three or four fold screen, cover one side of this screen with blotting paper, then, having the films properly and sufficiently washed, take one at a time, carefully press between folds of soft clean linen and pin to the screen by two corners; when the screen is full it is reared up on end and the films allowed to dry.

Films on celluloid—here I refer to the "altogether"—have one grave fault indigenous to the film tribe, rollable and rigid; this is that the film—here I mean the gelatine and chemical film—is extremely thin, unnecessarily thin, I consider. It is incredible that this can be the same film that is spread upon glass. I am addicted to an occasional enlargement by the process of film transference and stretching, also I require one now and then to reverse for process work, and it requires a perfection of skill aided by a large amount of luck to do this with certainty with the film on celluloid; needless to say, I have failures. Why should not the celluloid have a tougher and thicker layer is a question which I feel sure many film workers must feel inclined to ask of the makers; certain it is that the film removed from any good plate is considerably thicker and tougher.

Last year I mentioned a cheap "casket" set with which I had achieved some very good results; I would not like to withdraw a single word of last year's report, which was mainly, if not altogether, commendatory. It is an error to term these lenses rapid, remembering that the term has been for so many years applied to a class of lens which really deserves the appellation. This is no drawback in nine times out of ten in outside work with the casket set referred to; it is when we are doing some architectural work indoors that one begins to wish the combination were more rapid. You have to sit in a drowsy old church while the light, such as it is, is working its own sweet will on the sensitive plate, and time passes very slowly; it is not proper to smoke, hardly safe to sleep, and the literature to be found in the pews is scarcely of the lively and breezy sort which I, for one, like best at holiday times; while to import such seasonable literature as "Photo Bits" or "[illegible] Sloper" seems incongruous to a sensitive and naturally reve[illegible] mind. No, the lenses are not quick, but they serve, and [illegible] best results this year are on plates, and with, for the n[illegible] part, the lenses mentioned. Whiling away the time in one [illegible] country church, I was mildly interested in the official B[illegible] (a ponderous volume) of Common Prayer; it dated from [illegible] Georges, and the alterations, neatly written, from George [illegible] to IV., then to William IV. and Victoria, and more recen[illegible] to Edwardus Septimus, filled up all the margins and a li[illegible] over; they want a new prayer book there badly, and I [illegible] strongly tempted, while there, to present a new set, but, a[illegible] for the ephemeral nature of good intentions! An excell[illegible] object lesson demonstrating the value of a portable set of len[illegible] was made use of. From the dining room of the rectory ([illegible] host is a pillar of the church) there is a very excellent vi[illegible] of the picturesque old church and garden; it was just t[illegible] subject for experiment with a set of lenses, and I got t[illegible] very thing desired by the use of the fourteen inch lens on[illegible] whole-plate without leaving the room. Now, presuming one [illegible] on the outside of the fence and a fractious bull is in t[illegible] pasture, how much more comfortably we can get the picture [illegible] want by the insertion of a long focus single combination, [illegible] maining in a safe place meanwhile. Try photography with t[illegible] bull intervening, and you are glad you bought the casket set.

One of my best views was taken under the circumstances fo[illegible] lowing:—It had been raining all day—once or twice we ha[illegible] covered ourselves with wraps and sped off into the garden, [illegible] veritable bit of virgin forest, with its luxuriant undergrowt[illegible] and wealth of tree and shrub. Rain was descending relen[illegible] lessly, but about seven o'clock in the evening I got out th[illegible] camera, and under the shade of a sheltering umbrella focusse[illegible] a previously selected spot; the main idea, I'm afraid, wa[illegible] something to pass the time, but I wanted to see how the subjec[illegible] would turn out. It was a case of dripping wet: water wa[illegible] dropping from every leaf; there was a soft gentle light, an[illegible] the ground—where visible—was covered with little pools o[illegible] water; a long exposure was given, and the negative is quite [illegible] success—as a printer; but the presentment is entirely a failur[illegible] so far as a representation of a weeping woodland scene is im[illegible] plied; it looks, in fact, like a very good view of the subjec[illegible] taken in sunlight, and is very good, because—in sunlight—th[illegible] picture would have been difficult to take; certainly the expo[illegible] sure would have been puzzling.

In the operation of development it is not well to be slavishl[illegible] bound to one formula; an occasional digression is advisabl[illegible] and may be useful. It is an easy matter to get wrong in th[illegible] direction of exposures with one's drop-shutter work; change[illegible] of light may pass unnoticed, and persons have been known to[illegible] insert a smaller stop for a particular subject, and then forget[illegible] to change it again, the succeeding exposures getting rather less[illegible] influx of light than they require. However that may be, it is[illegible] possible to find one's exposures turning out rather badly with[illegible] the developer to which we have accustomed ourselves. I do[illegible] not know of any better developer than the pyro-metol combina[illegible]tion of the Imperial D.P. Co. Here it is:—

"Imperial Standard" Developer.

No. 1.

Pyrogallic acid	55 grains.
Metol	45 grains.
Metabisulphite of potash	120 grains.
Bromide of Potassium to	20 grains.
Water (boiled or distilled) to	20oz.

No. 2.

Soda carbonate (washing soda)	4oz.
Water (boiled or distilled) to	20oz.

For use take equal quantities of No. 1 and No. 2.

Metol, however, has always played such pranks with my cicle (other reducers when combined with caustic alkalies will sometimes cause the same disturbance), that I use it only as a *dernier ressort*. Metol is so valuable that one is almost obliged to make use of it on occasions. Anyone afflicted with tender and sensitive finger ends should totally abstain from contact with the solutions. Personally, I indulge in half-a-dozen rubber tight-fitting rubber finger stalls, which are worn on the thumb and two first fingers of each hand. With the aid of the above-mentioned developer and the finger coverings referred to a good proportion of my films turned out trumps, and last, but by no means least, I have had no symptoms to date of the objectionable irritation and soreness at the finger ends.

I have felt constrained to call the attention of my customers to what I consider a great fault in the construction of some (otherwise very well made) printing frames. The old-fashioned frame, apart from the "well" shaped article, with its plate-glass bed, is made with the two ends brought down flush with the negative. Now this serves a very useful purpose, because when using a soft brush to clear away any dust that may have got on the surface of the negative, there is a clear space through which, at either end, to brush away any small particles that may have got thereon. Compare a frame of this sort with a so-called improved pattern, neatly made in white wood, but with the grave fault that the negative is in the position of lying at the bottom of a box; then try to brush the dust off it, and you will see a vast pull in favour of the old pattern. It is much the same with cameras; the improvements, to an old-fashioned man, are somewhat difficult to find. I use an up-to-date camera, but my thoughts often turn to that which I was wont to carry in the seventies and eighties. There is another advantage in having a printing frame with the ends open—by the way, the bulk of the stiffening might be on the front of the frame—and this is, it allows the negative to be lifted, one end marked out, or one portion vignetted. Of course, as a rule, a good piece of thin plate glass should then be used as a support for the negative.

A CORRESPONDENT sends us another of "Clicker's" profundities, from the "Camera Causerie" in the "South London Observer," Sept 27th. Speaking of the use of the "stop," he says: "Its function is to concentrate the light."

VANISHING WESTMINSTER.—Mr. Archer Clarke writes: "A considerable number of houses and streets will be non est before next summer in the older parts of this city. Great College Street, behind the Abbey gardens, the residences of many noted men: Great Tothill Street, now a slum, once equally noted persons lived here. One or two window frames are curious, and so are many door faciæ in this street; all the old wharves from Lambeth Bridge to Palace Gardens are also doomed."

AT the South-Western Polytechnic, Manresa Road, Chelsea, S.W., a course of about twenty-five lectures on Photography, suitable for the City and Guilds Examination, will be given by Mr. E. Senior on Monday evenings at 7.30, commencing October 6th, with practical instruction in negative making, enlarging, platinum, carbon and silver printing and general studio work. The photographic department contains a large studio fitted with a powerful arc lamp and every appliance for work at night, with a spacious dark room and electric light enlarging plant. All chemicals and necessary apparatus will be provided; but students must find their own sensitive plates, papers, etc. Syllabus: Light and its application to photography. Various kinds of illumination used in photography. Lenses for photographic purposes. Testing lenses. Preparation and use of colour screens for isochromatic photography. Various forms of cameras, stands, etc. Testing cameras. Apparatus for rapid exposures. Preparation of gelatine emulsions. Negative making. Length of exposure. Under and over exposure. Theory and practical use of colour sensitive plates. Theory and practice of developing, fixing, clearing, intensifying and reducing gelatine plates by all the principal methods in use. Landscapes, etc. Lighting and general arrangement of surroundings. Rules for selection of point of view. Use of view meters. Best conditions for obtaining portraits in studios, ordinary rooms, and out-of-doors. Theory and practice of printing on the various silver printing papers, including vignetting, printing in clouds, tinted borders, etc. Printing with salts of iron and chromium. Theory and pratice of toning and fixing. Mounting and finishing, enlarging and reducing. Determination of conjugate foci. During the session demonstrations in the method of obtaining photographs in natural colours will be given.

PHOTOGRAPHY AS APPLIED TO ILLUSTRATION AND PRINTING.

[Cantor Lecture delivered at the Society of Arts]

I.

THE object of this and the following lectures will be to explain generally, and, as far as possible demonstrate, the means and methods at present employed in the production of illustrations by photographic processes for the printing press.

It is not expected, and I do not propose to give you, close technical details or exact formulæ of the working. Those dry bones of my subject may be ascertained by those who wish it from the numerous text-books, dealing with every branch of photo-mechanical illustration, or special information may be obtained in a practical form by attending the admirable lectures given by the technological classes organised by the polytechnic institutions and London County Council. I shall, therefore, to the best of my ability, endeavour to describe in simple language the general principles of the various processes, and by means of the lantern and of examples, demonstrate how the results are obtained.

If there happen to be any gentlemen present who are specialists, hoping and expecting to be instructed and enlightened in the particular working of one or other of the processes, I can only say that as far as these gentlemen are concerned, I humbly apologise for appearing before them, for I am about to talk to my uninitiated friends, and try to tell them what is going on in the world of process illustration.

The present methods generally employed in the production of printing press illustrations by photography may be epitomised as follows:—

Photo lithography.

Type block.—Reproductions from line drawings.

Type block.—Reproductions from wash drawings and photographs.

Photogravure. Rembrandt photogravure.

Collotype.

Woodbury type.

Type block.—Reproductions by the three-colour process.

There are many other photo-mechanical processes in existence, but to describe them all would occupy much more time than the limits of these lectures permit; it will, therefore, be necessary to deal only with the typical processes I have named. They are in one way or other allied to all known photo-mechanical methods of producing illustrations by means of the printing press; and whilst they cover the scope of my subject, such details as I can give you about them will no doubt also more than absorb the time at our disposal.

Photo-lithography is named first, because it is, I believe, one of the earliest, if not the earliest, practical application of photography to modern illustration by the printing press (I am excepting Fox Talbot's photo-intaglio process for the moment).

I hope I am right in assuming that you all know generally about photographic negatives and positives, and that you are aware there are several kinds of negatives and positives employed in the making of blocks and printing surfaces in photo-mechanical processes; those that are necessary will be described in their place. I may say now that the old (1857) collodion process of negative making still holds its own for process work against the more modern dry plates, though there are several successful process workers now using only gelatino-bromide dry plates for their productions. The first thing necessary for a photo-lithograph is a good clean sharp negative of the subject which is to be reproduced. This negative may be made of collodion or gelatine, but it is necessary that the negative

should be what is termed *dense* in the parts representing the whites, and that the lines should be clear glass. Generally speaking, photo-lithography is only employed for reproductions of line subjects, such as maps, plans, and architectural drawings, though there are modifications of the process for tone work, which I will mention later.

Now I must describe to you a principle which is the foundation of nearly every photo-mechanical process, viz., the action of salts of chromium in combination with organic substances. If a solution of gelatine in water charged with a small percentage of bichromate of potash is spread on paper and dried in the dark, and then exposed to light, it will be found that the gelatine surface has lost its solubility, and has acquired a new property, that is to say, it will no longer absorb water and dissolve, but will remain permanently hard, horny, and insoluble. This curious light action was discovered as long ago as 1839, by Mungo Ponton, and it is to-day the basis of a whole range of beautiful processes of illustration comprising carbon printing, photo-lithography, photogravure, photo-etching, and engraving, Woodburytype, collotype, and others.

Organic substances of the nature of gelatine, gum, starch, fish glue, isinglass, dextrine, etc., are all affected in the same way when treated with any of the bichromates, and the varied use of these substances often constitute the difference between one process and another.

To return to the subject of photo-lithography, here is a sheet of gelatined paper not treated with bichromate, and it can be exposed to light indefinitely without altering its nature. This sheet has been soaked for a few minutes in a three per cent. solution of bichromate of potassium in water, and dried. The light seems to act in two definite ways on bichromated gelatine: first, by rendering it insoluble; second, by causing it to lose its property of absorbing water, or swelling. This sheet of gelatine has been exposed to light under this negative for a few minutes, and if examined closely you will observe a faint brownish tinted image of the lines of the negative. Now another curious property of this oxidised gelatine is taken advantage of. I have said that it refuses to take up water, conversely, if it refuses water, it will admit of being greased or inked, and if a roller, charged with printing ink, is passed over the surface of the gelatinised paper whilst it is in a dry state, the ink will "take" all over the paper, but immediately the sheet is dipped in water the ink is loosed or repelled from the soluble portions, and adheres only to the parts where the light has acted and rendered the gelatine insoluble. The sheet now shown indicates the effect of the treatment described, the lines represented by the clear portions of the negative, through which the light has penetrated, retain the ink, whilst the dark or shaded portions of the negative are soluble, and refuse to retain any of the ink, at once giving a positive reproduction in *ink* of the lines of the drawing.

The inked-up photographic print of the lines of the drawing now shewn to you is technically known by the name of a photo-lithographic transfer, because it is used for the purpose of transferring the ink on its surface to a lithographic stone or a sheet of zinc, from which base it is printed from in the ordinary lithographic printing press, and any number of copies reproduced. I think I need not describe lithographic printing further than to state that the principal substance used for this purpose of a printing surface is a porous limestone known as Solenhofen slate: the surface of this stone is polished smooth and level, and it possess the property of greedily absorbing both greasy ink and water; if a drawing is made upon it with an ink composed of grease and lampblack dissolved in soap, the grease sinks into the stone, and each line of a design so drawn forms a permanent printing surface which, if the st is damp, will take ink from a roller charged with printing and give it up again to a sheet of paper pressed in con with the face of the stone. To prevent the ink "taking" over the stone when using the roller, the stone is dam with water between each impression. The stone absorbs wa everywhere except where the inked lines occur, which, be greased, naturally repel water, the simple principle being t a lithographic stone accepts ink and ink only where there already ink, and water only where there is no ink. Zinc a aluminium plates are used instead of lithographic stone printing from, and they are treated and used in precisely same way as the stones; these metal sheets have the advanta of being lighter, cheaper, and easier to store and handle.

You will observe that we have only spoken up to the prese of the reproduction of designs drawn in line, but within t last ten or twelve years considerable numbers of excellent illu trations have been produced by this process of drawings, whi are in monochrome, and of photographs. The difficulty whi occurs in dealing with reproductions of subjects which are repr sented by continuous graduated shades from black to white that there is no known printing surface or ink (excepting, pe haps, Woodburytype) which will distinguish any intermedia tone between black and white, in fact, the printing press only capable of rendering two shades, viz., black and whit This difficulty has, however, been practically overcome, and is now quite possible to produce the graduated shades of photograph, for instance, though the graduations are n homogeneous, but are subdivided into granulations or grain arranged close together for the deeper shades, and separatin or becoming finer for the lighter tones, giving to the eye th effect of unbroken shades, though they are really not so. shall have to speak of this in dealing with half-tone negative for block printing a little later; at present photo-lithograph is before us, and the problem of reproducing half-tone by tha process. Many methods have been devised for breaking up th gradations into lines, stipple, or dots, and much ingenuit was exercised by the earlier experimentalists to produce th effect of half-tone in photo-lithography. The names of Dallas Pretsch, Bolas, Waterhouse, Ives, and Husband are landmark in its history. The idea throughout was the production of grain or texture which would be to some extent discriminating that is to say, form automatically groups of large, close grain in the deepest shadow, graduating into finer and finer grain until the lightest tints were reached. It was found that th addition of a hygroscopic salt, like calcium chloride, to th ordinary gelatine and bichromate coating for the lithographi transfer, had the effect of breaking up the texture of the gela tine image, and permitted of a transfer being made of mono chromes or photographs. The process has been further de veloped by Messrs. Sprague and Co., who employ a method analogous to collotype for obtaining their transfers. The re sults of the process in their hands are very successful, and are largely used for commercial and artistic illustration. Photo-lithography generally is an important process, and it is employed for the rapid production of plans, maps, machine drawings, facsimile reproductions of manuscripts, and notably in the Ordnance Survey Department at Southampton.

Block Reproductions of Line Drawings.

The next important process in order of seniority and usefulness is the line block process on zinc, and it is curious in regard to it that the present methods of working are almost identical with those adopted by the original inventors. Another singular point is that the medium for sensitising the metal plate which to-day gives the finest results, namely, bitumen is the sub-

stance which M. Nicephore Niepce discovered in 1827 as being sensitive to light, and he submitted photographed images on a plate coated with a film of bitumen, to the Royal Society of his country in the year named. The process has now been in use for the past thirty years or more, and the principle of photo-lithography just described to you largely enter into the working of the line block process.

The first requisite for the production of a good result is a suitable original: the drawing should be made with perfectly black lines throughout, it is of no consequence how thin the lines are, but they must be black; it is important, too, that the scale of reduction should not be too great; the best proportion is for the drawings to be made about one-third larger than the required block. The paper used for the drawing should be white and smooth in texture.

The negative for a line block is made preferably by the wet plate or collodion process, because of the facility with which these plates can be intensified, and the clearness of the lines; the negatives for this process must be reversed, so that the resulting picture may be non-reversed, which result can be obtained in two ways, first, by photographing through a prism or mirror attached to the lens, or second, by stripping the film, carrying the image off the glass, and turning it over.

The reversed negative is next printed on the metal which is to form the block in the following manner:—A piece of polished and perfectly flat zinc is cut to the proper size, and freshly polished in water until it is free from all trace of grease; it is then sensitised by either flowing over it a solution of asphalt in benzol, or, as is more generally used because of its rapidity, a solution composed of egg albumen, water, and bichromate of ammonia; an even film of this solution is floated over the metal, and is dried by gentle heat; as soon as it is dry, it is sensitive to light, and is at once placed in a printing frame over the negative; a few minutes' exposure to daylight, magnesium, or electric light, is sufficient to oxidise the albumen where the light has obtained access to it through the lines of the negative; the plate is then covered all over with a thin coating of ink from a printer's roller charged with ink, to which a little turpentine is added, and is then dropped into a flat dish containing cold water; the inky surface of the plate is then gently rubbed with a pledget of cotton wool, and the ink coating, together with the unused albumen, leave the plate together, except in the places where the light has acted through the negative and rendered it insoluble, the result being an image of the subject photographed on the metal, covered with a greasy, acid-resisting ink; in this state the plate is ready for the first stage of the etching process, that is to etch or bite away with acid all the metal surrounding the lines, and render the pictures in high relief, so that it may be printed in a printing press in the same way as type. The etching of such a plate is the simplest thing possible in the abstract, but a considerable amount of skill and experience is required to carry the etching to a successful issue.

The theory is that a metal like zinc is quickly dissolved or eched by nitric or hydrochloric acid, so long as there is no grease or varnish on the metal to interfere with the dissolving action of the acid; that is so, but in the case of the plate we have to deal with a very thin protective coating, and with lines which are so narrow that they might be represented as knife edges. There is also an element to be reckoned with in the fact that the acid not only etching downwards, but sideways. It is, therefore, necessary to proceed with some caution, and the first etching is performed for a few seconds only in a very weak acid, just strong enough to taste acid; after this the lines are slightly re-inked with a roller, and whilst the ink is wet, it is dusted with powdered asphalt or resin, and afterwards heated to melt the powder into the ink. The etching proper is then proceeded with, and occupies two to five hours, but it is by no means a straightforward operation. For a time, every few minutes the plate is taken out of the acid bath, and further strengthened with ink and resin, and as the etching proceeds, the piled-up ink on the lines is heated and melted, so that it runs down the sides of the lines, to protect them from being undermined by the acid—when a sufficient depth is attained to make the lines high enough to ink sharp and clean in the printing press, the whole of the etching ink is removed, and the tops only of the lines carefully re-inked. A finishing etching is then given to remove the shoulder and steps on the sides of the lines caused by the various inkings and meltings. When finished, a properly etched plate should have each line firmly and cleanly cut, and be supported by a pyramidal-shaped base. The plate is now ready to be trimmed and mounted on wood type high for the printing press.

Reproductions of Wash Drawings and Photographs.

Save as regards line blocks, until early in the '80's, it can be said that there was no process in existence by which paintings, wash drawings, or photographs could be "processed," to use a bad term, into the form of a surface-printing block for the press, and the introduction then of the half-tone block marked an epoch in the history of photographic illustration which has done more to revolutionise the making of pictures than almost all the other processes put together. The origin of the process cannot be definitely claimed by any particular investigator. Its development was the result of a kind of evolution of Bullock's process of 1866. Meisenbach, of Munich, patented a half-tone process in 1882. Mr. Ives, of Philadelphia, Mr. W. B. Woodbury, and others were experimenting and publishing results in rapid succession, until within a period of a very few years the process as it now exists was practically established. I recollect very clearly the "dark ages" of the half-tone process, when all kinds of expedients were adopted to break up the gradations of a photograph into lines or dots by the interposition of a texture of silk or fine linen; also the days of wire gauze, ruled lines on paper, and other similar processes. The Americans were first in the field with an improved device for breaking up the image into dots, which was so much superior to anything invented in Europe that almost every other method was dropped in its favour. I refer to the diamond ruled screens made by Mr. Max Levy, of Philadelphia. These screens or gratings are so essential to a description of the half-tone process that I will occupy a few minutes of your time in telling you how they are made. A sheet of the finest plate glass is selected and is coated with a varnish composed of asphalt and wax. The coated glass is placed on the bed of an automatic ruling machine of extremely accurate construction, and capable of ruling lines of any degree of fineness up to 500 to the inch, the cutter of the machine is diamond pointed and gauged to cut lines of any desired width. The lines are ruled diagonally at 45 deg. across the glass, and the number to the inch varies according to the kind of work for which the screen is required, for newspaper printing the lines may be fifty or sixty to the inch, for commercial and catalogue printing 100 to 130, and for finer magazine or book illustration 150 to 200 to the inch. When the ruling of the glass is completed, the ruled surface is subjected to the action of the hydrofluoric acid, which eats into or etches the lines laid bare by the diamond, and forms a channel which is filled up with an opaque pigment. This enamel is baked in the lines in an oven, and then the surface is carefully polished until the lines are perfectly level, and the spaces represented by clear glass are bright and

transparent. Two of these ruled glasses are required for each screen, laid together with the lines crossing at right angles, and cemented with Canada balsam. As may be imagined, the screen gratings are somewhat expensive, a piece measuring 12in. by 10in., of 175 lines, costs about £25; whilst large screens of 24in. by 18in. are charged at £100 or more. I am glad to state that we have now an English firm (Messrs. J. E. Johnson and Co.) who rule these screens excellently, indeed, there is little to choose between this work and the best American, which is a comforting thing to say in these days, when it is habit of the ever present pessimist to decry everything that is English and all that the Britisher does.

To produce a half-tone block from a picture, wash drawing, or photograph, this ruled grating is placed in front of the sensitive plate, but not in contact with it. The screen distance from the sensitive plate is a point of importance in making the negative, and the skilful operator has to determine this distance according to his experience, and to the character of the subject which is to be photographed. If it is placed too close, the resulting negative will present what is known as a gridiron appearance, if it is too far away, the dotting will be too close in the lights, and too small in the shadows. You will understand how necessary it is to keep a nice balance in this matter in the case of a picture which is built up entirely of an infinity of dots, shadows being represented by grouping of dots, close together, with smallest of spaces between middle and light tones, by dots of different graduations in size, and the highest lights of pin point dots only. Everything is represented by dots, yet they are so accurately graded in relation to the light and shade of the original, that the eye does not detect them, unless examined closely, and the half-tone picture appears as a practical facsimile of the original from which it was photographed.

The method of printing half-tone negatives on metal is similar in most respects to that described for line blocks on zinc, with this difference, that most half-tone blocks are now etched on copper, and the sensitising solution generally employed for this metal is a compound of fish glue, albumen, chromic acid, water, and bichromate of ammonia. The copper is carefully cleaned with Tripoli powder, and washed, the sensitising solution is then flowed over it twice or three times, and placed on a revolving table, where it is rapidly whirled, in order to spread the coating thinly and evenly over the whole surface; the coating is then dried by gentle heat in a yellow-lighted room, and the plate is now ready for exposure under the half-tone negative; three to ten minutes' exposure to an electric arc light completes the printing, when the plate is removed to a bath containing cold water, and soaked and washed under a spray of water until the unacted-upon compound is dissolved out, an operation occupying five or six minutes. The image on the metal at this stage is almost invisible. In order to enable an examination of the film to be made, the plate is dipped into a solution of methyl violet, which dye immediately stains the film, and brings the picture into view. If all has gone well, the surface is dried either by flowing it with methylated alcohol or gentle heat. The next operation has an important effect, namely, a hardening of the delicate glue picture into a substance resembling enamel, and this gives the method its name—the enameline process. The plate is simply heated to a high temperature over the flame of a large Bunsen burner; during the progress of this "burning in," or enamelling, the image changes curiously; the blue picture gets pale, then grey, and eventually vanishes entirely; after a few seconds, as the plate gets hotter, the image appears as a faint brown, and gradually increases in strength until it fully attains a rich chestnut brown tint, wh the heat must be withdrawn, and the plate is cooled off. T plate has now a picture fixed upon it, which is formed of strong, hard, impermeable coating of enamel, and which w bear any reasonable amount of etching without further pr tection. The etching bath is made up of neutral perchlori of iron dissolved in water, and of a strength which registe 35 deg. with a Beaumé's hydrometer. The plate is first su jected to a general etching all over the plate, sufficient to gi the block a printing depth; that is, to etch away the spac round the dots forming the picture, so that the plate may l inked over with a printer's roller charged with ink, and a fir proof of the photo-etched picture pulled in the press. In mo plates made by this process a further and local etching mu be performed. The dulling of the general effect caused by th interposition of the necessary screen grating has to be re moved as far as possible, and this is done by artists who ar specially trained for the work. The parts of the picture whic are in shadow and are usually correctly rendered by a properly-exposed negative, are covered over with varnish and the next tones are etched again, then these tone are covered up, and the high lights are treated unti the resulting picture, when proofed, correctly represents th original. The plates are then trimmed by engravers, bevelle to admit of being rivetted to the wood mounts, and are mounte type-high for use in the printing press.

Many efforts have been made during all the years these mechanically grained blocks have been in use to find a mean of producing a printing surface which would give a pleasing result with an irregular grain like that given by collotype or photogravure, but the results so far have been disappointing; perhaps some of this disappointment may be due to the fact that the eye has been trained by years of use to look for and expect the smooth, clean results given by the mechanical ruled screen, and that any other result, though it may in a measure be more artistic, is not acceptable. I would like to mention, however, in closing this lecture, that Mr. Wheeler, of Bushey, has introduced a new screen for half-tone work. This promises much in the direction of the making of pictures which are free from mechanical effect, and are yet sufficiently delicate in texture to retain the finer details. His screens have no pigment in the graining; they are formed by a delicate etching of the surface, which leaves the plate very transparent, and the breaking up of the image to form the printing surface appears to be formed by causing the surface of the screen to act as if it were made up of an infinity of lenses. Some examples of this process will be shown to you, and will be found extremely interesting.

J. D. Geddes.

The Report for the year 1901 on the museums, colleges, and institutions under the administration of the Board of Education has been issued. Among other interesting items, it may be mentioned that the year was marked by a large falling off in the number of visitors to the western galleries of the Victoria and Albert Museum who received special assistance or facilities for the examination of the collections for scientific instruction and research. There was also a diminution in the total number of visitors to the Museum, the total in 1901 being 836,848 as compared with 1,017,314 in 1897, since which year there has been a steady decrease. The most important events in the history of the Royal College of Science during the year reported upon were the retirement of Sir Norman Lockyer after forty-four years' total service, and of Sir Arthur Rucker after fifteen years' service. Similarly the report of the Geological Survey is exceptional, since it records the retirement of Sir Archibald Geikie after a service of more than forty-five years. The Solar Physics Observatory was very busy during the fifteen months with which its report deals, viz., from October, 1900, to December, 1901. Bad weather entirely prevented observations of sun spots on 127 days throughout this period, and 171 nights during the same time were wholly bad for observing purposes, leaving 201 nights available, on which occasions the observers attended. —"Nature."

Exhibition.

THE ROYAL PHOTOGRAPHIC SOCIETY'S EXHIBITION.

[SECOND ARTICLE.]

THE PICTORIAL EXHIBITS.

The presence of a few striking pictures in an exhibition does more towards creating a favourable impression than a profusion of good but unsensational work, and, as there are few pictures in the present exhibition which stand out from their companions on account of size, boldness of treatment, or exceptional interest of subject, it is probable that the general opinion of the exhibition of 1902 will not be that it is one of extraordinary merit. We must confess that, in our opinion, which is uninfluenced by the considerations we have referred to, this section of the exhibition falls considerably below the standard of that of last year or even the year before. A glance at the list of exhibitors shows that many of the best known pictorial workers whose pictures have been among those which gave a tone to the whole collection are not exhibiting, while among the work of aspirants who have yet to win their spurs there is very little that shows decided signs of promise. Probably the decadence arises, not from one cause, but many. There is no reason to suppose that any irreparable injury has been wrought or to doubt that those who have stood aloof will again accord their support when the organisation of the exhibition has been placed on a sounder basis.

The judges have been liberal in their awards, no less than six medals having been given. With Percy Lewis the receipt of a medal seems to have become an annual event. The particular picture which has pleased the judges most is entitled "A Venetian Market," but the merit of his three exhibits seems so evenly balanced that the choice is but a matter of personal feeling. Although his individuality of treatment is evident in all, he has somewhat altered his methods, and has adopted a less sketchy style. This was almost inevitable in choosing carbon for his prints. W. T. Greatbatch is represented by two woodland scenes, similar in character and treatment as their titles suggest, "Woodland Mists" and "Autumn Haze." The former has received a medal. They seem to be unsophisticated samples of photography, and, if not very ambitious according to modern ideas of pictorial work, they are interesting, apart from being very pleasing pictures, from the evidence they show that legitimate methods of control are sufficient for pictorial effect. The frames are unhappily chosen. Equally straightforward examples of photography are the contributions of J. M. Whitehead, one of which "Where Once the Garden Smiled," has received an award. Though small in size, there is no want of breadth. "The Rose is Sweetness—the Gardener's Pride," by Wm. A. Stewart, is a pleasing picture at the first glance, but it hardly bears examination. We cannot help wondering why a gardener should be garbed in some strange robe of silk—it is the only texture in the picture that is recognisable, and why he should wear a sash. The print is mottled all over, which possibly may be a help to effect in this particular picture, but which, one cannot help suspecting, is due to carelessness, especially after viewing Mr. Stewart's other exhibit, which is already fading badly. "Seven Pines," by Frank R. Fraprie, another of the medalled pictures, is an inoffensive little work, but most people will wonder why it received an award. The remaining medalled picture is by John H. Gash, and is entitled "Marketing." The scene is apparently in Normandy. The quaint costumes of the peasant women and curious architecture make it interesting, and the grouping is happy, but it is far from beyond criticism as regards its tone values; in fact, there are no tones in the lower part of the scale, and the fault is not disguised by the unnecessary diffusion of focus adopted.

One of the most imposing pictures and occupying one of the most prominent places in the gallery is "The Deserted Mill," by M. Arbuthnot. It is a gum print, and, as in many gum prints, a gain in breadth has been secured at the expense of truth of tone. The theme is a somewhat hackneyed one, and one would probably guess, from subject and treatment, it was of Continental origin; this, however, is not the case. It is, on the whole, a creditable piece of work, and its author deserves an encouraging word. Equal prominence has been given to a large photograph, by J. C. Warburg, eititled "Summer Heat." The print, which is described as being by Pouncy's process, is of a pleasant cool green tint, and any other year than this we should have said that summer heat was the last atmospheric condition it suggests. As a specimen of photographic skill it is noteworthy on account of its size, but it possesses little pictorial interest. Of Mr. Warburg's other four examples, "A Surrey Roadside" is, perhaps, the most passable. "The Park Palings," which really represents the iron posts and rails, is evidently an enlarged snap-shot, and it possesses just the combination of good and bad qualities that the average snap-shot displays as produced by the average snap-shotter. Mr. Warburg's colleagues on the hanging committee surely have treated him unkindly in not suppressing such immature attempts as those which bear his name. Dr. Grindrod has no less than six pictures. His work is always interesting, on account of its boldness and freedom, and its breadth of effect, but there is no one that we know who stands on an equal footing with him whose work suffers so much from carelessness and inattention to details. "Carting Trowse," for instance, is full of anomalies in its tones, which would strike the least educated eye. J. C. S. Mummery has shown far better work than that to be seen here. In "Low Ebb," he has a good effect of atmosphere and a sufficiently pleasing composition, but the technique of the picture has an unpleasant characteristic, which we can only describe as "scratchy." The "Village Street" is not so happy as a composition; its cramped foreground quite spoils it, but in treatment, in tones, and in other respects it is admirable. John H. Gear's "Scharzwald Peasants" is a careful piece of work, and, in spite of many good qualities, is not quite satisfying; probably the interest in the figures and the landscape is too evenly balanced. His "Tivoli" is much more successful, although the subject is a less ambitious one. J. Page Croft is another member of the selecting committee whose colleagues have tempered justice with mercy. He is certainly not fulfilling the promise of his youth, as far as photography goes. Always prone to extravagance, experience should have taught him restraint, but it has not, and he attempts things far beyond the warrant of either his art knowledge or his technical skill. Surely his own sense of beauty should have led him to suppress "A Photo Sketch," which apparently represents the nude figure of a woman suffering from some loathsome disease, which has distorted her, body and limb. The picture is as vulgar as its title. "A Portrait," a girl with a veil, is his simplest and best work.

The brothers A. and F. Read show two landscapes of decided promise. When they learn to strain less after effect and to satisfy themselves with simpler subjects, they will do well. The half-dozen pictures by R. Eickmeyer are all full of that daintiness and feeling we are accustomed to in his work. "A Portrait" (157) is a charming head unconventionally treated. An attempt in gum, entitled "Over the Hills to the Poorhouse, I'm Wending my Weary Way," shows the usual defects of that process in unaccustomed hands.

Among the portraiture, a noticeable work is "A Glasgow Journalist," by W. Ralston, in which reflected light is used to produce a striking effect. "A Portrait," by Dudley Hoyt, is good, but the treatment, though possibly legitimate in photography, is not of a kind that would be adopted with any other medium. Jas. Auld sends a far more attractive head than that which received a medal last year. W. M. Warneuke has a very pleasing portrait of a lady. F. Hollyer's portrait of Professor W. C. Unwin is entirely successful. "A Haddon, Esq.," by Furley Lewis, is also a commendable work. "Lady Anglesey," by H. Walter Barnett, can hardly be called a fair specimen of his work. R. N. Speaight has two admirable portrait studies, and R. Fellows Willson's one contribution is quite up to his usual standard. Two capital little portraits or figure studies, by C. F. Inston, are happy in subject and delightful in treatment.

W. A. J. Hensler has in "Epping Forest," a very well worn subject, but it is well treated.

Pierre Dubreuil's five works in gum are equally examples of the control and the absence of control in that process. A portrait of a painter shows the latter and the portrait of Mr. D. the former. H. Stuart, whose work in carbon was always noticeably good, this year sends a very modest-sized gum, which is not a great success. W. Rawlings has in "A Field of Thistles" a good subject, but it is hardly successful. "The Seaweed Cart" is better, but neither is equal to Mr. Rawlings' usual work. J. Fielder Hadens's "Harvest" seems to us a very commonplace photograph, although it is chosen for illustration in the catalogue. "In the Gloaming" is far better both in subject and in treatment. Douglas English has made an interesting picture of mice, and several of his pictures of the smaller animals in the technical section would be distinct acquisitions to the pictorial section. W. J. Croall also shows upstairs a lion's head, which has very considerable pictorial value; indeed, it is a far better picture than his pictorial exhibit. "Nemo me impune Lacessit," by Robert Mackay, has an equal right to be exhibited in either section. It is a group of thistles; as a decorative work it quite deserves its place among the pictures.

The exhibition contains some notable studies of breaking waves by Joseph Appleby, and which are refreshing examples of straightforward photography. Architecture seems to be quite unfashionable now, but among the few examples there are some distinctly commendable. "Promenoir Staircase, Mont St. Michel, Normandy," by Alfred Bedding, is characterised by its harmonious tones. "Across the Nave, Beverley," by J. W. Hodges, is another well-managed interior; and "In the South-West Tower, Chichester" gives Wm. A. Clark an excellent opportunity, which he has availed himself of; and "An Ancient Chamber," by John Schofield, is a carefully executed piece of work, and there is some good work by H. R. Campion.

Miss Acland contributes the one photograph in colours which the pictorial section can boast of. We cannot justly describe it as in the colours of nature, but it is very tiny, quite inoffensive, and interesting in its way.

"On a Moorland Road," a study of sheep, by J. B. Johnstone, strikes us as being one of the best things in the exhibition. It is certainly not faultless, for it has precisely the faults which are so difficult to avoid in a photograph when a low scale of tone is adopted—there are dozens of examples of the same defect in the room—but the grouping, the arrangement, and the general effect are extremely good. It is most unfortunately hung at the lowest level. Of the three pictures by W. C. Wickison, "A Hampshire Farm" is the most interesting, but the subject seems somewhat reminiscent of the "warranted hand painted" oil paintings of the cheap furniture shops. It is, however, a distinctly clever work, in spite of its artificial appearance. "Winter," by Thomas Wright, is a very effective piece of snow scenery. From a pictorial point it is rather too crowded with incident, but is just the picture to appeal to the general public. Another picture which will be popular is "Friend or Foe," by John Smith, which represents a child making advances to a cat.

Of course, there are many other pictures that deserve notice with those we have commented upon, but however fully we were to record our own impressions a greater amount of instruction could be gathered from a single visit.

TRADE EXHIBITORS.

The first experiment, the year before last, in providing space for the display of their wares by manufacturers and photographic dealers, though otherwise successful, resulted in an assemblage of stalls decorated so that the noble fountain court presented something the appearance of a fancy fair. The same fault cannot be found now; and, although the intention is quite as well achieved, the appearance is very much more in consonance with the dignity of the Royal Photographic Society.

Messrs. Wellington and Ward have arranged their space in the usual tasteful manner, and display enlargements on their various grades of bromide paper, also enlargements in carbon and specimen negatives on their celluloid film.

Messrs. J. H. Dallmeyer, Ltd.—The chief attraction is the long-expected "Adon" telephotographic lens. This differs from ordinary forms in being attached to the front instead of to the back of the ordinary lens. It can be adjusted to work at the same infinity focus as the ordinary lens, and thus the focus can be adjusted before the attachment is applied. The "Adon" is in itself an image-forming lens, and it can be used by itself as an ordinary lens. An important advantage in this over the usual from of telephoto attachment is that the light intensity of the ordinary lens is but slightly diminished, and its use in a hand camera is therefore quite possible. Another novelty is a new camera back for studio cameras, which allows the sensitive plate to be brought into position for exposure in a fraction of a second after focussing has been performed. It is extremely ingenious and undoubtedly useful.

Messrs. Sanger Shepherd and Co. have many new and important pieces of apparatus which will be of great interest to those who are engaged in the production of photographs in natural colours. There is also a new light measuring instrument, and a new hand-fed arc lamp for projection purposes.

Messrs. Ross, Ltd., have an attractive display of their lenses, of various types, also cameras of their own and other makes to which their lenses are fitted. They also show lanterns for enlarging and projection with their special forms of arc lamps and high power lime-light jets, their new pattern prism binoculars, and other specialties of the firm.

Mr. C. P. Goerz shows examples of his anastigmatic lenses, including the last new series and the ingenious "Hypergon" lens for including an extremely wide angle; the Goerz-Anschutz camera, Sector shutters, various photographic accessories, and the Trieder binocular. Some good specimen photographs are also shown.

Messrs. W. Watson and Sons have an admirable selection of cameras of various kinds, including their latest patterns, their focal plane shutter, adaptable for time and instantaneous exposures, and convertible Holostigmat lenses, with specimens of their performance. A new patent shutter release is also shown, which seems to be without the disadvantages of the ordinary pneumatic ball and tube.

Messrs. Burroughs, Wellcome and Co. make a good show of specimens of their "Tabloid" photographic chemicals. There is also to be seen here Wellcome's Photographic Exposure Record and Diary.

The Kodak Company make a good display of their wares. The new developing machine for developing roll films in daylight is on view. The method of using it and other simple demonstrations are frequently given.

The Platinotype Company show numerous specimens of platinotype printing. They have also a full equipment for the platinotype patent lamp for portraiture, and demonstrations are given at intervals in the evenings.

THE TECHNICAL SECTION.

Scientific, technical, and photo-mechanical exhibits reach a total of some one hundred and fifty examples, somewhat less, if memory serves aright, than was the case last year. The exhibits illustrate the applications of photography to astronomy, spectroscopy, radiography, natural colour rendering, copying, investigations into the structure of metals, the miscroscope, ballooning, and natural history work.

ASTRONOMY.

The Astronomer Royal contributes the lion's share of the astronomical examples. They consist of transparencies showing the solar corona, as photographed at Sahdol (1898), Ovar (1900), Sumatra (1901), and Mauritius (1901). The credit for the work is shared by Mr. Christie (Astronomer Royal), Mr. F. W. Dyson, and Mr. Maunder, and the instrument employed has been the Thompson Coronograph, O.G. 9 inch diameter, with plates varying from lantern, process, and ordinary to specially rapid backed plates. The visitor will also find photographs of the Pleiades, taken with the Thompson Reflector, with an aperture of 30 inches and a focal length of 11 feet 4 inches. The same instrument was used for the photograph of the Great Nebulæ in Orion (1899), and in Andromeda (1898). There is also a photograph of the moon (age 231 hours) taken with an arrangement forming a telescope of 50 feet focal length, which is of excellent quality. Sir Norman Lockyer shows the corona of May 28, 1900, and two frames of star spectra, which speak for themselves to those who appreciate or follow this method of studying the heavenly bodies. Of equal interest is the exhibit of Captain E. H. Hills, who deals with the eclipse of January 22, 1898, as seen from Pulgaon, in India. The two frames he sends in contain spectrum photographs of the sun's limb at the points of second and third contact, taken a few seconds before and after contact, and at actual contact. The work of another well known astronomer, Mrs. Maunder, also calls for reference. She exhibits carefully prepared drawings from her photographs of the solar corona in the eclipse of May, 1901, both of which have been very highly spoken of by experts in this field of work.

THE X RAYS.

Dr. R. Norris Wolfenden, Mr. C. Thurston Holland, and Mr. Frederick H. Glew are responsible for the interesting exhibits coming under the above heading. The first-named gentleman devotes much of his time to deep sea dredging in the Orkney and Shetland waters, and the creatures he brings up are subsequently thoroughly examined by means of the Röntgen rays. We do not propose to describe in detail the Doctor's exhibits, which show marvellous skill, but will pass on to the others. Mr. Holland's pictures are of a more surgical interest. They show the location of foreign substances in the human body and limbs, and the site of fractures or other disorders of the bones. Mr. Glew's single exhibit is a radiograph of an injected baby, showing the system of blood vessels with startling clearness. Altogether, this class is of a very instructive character.

PHOTOGRAPHS IN COLOURS.

Small though the number of these exhibits, they cover nearly all of the processes in use. Mr. W. E. Brewerton some years ago, when the exhibition was held at Pall Mall East, took a medal for a method which he still practises, with some success. He shows two prints—"A Poppy Field" and "A Group of Fruit." In each case the blue sensation is rendered by means of a ferro-prussiate print, while the reds and yellows of the originals are in the form of carbon prints, superimposed upon the ferro-prussiate base. There are faults in both examples, but not more so than in the other processes of colour reproduction. Close by are the exhibits of the Lumière N.A. Company, Limited, produced by the superposition of three stained films representing the three primary colours. The prints on paper, which are here shown by the enterprising firm, are from still-life subjects. They produce the colours of the original, with more truth perhaps than the casual observer is prepared to admit. We are so accustomed to view objects in their natural colours that the strength of the colouring does not force itself upon us, but one has only to consider the images seen upon our focussing screens to admit that by some mental process we largely ignore the true intensity of the colours of objects seen in the ordinary way. Processes of colour photography appear to the writer to render what actually is, rather than the human perception of colour in things, and one is naturally led to question whether this is the correct way to approach the subject of colour rendering, or whether the results should conform more closely to the milder sensation of colour in which nature presents itself to our imagination. Adopting the first standpoint there can be no question that the exhibits in question are strikingly good, seen without the originals before us. The paper prints are more to our liking than the same firm's vivid glass transparencies, in which the bounds of colouring are somewhat overstepped. Miss Acland, of Oxford, is well known for her untiring pursuit of the problem of colour rendering. She chooses the Sanger Shepherd superimposed films method in the case of transparencies, of which she has made a good many, but the paper prints she now exhibits are by a modification of the same process worked out by herself. This notice deals essentially with the technical exhibits, but for the purposes of describing Miss Acland's exhibits we must include a print displayed in the pictorial section, also made after her method of working. There came before us, therefore, five prints—two reproductions from coloured miniatures, a red lily, a portrait of the Hon. Lady Acland, and a view of the X fleet in Torbay. The foundation blue print consists of an ordinary bromide

print, bleached in ferricyanide of potassium, washed, treated with perchloride of iron, rinsed, followed by a hyposulphite of soda bath, again washed, cleared in a dilute sulphuric acid bath, and finally washed. The pink and yellow prints are made upon bichromated gelatine tissue, containing a small quantity of silver bromide for the purpose of assisting the dissolution of the gelatine in the subsequent operations. These bichromated gelatine prints are squeegeed to pieces of glass, edged with rubber solution, and coated with collodion and again with rubber solution, in order to keep the gelatine films firmly on the glass supports. The prints so mounted are soaked in cold water, developed with warm water, fixed, and washed. When dry, the prints are faintly stained pink and yellow respectively, coated with rubber solution, to hinder the dye from running, and finally covered with collodion. The blue bromide print is then mounted on card and coated with thin varnish. A particular gelatine solution is then flowed over the print, and the pink print placed in register above it. When dry, the two prints are stripped away from the glass and made ready for the yellow print as before. Variations on this procedure were made for some of the prints, to the extent of omitting the silver bromide, and consequently the fixing, as well as in other directions.

Another example of colour work is the transparency of Mr. E. A. Jahn. This again is by the Sanger Shepherd process, and the subject, "Daffodils and Anemones," is pretty well rendered. Mr. Edgar Senior is represented by a Lippmann photograph of the arc spectrum, which is very good indeed, and a frame of two photomicrographs of sections through the "blue" and "red" of one of these photographs, multiplied respectively 4,320 and 2,700 diameters. The laminæ, to which the whole of the colour is due, are very well rendered, but it suggests itself to our mind that it would have been better to have enlarged the two sections to the same magnification, so that the thicknesses and distances of the laminæ, to which the different colours are due, might be kept in their relative proportions. As it is, the laminæ in the two photographs are shown at about the same size, and one has to remember that the magnification in each case is different.

PHOTOGRAPHY WITH THE MICROSCOPE.

The series of micro-photographs by Mr. Ernest A. Lewis, F.C.S., chemist to Muntz's Metal Company, call for special mention. They show at different degrees of magnification the structure of metallic alloys, such as copper and manganese of various percentages, copper and aluminium, zinc and iron, zinc and silver, zinc and copper, zinc and antimony, zinc and cadmium, etc. Similarly instructive, when time is given to sufficiently consider the work, is the exhibit of Dr. Clowes, consisting of photomicrographs taken in connection with the long series of experiments in the bacterial treatment and destruction of crude sewage. The actual photographic work with the microscope is that of Dr. Albert Norman, whose reputation for this class of research is one of long standing. We wish that some of his more recent work at the problem of photomicrography in natural colours could have been on view. The cultures photographed were, it should be added, by Dr. Houston.

Dr. Edmund J. Spitta has also a reputation amongst photomicrographers which is second to none. His three exhibits at the New Gallery amply maintain this reputation. He shows the amphipleura pellucida x 4,200 diameters. It was photographed with the exhibitor's new arrangement for obtaining pure monochromatic light with the mixed jet. This arrangement enables the "beads," which are about 1-100,000 inch in diameter, to be seen and to be photographed. Dr. Spitta has been over four years in accomplishing this feat with the limelight. White light fails to render these dots. Yellow, green, or, better, blue-violet, light is wanted. Many experts have tried with the aid of prisms to get this blue-violet light, but there is not enough of it and that is not direct. Dr. Spitta believes that he is the first to photograph these dots by limelight. Van Heurck did so with solar light, in an imperfect manner and with apparatus costing a good deal, whereas Dr. Spitta has succeeded with an ordinary microscope, the usual condenser, and a Zeiss 1.40 apochromat. Those who are able to judge speak of this achievement of Dr. Spitta's with unlimited praise. The second and third photographs are the amphipleura pellucida x 10,000, a single diatom photographed by limelight at 2,000 diameters and re-enlarged; and an excellent photograph of the entire proboscis of a blow-fly made with the Conrady one-inch semi-apochromatic series, and a double green screen. Mr. Frederic E. Ives contributes twelve photomicrographs made with a small fixed focus box camera and adjustable fixture.

PHOTOGRAPHY FOR THE NATURALIST.

There is quite a fair collection of animal pictures, the palm being carried off, we think, by Mr. Douglas English with his several frames showing the old English black rat (almost, if not, extinct) in three characteristic attitudes. The four little prints of a dormouse engaged in his antics and the three pictures of the squirrel are very clever. There are also four pictures of a repulsive-looking creature—the polecat, intent on the body of a rabbit. One of the pictures is enlarged, and shows the animal about three-quarters natural size. Mr. H. Nouaille Rudge is the exhibitor of four enlarged photographs of a spider monkey, an ostrich with mouth open, and two vultures, all of which are good, but perhaps a little hard, due no doubt in part to the nature of the gallery lighting. Miss E. L. Turner has some dainty little photographs of the coal and blue tits, the lesser white-throat, and the young red-backed shrike—the latter being a series showing the rapid feather development during the ten days following the hatching of the bird. Other exhibitors in this class are Mr. W. L. F. Wastell and Mr. W. J. Croall, both with pictures of a lion, which, though very differently treated, do both gentlemen credit. Dr. Lindsay Johnson, with Mr. J. J. Webb, show several frames illustrating "Scenes in the Life of the Chimpanzee Consul II." The pictures are doubtless faithful enough records, but they call for no especial notice. Mr. R. A. Malby's "Night jar," showing the close resemblance which the plumage of the bird has to the rough bark upon which it rests, may also be mentioned; but there is nothing particular about it, or about Mr. B. H. Bentley's "Grey Parrot."

BALLOON PHOTOGRAPHY.

The only balloon photographs on view are those of the Rev. John M. Bacon, well known for his explorations amongst clouds and air currents in recent years. His pictures tell us nothing new, but are none the less interesting on that account. He shows a photograph entitled "Sunrise over the Medway," and bearing an additional note to the effect that night still obtains on earth. We have no information as to the altitude from which the photograph was taken, but are inclined to put the question, Whether at the elevation in question the balloonist can claim to be appreciably ahead of the earth in regard to sunrise or behind in the matter of sunset? Perhaps Mr. Bacon's best and most popular picture is that of "Trafalgar Square from three-quarters of a mile above Soho." This is remarkably clear, and as a plan of this part of our city not easy to be beaten. The principal buildings, bridges, and thoroughfares stand out with an amount of distinctness that engages the attention at once. Mr. Bacon and his daughter have done much to popularise these unusual aspects of town and country, and the lecture on balloon photography which he is announced to give at the Gallery on Saturday, October 11th, should bring together a large audience. We should like to ask a question about No. 311, "Cloudscape above London," the frame of which bears a note to the effect that churches may be seen below. Where are the churches? Diligent search fails to reveal them to our eyes.

REPRODUCTION PROCESSES.

There is a very marked falling off in the number of exhibits coming under this head compared with previous years. Messrs. Bemrose and Sons, Limited, have on view two frames, containing respectively eight reproductions of carbon and silver prints and six reproductions of coloured mezzotints. The work has been executed with all the care and skill usually associated with this firm's productions, but it seems a pity that there is nobody to compete with them on this occasion. Close by is a platinum print from a negative of Solomon J. Solomon's "Blind Beggar," made by Mr. H. W. R. Child, who devotes himself to this work very considerably; and next to it is a copy of an oil painting of the "Virgin and Child," by Dr. Lindsay Johnson, which does not appear to call for comment. With a brief glance at Mr. Gus Rochefort's copy of an old print, we come to the exhibits of Mr. J. Hort Player, who shows a series of copies from engravings made by a method which he has utilised for some years. The negatives from which these positive pictures have been printed were obtained by passing sunlight through a solution of picric acid on to the back of sensitised paper placed face downward in close contact with engravings. The sensitised paper is thus interposed between the source of light and the engraving to be copied. It was for similar results that Mr. Player secured the R.P.S. medal a year or two ago.

MISCELLANEOUS EXHIBITS.

There is a number of exhibits which do not fall easily into classification. Amongst them are five frames of blue carbon prints, showing the peculiar forms taken by frost crystals on window panes. Mr. James Leadbeater, who shows these prints, finds a special pleasure in recording these phenomena, apparently, for on previous occasions we have seen similar examples of his work. Mr. Paul Stellbring shows an interesting photograph of lightning; and a picture of a multiple lightning flash taken at Balham by Mr. J. Howden Wilkie is good of its kind. The Royal Observatory also lend an example of lightning photography. In Nos. 349 and 351, Mr. H. T. Malby has two excellent examples of the use of the telephoto lens on near objects, compared with pictures made with the ordinary lens, that is with the negative element removed. In both cases the telephoto picture is decidedly in advance, in point of merit, of the smaller photograph. Mr. Bagot Molesworth has one exhibit—"Sunshine and storm clouds in the high Alps"—a telephotograph from a point ten miles distant, taken at the moment when a gleam of sunshine breaking through the clouds illuminates the mountain summit. Close by is a good flashlight picture by Mr. Thomas Robertson, showing an incident down in the mines—a man pushing along a trolley under a low roof. Mr. John C. Warburg has here also a little frame, containing a print

entitled "Sand ripples," which is almost effective enough to find a place amongst his other work in Section I.

There is a wonderful series of photographs by Dr. Vaughan Cornish, whose studies in sand ripples, cloud waves, and the like at last year's show attracted so much attention. He contributes this year, in addition to some ordinary snow scenes in the Selkirk Mountains of British Columbia, a number of photographs of snow "mushrooms." These peculiar formations of snow reach as much as 12ft. in diameter, and are shown, as a rule, upon broken tree stumps of 2ft. to 4ft. diameter. The snow itself is rendered in a splendid manner, but apart from excellencies of this character, the objects themselves deserve attention. One of the most weird is that of a snow cap of very large size supported on the top of a telegraph pole. The straining of the wires is very clearly rendered. Views of ice hummocks on the frozen St. Lawrence also possess interest of their own.

Sir Norman Lockyer exhibits frames of arc spectra of plant ashes (such as spinach ash and straw ash), volatilised on silver poles, showing the varying intensities of the lines due to the principal constituents. Of a similarly analytical nature are the spectrum photographs of meteorites, volatilised on poles of silver, and the volcanic dust from Martinique. Both show the lines of the metallic elements present.

From the Cape come several frames of exhibits by Mr. A. J. Fuller and Dr. Marloth. They are all noticeable for their excellent technique. Mr. Fuller has photographed specimens of a very destructive moth which, coming from Mauritius and Bourbon at the end of 1899, wrought great havoc amongst the fruit crops. The same exhibitor shows a picture of the Karroo plant, which stores water within its leaves for its nourishment during the long drought. Dr. Marloth shows photographs of a number of succulent plants, ferns, orchids, and various flowers, at different altitudes of Table Mountain. These technically excellent prints are well deserving of examination.

THE APPARATUS.

There is more apparatus, and its interest is also greater than in recent years. Mr. James Wheeler contributes a direct ray printing box, designed to the securing of a right-angled incidence and avoidance of side reflections. Messrs. Penrose and Co. show the latest forms of Tallents' diffraction spectroscopic camera. A new slit, more sensitive in adjustment, is provided, and one or two commendable changes are made. Messrs. R. R. Beard exhibits an enlarging apparatus fitted with his electric arc lamp, 9in. condenser, rotating negative carrier, and a means of swinging or tilting the negative to correct inclined lines. Messrs. Taylor, Taylor, and Hobson show their new Cooke focussing lens, which contains within itself a means of focussing objects at various distances from the camera. It is particularly suited to hand cameras, which, fitted with the lens, require no bellows or ordinary focussing mechanism. The mere rotation of the mount alters the focus of the lens by the separation of its elements.

Mr. Edgar Senior has on view a sensitometer designed to facilitate the selection of the screens for use in three-colour photography. The apparatus is based on Sir William Abney's method, and is dealt with in Penrose's Annual, 1901. In connection with this exhibit must also be mentioned the specimens of trichromatic inks and an example of the test showing the method of using the sensitometer. Last, but not least, for it has gained the Society's medal, comes Mr. F. E. Ives's parallax stereogram. We have already published a note upon this very clever device, which is made to produce the illusion of a solid object standing in space between the glass positive and the observer's eyes.

THE SLIDES.

The lantern slides are most disappointing in number, and those selected for exhibition may be quickly disposed of. Those that will arrest one's attention more than the others are by Mr. Ellis Kelsey, who exhibits five night effects, the most striking being the man in bed reading by candle light, "Firelight," and the cyclist. A score of stereoscopic prints include a number by Mr. F. E. Ives, having definite objects in view. These are photo-micrographs of diatoms made with an oil immersion objective, and Mr. Ives took them in order to study the relation of the diffraction image to the dioptric image, and to see whether his procedure might not be helpful in the study of minute structures, and perhaps settle some vexed questions.

The method of procedure is believed to be new, in that the difference between the two images is brought about solely by decentering the diaphragm at the back of the substage condenser, so that there can be no suppression of diffraction pencils at the back of the objective. So far as the exhibitor is aware, it has always hitherto been the practice to cover half of the back of the objective. The amplifications vary from x 300 to above x 2,000. In the examination and study of some of the results it is necessary to take into consideration the roundness of the field of the objective, which makes the plane of sharp definition vary where there is no alteration of object distance. (An achromatic hand stereoscope is provided for the examination of this exhibit.)

THE "L. N. A." THREE-COLOUR PROCESS.

Recently the directors of the Lumière North American Company gave the Press, both lay and photographic, the opportunity of ascertaining the steps that were being taken to popularise trichromatics on glass amongst the general public. A well-attended demonstration, at the Holborn Restaurant, was followed by a luncheon and an optical lantern display. Briefly, what the company has done is to place within the reach of the photographer, for a comparatively small sum, the materials for producing three-colour transparencies by the stained film process. Three screens, three dye solutions, the bichromate sensitiser for the positives, the printing surface, and clearly written instructions not above the mental comprehension of the youngest photographer comprise the "L. N. A." three-colour outfit. Great interest was manifested in the demonstration at the Press view, and subsequently at the luncheon (presided over by the chairman of the company, Mr. E. Llewellin White), Mr. T. K. Grant lucidly explained the principles of the process. The projected transparencies were of excellent quality, and the company may, at any rate, be congratulated on having imparted to the majority of its journalistic guests a clearer idea of practical trichromatics than, in many cases, had hitherto been possessed.

It may be added that the materials for the "L. N. A." process are obtainable at the company's address, 4, Bloomsbury Street, New Oxford Street, London. We subjoin a description of the working details, taken from the "Book of Colour Photography":—

The production of a lantern slide or transparency in natural colours resolves itself into three divisions:—

(1) Production of the three negatives necessary.
(2) Printing the three positives.
(3) Dyeing and mounting positives.

THREE NEGATIVES NECESSARY.

The three negatives necessary must be taken on three special plates with the use of light filters supplied. The ordinary dark slides are employed and the three exposures made as rapidly in succession as possible, care being taken that the camera be not moved between the exposures. The filters must be so placed that they come between the object photographed and the sensitive plate, and also in such a position that they may be easily changed when needed. The position filling these requirements most readily is immediately in front of the lens. They may be so attached by the use of a small adapter or carrier which clips to the lens hood, and allows of the easy insertion or withdrawal of a screen.

THE PLATES TO BE USED.

For use with the blue violet filter we employ the Lumière Extra Rapid Blue Label plate; with the green filter, the Lumière Orthochromatic Series A; and with a red filter the Lumière Orthochromatic Series B. These plates being specially prepared, showing high sensitiveness to the colour rays passed by these filters, should be always employed. The use of any other plate will materially affect the quality of the results, and is to be avoided.

THE RIGHT EXPOSURES.

The exposure through light filters is naturally more extended than would, under ordinary circumstances, be the case, and with the filters supplied it will be found necessary to give an exposure—using the blue screen—of four times that necessary without its use. As, for instance, if the normal exposure on a subject, without screen, were ¼ of a second, we should have to give an exposure of one second through the screen.

With the green screen, an exposure of six times this duration must be given; and with the red sixteen times; so that the three exposures will read as follows:—

Blue screen	1
Green	6
Red	16

THE DEVELOPER.

Having made the exposures, we next proceed to develop our negatives, and as the negative most suited to the process is one containing the maximum of detail and softness, all harsh contrasts must be avoided. To obtain such a negative, we advise the use of dianol, which should be prepared as follows:—

Water	250 c.c. or 9 ozs.
Anhydrous soda sulphite	8 gr. or 120 grains.
Dianol	1 gr. or 15 grains.

CAUTION.

Before taking the plates from the slide, the developing dish and solution should be placed in readiness, and the dark room light turned to its lowest point. The dish should be sufficiently large to take the three plates, and it is best to use a large quantity of developer, as by this means the complete covering of the plate is assured. On taking the plates from the slides they should be numbered, or marked, to render them easily distinguishable, the use of a lead pencil on the film

side being perhaps the simplest method. The extra rapid plate should be marked 1; the Ortho A plate, 2; and the Ortho B plate, 3.

Place the three plates in the dish in such a manner that the position of the E. R. blue label plate is known, as this is the plate we examine during development. After pouring on the developer, cover the dish and rock freely.

At the expiration of a minute, the E. R. plate may be withdrawn from the developer, and momentarily examined by turning up the light. Care should be taken to keep the dish well covered during the examination, as the plates therein are sensitive to red rays, and fogging would result. The high lights of the subject will be found well marked if exposure has been correct, and the plate must be returned to the developing dish and rocked for a further three minutes. At the expiration of this period the plates should be rinsed, and placed in an ordinary fixing bath for ten minutes. Care should be used that the light be not turned up before the plates are thoroughly fixed unless the dish cover is in position. When fixed, wash as usual, and place to dry.

PRINTING THE THREE POSITIVES.—SENSITISING.

Take three pieces of the special film supplied, and immerse for two minutes (by artificial light, or very subdued daylight) in the sensitizing solution, the temperature of which must not exceed 65 degrees.

DRYING.

These should then be suspended in a dark airy place to dry, which operation should not be too prolonged. Film sensistised at night should be ready for use next morning.

PRINTING.

When dry, prints may be made on this sensitive film, after carefully cleaning the back of the support the negative being placed in an ordinary printing frame, and the emulsion or gelatine side of the film turned away from the negative, so as to print through the support. A "safe edge" is preferably provided, and can be made by the use of an ordinary lantern mask, or by gumming slips of black paper round the sides of the negative—so as to frame the picture as it were. When the image is visible in faint detail, printing will have proceeded sufficiently far for development, which is accomplished as follows:—

MARKING.

The three pieces of film are removed from the frames and marked carefully for identification. This is most readily performed by clipping the corners of the tissues with a pair of scissors. From negative one, one corner should be clipped off the print; from negative two, two corners; from negative three, three corners removed. This marking is necessary, as it is our guide when dyeing, and must be carefully carried out in all cases if error is to be avoided.

DEVELOPING.

Now immerse one piece of the printed film in a dish containing warm water, a temperature of 90 degrees to 100 degrees being the most suitable for use. Rock the dish, and portions of the gelatine will be seen to dissolve away, gradually leaving a positive image printed on the support, and of a creamy white colour. When all the soluble parts have been dissolved, this should, viewed by transmitted light, present a well graded appearance, and reproduce all the detail of the negative.

CLEARING.

This positive must now be cleared or rendered transparent, which is accomplished by immersion in a bath composed as follows:—

Hypo	2 ozs.
Schering's Photo Formalin	2 drams.
Potassium ferricyanide	24 grains.
Water	20 ozs.

The same process is used with the remaining two prints, and a short wash and drying in a position free from dust will complete the second step of the process.

DYEING AND MOUNTING POSITIVES.

It now remains to dye and mount the three transparent prints that we have produced. Three bottles of dye are contained in the cabinet, the contents of which are ready for use, and may be employed over and over again until exhausted. It is at this point where we find the necessity for the careful marking of negative and print that has been previously advised. The print with one corner clipped (taken from the extra rapid plate) is immersed in the yellow dye (No. 2). The print with two corners clipped (taken from the Ortho A plate) is placed in the red dye (No. 3), and the print with three corners clipped (taken from the Ortho B plate), is dyed blue in the blue dye (No. 1).

Dyeing takes from one to two hours, according to the temperature of the solutions, but as it is possible to a large extent to adjust the final results, no particular care is necessary. When dyeing is judged sufficient, that is to say, when the picture presents a full range of tone and detail, the prints should be removed from the baths, rinsed, and placed to dry in a position free from dust.

ADJUSTING FINAL RESULTS.

When dry, we can readily judge if they are correct by placing in temporary superposition. For this a supply of clips (procurable at any stationer's) will be found useful. Place the yellow and blue prints in register, and clip together at the side, afterwards adding the red monochrome, and again clipping the three together.

REGULATING THE COLOURS.

Should there be shown an excess of any colour, this may be regulated by the use of a solution of ordinary glue—about 1½ drachms of glue to a pint of water. To mix, allow the glue to swell in cold water, then dissolve. In this solution any of the monochromes may be reduced by immersion. Should, however, any need strengthening, this may be effected by a further immersion in the proper dye bath.

MOUNTING.

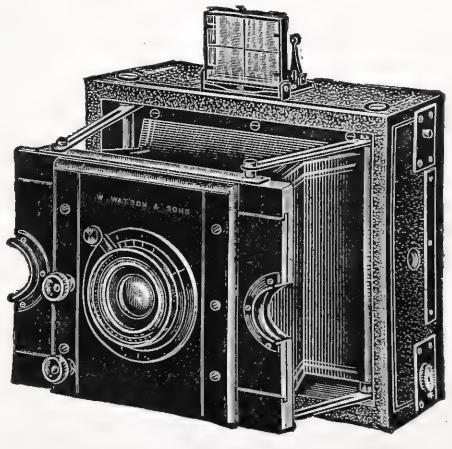
When the monochromes needing alteration have been adjusted, and all three are judged correct, the blue positive should be placed in position on a cover glass, and fastened securely by gummed paper slips. On this, in correct register, should be mounted the yellow and red monochromes, which are retained in position in the same manner. A suitable mask and cover glass will complete the transparency. Many advantages will be shown in lantern slides prepared by this method, by which the maximum of transparency is attained, as they will stand heat well, and will not be found to expand or lose register in the lantern, as is so frequently the case.

If preferred, the monochromes may be cemented together with Canada Balsam.

New Apparatus, &c.

A Focal Plane Camera. Sold by W. Watson and Sons, 313, High Holborn, London, W.C.

It is some years since hand cameras of the type which forms the subject of the present notice found their way on to this market; but, such is the curious conservatism of the English photographer, it is only recently that we have perceived signs of appreciation of a class of instrument the practicability and efficiency of which, in competent hands, is easily demonstrable. Some photographers of our acquaintance—men of long experience—go so far as to pronounce the focal plane camera as the ideal machine for rapid work. Observe how beautifully simple and at the same time scientific is the manner of its use. Holding the camera to the eyes, you sight your object through the cross-wired finder over your lens plane, and the most delicate touch of a little pin by the index finger of the right hand releases the slitted blind, and your exposure is made. You take, in fact, a veritable shot at your prey. In the very early days of the hand camera we published in these pages an article predicting the advent of such an instrument as that before us; and we are glad to see our ideas taking concrete shape. There is evidently a growing



demand for focal plane hand cameras, and Messrs. Watson, we think, are wise in entering the market with the beautiful little instrument before us. Here are its main features concisely summarised: The camera is of fixed extension; focussing is effected by a lever movement controlling the lens, which moves posteriorly or anteriorly in a tube; the focal plane shutter allows of both time and instantaneous exposure being given. A half plate when folded up measures 8in. by 7in. by 3in.; the camera front moves horizontally and vertically; black leather is used to cover the instrument, the body of which is made of ebonized mahogany.

Messrs. Watson supply the following instructions for working camera:

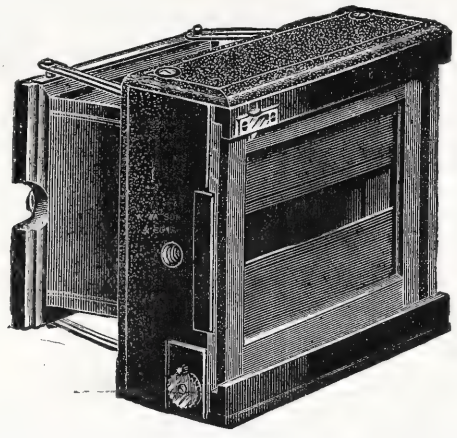
To open the camera, draw the front out by means of the two projecting grips provided, as far as it will go, the slotted metal arms will then spring into position and hold it securely.

To focus the picture, set the lever so that the bevel'ed edge of it coincides with the figure indicating the distance of the objects. The figures marked indicate distances in yards.

To close the camera, press out the supporting arms on one side, letting the front of the camera on that side go back slightly, then press out the arms on the opposite side, when the front, being released, can be closed into the body.

To set the shutter, wind the blind by means of disc having two projecting knobs on one side of the shutter as far as it will go; discharge by pressing the knob on the front edge of body.

To alter the width of slit (in half-plate shutters), pull straight out, but do not turn, the small bright milled head on the numbered disc, and wind the knob on the opposite side of shutter until the width required —as shown by the figures on disc (which represent the width of slit in m/m)—comes opposite the little vernier projecting over disc. Then release the milled head on disc, which will lock the blind in position; now wind up the blind. This applies to half-plate shutters only. For ¼-plate



and 5 by 4 the top one of the two milled heads is turned to the left to open the slit and to the right to close it. When the figure 5 shows at the aperture, the slit is fully closed. The width of the slit should not be altered after the shutter is wound up.

Time exposures.—Pull the small lever up to the letter T, and pull out small milled head on disc. Wind the blind right up and press and release the discharger; the shutter will remain open till this is pressed again to close it.

Shutter speeds.—The speed of the shutter can be altered by turning the bottom milled knob, and the exact exposure will be shown from the figures 1, 2, 3, 4, 5, and 6. The most useful speeds result from the following combinations:—

Indicator.	Width of Slit.	Exposure.
1	Full opening	1-5th sec.
2	Full opening	1-12th sec.
1	60	1-20th sec.
3	60	1-35th sec.
6	60	1-80th sec.
6	40	1-125th sec.
6	25	1-200th sec.
6	15	1-300th sec.
6	10	1-500th sec.
3	5	1-600th sec.
5	5	1-800th sec.
6	5	1-1,000th sec.

A careful examination of this camera disposes us to regard it with high favour. Either a Goerz or a Holostigmat lens may be fitted to it; and it is adapted to take a special form of changing box. We were particularly struck with the dark slide sent for our inspection. This had flexible roller shutters, and thus, to uncover the plate, all that is necessary is to wind the shutter of the slide out of the focal plane—a very neat and convenient device.

The "Wellington" S. C. Papers: Art White and Art Tinted. Manufactured and sold by Wellington and Ward, Elstree, Herts.

We have received for trial sample packets of these varieties of printing papers, which have just been added to Messrs. Wellington and Ward's series of Slow Contact Papers. Since these Papers were placed upon the market about twelve months ago, the Wellington and Ward brand has become a favourite printing medium with many photographers. At the time of the introduction of Velox, the first of the slow gas-light papers, we pointed out that the supercession of the dark-room and the certainty with which exposures could be timed, and identical prints obtained, offered facilities to photographers which they would readily appreciate. In adding two new kinds to their series of slow contact papers, Messrs. Wellington and Ward place a further power in the hands of the printer. These varieties are of the moderately rough type, and impart to the print a pleasing grain, which adds much to the charm of many photographs, especially in the larger sizes. The tinted paper is of a rich cream colour, and rather coarser in texture than the white. We obtained very fine prints from a negative of average density and long scale of gradation. The developer we used was Rodinal, diluted with 30 parts of water, to which a slight addition of bromide of potassium was made. The characteristics of the emulsion are excellent, the prints showing pure black in the deepest shadows, a wide range of delicate half-tone, and faultless high lights. We think these new papers will be much appreciated both by professional and amateur photographers. Messrs. Wellington and Ward also issue a booklet entitled "Notes on the Use of the Wellington Papers," which occupies 62 pages, and is full of information relating to manipulative details. From this booklet, which is now in its third edition and is obtainable on application to the firm, we take the following lists of the Elstree firm's specialities, in addition to those above noticed: "Wellington" Bromide Papers.—Ordinary, in rough and smooth. Enammo, a glazed surface paper. Useful where ordinary printing on chloride paper is inconvenient. This paper is also made in a thick grade for post cards, menus, and other such like work. Special Thick, smooth surface, like thin card. When printed with a margin it requires no further mounting, and is suitable for Christmas cards, menus, etc., and post cards. P.O.P. (ordinary), a gelatine chloride (print-out) paper. For the phosphate and formate toning baths, or the combined bath. P.O.P. (special), a gelatine chloride (print-out) paper. Specially manufactured for the sulpho-cyanide bath. It is also suitable for the formate and combined toning baths. P.O.P. (thick), a gelatine chloride (print-out) paper. Specially suited to the printing-off from small negatives. Films (celluloid), daylight cartridges, etc., for all daylight loading cameras. Films (gelatine), suitable for snapshot work, negatives for carbon and collotype work, and for use in the ordinary slides. Carbon Tissues, specially suited to exhibition work. In various colours. Post Cards (sensitive). These are manufactured in S.C.P., special thick bromide, special thick enammo, and thick P.O.P.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Oct.	Name of Society.	Subject.
10	Croydon Natural History	*Focal Plane Shutter and its Uses.* Mr. W. Kilbey.
10	Borough Polytechnic	*Bromide Printing.* Mr. F. W. Bannister.
11	Royal Photographic Society of Great Britain	*Photography from Aloft.* Rev. J. M. Bacon.
13	Oxford Camera Club	Short Demonstrations by Mr. Underhill.
14	Leeds Camera Club	Conversazione and Opening of the Exhibition in the City Art Gallery.
14	Leeds Photographic Society	*The Alhambra Re-Visited.* Mr. R. Child Bayley, F.R.P.S.
14	Birmingham Photographic	The Annual General Meeting.
15	Photographic Club	Demonstration by Kodak, Limited.
15	Leeds Camera Club	*Suggestions.* Mr. W. Thomas.
15	North Middlesex Photographic	*Practical Picture Frame Making.* F. A. Haylett.
15	Croydon Camera Club	*The Liquid Lens and its Application to Theatrical Photography and to Snapshots in Dim Light.* Dr. Edward F. Grune.
15	Borough Polytechnic	Lantern Night. (Final of Monthly Outings Competition.)
16	London and Provincial	The Henderson Award meeting
16	Liverpool Amateur	Platinotype Demonstration organised by Dr. Llewellyn Morgan.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

October 2nd.—Mr. A. Haddon in the chair.

A very important and interesting discussion on the "Fading of Albuminised Paper" was opened by Mr. A. L. Henderson, who remarked that, although the experiments of twenty or thirty years ago may have been conclusive, such experiments would differ now. A very faded specimen was passed round, which Mr. Henderson had come across at the seaside, and being the work of an excellent photographer, the manipulation could not be the cause. In the first place, it was pointed out that an imperfect base may be the fault, as we do not know what the paper of to-day is either bleached or sized with. Another reason, the albumen may be in a stale state, as it used to be kept a long time to obtain a higher surface. Also, albumenate of silver may remain in the print, and cannot be removed by any known solvent without dissolving the image also. The atmosphere, again, plays an important part, especially sea air; as Mr. Henderson remarked, he has come across many more faded prints at the seaside than anywhere else, there being something in the sea air which will not only attack the image, but also the paper base, and is an action which we do not yet understand. The fault may also be in the fixing; the fixing bath should be slightly alkaline; also if the fixing bath is used too strong, which has the effect of dissolving the metallic silver, whereas a weaker bath will not.

The cards the prints are mounted on are still another cause; some cards contain impurities which are bound to come through the print.

In regard to the toning with lead and gold, Mr. Henderson said that Messrs. Lumiere had experimented to try and find traces of lead after toning in such a bath, and had come to the conclusion that the lead does not remain in a properly toned picture. Mr. Henderson also remarked that he could produce prints toned with lead and hypo only, and no gold. Such prints were made years ago, and are good to this day. In regard to the keeping qualities of albumen paper, Mr. Henderson gave a formula which was the result of 40 years' experience. The silver bath contains 40 grains to the ounce, a chief cause of blistering being in the use of a stronger bath; the preparation of the paper being three grains of citric acid and one grain of gelatine per ounce, which should be filtered through cotton wool or a sponge, and the paper floated for about four to five minutes, afterwards fuming with ammonia. The gelatine prevents the free silver being acted on so much by the air.

Mr. A. Haddon gave it as his opinion, that the fading of an albuminised print is not due to the paper itself, but rather to the albumen; especially is this the reason now that the albumen is fermented; also prints made on albumen paper now do not stand so well as those made years ago.

Mr. J. E. Hodd remarked that water no doubt plays an important

part in the fading of a print, as some waters contain injurious salts, which remain in the paper after the print is removed from washing water and hung up to dry, therefore it is a good plan to soak off as much moisture as possible before drying.

CORNISH CAMERA CLUB.

THE annual meeting was held last week. Mr. R. Pearce Couch, the vice-president, occupied the chair in the absence of Mr. Baily, the president. Mr. A. Pool, the treasurer, read the statement of accounts, which showed that the club started the year with a credit balance of £5 8s.; subscriptions received amounted to £23 17s.; making a total of £29 5s. The expenditure amounted to £26 19s. 1d., leaving a balance in hand of £2 5s. 11d. The expenditure was heavy owing to the extensive alterations and improvements effected, for which Mr. T. James was paid £10 6s. 3d. The accounts were unanimously adopted. Mr. R. Pearce Couch was elected president in the place of Mr. W. E. Baily; Mr. Henry Stewart was elected vice-president in the place of Mr. R. Pearce Couch, Mr. A. Pool was re-elected treasurer, and Mr. H. Tonkin was re-elected secretary. Messrs. W. Colenso, H. Wood, and H. Bradbury were re-elected on the committee, and Mr. Edward Uren elected in the place of Mr. Henry Stewart. Mr. W. E. Bailey was elected a patron of the club, and Mr. W. Bailey was re-elected auditor. A hearty vote of thanks was accorded the secretary, treasurer, and officers for their duties, and all present expressed pleasure at the position now attained by the Cornish Camera Club.

SOUTHAMPTON CAMERA CLUB.

THE members of the above club held the last meeting of their summer programme on the 29th ult., when the President, Mr. W. Burrough-Hill, occupied the chair. After the election of several new members, the deferred lantern slide competition between Messrs. Trigg, Compton, Jurd, and De Silva (who had tied during the winter programme competitions), took place, and after a very keen contest, resulted in Mr. A. De Silva winning the silver medal (given by the Rev. E. C. Bennett) with a splendid pair of slides, the winner being closely followed by Mr. W. H. Trigg. The 1902 Ramble Print competition was then conducted, the conditions being the production of three prints, by any process, from negatives obtained during two or more of the outings of the season. After a very severe contest, Mr. Geo. R. Johnson deservedly won the silver medal given by the hon. sec., Mr. S. G. Kimber. The contribution of the winner was a very fine series of toned platinotypes, representing scenes from "North Stoneham Park," "The New Forest," and "Salisbury Cathedral." The second place was taken by Mr. E. J. Evans, who pressed the winner very closely with an admirable set of prints in black platinotype, one being of "St. Cross," and two of "Salisbury Cathedral." The president then presented the silver medals referred to above, and also one given by Mr. W. Jarvis, to the holder of the greatest number of club certificates of merit, for the print competitions of the season. This medal was won by Mr. R. E. Jurd, who won certificates for "Portraiture," "Animal Studies," and "Snapshots," The following club certificates of merit were also presented for lantern slide competitions: Mr. R. E. Jurd, "Still Life"; Mr. W. H. Trigg, "Architecture"; Mr. J. T. Compton, "Landscapes," and Mr. A. De Silva, "Animal Studies.' For print competitions, Mr. A. De Silva, "Landscapes," and Mr. C. C. Cook, "Architecture." It was announced that the "Winter Programme" will commence on the 13th instant.

DECIMAL ASSOCIATION.

THE report of the executive committee, which was issued on June 4th last, referred to the efforts they were making to bring before the Conference of the Colonial Premiers the question of adopting the metric weights and measures throughout the British Empire It is most satisfactory to record that one of the final acts of this Conference was the passing of a resolution in favour of the proposed reform. This is regarded as a most important step in advance, and should greatly facilitate legislation in the House of Commons. The Committee are also pleased to report that as further evidence of the rapid growth of popular opinion since June 4th, twenty-six more Members of Parliament have signified their approval of the Association's programme. There are now 292 Members pledged to support a Bill in the House of Commons.

Information has recently been received from the United States which shows that there is every prospect of a Bill being passed at the next Session of Congress, by which the Metric Weights and Measures will be rendered compulsory in all the State Departments at Washington (other than those which deal with the survey of land), to be followed later by the general adoption of the system throughout the country. The Executive Committee have, as a matter of national pride, been most anxious that this country should lead rather than have to follow the United States, and all who are in favour of the aims of this Association are urged to do their utmost to stimulate the movement. On the initiative of the Lord Mayor of Sheffield, the Town Council of that city recently passed a resolution in favour of the adoption of the Metric Weights and Measures throughout the British Empire. Copies of this resolution were forwarded from Sheffield to over 400 Town and County Councils. Many of them have acted on the suggestion, and after passing the resolution have notified the Board of Trade and the Members of Parliament representing their division. The following is a copy of the resolution referred to:—"In the opinion of this meeting it is most desirable in the interests of education and commerce that the Metric System of Weights and Measures should be made compulsory throughout the British Empire, after the lapse of such time as may be necessary for preparing for the change from the present system. That a copy of this resolution be forwarded to the President of the Board of Trade and to local Members of Parliament." It will be seen that a considerable amount of pressure is now being brought to bear upon the Government, and the present is a most favourable time for strong action.

CROYDON CAMERA CLUB.

THE opening of the winter session took place on Wednesday, the 1st inst., and drew a crowded attendance of members, who were addressed by the President (Mr. Hector Maclean, F.R.P.S.) on photography in general and the club affairs. In the course of his observations, he drew attention to many instances which had come to his notice of members of photographic societies ultimately acquiring positions of distinction and emolument, their initial photographic knowledge having been acquired by attending the meetings. Besides many other interesting topics ably dealt with, special attention was drawn to a collection of 57 prints arranged on the walls, all of which had been taken in the course of five days during the holding of the Convention at Cambridge by Coun. J. Noaks. These he regarded as unusually good examples of sustained topographical work. Later on the President explained the working of the Kodak developing machine, and successfully developed a spool by its aid.

During the evening the hon. sec. (Mr. E. A. Salt) showed two novelties of the Autotype Co., one being a matt double transfer paper having a medium rough surface, which he thought a welcome departure, the other being a pyramidal grain single transfer paper, especially suitable for small work. Mr. S. H. Wratten exhibited an ingenious little invention of his own in connection with a glue pot, the formation of thickened scum on the surface of the liquid glue being prevented. Mr. L. G. Kough showed a new kind of silver paper which might shortly find its way on the market. Capital tones were obtainable with a solution of borax without gold.

By the kindness of Sir David Salomons (a vice-president of the club), the members paid a visit to Broomhill on Saturday last, the Eastbourne, Hove, and Tunbridge Wells societies being also included in the invitation. Over 80 guests were present, and a really enjoyable time spent.

Sir David gave some interesting displays of "trick" cinematographs, and a short concert on his electrical orchestrion. A fine display of motor cars was also on view, including one which cost £1,800. Apart from these special features, Broomhill itself may aptly be described as a "Mansion of Marvels." A hearty vote of thanks to Sir David Salomons, proposed by Mr. Joseph Chamberlain (hon. sec. of the Tunbridge Wells society), seconded by Mr. Maclean, and supported by the representatives of the other societies, was carried with enthusiasm.

Commercial & Legal Intelligence

VELOX Postcards.—Messrs. J. J. Griffin and Sons, Limited, of 20-26, Sardinia-street, Lincoln's Inn-fields, W.C., draw our attention to their Velox postcards. These are put up in packets of twelve, and sold at 1s. In each packet Messrs. Griffin include one border negative and mask. Different negatives are put in the packets Velox postcards are manipulated in precisely the same way as Special Velox, and they take ink readily without any tendency to smudging. For the convenience of their customers Messrs. Griffin put up the border negatives and masks separately in boxes of twelve assorted at 1s.

COMPENSATION for a Photograph.—In the London Sheriff's Court on Monday last, before Mr. Under-Sheriff Burchell and a special jury, the claim was heard of Mr. H. J. Dalby, photographer, of Woolwich, against the Woolwich Borough Council, for compensation for disturbance. It appears that the Woolwich Borough Council has secured powers to take the premises 82 and 83, Wellington Street, Woolwich, along with others, as the site of new municipal buildings which they proposed to erect. Mr. H. F. Dickens, K.C., and Mr. Corrie Grant were for Mr. Dalby, and Mr. E. Boyle, K.C., with Mr. J. Courthope Munro, appeared for the Woolwich Borough Council. In the course of the hearing, the sum of £300 was settled as far as compensation for loss upon fixtures, stationery, etc., was concerned, Mr. Dalby to be entitled to remove everything, and the nett profits of the business were agreed at £675 per annum; and for Mr. Dalby it was contended that the rental value of the premises he was to give up was £250, although as recently as 1900 the nett assessment was only £93. Further, for Mr. Dalby, it was argued that he would have almost insuperable difficulty in securing premises from which he could carry on his business as advantageously as before. For the Council, evidence was given to the effect that £165 or £170 was the outside value of the rental of the premises, and that 500 guineas would be ample compensation for disturbance. The jury awarded Mr. Dalby £2,000, including £300 for loss on fixtures, etc.

THE Science of the Workshop.—In a paper on this subject read by Mr. William Taylor, of Leicester, before the British Association at Belfast, it is complained that technical schools do but teach more or less backward shop practice, so that the workman out of the shop cannot really improve his knowledge or practice by attending a school. Yet there is a science of the workshop. Its material is scattered in books and papers, and much is known to men of experience, but the author knows of no attempt to gather such knowledge into more attainable form. The teaching of the shop has been all wrong. The schools cannot teach methods, but have tried to do so and have failed. What they should teach is principles, as embodied in the physical properties of materials and their effect on cutting and shaping, stresses generally, photomicrography, alloys, the flow of solids; these are all examples of the science which underlies shop work. How little, for example, is known of tool steel

by most shopmen! How blind we have all been to the action of superheated steam on cast iron. Look at the failures to make a satisfactory boiler stay-tap, the money lost in striving to secure an even contraction of the hardened tap. Take the question of flow of metals. It is said that a milling cutter of 3in. to 4in. diameter with deep teeth on face and edges has actually been formed cold from a blank by hydraulic pressure. Time to allow of flow appears to be an element in all processes of rolling, extension pressing, etc., of metals, but there is no written matter to teach others. So many of the best shop men do not or cannot write; we use the word in its narrower sense. It is a pity it is so, for much valuable knowledge is lost for lack of the setting of it down, and too often when handed down by tradition the essentials become blurred and debased. Practice soon forgets scientific reasons, and loses its best part. The decadence of the workshop tends to keep out the better men, and shop work becomes set apart as a thing to be avoided. The science of tools and materials can alone add something to the sordid life of the shop. There are so many half-known facts to be explained. Why will a saw that cuts steel break to pieces if set to cut copper? What limits or fixes the speed of various cutting or abrading agencies? Cannot our technical schools teach the principles that enable men to think out these matters? This is what they should attempt.

The Metric Weights and Measures in U.S.—The Secretary of the National Bureau of Standards at Washington has recently sent the British Consul General in New York the following resume of what has been done in the United States:—"In 1893, in accordance with the order of the Secretary of the Treasury, April 5th, 1893, the metric prototype standards, the metre and kilogram, were adopted as the fundamental standards of the United States, from which the standard yard and pound were to be derived. As you know, the international postal rates are based exclusively on the metric system, and all the larger offices in the United States are provided with metric scales. Metric weights are used in the coinage of all the subsidiary silver currency. Our five-cent piece also is exactly two centimetres, and weighs five grams. All the states and territories of the United States have been provided, by order of Congress, with carefully-prepared copies of the metric standards. Congress authorised the signing of the Convention of 1875, establishing the International Bureau of Weights and Measures, for the construction, care, and comparison of the metric standards. As you are aware, the metric system has been for many years, and is to-day, the legal standard in Porto Rico and the Philippines. In 1894 Congress adopted the international units of electrical measurement, which are based entirely upon the metric system." From the above it will be seen that the United States have taken a long step towards the adoption of the metric system, and as far as their fundamental standards are concerned, they are to-day upon a metric basis. The Secretaries of the Treasury from 1847 down have repeatedly urged upon Congress the importance of adopting the metric system. The delegates representing the United States in the Pan-American Congress of 1889 were instructed by the Secretary of State to favour the adoption of the metric system as the basis of the unification of the weights and measures of all the countries represented. Among the Associations favouring the system are the National Board of Trade of the United States, the American Steel Association, the American Export Association, the American Institute of Electrical Engineers, the New England Cotton Manufacturers' Association, the National Association of Builders, the American Chemical Society, the American Medical Association, the National Academy of Sciences, and the American Metrological Society. The Committee of Coinage, Weights and Measures, to which a recent Bill on the subject was referred for consideration, adopted a favourable report by a vote of 15 to 2. The matter will probably come up early in the next Session of Congress.

The Right of Privacy in the United States.—A trade-mark case of unusual interest was recently decided in the Court of Appeals of New York State. The case in question, Roberson v. Rochester Folding Box Company and the Franklin Mills Company, appellant, involved the right of the defendant to use the plaintiff's portrait as a poster in advertising the Franklin Mills flour. In this State no precedent for such an action is to be found in the decisions of the Court of Appeals. For that reason the decision now handed down is one of considerable legal importance. Chief Justice Parker, who wrote the prevailing opinion, held that the right of privacy—founded upon the claim that a man has the right to pass through this world without having his picture published, his business enterprises discussed, his successful experiments written up for the benefit of others, or his eccentricities commented upon—would, when recognised to the fullest degree, result not only in a vast amount of litigation, but litigation bordering upon absurdity. For, the right of privacy once legally asserted, it would necessarily be held to include the same thing if spoken instead of printed; for one, as well as the other, invades the right of privacy. On grounds, therefore, of public policy, and on examination of the authorities which have indirectly dealt with similar cases, the Court was led to the conclusion that the so-called right of privacy has not as yet found an abiding place in our jurisprudence, and that the doctrine cannot now be incorporated among our legal principles without doing violence to settled principles of law. It therefore seems that there is no possible means of preventing one's picture from being used as an advertisement. But the plaintiff always has his action in tort, if he can show that he has suffered actual injury. Furthermore, the New York Penal Code provides ample punishment for the malicious publication of pictures. In his dissenting opinion, Mr. Justice Gray holds more liberally that an individual has a right to privacy, which he can enforce, and the invasion of which equity will prevent. The right of privacy, in Judge Gray's opinion, or the right of the individual to be let alone, is a personal right, which is not without judicial recognition and is the complement of the right to immunity of one's person. The common law regarded individual personal property as inviolate. When, as here, there is an alleged invasion of some personal right or privilege, the fact that early commentators on the common law have not discussed the subject is of no material importance in awarding equitable relief. Judge Gray takes the broad view that, because the preventive power of a court of equity has not hitherto been exercised in analogous cases, no valid objection can be made to the assumption of jurisdiction in the particular circumstances of the present case. The performance of an act by a defendant which is wrongful because constituting an invasion in some novel form of a right to something which is conceded to be the plaintiff's, and as to which the law provides no adequate remedy, should be enjoined. The case came up before the Court on demurrer from the Appellate Division, the opinion of which was reversed, the Court standing, four for reversal and three for affirmance.—"The Scientific American."

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

THE R.P.S. EXHIBITION.

To the Editors.

Gentlemen,—Those who have the welfare of the Royal Photographic Society at heart must have noticed, with feelings of approaching consternation, a curious fact in connection with the pictorial section of the present exhibition. Three members of the Selecting Committee, and also some members of a certain postal club, have an overwhelming number of pictures accepted.

The figures for three members of the Selecting Committee are:—

Mr. J. Page Croft	6
Dr. Llewelyn Morgan	5
Mr. J. C. Warburg	5

The total number of frames in the pictorial section is 290, contributed by 177 exhibitors. If the contributions of these three are subtracted the numbers are 274 frames and 174 exhibitors, or an average of 1.5 per exhibitor, while these three members of the Selecting Committee contribute 16 between them, or nearly four times the average, and the general average would be lower if the works of the members of the postal club alluded to were excluded from the calculation.

A Selecting Committee should be above suspicion, but when members accept their own work four times as liberally as that of others, can they claim to appear so? This fact is the strongest possible evidence of the utter unfitness of these men for the task that they have undertaken, and of the principles that have apparently influenced their decisions. The quality of their work does not affect the question. If it were the best in the room instead of being as crude as it is, the argument would still remain the same. The acceptance of their own works in much greater numbers than those of others is the fact that condemns them hopelessly. There can be no confidence in their judgment.

There were some men on the Selecting Committee whose ability and impartiality are beyond question. It would be interesting to hear what explanation they can give. Did they protest? Were they out-voted? It would also be interesting to hear what Messrs. J. C. Warburg and J. Page Croft can say in defence of their position. It appears, in the absence of explanation, to be absolutely indefensible.—I am, Sirs, yours truly,

HENRY W. BENNETT.

Granville House, Arundel Street, London, W.C.

To the Editors.

Gentlemen,—Each year I consider the exhibits in the pictorial section more disappointing. Being photographer to practically the largest firm in London, and having close on twenty years' experience, I know for a certainty that if I turned out work similar to 75 per cent. of the pictures (?) hung, my place would not be worth twenty-four hours' notice.

Where is the pictorial effect, say, in Nos. 8, 107, and 148? The last number, I notice, is "Not for Competition," and no doubt the exhibitor knew it would otherwise have failed to be accepted.

Again, No. 152, "Really," this is beyond comprehension, how it ever was allowed to be hung. I wonder if any of the judges knew what the "Smear" is supposed to be. Of course, this is also "Not for Competition." No. 245 (medal).—I would ask any artist to try and find the "Roses." Unless it was labelled, no one would ever have dreamed roses were supposed to be there, and the gardener, undoubtedly, looks like a "doctor of science."

How on earth No. 279 could have been chosen for a medal, words fail me. There are four or five dead black trees, stuck up in the sky, without absolutely any foreground. My poor pictorial mind would, without doubt, have chosen No. 277 in place of the "black sticks."

I understand that 1,700 pictures were submitted, and only 290 hung. Would it be possible another year to engage an extra room for the

Rejected," and charge admission? I feel sure a good round sum ould result. It would give the profession an idea of the great ıxiety and trouble the judges had in selecting.

I would be glad if some competent artist would answer follow-g:—

1. Why are "Fuzzy Wuzzy" (or out of focus) photographs con-dered artistic?

2. Are there any professional photographers exhibiting in the pic-ɔrial section or only amateurs?

3. Would any photograph absolutely in focus be accepted and hung?

The professional exhibits are well worth studying for hours, but ıe pictorial section, taken it all through, should never have seen day-ght.

I asked a well-known artist his opinion of the pictorial section hilst viewing same. He was candid, and expressed rather stronger iews than my own, and finished with the remark, "The judges should e given an opportunity to state their reasons why absolutely 'unpic-ɔrial, unartistic' pictures were ever allowed to be hung as represent-ıg the art. Perhaps they had no option."

In conclusion, Mr. Editor, allow me to say I am not one of the xhibitors and never exhibited, nor do I know personally any exhi-itor.—Yours faithfully, M. R. P. S.

P.S.—I enclose card.

C.C. PAPER.

To the Editors.

Gentlemen,—For the past week or two there has been quite a host ɔf correspondence on the C.C. Printing-out Paper. For the past ten ɔr twelve years I have used nothing else. In looking over my old ɔrints I cannot find one faded or showing spots. There are many ad-ɔantages to be gained in printing on C.C. The first is the rapidity ɔf printing (about half that of albumenised paper; (2) no spotting of ıegative while printing in damp, winter weather; (3) greater ease ın toning in comparison with albumenised paper; and (4), the time ɔne may keep the paper or the prints after printing without showing ıny bad effects. (A print was left by accident in the printing frame ɔr over six months, when toned and fixed, and no difference could ɔe observed from one freshly printed and toned.) I do not write as ı novice in this style of printing. I have printed as much as a ream ın a week, and in sizes 25in. by 16in. I have seen a batch of fifteen ɔf half size hung up to dry and not a defective print in the lot. There ıs very little chance of this occurring if the prints are treated with lue care. I always put my prints through a 5 per cent. solution of ɔommon salt, and thoroughly wash them before toning, to make ɔertain that all the salts of silver are converted into chloride of silver. You may call it a fad, if you will, but this mode of treating them I have ɔractised for more than thirty years, and during my whole experience I have never been troubled with white spots. The printing is not ɔonducted by highly paid male operators, as I have found girls do the work equally as well.

One correspondent says he has given up C.C. paper, as it is easily ɔcratched; for the same reason he might as well give up carbon print-ing, as it is quite as easily damaged by scratching.

I have not the same experience of the C.C. Mat. Paper, and it is quite possible that the short time that it is allowed to be in the gold bath may ɔend to a want of permanency.—Yours, etc., JOHN STUART.

Studio, Helensburgh,
October 6th, 1902.

To the Editors.

Gentlemen,—Since writing you on the subject of C.C. matt, I have looked up three photographs of American origin by this process (toned gold-platinum), and find they are in absolutely perfect condition. Two of them are four years and the other six years old, but they have been framed all the time. This is reassuring.

I had last year a very similar experience to Mr. Lang Sims. Having placed some pictures face to face when not quite dry to make room, I found them next morning quite spoilt with spots.

My impression is that matt C.C. plat toned is all right if kept perfectly dry, but dampness seems more fatal to it than to any other process; but I would cheerfully welcome any facts on the subject. I deprecate Mr. Hewitt's idea that C.C. is used by photographers to defraud their clients. Of course, some may so do, but to my mind platinum-toned C.C. is far superior in appearance to genuine platinum, and many of my sitters think the same. The egg-shell gloss improves upon the crudity of platinum paper.

Then again, it is not the inability to produce suitable negatives for platinum printing that causes photographers to use C.C.

Mr. Hewitt doubtless knows that to produce a really good platinum toned C.C. print as good a negative is required as for a genuine platinotype. A thin, wasty negative is useless.

Personally, I sell C.C. prints for what they are, and do platino-types, if demanded, from the same negatives.—Yours,

OTHELLO.

October 4th, 1902.

LECTURES ON THE FOCAL PLANE SHUTTER.

To the Editors.

Gentlemen,—Our Mr. Eustace F. Wallis is arranging for a number of lectures during the coming winter to various photographic societies upon "The Focal Plane Shutter," and, as there may be some societies whom we have not written to, we shall be glad if you can find space in your valuable paper to make the announcement that we shall be pleased to receive communications from the secretaries as to date, etc.

The lecture will be illustrated with lantern slides and apparatus, and will be a useful explanation of the action of shutters, lenses, etc., given by a lecturer well acquainted with his subject, and accustomed to giving popular addresses.—Yours faithfully,

WALLIS BROS.

Kettering, October 2nd, 1902.

ORTHOCHROMATIC PLATES.

To the Editors.

Gentlemen,—We notice your remarks in this week's JOURNAL re orthochromatic plates, and in reply to them, beg to bring to your notice the fact that such a plate as you mention has been upon the market now for about three months. We refer to the orthochromatic plates made by Westendorp and Wehner, and for which we are sole agents. These plates are specially sensitised for the yellow and green rays, and consequently do away with the use of a yellow screen. They are extremely rapid, yet can be developed in a proper ruby light with safety.—We remain, yours obediently,

EDMEADS AND CO.

30, Burchell Road, Peckham, September 29th, 1902.

EXHIBITION AT ST. PETERSBURG.

To the Editors.

Gentlemen,—The St. Petersburg Photographic Society, under the most august patronage of His Imperial Highness the Grand Duke Michael, Heir Apparent, and by permission of the Imperial Ministry of Finance, proposes to hold an international exhibition at St. Petersburg in the spring of 1903.

In transmitting herewith the programme and rules of the exhibition, together with blanks for information and inventory, the committee of the Society invite all persons connected with the Government, or with societies, and all private persons in England who may have photographic collections or who use the photographic process in any form whatsoever in their business, to take part in the exhibition. All English amateurs or professional photographers, and all manufacturers of photographic appurtenances are also cordially invited to exhibit.—Yours, etc.,

W. GRACHEFF, President; BORIS AGLAIMOFF, Secretary.

St. Petersburg, Fontanka, 64, September, 1902.

PHOTOGRAPHY AS A FINE ART.

To the Editors.

Gentlemen,—I have read the articles on above subject with very great interest, especially "F. V. C.'s" indignant letter, and "C. W. C.'s" straightforward question. The article referred to by "F. V. C." in the *Daily Mail* was written by a person who was ignorant of his subject, or else thoroughly in error. That photography is mechanical, in the hands of most photographers, is beyond dispute. The following is an instance. The photographer will take out his camera, take several views in the course of a few hours, and call the results (probably finished on highly glazed P.O.P. or bromide) pictures. The painter, on the other hand, will previously think out his subject, find out what time and sort of day most effective, and go time after time till he obtains the desired result.

The comparison is obvious. The photographer secures some ordinary photographs, devoid of any sentiment or pictorial interest, and the painter is repaid for his thought and perseverance with a picture expressing his feelings. If the photographic artist would adopt the painter's plan, he would then know if a broad or minute, delicate, or bold effect most in keeping with his ideas, and work earnestly and perseveringly, most probably have to come several times before he obtains a result in harmony with his thoughts. By finishing his picture in carbon, he will have nearly every known colour to choose from, and the picture so greatly under his control, that if he chose he could so alter as to be beyond recognition. It is at this stage where he has to emphasise or modify, as his feelings prompt.

By intention, I have omitted the intermediate stage between the taking and finishing of picture. If the picture has been thoroughly thought out, what alterations the photographic artist has to make, can be done on the carbon picture with much more truth and reality. If he has expressed himself with truth and conviction, the result will be a work of fine art, in the truest sense of the word.

I said the very great majority of photographers are mechanical. Why? Because they cannot see or express themselves in the same way as the artist. This difficulty may perhaps in some small way be overcome by studying art, but personally I think an artist is gifted from his birth, and that it cannot be mastered by any other. To be in any way

a fine art, photography must have an artist at the head, who has mastered the mechanicals (it can be mastered, and has to be), it will then be a fine art, in which he can show the poetical sentiments he desires.

In conclusion, I would ask our leading artist photographers, if they do not think it time to state their opinions in the daily papers? I certainly think the criticism now written on photography as a fine art will make our artists widen their thoughts and subjects, but we must also remember that the public are being convinced one way or other. Let our leaders, therefore, write at once to all the leading papers (laying aside all false modesty and nom-de-plumes), distinctly and convincingly, to prove that photography is a fine art in the hands of an artist.—Yours, sincerely,

HERBERT BALL

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY, 24, *Wellington-street, Strand, London, W.C.*" *Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

PHOTOGRAPHS REGISTERED:—

A. Salmon, 169, Hampstead Road, N.W. *Photograph of Canadian Arch, White hall.*

J. Graham, 17, Ordnance Terrace, Chatham. *Photograph of old Viaduct New Road, Chatham, demolished.*

H. W. Harrison, 18, The Crescent, Bude. *Photograph of "Rough Sea at Bude."*

J. Rushton, Dockray Street, Colne. *Three photographs of Colne Cricket Club.*

ADDRESS WANTED.—L. AND W. E. BAKER write: "Can you oblige us with the address of the English representatives of the papers of the American Aristotype Company?"—In reply: So far as we know, the company have no representatives in this country.

BOOK WANTED.—PROCESS writes: "Would you kindly let me know which you consider the best text book containing instructions for making half-tone blocks; that is, with the screen?"—In reply: The book that will probably suit you best is "Half-tone Process on Zinc and Copper," by Julius Verfasser.

STALE PLATES.—HUGH ROSS writes: "Please say what is wrong with this plate. The whole box of them are marked more or less the same way. You will notice marks of paper that keeps the plates separate in box."—In reply: It is a case of stale plates. The plate sent has deteriorated by long keeping.

ADDRESS WANTED.—J. BENGHIAT writes: "Please let me know the address of any dealer in collodion materials, ferrotype plates, etc."—In reply: Messrs. Mawson and Swan and the Autotype Company supply collodion. Messrs. Fallowfield, Charing Cross Road, supply all the necessary materials for working the ferrotype process, and make a speciality of them.

BOOK WANTED.—W. F. writes: "Could you give me the name of a good book upon bromide printing and enlarging? I want something beyond the ordinary text book; something suitable for an advanced operator."—In reply: The best book we know of is "Bromide Paper: Instructions for Contact Printing and Enlarging," by Dr. E. A. Just. Any of the dealers will procure it for you; the price is 1s. 6d.

TRANSFERRING P.O.P.—INQUIRER writes: "Would you kindly inform me of a simple method of transferring a small P.O.P. print on to a silver locket?"—In reply: Mount the print, after being alumed, face downward on the locket with starch. When dry, abraid the back of the paper, and, after moistening it, carefully rub it away with the finger. It will require some little patience to do the work successfully.

PLATE FOR COPYING.—TENWICKE writes: "May I trouble you to tell me what would be the best plate, etc., to use in copying some old oil paintings? Would a yellow screen be necessary, as I have not one? Never having copied paintings, shall greatly value any hints you may kindly give."—In reply: Use one or other of the isochromatic plates as now supplied by most of the makers. The results will be much better if you employ a colour screen than if the pictures are copied without one.

PRINTING PROCESS.—VERY LATEST writes: "I should esteem it a favour could you inform me where I can get a paper so fashionable in U.S.A. It has a soft, velvety appearance, quite like a down on the surface. It is in black and white, but rather a browny tone in shadows."—In reply: There are several papers made in America that are not on the English market. We do not know of any that answers your description. Had you sent us one or two specimens to see, we might possibly have been able to help you.

DEVELOPER STAINS.—A. H. S. writes: "I got the recipe, as below, from your valuable JOURNAL, and have found it to be an excellent one. There is but one drawback, namely, it stains the fingers very badly. Could you give any remedy for this defect? Metol, 80grs.; hydroquinone, 8grs; soda sulphite, 200grs.; soda carb. sicc., 360grs.; potass bromide, 10grs.; water up to 20ozs."—In reply: If care is taken in handling the plates, the fingers will not be stained. Hold the plates only by the edges, and rinse the fingers under the tap after contact.

PORTABLE STUDIO.—C. J. FARMER writes: "I am about to have a portable studio made on wheels to go to villages with. Could you give me a few hints on the size and the light for same? I thought of having it 18ft. long."—In reply: Eighteen feet would be short for the studio; four or five feet longer would be preferable, and the width might be, say, nine or ten feet. We should suggest that all one side be opaque, and, say, four feet six inches at either end of the other side also opaque; the rest glass, to about eighteen inches to two feet from the floor

BOOK WANTED.—E. G. B. writes: "(1) Can you tell me if there is such a work as 'The Chemistry of Photography'? If so, what is the price, and who publishes it? (2) In toning Alumenised Paper, is a grain to a sheet (the usual size) about the right proportion for the gold?"—In reply: (1) Yes: Meldola's book. The price, we think, is 2s. Or "Chemistry for Photographers," by Townsend price, 1s. These books may be had through any of the dealers (2) From one to two grains will be required for each sheet, according to the depth of toning. For light red-brown tones, a grain will suffice; but for purples more will be necessary.

EXPOSURE.—G. DUNKERLEY writes: "Could you kindly inform me the exposure required, under favourable conditions, to photograph the forthcoming comet; say, with Imperial special rapid plates and stop f/10? Also whether any precautions will have to be taken to counteract the effect of its motion."—In reply: We are unable to give any idea whatever, as the light from the comet is so feeble. You can only arrive at the exposure required by a few tentative experiments. We do not expect you will be very successful with an ordinary camera, unless it is mounted in the same way as an astronomical telescope is, to follow the motion of the comet.

PYRO-STAIN WANTED.—STAIN writes: "Can you suggest any liquid that would be suitable for imparting to negatives a similar yellow-brown stain to that on negatives developed with pyro-soda? I find old pyro-soda developer is unsuitable for several reasons, and the colour left by ammonium picrate is a lemon-yellow, which seems to lack the printing quality of the pyro-stain."—In reply: Any of the soluble-in-water coal tar colours will stain the film, but we do not expect that any of them will yield the same results as the stain of a pyro-developed plate. Old pyro solution will probably give the best result.

URANIUM INTENSIFIER, ETC.—E. STANLEY writes: "Please say if, with uranium intensifier, you simply bleach white and then redevelop in daylight. If there is a better method, kindly let me know. I do not care to use mercury, on account of its poisonous nature. What is the best preservative to keep paste mountant for six months?"—In reply: Simply use the formula as given. There are many different ways of intensifying negatives (see pp. 1,077-8-9 of the Almanac). Although the bichloride of mercury is poisonous, with ordinary care you would not be likely to suffer any ill-effects from its use. The best preservative would be a small quantity of carbolic acid, but we should much prefer to always use paste freshly made.

P.O.P.—DUSSELDORF writes: "Can you tell me of any book of instructions for working P.O.P. with the combined bath? I have been used to the separate bath till I came to my present place at Derby, where I had to get into using this combined bath. I manage it fairly well, but do not get the tones the same one day as the next. I make the bath very carefully, and try all I can, but I'm afraid if I don't improve I shall lose my berth, and that I should be very sorry to do. Could I get a book from the makers of the paper that would explain defects and troubles of combined baths?" In reply: You should have no difficulty in working the combined bath, if you follow the instructions issued with the paper you employ. We do not think any of the makers of papers issue a book specially on working with the combined bath. Usually the combined bath is considered easier to work than the separate toning and fixing method.

*** NOTICE TO THE TRADE, WHOLESALE AGENTS AND BOOKSELLERS.—*A Contents Bill is issued with each number of the* JOURNAL, *and copies may be had on application to the Publishers.*

*** NOTICE TO ADVERTISERS.—*Blocks and copy are received subject to the approval of the Publishers, and advertisements are inserted absolutely without condition, expressed or implied as to what appears in the text portion of the paper.*

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*** *The Editor can only be seen by appointment.*

*** *We do not undertake to answer letters by post.*

THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC FOR 1903.

Edited by Thomas Bedding, F.R.P.S.

The forty-second annual issue of The British Journal Photographic Almanac will be published early in December next. This year's Almanac reached a total of 1,560 pages, and the entire edition of 20,500 copies was sold out a fortnight before publication. Of no other photographic book ever issued can two such unique facts be recorded.

The edition for 1903 will be increased to 25,000 copies, a large number of which are already ordered.

The striking favour with which past Almanacs have been received is the surest proof that the lines upon which the publication is produced meet the requirements of its readers and supporters. Upon such lines we propose compiling the volume for 1903. At the same time, we shall be pleased to receive and consider suggestions for increasing the value of the Almanac in directions which may occur to our readers as susceptible of improvement.

The Almanac for 1903 will appeal to photographers all the world over as a daily reference guide in practical work. The standard matter and formulæ will be revised and added to where necessary, and the latest departures in theory and practice will be chronicled. The year's advances will be recorded, and wherever practicable new features of an informative nature will be added.

Secretaries of societies will oblige us by promptly forwarding lists of officers and other details for inclusion in the directory of photographic societies. We shall also be glad to receive any additions that may be made to the list of telegraphic addresses of the trade, etc. As usual, a section of the Almanac will be devoted to notices of the latest introductions in photographic apparatus, etc. Those firms who wish to take advantage of this feature should communicate with us not later than Ocober 31.

The publishers ask us to remind advertisers that many of the advertisement pages of the Almanac are already booked, and that, to ensure insertion and good positions, orders and copy should reach them without delay.

EX CATHEDRA.

American Optics.

"The Greatest Show on Earth!" The invention of this phrase will keep green the name of Barnum for many generations. It appealed most effectively to the patriotic bias of the American people, and thus became a splendid advertisement. Mr. Worcester R. Warner, of the American Association of Opticians, may claim a high position in the esteem of his fellow-countrymen as an exponent of the art of Spread Eagleism, if the following extract from the *Optical Journal* correctly represents him:—"The modern system of making objectives by the scientific method, instead of the old cut-and-dry plan, has given us the best telescopes ever made. This system first calls for small prisms made from the same glass as the objective. These prisms are carefully tested and their indices of refraction determined, from which data the curves of the objective are computed. Carefully made appliances enable the optician to work closely to these computed curves, thus producing the most nearly perfect objectives ever attained. We may be justly proud of the fact that this system is wholly American, and its success is so marked as to ensure its early adoption by all makers of telescope objectives, who can master the optical and mathematical principles involved." Mr. Warner must be a bold man to expect that we should shut our eyes and swallow optical pabulum of this kind. It may appeal to an American audience, but we respectfully decline to believe him, unless he can offer us some evidence for his assertions. We are old-fashioned enough to believe that we are indebted to Fraunhofer for the method of determining the refractive index of glass by means of a prism. His determination of the lines in the solar spectrum opened the way to the exact computation of the curves of an object glass. Dr. von Seydel supplemented the work by giving us the formulæ for computing the path of the extra-axial rays. Is this the cut-and-dry plan which has been superseded by American opticians? Per-

haps the *Optical Journal* can supply us with further particulars.

* * *

The Artigue Process. From the *Revue Suisse de Photographie* we gather some interesting particulars concerning the origin of this photographic process, by which very beautiful results may be obtained. Monsieur Eugène Rouge writes that Monsieur F. Artigue made the discovery in 1878. It had been his habit to copy architectural drawings by coating paper with a colloidal substance containing pigment, and after exposure developing it with cold water and a sponge. On one of these drawings a water-colour sketch had been made, and after development it was found that the sketch had been very perfectly reproduced in half-tone. Unfortunately, Monsieur Frédéric Artigue died before he could complete his experiments, but his son, Monsieur Victor Artigue, recognised the value of the process, studied it and perfected it. The first prints were exhibited at the International Exposition of 1889. The paper may now be had as a commercial article. It requires some dexterity in manipulation and does not keep well after it has been sensitised, but some very fine results may be obtained by its means.

* * *

Modulation in Portraiture. In an article on "Questions of the Day," published in the *Atelier des Photographen*, the merits of the old portrait lens for studio use are discussed in comparison with modern anastigmats. The complaint of the professional photographer is put in a rough and ready form by the statement that X.Y.'s anastigmats are advertised for a 10in. x 8in. plate, but will not give a good carte de visite half-length portrait. The image is flat, without pluck, the high lights are wanting, and there is no modulation. "The old Dallmeyer portrait lens of thirty years ago suits me much better, and it gives a portrait of far better quality." The writer of the article admits that the photographer is right, if he compares the image obtained with a portrait lens of large aperture with an anastigmat of only moderate intensity, but maintains that the difference is entirely due to the larger relative aperture of the portrait lens. In illustration of this, he recommends the photographer to take a lens of large aperture and insert a stop with two small apertures as wide apart as possible. If a bust or some similar solid object be focussed, only one plane will be in sharp focus and the image will be double in the other planes. From this it will be seen that the various parts of the surface of the lens are different points of view, each forming a more or less different image. The result is a diffusion of the image in all parts of the picture, excepting the plane which is accurately focussed. This diffusion, contrasted with the sharp portions of the image, gives atmosphere and relief. Whilst this is true, we do not think this accounts for the whole of the difference between portrait lenses and anastigmats of the same rapidity. The portrait lens has a round field and a small area of fine definition. The anastigmat has a flat field and a large area of fine definition. Consequently the photographs must differ far more in sharpness than the writer accounts for by his experiment. In dealing with the bust, the professional photographer can urge very good reasons for his preference for the old Petzval lens.

* * *

Deceptive Trade Statistics. The well-known saying, that you may prove anything from statistics, is well illustrated by a paragraph in the *Photographische Chronik*. We should not draw attention to it but for the fact that it deals with figures which must l of great interest to those who deal in photographic good The writer prefaces his remarks by the statement tha whilst foreign photographic apparatus is preferred i Germany, although the home-made articles are bette foreigners are so convinced of the superiority of Germa goods that the efforts of other countries, especially Franc have had but small success in securing foreign trad Definite statistics are given by Belgium, whose imports scientific apparatus were the following:—

	From Germany. fs.	From France. fs		From Germany. fs.	From Franc fs.
1891 ...	520,000	305,000	1896 ...	537,000	426,000
1892 ...	430,000	296,000	1897 ...	578,000	500,000
1893 ...	371,000	275,000	1898 ...	590,000	489,000
1894 ...	419,000	277,000	1899 ...	597,000	452,000
1895 ...	414,000	302,000	1900 ...	712,000	502,000

At first sight these figures appear to be strikingly in favou of Germany, but a closer analysis will show that France ha made very substantial progress, and that Germans may b deceiving themselves by a very plausible statement of th facts. If we take the entire trade for the period of ten years the percentage of German goods is 57.5. The fol lowing are the percentages for each year, and it will be seen that Germany only rose slightly above the average in 1900:—

1891.	1892.	1893.	1894.	1895.	1896.	1897.	1898.	1899.	1900.
p.c.	p.c.	p.c.	p.c.	p.c.	p.c.	p.c.	p.c.	p.c.	p.c.
63	59	57	60	58	56	54	55	57	59

If we compare the progress of the trade of both countries, taking the year 1891 as a basis, the figures are considerably in favour of France, viz.:—

	1892. p.c.	1893. p.c.	1894. p.c.	1895. p.c.	1896. p.c.
Germany	− 17·3	− 28·6	− 19·4	− 20·4	+ 3·3
France	− 3·0	− 9·9	− 9·2	− 1·0	+ 39·7

	1897. p.c.	1898. p.c.	1899. p.c.	1900. p.c.
Germany	+ 11·1	+ 13·5	+ 14·8	+ 36·9
France	+ 63·9	+ 60·3	+ 47·5	+ 64·6

Even the volume of the increase is in favour of France when we compare the year 1891 with 1900. It will be seen that Germany's trade increased by 192,000fr., whilst France's advanced 197,000fr. In other words, although France exported to Belgium in 1891 about two-fifths less than Germany, she has secured more than half of the increase of trade when we compare 1900 with 1891.

* * *

Invisible Guns. There seems to be quite a craze just now for making things invisible. Only the other day we pointed to the efforts which were being made in this direction in the case of our warships, which, for the future, are to receive a coat of grey paint. The position of artillery has already been screened from view by the use of smokeless powder, and now, on the initiative of an officer at Aldershot, the still further precaution is being tried of painting the guns, their carriages, and their limbers, of such a colour that they will be inconspicuous against all kinds of backgrounds, so far as that is possible. But the manner in which the guns tested, a battery of six, have been painted is certainly curious. Instead of giving them a neutral tone they are painted rainbow fashion, with streaks of red, blue, and yellow, and we are told that at a short distance these colours blend into a confused mass that renders each gun difficult to locate, whatever its surroundings may be. "At 800 yards," says the report from which we quote, "the outline of the gun is lost, whilst at a thousand it harmonises with trees, open grass land, sandy plains, or broken country." This is no doubt perfectly true, but exactly the same effect would have been produced by painting the guns with a good neutral tint, say, that pigment

nown to artists as "Payne's Grey." We all know that, ccording to an old theory, a mixture of blue, red, and ellow should produce white. But in practice a dirty eutral colour results from their admixture. Even with ie far purer tints employed by Mr. Ives to represent the iree-colour sensations in his lantern kromskop, their iingling is very far from representing a pure white. To each this ideal we must reconstitute the actual coloured ays forming the solar spectrum, as Sir Isaac Newton did ong ago. But to return to the guns. It seems ridiculous hat they should be disfigured in the way described, and 'e cannot imagine anything more incongruous than these arlequin-painted guns appearing on the parade ground in ompany with well drilled and well groomed soldiers. It s a fad based on ignorance, and the sooner that the gaily oloured weapons are painted over in a sober tint and nade to look respectable the better.

* * *

A Notable Meteorite. It is a curious coincidence that, just at the time we were writing the other day about the rarity of meteorites one should have been seen to fall and captured in these islands. Another curious coincidence is that the fall took place close to Belfast, at the time that the meeting of the British Association was in progress there, for the event is one of such extreme rarity that it would naturally arouse the keenest interest among savants. A photograph of the meteorite has been published in the pages of our contemporary *Nature*, but we trust that a better reproduction will be available soon, for one cannot expect an ordinary newspaper print to show the delicate markings on the surface of such a stone. The story of this strange visitor is an interesting one. At a certain farm at Crumlin (Co. Antrim), about ten miles west of Belfast, on September 20th, at half past ten in the morning, a labourer was gathering apples. He suddenly heard a terrific and awe inspiring sound, and something dropped with a thud within twenty yards of the spot where he stood. Then he saw a cloud of dust rising from among the wheat close by, and on closer inspection found a hole in the ground. He ran to the farmhouse for a spade and dug that something up, from a depth of thirteen inches. It proved to be stone, very hot to the touch, which measured $7\frac{1}{2}$ by $6\frac{1}{2}$ by $3\frac{1}{2}$ inches, and its weight subsequently proved to be 9lb. $5\frac{1}{2}$oz. This is the largest stone which has been *seen* to fall from the sky to the British Isles for 89 years, and is larger than any which has fallen in England itself since the year 1795. Of course, this visitant from space made a great impression on the populace, as well as upon the soil, and hundreds flocked to the farm to see the "thunderbolt." The news came to Mr. Fletcher, the principal of the mineralogical department of the British Museum, and he immediately telegraphed to Crumlin for further particulars. He had had to deal so often with reports of bogus finds of this character that he was cautious in his inquiries; but as this seemed to be a genuine case, he journeyed down to Crumlin and investigated the matter on the spot. His experienced eye at once saw that the meteorite was a true visitor from space, and he was able to gather from the eyewitness of its fall, all particulars concerning it. The farmer proved willing to part with his prize, and the Crumlin meteorite now reposes with other historic stones of the same kind at the Natural History Museum at South Kensington. The question naturally arises, "How many meteorites fall in the course of a year in unfrequented spots and get buried in the soil?" It is just a chance that this one had a witness to its flight, and we should think, seeing the thousands of square miles of land that remain unoccupied even in these well-peopled islands, that many such falls must occur without anyone being aware of them. And as the sea covers nearly three-fourths of the globe, it is evident that the chances of a meteorite being drowned rather than buried are about three to one. There is an interest attaching to these metallic bodies which is quite peculiar to them, for they are the only substances which reach this earth from the immensity of space: reminders that there are other worlds than that upon which our lives are passed.

* * *

Irish Photographs. In spite of the circumstance that great efforts have been made of late years to call attention to the beauties of the Emerald Isle, and to attract tourists there, it is obvious to those who visit our photographic exhibitions, that camera pictures of Ireland are not nearly so numerous as those which find their origin in other parts of the United Kingdom. The meeting of the Photographic Convention a few years back, at Dublin, had the natural effect of setting cameras to work at the Irish Capital and in its vicinity, and we may hope that in a minor degree the recent British Association meeting, at Belfast, may have operated in like manner. But the fact remains that Ireland is not the happy hunting ground of the photographic tourist that it might be. Some account for their abstention by political considerations, and some blame the hotel accommodation, but no one can truly say that the country does not offer much in the way of beautiful scenery. The lakes of Killarney are far famed for their wondrous beauty and their poetical associations, and it would be difficult to find a neighbourhood of greater grandeur than that presented by certain parts of Co. Antrim. There is one spot here which has only quite recently been made accessible by the engineer of the Northern Counties Railway Company, and photographers would do well to turn their attention to it. It is known as the Gobbins Cliffs, which may be described as a series of basaltic precipices, edging the sea for some miles. Along the face of these pillared cliffs the railway company have cut a path, and where there is need of such an aid to progress, they have thrown light girder foot-bridges from point to point. This is the case at one well-known spot, known as the Man-o'-War Sea Stack, a rugged pinnacle of basalt, which stands out from the cliffs, and has now been connected with the mainland by means of these steel connecting links. A good photograph of this grand place appears in the current number of the *Irish Naturalist*, which also calls attention to the number of sea birds, of seals and porpoises, which may be seen playing about the spot. There are also some curious caves to be explored here, among them one which has been closed by a fall of rock for the past forty years. The debris, estimated to represent a weight of 500 tons, has now been removed, and the cave is once more open to inspection. Most spots in this country of ours are overrun with camera bearers, but this one has hitherto been an exception, for the reason already given. It has been one of those few seaside places where access to the sea is forbidden by natural barriers. Such another place is Boscastle, on the northern coast of Cornwall, where one can walk for miles along the top of the rugged cliffs, and get occasional peeps of the waves far below, without a chance, unless at the risk of broken bones, of getting down to the sea-shore. Possibly some day an enterprising municipality will do for Boscastle what a go-ahead railway company has just done for Gobbins Cliffs in Co. Antrim.

THE IDEAL DARK-ROOM.

If there is one thing above others connected with photographic practice which shows little improvement as compared with earlier conditions, it is undoubtedly the dark-room. Even the best equipped and most up-to-date of these indispensable chambers for development would hardly tend to make any worker of bygone days feel much ashamed of himself, or disposed to admit that nowadays we manage things better. It is certainly rather surprising, considering the striking progress that has been made in other directions, in cameras, lenses, plates and papers, and, indeed, photographic appurtenances in general, that so necessary and vital a matter as the convenience and comfort of the place in which the most important of our operations are carried out, should have attracted so little attention. Possibly the photographer has got so used to a philosophic belief that a certain amount of unpleasantness is inseparable from that stage of his work that he has not troubled his head about the matter, preferring rather to advance, when he does advance, on a line of lesser resistance.

We are not all alike, however, and instances, very rare unfortunately, may be found here and there of dark-rooms which are a joy and delight to work in, and a source of health and pleasure to their wise and fortunate possessors. The best example we ever saw of how things might be done, when thought and contrivance were cleverly directed on the subject was the dark-room of a most energetic and enthusiastic young photographer, who has just sailed for South Africa, with the intention of establishing a high-class studio in the Transvaal. It was a perfect model of the ingenious adaptation of every means and detail to the one end of producing good work with comfort and facility. Our friend had selected a fairly large room for the purpose, having as he averred a strong dislike to the "condemned cell" system of development. A large window of ruby glass provided the necessary illumination, which was artificial and proceeded from outside. Incandescent gas burners were used, and sufficed to give a bright and cheerful, but perfectly safe light all over the room. The plan of having them outside had, of course, the advantage of not taking away any of the interior air, and thus materially adding to the freshness and coolness of the room. The amount of light, it should be said, was regulated from inside. Our friend preferred as much as possible, which he quite correctly maintained was free from any risk if the plate were not held too near nor left uncovered too long.

The developing bench, which ran along one side of the room, was novel in construction. The upper part or shelf consisted of a number of round parallel wooden bars placed at about a quarter of an inch apart, so that all drippings and splashings would run down the spaces between, and yet sufficiently close to form practically a solid bench. These bars or rods were treated with a waterproof varnish or preservative of some kind, as indeed was all the woodwork in the room at all liable to contact with water or chemicals. Another new departure was in the sink, which instead of being, as usual, on a level with the bench, was placed on the ground, being formed in reality of a flooring of white enamelled tiles, the width of the bench, and sloping slightly inward towards the drainage openings. The outer edge of this novel sink consisted of a margin of glazed bricks, about six inches high, running the length of the room. The whole, in fact, reminded one in principle of the modern art tile and stone substitutes for fenders that help to beautify many of our up-to-date drawing-rooms. The water supply was liberal and the taps numerous, each one provided with a rose to minimise splashing. The pipes supplying the taps were encased in felt to secure a more equable temperature in winter another aid to which was to be noted in the fact that the hot air pipes which warmed the dark-room at that season were carried at a short distance below the water pipes Truly a model arrangement! We were informed that very little trouble was found in developing satisfactorily even on the coldest days. A point about the developing bench which we must not omit to notice was its unusually low height. Inquiry elicited the fact that this original worker preferred doing most of his work sitting down, a position of comfort which his ingenuity and resource certainly seemed to entitle him to. At one end of the room was noticeable a rocking shelf, capable of holding perhaps a dozen whole-plate dishes, and kept in motion by a simple clock-work contrivance.

It goes without saying that so well regulated a dark-room was amply provided in the matter of shelves and cupboards. The chemicals, measures and solutions required for immediate use were kept on a handy and accessible shelf just above the bench, stock solutions and larger bottles and jars being relegated to a higher level. Instead of labels, each bottle had a square portion of its surface ground, and the contents written thereon in waterproof ink. Everything was most systematically grouped, also according to its chemical composition or the purpose for which it was intended.

On the opposite side of the room were situated the drying cupboards for plates, films, and prints; an arrangement in which our friend pardonably took some pride. The shelves of these cupboards were arranged at different distances, and grooved top and bottom to take different-sized plates. A thoroughly efficient current of air for rapid drying was secured by ventilators communicating outside, and prevented from carrying dust by muslin screens in front. The doors, it should be said, were practically air tight, and the whole treated with several coats of enamel paint. The cleanliness and practicability of this system scarcely needs pointing out. Drying boards were also reserved for films and prints. The ventilators were not only dust tight, but likewise prevented from admitting light, and the cupboard was occasionally useful, therefore, for dry-plate manufacturing purposes—a thing, however, which its owner rarely cared to meddle with.

The operations connected with the making of enlargements were well provided for, a good enlarging camera being one of the features of the place. Our friend distinctly preferred to use artificial light for this purpose, and we noted that again the lantern and source of illumination were placed outside the dark-room, the camera and easel being placed within. Heat and stuffiness were, evidently, to be rigorously banished. Near the ceiling, and stretching tightly from wall to wall, were numerous waxed cords, for the suspension of enlargements during the period of drying, which, owing to the admirable system of ventilation, took place rapidly. A few remarks on the more purely architectural details of this ideal dark-room may help to complete the general impression. The flooring was of some hard wood, naturally polished; the walls and ceiling were whitewashed. There was nothing special about the actual framework of the room, for it was not one that had been originally designed for photographic purposes. Its owner, indeed, expressed some satisfaction that, in his coming tropical field of action, he would be able to start entirely *de novo* in a building of his own design and construction, when he would be able to put into practice sundry ideas as to the best way of erecting walls, with a view to securing equable temperature all the year round.

We have here a sufficiently literal and prosaic presentment of what may be, and actually has been accomplished in the direction of the perfect dark-room, and the contrast between such a one as that just described and the average apartment that satisfies most of us may well form fruit for meditation. True as it undoubtedly is, that satisfactory and excellent work may be readily produced with a minimum of those labour-saving and comfort-giving conditions that we have shown are at all events within our reach, it requires but little reflection to see that the possibilities and potentialities of photographic achievement must be added to materially where what was once a task is made almost a luxury. There is still far too much that is old-fashioned and behind the times in our working methods and surroundings, and anything that can shake us for a moment out of a rooted habit of easy-going complacency, and lead us to the conviction that there may be other and better ways than our own, admirable though they may be, is to be welcomed as aiding the universal movement of progress that in the end benefits everyone.

THE ELECTRIC CURRENT IN THE STUDIO.

WHETHER regarded as a luxury for general use, or as a necessity for studio work, in some localities, through exigencies of atmospheric conditions, or a late hour of working, the use of electricity as a light producer, and for other purposes, is a boon whose value it would be difficult to over estimate; yet the question arises, Whether the general body of photographers are sufficiently alive to its importance; or, having adopted it, they sufficiently realise its possibilities or are acquainted with its commercial limitations? Particularly with regard to one aspect of the latter were we surprised recently at the ignorance of the owner of a studio who, some time ago, had a complete electric installation to replace his gas fittings. We should have deemed it entirely superfluous to have mentioned such a matter had we no viva voce proof of the need to do so, in this one instance, at least. We refer to the fact that when electric wiring and lighting have been installed it is needful, before bringing it into use, to acquaint the fire insurance office with whom the property is insured with the fact of the application of the electric current, whereupon they will either send an inspector or otherwise assure themselves of the work having been properly carried out, so as to insure freedom from undue fire risks. Having done this, they will endorse the policy with a certificate to that effect, indemnifying the insurer against loss through fire caused by the current. If such indemnity be not obtained, the policy, by its terms, would become void, and the insurer would have no remedy against fire losses through the electric current or any other cause.

Already electricity is used to a considerable extent as a power agent, for driving apparatus, small or large; for ventilation purposes; for actuating a motor; for drying negatives; and a variety of minor uses, the need for which seem to spring up as soon as the current is laid on.

Up to the present time the electric current is prohibitively costly for heating a room of large dimensions, but for apartments of smaller proportions its application is increasingly convenient. Many elegant and useful pieces of apparatus in the form of electric stoves are to be purchased. We are informed that the cost of the current for this purpose is less than might be imagined, from the readiness with which the current can be switched on or off as required. Indeed, this is one of the great advantages of the electric current as against gas or solid fuel. The various switches are almost always so placed as to involve a minimum of trouble in turning off the current, so that upon entering or leaving a room the switching on or off becomes a mechanical routine act; while, as everyone knows, a gas fire or gas burner is usually left "on" if the room be left for a moment, a moment that sometimes is expanded into hours. For this reason, though the initial cost of electricity for a given lighting or heating effect may considerably exceed that of gas, the quarter's electric energy account not infrequently falls below the average gas bill for a previous corresponding period. In estimating the relative cost of gas and electricity this is a most important factor, but one too often lost sight of. In this direction the gain experienced through saving decoration expenses, owing to the great cleanliness of electric lightings, is now an old story, requiring nothing beyond a passing mention. Although, for heating large apartments—studios, for example—electricity may be costly, the local application of the current is so very convenient that its use may be recommended. For example, small studios with a special electric heating attachment complete, are now purchasable, and would be found extremely useful for many photographic purposes. We may now expect to have upon us the season of cold weather and low temperature in the water supply. The extent to which low temperature reduces the power of the pyro developer, for example, needs actually measuring before the full effects of its power in this direction is known. Indeed, we should not be wrong were we to state that at temperatures slightly above that of freezing point nearly twice the amount of pyro is used to produce a given density in a given time when compared with the same solution at, say 60deg. F.

The enthusiasm which surrounded the exponents of Röntgen-ray work has now entirely subsided, and, as far as we can learn, there are very few photographers who undertake the work. We think this falling off of interest is largely owing to difficulties in connection with the electric current. A large induction coil is a very costly instrument, and an excess of current would quickly lead to its destruction. We find that on the whole the preference is given to an "accumulator" for the current production. It has, of course, many objections; the accumulator once charged requires, for example, to be periodically charged, as, otherwise, it would, if left intact for some considerable time, become quite useless. There is thus a primary inducement to use the current from the main, and if an efficient resistance be supplied, we think that for all the usual Röntgen work a photographer need fear no opposition.

It has been our purpose to include the use of electric light in the studios, but already we have exceeded the bounds of our space in dealing with one aspect of the subject, and we shall therefore leave over for another occasion the important question of the use of the electric light for studio purposes.

THE Perth Convention.—On Monday, September 22nd, a meeting was held at the rooms of the Society of Natural Science, in connection with the arrangements for the eighteenth annual convention, which, by the invitation of the photographic section of the above society, will be held next July in Perth. The Convention has been to Scotland on three previous occasions, viz., to Glasgow twice and Edinburgh once. The meeting has never been held so far north before, and doubtless many members will embrace the opportunity of making the acquaintance of the many attractions and beautiful scenery in the immediate vicinity of our city. Mr. Henry Coates is taking great interest in the forthcoming gathering, and Sir Robert Pullar will be president. An influential reception committee is being formed, and the meeting should unquestionably prove a great success. Usually between 300 and 400 members attend the annual convention. The programme will be opened with a conversazione, lectures and papers will be read at the evening meetings, excursions will be organised, and there will be an exhibition of pictures and photographic apparatus open free every day, so that the inhabitants of Perth and district will have ample opportunity of making themselves acquainted with the many up-to-date contrivances in connection with the art science of photography. The local hon. secretaries are Mr. A. Rodger and Mr. Mackenzie.—"The Perthshire Constitutional."

THE STABILITY AND THE FADING OF ALBUMEN PICTURES.

ALBUMEN paper, though far less used by amateurs and by some professionals than formerly, is by no means yet extinct among the better class of photographers who still employ silver printing. The same may be said with regard to those on the Continent and, possibly, in America. Gelatine papers, we think it would be safe to say, are proportionately more largely used in England than in any other country, but for what reason we shall not here inquire; it is only albumen paper we are now considering.

We have many albumen prints in our possession that have been in existence for forty years and more, that are still unchanged. In the course of a discussion on the subject the other evening, one of the speakers, it may be mentioned, showed a number of prints that he had himself made twenty years ago, and only one of them had faded. With these facts before us, it is clear that albumen pictures are not necessarily fugitive, and they show conclusively that if those which have faded had been treated precisely the same as those which have proved stable, they also would not have faded.

It will be interesting to consider some of the causes assigned for the fugitiveness of so many modern prints, and see how far they are really tenable. One suggestion is that the base may be at fault, as we do not know what the paper of to-day is bleached or sized with. Did we know that at any time? We think we are correct in saying, and we say it without hesitation, that the paper used for albumenising now is precisely the same as it was thirty and more years ago. This paper is, and always was, made in one of two factories—the Steinbach, Malmedy, and the Kleiber "B.F.K." Rives, firms. Most of that now employed is that by the latter firm, and these two firms are the only ones that were ever able to supply a paper that could be successfully used for albumenising. These papers, we may safely say, are essentially the same now as they were in the early days, except in price, for since the "combine" of the two concerns, their price has been considerably increased. Hence we may dismiss this cause and fairly assume that the paper itself is as of old.

One of the most tangible causes of fading alluded to was the presence in the finished picture of a silver compound, "albumenate of silver." This was pointed out some thirty years or so back by Mr. John Spiller, who went very fully into the subject at the time. He then showed that, although this compound was soluble in hyposulphite of soda, it took a very long time for its solution—much longer than it took for the fixation of the print. He also showed that the "albumenate of silver" was soluble, and could be quite removed in a solution of carbonate of ammonia without injury to the albumen. But this was never much used in practice. Now, of course, the prints of old all contained this albumenate, but probably less in quantity, because the coating of albumen was thinner than now. Of late years the demand has been for highly glazed paper, and the albumenisers have met it by using stale and decomposed albumen, which gives a higher gloss than fresh white of egg does; also by thickening it by evaporation, or by the addition of dried albumen. But the use of decomposed albumen is by no means new; it was employed fully thirty years ago. It might well be surmised that, theoretically, the use of decomposed albumen might affect the stability of the prints made upon it; but is that idea borne out in actual practice? We happen to have some by us made on paper of the most fœtid description, which, when being sensitised, could be smelt throughout the house, yet they are still unchanged.

One very prolific cause of fading of albumen prints, and it applies also to gelatine and, indeed, to all silver prints by whatever process they are made, is an impure atmosphere in conjunction with moisture. If prints are kept absolutely dry, even in the presence of an impure atmosphere, or if they are mounted on impure mounts—also a prolific cause of deterioration—they will undergo but little change for many years.

There is one very important point in connection with the stability of the old prints, as compared with modern ones, that does not seem to have been touched upon in the discussion—namely, difference in the conditions under which they were made, as compared with present conditions, and that difference is of much importance. The paper of old bore a thinner coating of albumen than at present, and it was sensitised on what would now be considered a very strong bath—from sixty to ninety grains of nitrate of silver to the ounce of water, and it was used neutral, or nearly so. Furthermore, the negatives then used were of quite a different character from those now in vogue. They were collodion, very strong in the lights, and quite transparent—quite clear glass—in the shadows. Consequently the image, when printed, was well into the body of the paper, and was not confined almost, if not quite, to the albumen coating, as now. Often with a strong negative the print could be very distinctly seen on the back of the paper. As a consequence, the image was composed of a far larger amount of reduced silver than is the case now, and, of course, this, by its quantity, would resist pernicious influences much better than would the more attenuated image of the present day.

There is a very cogent reason why so many of the old pictures have so well withstood the test of time, which has been suggested to us by some of the old workers. It is this: Photographers some thirty or forty years ago took more interest in the stability of their pictures than is the case now. They gave more personal supervision to the work, or employed men who thoroughly understood it, and applied their knowledge in everyday practice. To-day we know that the work is too often entrusted to girls who know nothing whatever about it beyond what they have been instructed to do mechanically to secure nice-looking prints. Now there is nothing to be said against females doing the work; indeed, as a rule, they are more careful than lads when they have been properly taught their business, but this the majority have not been—they know nothing whatever of the theory of the subject and the necessary conditions that ought to be fulfilled which would conduce to the stability of their work. This remark applies equally as well to gelatine as to albumen prints.

The rapid fading of either albumen or gelatine prints may in all cases be attributed rather to their producers than to the processes themselves. This fact is one that is too often overlooked when comparing the relative stability of different processes, whichever they may be.

SEVERAL Continental and two or three English photographic periodicals, says "Process Work," seem to be making a great deal of fuss about a three-colour portrait from life made by Dr. Miethe. Whilst the result is good, there is nothing very wonderful about it. Three-colour portraiture has been frequently done during the last few years, and as good an example as Dr. Miethe's is to be found in the "Process Year Book" for 1901, between pages 56 and 57, the work of Messrs. John Swain and Son, Ltd. We may also point out that Messrs. Lumiere and Mr. Sanger Shepherd have shown numerous portraits by their colour transparency process. We mention the above facts with no desire to depreciate Dr. Miethe's work, but only to remind our contemporaries to give more credit to the productions of their own country, which they so frequently ignore.

HOTOGRAPHY AS APPLIED TO ILLUSTRATION AND PRINTING.

[Cantor Lecture, delivered at the Society of Arts.]

II.

Photogravure.

ISTORICALLY, photogravure, or heliogravure, is quite the rliest process of photomechanical printing rendered practical r the uses of illustration by the printing press, and its history full of interest for the student and experimentalist. We are, owever, not concerned specially in matters historical this even- ng, and I am expected to explain to you only its principles, me methods, and just how the process stands to-day in its lation to modern illustration.

Photo-intaglio engraving, as its name implies, is just the pposite in effect to the photo-relief blocks, which were de- cribed in the first lecture. The principles of working are, how- ver, practically the same as for type blocks, the results being btained by the employment of a photographic image in combina- ion with bichromated gelatine. The lines or gradation of the picture are sunk below the general surface of the metal, and he inking of the picture, instead of being done by means of a oller, is effected by forcing the ink into the sunk lines with a dabber, the surface of the metal representing the subject is hen wiped clean, and the impression is made by pressing a soft, sized paper in contact with the plate by heavy pressure; the pressure forces the paper into the inked lines or depressions forming the picture, and brings away the ink—the tones of the picture being represented by dark masses of ink in the deepest depressions, and by lighter gradations in the shallower portions, until the surface of the metal is reached, giving pure white.

Whilst photogravure justly stands at the head of all processes for artistic illustration, it is one which calls for more individual skill on the part of the engraver than almost any other. There is much uncertainty in the general results, and often more than one plate must be etched before a satisfactory effect is obtained, even then sometimes a good deal of help must be given to the plate by means of the burnisher, scraper, and graver, operations which remove the process from the mechanical, and call for higher artistic qualities than are generally essential for other processes.

The importance of the process renders it desirable that some demonstration of its working should be given, so that the un- initiated may better understand its principles, and I am glad to state I shall be enabled to show you some of the practical details this evening, through the kindness of Mr. Howard Far- mer, who has sent Mr. Symmons equipped in order to render us this service. The various operations will be slower than my description, but if you will permit it, I propose to make a break in my paper at one or two intervals, to tell you the essential points as the experiment progresses.

There are several methods of preparing photogravure plates, notably Fox Talbot's process, invented just about fifty years ago, and which is to-day, in practice, the principle of the most modern process; Klic's process, a modification of Fox Talbot's; Woodbury's process, which is, I believe, adopted by the French house of Boussod, Valadon, and Co.; Waterhouse's process, in which an electrotype plate is prepared from a sand-grained gelatine relief; Dr. Albert's process, and many others, only differing in slight details from the first-named.

The operations of preparing a photogravure plate by the process founded by Fox Talbot, are as follows:—The first requisite is a transparency or positive picture on glass of the subject which it is desired to engrave; the transparency may be made by the carbon process, or by any of the dry plate processes, but if the latter is used the transparency must be reversed. This positive on glass should be as perfect as possible, free from spots or defects, and full of detail. A piece of finely-polished copper is next selected, and carefully cleaned with Tripoli powder and water until the surface is free from the slightest trace of grease; after drying, the plate is ready to receive a graining of powdered asphalt or resin, so that the photographic image, when etched into the plate, will have the necessary roughness or grain to hold the ink required for printing. The powdered asphalt is placed in a box with an arrangement for creating a cloud of asphalt dust within the box, depending on the kind of grain required, whether coarse, or medium, or fine. An interval of some minutes is allowed to elapse before opening a door in the side of the graining-box and placing the plate face upwards for the dust to fall upon it. Three minutes is generally sufficient to ensure that the copper surface is evenly coated with the grains of asphalt. The plate is then taken out and placed on a plate of sheet-iron under which is a Bunsen burner, or is held over a flame of gas, to melt the powder so that it adheres firmly to the copper. As soon as it is cold the copper is ready for the next operation, namely, to have the gelatine resist carrying the picture transferred to it. The gelatine resist is prepared by printing an image from the transparency already referred to on a piece of sensitised carbon tissue, which is a surface of gelatine (backed with paper) mixed with some pigment like oxide of iron or carbon, and sensitised with bichromate of ammonia. The printing is carried out in the same way as for an ordinary carbon print, save that the resulting image is negative instead of positive. The printed carbon paper is immersed in water for a few minutes, and is then squeegeed to the grained copper surface, and developed with warm water until all the unacted-upon gelatine is dissolved, leaving only the negative picture on the metal. This print forms the "resist" for the subsequent etching-in of the picture, and carries the whole of the gradations of tone of the picture. As soon as the print is dry (it can be dried either spontaneously, or, if the grain is asphalt, by the application of methylated spirit) the etching of the plate may be proceeded with, but it is an operation requiring some care and skill in order to secure perfect results. The etching solution is perchloride of iron, which should be pure and neutral; the strength of the solution is important. Generally speaking, three strengths of solution are required, the first, tested by Beaumé's hydrometer, should register 38 to 40 degrees, and only attack the deepest shadows of the plate. Four or five minutes' etching with this solution is usually sufficient; then a solution of 35 degrees replaces the first, and the etching will be extended to the middle or half-tones for another period of four or five minutes; the third strength of solution is next taken, and the etching will attack the lighter tones up to the high lights. As soon as this is apparent, the etching is complete, and the plate is plunged in water and carefully washed, the resist and protection varnish removed, and the plate is ready for proofing in the press.

The graining of asphalt mentioned is commonly used for giving the etched surface a sufficient "bite" to hold the printing ink, but there are several other grains employed, notably, the mechanically ruled screen grain seen in half-tone blocks. This grain cannot be applied to the copper in the same way as resin or asphalt powder, but it can easily be added to the transparency used for printing the resist, or it can be printed on the carbon resist carrying the picture by giving it a short secondary exposure after the picture image has been printed. The advantage of the mechanical screen is that it gives a stronger grain to the plate, and admits of larger and more rapid printing. Photogravure plates of this kind deeply etched may be printed from at the rate of 500 or more per hour in a copper-plate printing machine. The Rembrandt intaglio process, which, by the way,

is a secret one, employs a grain of this nature, and from my observation it gives softer and smoother results than ordinary photogravure, though it lacks the brilliancy and strength of the latter. I cannot tell you how the process of Rembrandt intaglio printing is carried out, but from experiments I have made in this direction I an inclined to the opinion that the plates are bent on to a cylinder of a machine similar to that used for printing wall papers, and that an ink composed of dextrine or starch with a pigment replaces the usual greasy ink, also that a scraper or knife is used for "wiping" the plate, in the same way as in the old process of Docteur printing. I have some examples printed in this way which closely approach the Rembrandt.

Collotype.

I have on the syllabus of subjects to be considered this evening, the processes of collotype and Woodburytype printing; either of them would supply abundance of interesting material for an entire paper, but the limited time at our disposal will admit of my giving you little more than an outline of their principles and working. The collotype process is worked universally, and is known by a variety of names; the Germans call it "Lichtdruck," the French "Phototypie," the Americans "Phototype," and we English have given it the titles of "Photo-print," "Heliotype," "Autotype," "Photophane," "Photomezzo-type," "Graphotone," etc.

The process is based on the well-known action of light on bichromatised gelatine, and is allied to photo-lithography, with this difference that in collotype the exposed image in gelatine is employed for the actual printing surface, and not only can line subjects be printed from it, but copies of photographs, paintings, and drawings. It renders half-tones so accurately that when prints by collotype process are made on highly-glazed paper, with a suitable ink, there is scarcely any perceptible difference between them and ordinary silver prints; platinotype and bromide prints can also be closely imitated. The process is largely used for the production of view books, facsimile copies of engravings, copies of paintings, "art study" portrait work, and for commercial illustrations. I have explained in a previous paper that when a film of bichromate mixed with gelatine is exposed to light under a negative, then washed and dried, it will, when treated like a lithographic stone, absorb water where the gelatine film was protected from light by the dense portions of the negative, and will take ink and form a printing surface in the places where light has obtained access to the film through the negative. A collotype plate will not only take ink where absolutely clear glass occurs in the negative, but it will take ink in the half-tone in exact gradations corresponding to the amount of light passing through the negative. This property is most valuable, and, as a matter of fact, constitutes the process.

The preparation of collotype plates is not difficult, and the operations can be described in a few minutes. The printing plate is formed of a piece of plate-glass of about $\frac{1}{2}$in. in thickness, ground on the printing side to give a better hold to the gelatine. In order that the film may withstand the heavy pressure of the printing press, it is found necessary to coat the plates first with a substance containing albumen, water-glass, and water. This solution is spread over the cleaned glass in a thin coating and dried. The sensitising solution for collotype printing is composed of Coignet's gelatine 3oz., albumen 1oz., water 25oz., and bichromate potash $\frac{1}{2}$oz. The exact proportions are not arbitrary, and different operators modify their solution as experience guides. The sensitising solution is carefully filtered through flannel, and, whilst warm, is poured over the surface of the "substratumed" glass plate in a fairly thick film; the coated plate is then placed on accurately levelled supports in a drying-chamber or box, and heat is applied to the bottom of the box, which is made of sheet iron. Considerable heat is required to dry the plates, and the grain or texture of the plate is affected by the speed of the drying; about four hours is the usual time occupied. When the plate is dry and cool, it is ready for exposure under the negative; the qualities necessary in a collotype negative are that it must be reversed, and be of full printing strength. A negative that would render a full rich print by any silver printing process is the proper standard for collotype. The margins of the negative are masked with thin opaque paper or tinfoil, so as to permit of the picture being printed with a clean edge on paper with proper margins. The time required for the exposure under ordinary conditions, as regards light, is from twenty minutes to half-an-hour, but this is a matter which can only be fixed by experience. The image on the plate cannot be examined during exposure, and an actinometer scale is used for gauging the amount of light. After exposure, the plate is taken into a room lighted a dull or yellow light, and washed in running water for about half-an-hour in order that all the soluble unacted-upon bichromate may be removed from the film, after which the plate is allowed to dry spontaneously, when it is ready for printing.

The printing may be performed in an ordinary Albion press used for letterpress printing, or in a lithographic press. For rapid printing, or for long runs, special steam driven presses are constructed, with cylinder pressure, on which it is possible to print two to three hundred copies per hour.

When the plate is fixed in position in the press, it is first wetted all over with a sponge and water, or with a solution of common salt, glycerine, and water, which, after being allowed to act on the gelatine for ten or fifteen minutes, is sponged off and the plate is rolled up with ink. If the printing is being done on a hand press, a coating of ink is applied first with a leather roller, which inks up the shadows and stronger parts of the picture. This inking is then followed by another with a gelatine roller, which inks up the half-tones and details of the subject. A sheet of ordinary printing paper is now placed over the inked surface, and pressure is applied. The result is a permanent ink print on paper of the negative used. If the printing is done on a steam press, the operations are, of course, more mechanical, but the finished result is practically the same. Large plates can be successfully dealt with at machine, and pictures on paper up to 40in. by 30in. can be printed.

The collotype process has had a long and successful career, and the beauty and delicacy of its results, when properly printed, are fully equal to that of any other photo-mechanical process, but of late years the advances made in half-tone blocks, and more especially in the machinery constructed for printing them, has to some extent covered the ground hitherto occupied by collotype illustrations alone, and though the half-tone block can never oust or replace collotype for many kinds of illustration, yet it is sufficiently a rival to restrict its expansion and scope from a commercial point of view.

Woodburytype Printing.

Amongst all the processes for obtaining printing press pictures by means of photography, I think that of the late Mr. W. B. Woodbury is the most audacious from a purely photographic aspect. He aimed at the highest ideal, and attained it. His process is the only photo-mechanical one which, in the printing press, realises the gradations of tone without grain or texture of any kind; and Mr. Woodbury's working out of the process was so complete, that the operation of working it stands to-day precisely as he left it. The only variations since introduced do not alter the main principle of his invention, and refer more to mounting and transferring of the printed results than to the

process itself. The idea of the process emanated from the carbon print, in which the picture is formed in all it gradations by various thicknesses of pigmented gelatine, the shadows, representing the greatest thickness, being in relatively high relief, and the high lights the lowest. Reasoning backwards, Mr. Woodbury conceived the idea of making an electrotype mould of a carbon picture, and using the mould so obtained as a printing surface by covering it over with warm pigmented gelatine, and by flat pressure attaching a sheet of paper to the pigment, so that when the gelatine jelly was set he could detach it from its mould, and thus by repeating the operation obtain unlimited copies. This was practically the Woodburytype; but of course there were difficulties and imperfections, which the inventor quickly set to work to overcome. He found that a thick film of gelatine and bichromate, when exposed under a negative and washed, gave a very high, sharp relief; and he also found that when this relief was perfectly dry it possessed the property of being absolutely incompressible; in other words, it was as hard as steel, and could be used as a die. The relief film of gelatine was placed on a block of smooth, hardened steel, with raised edges; upon this was laid a sheet of type metal or lead about ¼in. thick, and the arrangement was then placed under a hydraulic press capable of exerting a pressure of about 40cwt. to the square inch. The pressure forced the lead into the gelatine image with such accuracy that every shade and detail of the relief was impressed. The raised edges round the steel block prevented the metal from squeezing out, and on being detached, a mould in lead was obtained which could be used as a printing surface for thousands of copies. The seemingly delicate relief in gelatine was quite uninjured by this treatment, and would serve for any number of further pressed moulds.

The printing press for these pictures is special, but quite simple. It is formed of a cast iron base, on which is fitted a movable table to hold the mould, which is bedded down on to it with gutta percha; over the table is a hinged lid, faced with plate-glass, with a lever attachment for giving the pressure. The printing ink is a solution of gelatine in a hot state to which a pigment is added to give any desired tint or tone to the resulting print.

In printing the lead mould is first oiled to prevent the gelatine sticking, and a pool of the warm ink is poured on to the middle of the mould; over this pool is laid a sheet of paper waterproofed with shellac, and the lid of the press is brought down over the whole, and pressure applied. The pressure squeezes out over the edges of the mould all superfluous ink, and all that is left is that retained in the graduated hollows and depressions of the lead mould; the warm ink sets in a few minutes, and on opening the press the paper support is removed, with its gelatine copy of the moulded picture firmly attached to it. This is the Woodburytype print, and it only requires drying and dipping in a bath of alum to render it absolutely permanent. The beauty and finish of these prints is beyond question, and the only drawback to them for some purposes is that they must in all cases be mounted before they can serve as book or other illustrations. There is no means of printing them directly on paper with a margin, though this difficulty has been surmounted in a round-about way by transferring the thin gelatine pictures to prepared plate paper.

The Stannotype process is a modification of the Woodburytype, and was also invented by Mr. Woodbury. It has almost gone out of use now, and it will be sufficient if I explain that the printing is done direct from the gelatine relief by covering it over with a thin foil of tin. The foil prevents the wet gelatine ink from actual contact and destroying it. The printing is carried out in the same way as for the Woodburytype.

J. D. Geddes.

THOUGHTS ON THE R.P.S. EXHIBITION.

[From a Correspondent.]

A visit to such a many-sided exhibition as that of the Royal Photographic Society is of, what many would call, a paradoxical character. It is instructive and amusing. The quantity of the latter compared with the former is small, no doubt, but the superior wisdom of the visitor will be sure to find something to laugh at in the varied work that is displayed for his benefit, and the more this emotion is aroused in him the more will he need stimulation by that instructive force which is always present in generous quantity, in order to combat successfully with that spirit of ignorant ridicule which is the birthright of the narrow-minded, self-contented, individual.

It is the man of large sympathies who will enjoy his visit the most, for though there will doubtless be work exhibited which does not meet with his approval, nevertheless the variety of the fare will act as a stimulant to his mental faculties, arousing within him a series of emotions which will inevitably be subjected to a critical analysis. We can excuse anyone for being down on technical faults where these are obviously capable of eradication, but the more closer manifestation of the brain, the evidence of the spirit which prompts the work, can only be accepted as it is presented; for a man's ideals are not so sensitive to violent changes as they are to the more gradual alterations which time produces in us all.

"Tempora mutantur, et nos in illis mutamur"—it is always so, some of us hurry along, others are content to go more leisurely, we all think ours is the best way; and so the symmetrical balance between the plus and the minus quantities remains more or less constant, unless some sudden rush takes more over to a new sensation than it leaves behind, when, for a time, the novelty claims an improportional prominence, which, however, is short-lived, for the majority will return to their inherited ideas, and things will again run on in their good old way.

And this very real undercurrent is manifested in the photographic pictorial work of the present day.

Men are returning gradually from the pursuit of the ridiculous, and the wild flights of a feverish imagination, goaded on by the spirit of novelty; are becoming less noticeable; and the evidence of more sober thought is manifested in their work.

And it is probably on account of this that we did not find any single piece of pictorial work which seemed to stand out above the others, but there was, to us, a more healthy tone about the exhibition viewed as a whole, which gave us more pleasure than the obviously neurotic manifestations which were prominent a few years ago. And yet, perhaps, we are wrong in using the word "ridiculous;" though we may not agree with the efforts which in a hasty moment we characterised with this expression, are we so sure that we are just in using it? The author of the most advanced piece of impressionalistic work, doubtless took endless trouble to produce the specimen which we, in our hastiness, might laugh at.

But in the more sobered atmosphere of mental examination we would perhaps be truer to our own feelings were we to call it mistaken, pathetic, and miserable, but not ridiculous. And so, gentle reader, whoever you are, do not go to the Exhibition with the intention of condemning everything that does not agree with you, but rather take these very pictures for your more careful consideration, and do not leave them until you are quite certain what it is you do not like in them, and how, were you to have had the original handling of the subject, you would have treated it; then you will have reaped much benefit by your examination, as well as have the satisfaction of being fairer to your opponent and truer to yourself. We well remember being much impressed by the condensed philosophy contained in the sage remark of P. H. Emerson, in the second edition of his well-known work, "Naturalistic Photography."

He is speaking of art in general, and thus defines it:—"Art is the application of knowledge for certain ends." It will be observed that the broadness of this statement is its chief characteristic. We are told that art (not any one particular manifestation, but the sum total of it), is of a subjective character. Mr. Emerson proceeds: —"But art is raised to Fine Art when man so applies this knowledge that he affects the emotions through the senses, and so produces aesthetic pleasure in us, and the man so raising an Art is an Artist. Thus photography may be, and is, in the hands of an artist, a method of expression producing works of fine art, because no such works can be produced by one who is not an artist, and moreover the real test as to whether the result of any method of expression is a fine art or not, depends upon how much of the intellectual element is required in its production." So we see that, while art is subjective, the result of art—that is, a work of art, is the objective. We cannot help feeling that many of the exhibitors in this year's R.P.S. show have fully realised the truth of this statement—they are, in fact, Artists, and their work is quite capable of arousing within us feelings of aesthetic pleasure. Nor do we find this evidence of individuality confined to any particular class of work. In the landscape pictures there is ample evidence of artistic feeling made manifest by sound technical manipulation, the portraits as a whole give us the expression of the character of the individual, with a praiseworthy subordination of distractory accessories, and the architectural work is invariably well chosen and handled with a poetic reverence.

We have throughout the Exhibition ample manifestations of the intellect employing a wonderful process for the illustration of its emotions, and the quiet realisation of its possibilities, in the hands of competent artists, augurs well for the future prosperity of photography as a Fine Art. It is not our present intention to go piece for piece through the work exhibited, for this has already been done, but rather to draw attention to certain of the exhibits, which appeared to us to be specially interesting and instructive. Professional photographers cannot afford to neglect the work of our leading amateurs, and in many cases it is the amateur who gives the initiative in some particular method of treatment. We will take some of the portraits in the Pictorial Section, and examine them. No. 32, "Portrait of a Gentleman," by Charles Sweet, is worthy of careful attention as an example of quiet, dignified treatment.

The subject is well lighted, and the expression quite natural, while the pose is easy and picturesque. No. 36, "Monteith Randell, Esq.," by E. Montague Treble, is another good piece of work. The subtle way in which the light is managed emphasises the dignity of the white hair, while losing none of its detail. The pose again is most natural, and entirely suitable. In No. 98, "A Scottish Professor," by John Moffat, we have as good an interpretation of the individuality of a striking man as anyone could desire. The pose is perfectly natural, and the treatment of the cloak is eminently graceful. The expression is in no way forced, while the anatomy of the face is fully rendered. No. 131, "Portrait," by Dudley Hoyt, is a striking piece of work, though we do not like the vignetted effect at the bottom. The subject herself has apparently a striking individuality, and the artist has succeeded in conveying an impression of firmness of character by his treatment. The way in which the face is lit is well suited to the subject, and the drapery and irregular line of the hat, with the light flowers therein, give an unaffected grace to the picture. The drapery is particularly well handled, being neither too great nor too little in quantity, and the result of placing it below the shoulder is to set off the strong and large face by a well-balanced proportion of the body. No. 156, "Rev. Alex. Whyte, D.D.," by R. S. Webster, is deserving of the same criticism as we bestowed on No. 32, and the quiet and simple treatment of a dignified subject is worthy of special praise.

We have singled out the above portraits because they seem to us to be examples well worthy of being followed by those who make portraiture their speciality.

In no case is the treatment in any way theatrical, but the individuality of the sitters has been grasped and illustrated in a most commendable and pleasing fashion. The centre of interest was always the face, and the subordination of the dress, etc., was never overdone. The backgrounds were quite plain and dark, and so did not distract the eye from the sitter.

It is such work as these examples which raise photography to a high level; not those crude efforts in which the subject is rendered in an unreal and inhuman manner, with an exaggerated expression, harsh lighting, and with all the anatomy obliterated. Another very fine piece of work is the picture by Mr. Fellows-Willson, No. 283, entitled "A Pretty Maiden." It was this print which won forMr. Willson the special "Gravura" prize in Messrs. Illingworth's recent carbon competition, nor can we in any way find fault with the wisdom of the judges in awarding him the prize. Apart from the picturesqueness of the subject and the perfect technique displayed, we draw special attention to the lighting of the face. The way in which the fine, though large, chin is done justice to by the effective handling of the light and shade is a particularly interesting and instructive illustration. Before leaving the pictorial section we would wish to draw attention to No. 157, "Portrait," by Rudolf Eickemeyer, junr. Here we have a particularly fine subject treated in a way which, in our opinion, does her no justice whatsoever. The hair is thrown into a wild state of disorder, and is then cut off at the top of the head by the trimming of the picture. The mastoid muscle on the right side is carefully extinguished, and no evidence is given of the scapula. Those would undoubtedly have been visible to a certain extent in the original on account of the poise of the head, and their removal does not contribute to the dignity or naturalness of the production. Such efforts as these do not, we fear, appeal to us as being even picturesque. Novel they have even ceased to be; and we are glad to see a steady return to sounder and more unaffected work on the part of many regular exhibitors. Photographic portraiture is a subject which has to be attacked from many sides if the result is to approach a state of perfection. Broadly speaking, we may divide it into scientific and artistic sections. The artistic side must predominate, and the science of the process must be utilised for the illustration of the artistic conception. Neither portion can in any way be neglected—all must be under the direct control of the worker, and all steps must be taken with the goal—that is, the final result—a predetermined conception.

Unless this is done, the worker will be like a man on a treadmill, never able to see further than the step in front of him, but, if the broader method is adopted, and full advantage taken of previously acquired knowledge of all matters having any relation to the task in hand, the result will cease to be analytical and will become synthetical in its character. And this is a very great fundamental distinction, which must be carefully learnt and laid to heart by all those who desire to produce work of a lasting value on account of its sound character, rather than to achieve to a short-lived notoriety as the producer of some odd freak, which is a pitiful testimony to the violation of truth. In all art the final result must be the objective, and the methods of realising that end subjective thereto. The infinite ideal may not be capable of realisation, but we must do all in our power to make the finite conception as perfect as possible. And so it is probably on account of this that we do not bestow praise

such works as Nos. 174, 185, 273, and 278, to mention some and. We do not doubt that their authors have meant them be such as they are, and therefore they would, from what we e said, be specimens of synthetical work; but the reality of conception is too indefinite to please us, and no sensations aesthetic emotions are aroused within us by our contempla- of these efforts. It is just the other way, though, with the k of W. Crooke and Furley Lewis, to mention the two profes- nal exhibits which most attracted us. The picture of Mr. wney by the former is really a very fine example of photo- phic work. Here we have a most life-like portrait of this l-known gentleman, the result of very careful and experi- ed operating.

This example is a striking illustration of synthetical treat- nt. We can imagine Mr. Crooke conceiving the ideal of Mr. wney in his mind, and setting himself the task of illustrating s impression. It is the artistic qualities which first attract d the subjective handling of the photographic processes is t further evidence of the power of the artist.

There are many ways in which this subject might have been ndled, but the method chosen by Mr. Crooke would be diffi- lt to improve on.

The treatment is eminently simple, the background dark d calculated to set off the figure. The lighting reveals the ll character of the face, and no anatomy is lost; the pose is rfectly natural, and the photographic technique of a high der.

We must bestow a similar criticism on some of the works of r. Furley Lewis. Notably No. 4, "Girl at Piano," calls for dmiration. The subordination of objects not directly connected ith the artist's ideal is admirably managed, while the pose and he expression are so perfectly natural that the whole work eems redulant with life. The technique is especially good, nd the complete work a charming picture. His portraits of Ir. Haddon, Mr. Everitt, and Dr. Fincham are also excellent xamples of sympathetic treatment and artistic skill. Perhaps he lighting on Mr. Haddon's nose is a trifle too strong, but this an easily be toned down in the print if desired. The mounting nd general finish of his work proclaim Mr. Lewis a skilled and asteful worker, and we shall look forward with pleasure to an nspection of future specimens of his work. His treatment of Mr. Snowden Ward we do not think is so happy, the excessive vidth of the picture, caused by both arms being stretched out nd holding a big book, is rather distractive, but the lighting f the face is very good, and the expression thereof most pleas- ng.

The specimen exhibited by Mr. Walter Barnett, No. 269, Pictorial Section, we must own does not please us so much as some other examples we have seen. The pose is somewhat stiff, though the arrangement of the skirt is graceful, but the hands are too obviously posed to look natural; the lighting of the face, too, is not beyond criticism.

The technical section of the Exhibition does not call for any particular notice in this article. There is evidence of much skill and patience in the fine specimens of microscopic work shown by Mr. Spitta, and the examples of three-colour superposed prints by Mr. Brewerton and Miss Acland are exceedingly interesting, though a little crude in their colour. The process, however, seems one of great promise, and will undoubtedly be heard more of in the near future. Mr. Senior's beautiful specimen of Lippmann's interferential colour photography only serves to remind us how very few there are who have succeeded with this method. And yet to hold a specimen in one's hand is to hold the power of almost calling colours into being—surely here is a grand field for the experimentalist.

Mr. Ives' parallax stereogram well deserved the medal which was awarded to it, but the method of its production has already been dealt with in these columns, so we will be content with this passing notice.

We have no space now in which to take up the question of the merits or demerits of the landscape work, but our readers must forgive us and reap what benefit they can from our observations on portrait work. And so we came away from the New Gallery feeling that inside it there are many examples of artistic and scientific interest and that a visit thereto by a thoughtful person could not fail to be interesting as well as instructive. Some specimens there were which bore evidence of synthetic treatment, others did not do so; but, viewed as a whole, the work is undoubtedly good, though the absence of any one striking piece of work is to be regretted.

New Books.

"How to Buy a Camera." By H. C. Shelley. 144 p.p. 41 illustrations. Price 1s. 6d. nett. London: Published by George Newnes, Limited, Southampton Street, Strand, W.C.

"Why buy a camera?" asks Mr. Shelley, in the very first sentence of the opening page of his last contribution to the popular literature of photography. The following fourteen pages take up the answer to the question, and we have seldom read an abler or more convincing plea for one of the most fascinating hobbies of the time. If our business in life were the selling of photographic apparatus, we would persuade Messrs. Newnes to let us reprint this chapter, so that we might distribute it amongst those unfortunate people who have yet to make the acquaintance of camera work. It would bring in converts by the thousand. Mr. Shelley is fairly comprehensive in his description of the principal types of cameras now before the public, and by no means sticks so closely to his text as to turn his book into an expanded catalogue. Thus he discourses of lenses and shutters; the rest of the outfit; the dark-room and its fittings; and films, plates, and printing papers. In nearly every instance the price of the article written about is given. Mr. Shelley wisely refrains from frightening the novice by the exclusion of all references to theoretical matters; and the book can be cordially recommended as a useful and reliable purchasing guide. New cameras are nowadays placed on the market with great frequency. If a second edition of the book is called for, Mr. Shelley will have ample opportunity of adding to the list of instruments which he describes.

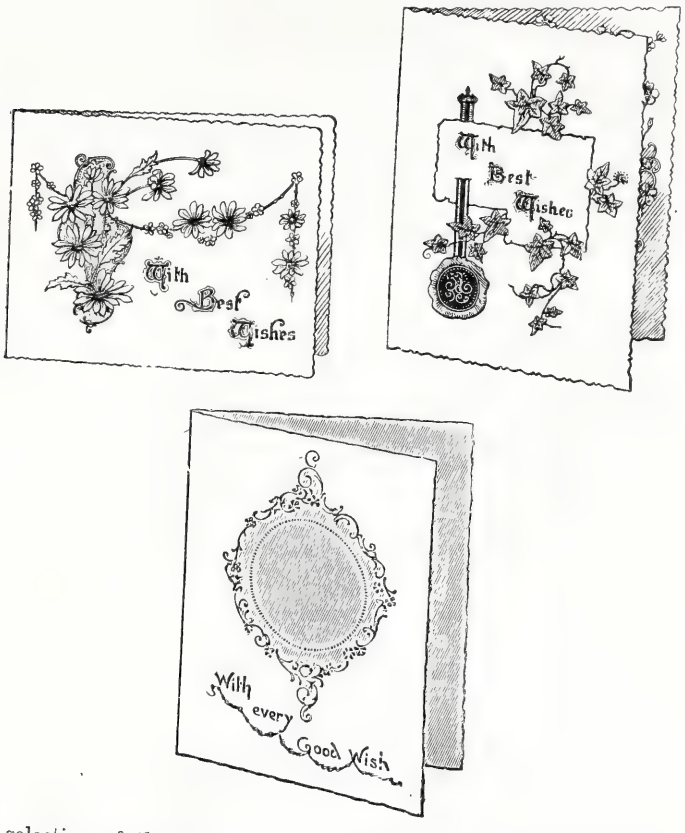
"A New Photographer."—I have happened upon a new photographer, and shall gladly give his address to anyone who is desirous of undergoing the ordeal by torture of the camera. To be photographed is no amusement. Almost unconsciously you become self-conscious. But, after all, it is not so bad as the dreadful moments which people must go through when, in full (or, to be more exact, scanty) evening dress, you have to keep an appointment at the studio of a portrait painter at eleven o'clock in the morning—a piercing north light from the studio window beating upon you remorselessly withal.—Guinevere, in "The Referee."

Pictorial Postcards and Charity.—Why should not the pictorial postcard craze be turned to artistic and practical account? asks a correspondent of the "Morning Post." The near approach of Christmas suggests that these cards might be made entirely to take the place of the antiquated and meretricious Christmas greeting cards, which, when once looked at, become useless. To begin with, the postcard would save a world of time in packing, and even in stamping if sold ready-stamped; secondly, it might contain artistic suggestions of the season more suited to the improved tastes of the public than the prevalent robin and the portentous plum-pudding. Why should we not follow the example lately set at Cadiz, and hold a Pictorial Postcard Exhibition in aid of a charity, an exhibition which might be contributed to by artists and amateurs from the highest in the land to the lowest. The King of Portugal to the Cadiz "show" contributed artistic scenes from his own brush, while other pictorial trophies were merely "finished" off by the epigrams, aphorisms, or autographs of great men, from the German Emperor to Coquelin, from Sagasta to Saint-Saens. Such an exhibition in London at the present time besides providing artistic souvenirs for Yuletide, might help to cope with the distress threatened by the return from the war of over two hundred thousand men. Though some eighty-five thousand may get back again to their old positions, some seventy-five thousand yet remain to be provided for, not to speak of those who during the war took the place of the reservists at home, and who naturally are now without work. Any exhibition and sale in aid of the societies which provide employment for reservists, discharged soldiers, and others, would or should meet with hearty support, for none can find it in his heart to let these men—who have earned medals, and bars innumerable—spend their first Christmas at home in destitution. So that all could unite in helping the exhibition it might be divided into sections, the artist section composed of signed sketches on post-cards, the authors', the political, the dramatic and musical sections consisting of pictorial cards chosen by celebrities and signed by them, the philatelists' sections consisting of rare stamped cards from all parts of the world. Surely some philanthropic person will lend house or hall for the purpose, and some fair ladies preside at the stalls.

New Apparatus, &c.

Christmas and New Year's Mounts. Sold by George Houghton and Sons, 88 and 89, High Holborn, W.C.

As usual, at this season of the year, Messrs. Houghton make a point of drawing the attention of amateur photographers to a very large and varied stock of mounts for prints which it is the pleasing custom of friends to exchange at the great winter festivals. The stock is described and illustrated in a 24-page list which is before us, accompanied



by a selection of the cards. These latter beggar description, so great is their variety, so numerous their styles, designs, tints, and shapes. We must rely upon the annexed illustrations to give the reader some idea of a few of the samples; consultation of the special list will assure him that Messrs. Houghton are catering for all tastes, and that in the production of such a simple thing as a small photographic mount a vast deal of artistic skill and ingenuity may be concentrated.

The Paget Prize Self Toning Paper. Manufactured and sold by the Paget Prize Plate Company, Watford.

Self toning papers, to make use of a familiar locution, are 'in the air" of the photographic world, and we are not surprised to hear on all sides that the Paget Company are meeting with great success in popularising this simple and effective method of printing. The process is essentially one for the busy worker, notably that important supporter of modern journalism, the Press photographer, whose finished results are as a rule wanted with the utmost rapidity for reproduction purposes. It is this facility for rapid proofing which gives the "self toning" process a peculiar value. But the colour and quality of the image in these days of eclecticism of photographic taste are such that they are pleasing to most if not all eyes. The deposit reminds us of that obtained by a favourite printing method of our photographic youth: "plain paper," so called because it was non-albumenised. But in those days matt surface effects had not many adherents. During the last few days samples of the latest make of Paget matt self toning paper have been submitted to us, and we have pleasure in directing the attention of our readers to the merits of the process. At first sight the prints made for us reminded us of carbon images, so accustomed have we been to associate pigment printing only with the familiar "warm brown" colour. Adherence to the appended simple instructions produced excellent specimens of printing; and, judging by the finished examples placed before us, the Paget Company have mastered the art of preparing a paper having the valuable characteristic of yielding uniform results. We have seen great numbers of such prints produced by amateur as well as professional photographers, and there is no doubt the paper has earned very great popularity on that account.

Instructions.—Print a little deeper than finished print is required (about the same as for P.O.P.). To obtain a warm, brown tone, wash print in running water, or several changes, for five minutes, then place in fixing bath (Hypo. 2ozs., Water 1 pint) for fifteen minutes; wash thoroughly and dry. If a colder tone (bluish purple) be desired, instead of first washing, place print in a solution of Common Salt in water, about 2ozs. to the pint, for ten minutes, then rinse in water, and fix as above.

Note.—The colour of the print cannot be judged while wet; its final tone is not arrived at until quite dry. Prints may be quickly dried in front of the fire as they do not soften like gelatine. They may be burnished or enamelled in the same way as ordinary Collodion or Albumen prints, but cannot be enamelled by simply laying down on glass like P.O.P.

Tylar's Spring Grip Card Stands.

We have received from Mr. Tylar, of Birmingham, a small box containing twelve spring grip card stands. These stands are very strongly made, and the photographs or cards are held by means of a spring.



The "stands" afford a very simple and easy means of showing mounted photographs or cards in a window or on a mantelpiece without damaging the photograph in any way. They are sold in boxes of twelve for 1s.

Mr. J. T. French instructed the South London Photographic Society in the art of bromide enlarging at their last meeting. In the course of the evening three enlargements were made with a lantern of Mr. French's own manufacture, using the incandescent gas-light, and successfully developed with rodinal. After the demonstration the lecturer was plied with questions. A vote of thanks to the lecturer ended the proceedings.

Pure magnesium only should be employed in all flash-lamps. Compounds containing chlorate of potash, saltpetre, etc., should not be used: they are not safe. Compounds ignite when a light is applied to them, but not so with pure magnesium. It will not ignite except when finely divided and blown through a flame. The Todd-Forret is thus a safe piece of apparatus to use. We have tried some interesting experiments with pure magnesium powder, and also with the magnesium mixtures. We made a small heap of pure magnesium powder, and tried to ignite it, but it would not burn, do what we would; in fact, it put the light out when we laid it on the heap. We then dropped on acids and other oxidising agents, but without effect. Another lot of this same sample of pure powder was taken and fired off in a Todd-Forret lamp. The result produced was such as we expected, namely, a large, most brilliant, and intensely actinic flash. We next mixed some magnesium powder with chlorate of potash, saltpetre, finely-sifted sugar, and other aids to combustion. With a match we most readily ignited one and all of the mixtures, which we had placed in heaps. One of them immediately fired when a drop of acid was allowed to fall on it. We did not try any of the mixtures in a lamp: we took the experience of others for granted. Our readers can draw their own conclusions, but, in a word, we should say that pure magnesium will not ignite in the open, and in a lamp it is perfectly safe. Magnesium compounds or flashlight mixtures are dangerous when used in lamps, and when in the open may ignite by the mere contact with an acid.—Andrew H. Baird's "Photographic Chat" for October.

The earliest human likeness.—The Hon. Auberon Herbert recently wrote to the "Times" a communication under this heading with photographs of the stones of which it speaks. He considers these stones to be examples of very early carving. They undoubtedly bear a certain resemblance to human faces. Mr. Herbert says that he also finds in the Ringwood gravel pits "a very large number of stones which are quite clearly meant to represent different types of animal life. They are generally very little worked. The workers have taken advantage of the many naturally curious forms which are constantly to be found among the flints, and with a few little cuts—sometimes very dexterously and artistically applied—had given life and movement to the stone. I am leaving England for some time, but hope on my return to take photographs of these animal forms, and as long as the supply lasts shall be glad to send copies to those interested. But perhaps in this matter nothing is so convincing as the human profiles. Some of my rather sceptically-minded friends still give help and comfort to their disbelief by the theory of fractures by frost and flaws in the flint; bnt I think you will agree with me that the frost-flaking or flint-flawing can hardly be held to account for the little work of art of which I send you the photograph. I expect you will be as much startled as I was by the type of face—a type that does no represent one's mental picture of the early stone-workers; but I am strongly impressed with the feeling that we have never yet done anything like justice to the civilisation of this early race. At the same time I ought to confess that their attempts at full-face drawing in flint betray a much lower kind of art. There are a good many of them, and they are much like the scrawls of a child—two eyes, and a mouth somewhere or other down below; and they suggest our friend the monkey nearly as much as the man. They distinctly inspire less confidence in the dignified appearance of our worthy ancestor. I should be very glad if some suitable arrangement could be made by which this particular stone could be examined and criticised. Meanwhile there is a fine bit of work waiting for anyone who will carefully study the beds of this district, leaving all old prepossessions behind him."

Commercial & Legal Intelligence

At the International Exhibition for Photography and allied industries, Amsterdam, August and September, 1902, the well-known photographic "Agfa" articles of the Actien-Gesellschaft fur Anilin-Fabrikation, Berlin, S.O. 36, viz., Agfa dry plates, Agfa flat films, Agfa rollable films, Agfa developers, Agfa specialities, etc., have received the diploma of honour, being the highest distinction.

At the Guildhall Police Court on Thursday last Welford Mitchell, errand boy, of Kenning Road, Greenwich, was charged with stealing a large quantity of photographic dry plates, cards, etc., value about £30, the property of his employer, Frank Butcher. Goods had been missed for some time, and suspicion fell on the prisoner, who was stopped as he was going home the previous day. Part of the goods were found upon him, and when Detective Greenough went to his residence he found about £27 worth of stolen property. A remand was granted.

Photo Frauds.—At the Westminster Police Court on Friday last, Ernest F. Hopper, 24, of High Street, Plumstead, and Charles Davies, 46, of Darwin street, Walworth, were brought up on remand on a warrant charged with conspiring to obtain money by false pretences. Mr. Muskett prosecuted on behalf of the Police Commissioner. A number of young women, domestic servants, barmaids, etc., were called, and deposed to paying deposits to the prisoners for photographs. When they went for a sitting they found that they had been swindled. The prisoner Hopper, when arrested by Detective-Sergeant Baxter made a long statement, blaming his fellow prisoner, Davies, for his fall from honest paths. He now repeated that he was acting solely under the instructions of Davies. The prisoners both asked to be dealt with summarily. Detective-Sergeant Baxter said that he had had Davies under observation for two years, during the whole of which time he had defrauded the public. Hopper absconded, or both men would have been arrested before. Mr. Sheil sentenced Hopper to three months' hard labour, and Davies, whom his worship described as a regular scoundrel, to six months' hard labour.

Wholesale Thefts at Messrs. Butcher's.—At the Guildhall Police Court on Friday last, Annie Price, a stock-keeper to Frank Butcher, photographic apparatus manufacturer, of Shoe Lane, was charged with stealing a hand camera, dry plates, printing frames, etc., the property of her employer. Detective-Sergeant Hallam said he saw the prisoner at her employer's premises on Thursday. He told her the boy named Mitchell, under remand, had stated that she had been stealing goods, and asked her if it were true. She replied that she had borrowed a hand camera, and in answer to further questions, said she had taken other goods. She was subsequently charged, and upon her residence being visited goods to the value of £2 16s. belonging to the prosecutor were found. The prosecutor said the girl had been in his service for about three years, and he did not wish to further press the charge against her. She was most respectably connected. She was remanded on bail of £25.—The Prosecutor: Will you take my bail, sir?

The Alderman: Yes; it is very kind of you.—Jessee Barrow, 18, the same service, was also charged with stealing a camera, two dozen plates, and a quantity of mounts, value 16s. Detective-Sergeant Hallam deposed to the arrest and the subsequent search at prisoner's address, where he found a camera, two lenses, three dark slides, and other articles, value about £30. He was remanded.—Percy Rowler, 17, also pleaded guilty to stealing photographic goods, and was remanded on bail, the prosecutor becoming surety.

Re Ed. John Murray, residing at 5, Thurlow Park, and trading at 8, Union Street, Torquay, photographer. The first meeting of the creditors interested under this failure took place at the offices of the Official Receiver, Exeter, last week. The summary of accounts showed gross liabilities amounting to £606 12s. 2d., all expected to rank for dividend. The assets amounted to £415 14s. 3d., made up of cash deposit with solicitor for costs and petition, £10 stock-in-trade; fixtures, fittings, etc., £400; book debts, £5 14s. 3d. These, after deducting £21 5s. for distrainable rent, preferential rates, taxes, wages, etc., leave a deficiency of £190 17s. 11d. The cause fo failure alleged by debtor was losses in the photographic business, and through an action for alleged misrepresentation in connection with the purchase of the business. The Official Receiver's observations were to the effect that debtor commenced his present business in March, 1901, with a capital of about £600, having previously been in business at Bath and York. In the present year he became involved in an action with the person from whom he purchased the Torquay business, claiming that the turnover was less than represented. This action he lost at the Devon summer assizes. Early in June, 1902, he got control of about £500, his wife's money, and on August 12th he paid her £266 11s. 5d. on account thereof, being the whole of his bank balance at that time; the bulk of the difference went to his solicitors. There were no trade creditors. The unsecured creditors included one for £148 8s. 7d., and one for £95 18s. 7d. for law costs, and one for £100 balance of purchase money of the business. There was £234 still due to the wife. Mr. A. L. Honey, of Exeter, was appointed trustee. Messrs. Helson, Torquay, appeared on behalf of debtor.

Scientific Literature in England and Germany.—Germany leads the world in scientific research, and it is therefore perhaps natural that handbooks on various branches of theoretical and technical science should multiply more rapidly in that country than in our own. When one compares the scientific publications of recent years in the two countries, one is struck, however, by the wide gap that separates the English and German text-books, says the "Electrical Review." The majority of the former deal with elementary science, and are designed for the preparation of students for some particular examination. A large proportion of them are written by ambitious teachers, whose qualifications to be considered an authority on the particular science, are based on a London Science Degree or upon a South Kensington "Honours" Pass. In this type of text-book our supremacy is undoubted and unassailable. The German publications, on the other hand, in most cases pre-suppose an acquaintance with the elementary facts of the science with which they deal, and are intended for experts, or for those who wish to become experts, in the various branches of study. The latest example of this difference in the scientific publications of the two countries, is the announcement of a series of monographs—on applied electro-chemistry—by the well-known German firm of Wilhelm Knapp, of Halle. The first and second of these volumes, dealing with the electrolytic production of oxygen and hydrogen and the extraction of aluminium, have already appeared. In this country we have barely arrived at the point of recognising electro-chemistry as a special branch of scientific study, and only one University has yet appointed a special lecturer on the subject. The elementary text-book on Electro-chemistry, designed for cramming students for a South Kensington "pass," has yet to appear; but possibly some diligent science school teacher is even now preparing it for publication. In Germany most of the Universities have been equipped for some years with laboratories for electro-chemical work, and special Professors or Lecturers for this branch of physical science have been appointed. A large number of students have taken up electro-chemistry as a special study, and useful research work has been carried out by these men when working for their Ph.D. degree. An educated public has therefore to some extent been created in Germany, to whom the present series of handbooks will appeal, and as some of these monographs will no doubt be translated and reproduced in Paris, London, and New York, the venture may prove a financial success for the firm which has been bold enough to undertake it. Whether successful or the reverse, the publication of a series of German handbooks on applied electro-chemistry, is a proof not only that our Teutonic cousins have more faith in the future of this branch of applied science than we ourselves, but also that their system of education is better fitted than our own for following up and developing new branches of scientific study.

The Weak Places in "Trusts."—We see some hope that the rather absurd panic which American capitalists have recently produced in the British public, and indeed in the public of all Europe, is at last passing away. It really seemed for a few weeks as if Englishmen believed that Americans had discovered some new secret for trading with success, and would in a year or two strip them, and with them all other Europeans, entirely of their commerce. Partly owing to the success of great co-partnerships like the Standard Oil Company and the Steel Trust, a success dependent upon artificial conditions due to the American craze about Protection, and partly to the wails of sensational journals, a kind of horror seized the European mind. Americans were credited with limitless resources and boundless recklessness in throwing them away, and the gravest men began to believe that the Austrian Chancellor was right, and that the "American peril" would prove a terrible reality. Europe might go hungry while American billionaires put up onyx staircases. An event of no great importance in itself has this week in part dissipated the delusion. A great American "Combine" endeavoured to obtain a monopoly of the wholesale trade in tobacco, and after a brief struggle with the British importers, who combined against it, was compelled by its losses to accept terms of peace which leave the British still masters in their own field. It was perceived at once that Americans, however wealthy and however bold, did not always win in a trading campaign, and confidence was restored almost as quickly as it had disappeared. Then it was announced that the great Shipping "Combine," which was to purchase all British shipping and destroy at a blow all British maritime prosperity, attracted the attention of the British Government, had been faced, and had been foiled. The all-powerful Mr. Pierpont Morgan, who could "buy anything," from a State or a Royal palace to a rare volume, shrank from a contest with a capitalist far greater than himself—namely, the British Treasury—and accepted terms which leave the British liners in British hands, and, if we read the agreement aright, make it his interest to work with rather than against the British people. Indeed, we doubt if he ever desired to work against them. The cloud of despondency was lifted, and we may, we think, trust that, whatever the future may have in store, British capitalists and industrials will meet emergencies with some confidence in their own resources and their own enterprise and brain-power. They will have both to think and to exert themselves; but they are not opposed by industrial Genii with magical means, but by men like themselves, with nothing special in their favour, except that, being accustomed to deal with the transactions of a very large continent, they get the habit of planning enterprises upon a very large scale. Even that scale may be exaggerated in the popular mind, for, though American millionaires, having no permanent interests or ambitions except money-making, grow richer than our own, we also have the habit and power of combination. If we called the Midland or the Great Western a "Trust," we should perceive that we also can create and manage successfully "gigantic" businesses. The truth is that there are two or three weak places in the vast American speculations of to-day. One but little noticed, which was pointed out to us some years ago by one of the earlier millionaires, is that they rather overtax the brain-power available for their management. It is very hard, even for a State, to obtain a succession of great statesmen, and these vast businesses demand as much mental capacity and more sedulous and harassing attention. Their owners have therefore to pay enormous sums for competent management, sums often ten times those paid to statesmen, and are liable even then to pick the wrong men, while they themselves become constantly victims to nervous and cardiac disorders. They do not last like the statesmen, and, owing to difficulties of health, they do not gain, as the statesmen do, the full benefit of their experience. "Money worries" are very harassing, but no fortune will keep a man in full mental strength if a doctor has to see

him twice a day. As the generation of founders dies out this difficulty will be felt more and more, for remember, though you can hire business ability as well as other forms of intellect or knowledge, you cannot hire the courage which will risk ruin to employers in order to make a coup. Another weak place is that a "Trust" must be held in shares; that the only way to establish a monopoly by sheer force of capital is to incur, or at all events risk, loss at first, as it is said—we do not vouch for the legend—that the American Tobacco Combine has done, and that shareholders, however big, soon grow weary of losses the end of which they do not clearly see. Even rich individuals weary of baffled hopes and demands the limit of which is not fixed, and shareholders are not either specially far-sighted or sustained by the pride of dictatorship. Continental observers say—for instance, M. de Witte, no mean authority, has said—that under the American system dividends are secured by the Tariff, and the managers of American "Trusts" have a free hand outside the States; but the argument surely displays some ignorance of human nature. What kind of shareholder is that who, when 20 per cent. might be divided, is content to see 15 of it thrown away in speculation? He would rather take the odd 15 and speculate for himself. He limits waste, and to establish a monopoly by sheer bribing-power or by resolve to undersell, requires that waste at first shall be without limits. And the third weak place is the bitter hostility that monopolies have created ever since the days when the prophet Isaiah denounced those who "lay field to field till there be no place" for the poor. The profit of monopoly can only come either from raising prices or stopping the fall which competition would produce, and the former result, at least, is resented with a bitterness compounded of suffering, broken hopes of free careers in the trade monopolised, and of the widely-spread hatred to the very rich. The Americans have no instinctive Socialism; they admire millionaires, and they are penetrated with the Protectionist fallacies; yet it is doubtful whether disgust with Trusts will not undermine the Tariff. No Government in Europe can long resist severe pressure from below, and the means of restricting the action of, and therefore of impeding the profits sought from, great combinations of capital will ultimately be discovered.—"The Spectator."

PHOTOGRAPHIC Convention of the United Kingdom.—There will be a meeting of the Council, at Anderton's Hotel, Fleet Street, London, E.C. on Tuesday, October 21st, 1902, at 6 o'clock. Agenda:—To receive balance-sheets of the Cambridge meeting. To revise the standing orders. To discuss the preliminary arrangements for the Perth meeting. To elect an honorary secretary. General business.

LEICESTER Literary and Philosophical Society.—Section G (Photography).—A meeting of the above society was held in the Council Room, Town Museum, Princes Street, on 3rd October, when a lecture by Colonel Barrington Baker, entitled "My Cruise amongst the Fjords of Norway," was given, and illustrated by lantern slides. There was a very large attendance of members, and the lecture was thoroughly enjoyed.

THE Editor of "Black and White Budget" writes:—May I draw your attention to the fact that we announce a competition for coloured photographs (transparencies or prints) in "Black and White Budget" this week? As this is the first time that a popular paper has ever offered a prize for current photographs, it may be worth your while to draw the attention of your readers to the fact. Our object in setting this competition is to help in popularising the department of photography which has hitherto been confined to the few. All prints and transparencies, except the prize winners, will be returned to the competitors, provided stamps are enclosed.

AT the Cripplegate Institute, Golden Lane, Cripplegate, a photographic class, open to both ladies and gentlemen, is, as usual, conducted by Mr. C. W. Coe. During the winter term, 1902, a course of eleven practical lessons in development, printing, and toning, etc., specially arranged for amateurs, will be given. The following is the syllabus:—No. 1.—Introductory. No. 2.—Apparatus. No. 3.—Plates and Exposures. No. 4.—Development (Lessons in). No. 5.—Development. No. 6.—Printing Processes. No. 7.—Printing, Toning, and Finishing, P.O.P. No. 8.—Carbons, Bromides, and Platinotypes. No. 9.—Enlarging. No. 10.—Mounting and Finishing. No. 11.—Defects and their Remedies. The classes commence on Friday, October 24th, 1902, at 7.15 p.m.

THE application of the stereoscope to lantern projections has proved a fruitful field for the ingenuity of inventors. M. J. Mace de Lepinay now describes a very simple method of producing the desired effects. He projects two pictures side by side on the screen, and provides each observer with a pair of prisms the angle of which depends on the distance of that observer from the screen. Taking the two images at a distance of one metre apart, the angles of the prisms used are 12 deg., 10 deg., 8 deg., and 6 deg., for distances of 4.5, 5.4, 6.8, and 9 metres, the accommodatory power of the eye enabling intermediate distances to be used without further multiplication of prisms. One of the advantages of the system is the convenient and portable character of the prisms when mounted in the form of spectacles for observing the projections.—"Nature."

LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.—The usual meeting of this society was held on Thursday week in the rooms, Eberle Street, the president (Mr. E. R. Dibdin) in the chair. Mr. Fred. Anyon gave a practical demonstration of enlarged negative making. Dealing with his subject in his usual lucid and interesting manner, Mr. Anyon pointed out the advantage to be gained by making an enlarged negative over the usual method of enlarging direct on to bromide paper. The crux of the whole process lies in the production of a suitable positive from the original small negative, and Mr. Anyon gave details of his process, which, judging from results passed round the audience, left nothing to be desired. Mr. Anyon developed a couple of enlarged negatives, the result proving that with care in producing the positive there was absolutely no loss of fine detail and a total absence of granularity in the enlarged negative.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Oct.	Name of Society.	Subject.
17.....	Borough Polytechnic.....	*Printing and Toning P.O.P.* Mr. F. W. Bannister.
17	Croydon Natural History.....	Demonstration on the Sanderson Camera and other New Apparatus. Miss Houghton.
22.....	Leeds Camera Club.....	*Platinotype: How to Obtain a Variety of Tones.* Rev. J. Beanland, M.A.
22.....	Borough Polytechnic	*Combined Toning and Fixing.* Mr. Ernest Human.
22.....	North Middlesex Photographic	*Some Curiosities of Vision.* Rev. F. C. Lambert, M.A.
22.....	Birmingham Photographic	A Demonstration of *The Making of Lantern Slides by Contact.* By Mr. Harold Baker.
22.....	Ashton-Under-Lyne	Demonstration on *Glycia P.O.P.* By Mr. Samuel Woolley.
23...	London and Provincial	Open night.
23.....	Liverpool Amateur.....	*Exposure.* Mr. Alfred Watkins.
23..... ..	N.-W. London Photographic ...	*Peeps in Paris.* Mr. Walter Booth.

ROYAL PHOTOGRAPHIC SOCIETY.

OCTOBER 14TH (Ordinary Meeting), Mr. Thomas R. Dallmeyer, president, in the chair.—The meeting gave its hearty support to the Council who, the president announced, had resolved to congratulate His Majesty the King, as the Society's patron, on his coronation and on his happy return to health. Nominations of forty candidates for membership were read, and seven candidates were duly elected members. Presents of old apparatus and examples from Mr. A. L. Henderson, and the parallax stereogram and stereo-photomicrographs by Mr. Frederic E. Ives, were acknowledged. The affiliation of the Cape Town, Johannesburg, Christchurch (N.Z.), East Ham Teachers, Welcome Institute, and Catford Photographic Societies was announced. It was resolved to confirm the Council in their action in supporting the objects of the Decimal Association.

Medals.—The president read a list of the awards at the current exhibition, and presented them to the representatives of the successful exhibitors. Mr. W. T. Greatbatch was represented by Mr. P. Bale Rider, and it was announced that his medal picture had been purchased by the Society. Mr. John H. Gash received his medal through the secretary Mr. Bartlett, who has also desired to transmit their awards to Mr. Frederic E. Ives, Mr. F. R. Frapie, Mr. W. A. Stewart (exhibit purchased by R.P.S.), Mr. J. M. Whitehead (exhibit purchased by R.P.S.), and to Mr. Percy Lewis.

The chair was then taken by Mr. A. Haddon, and the president read his annual address. Mr. Dallmeyer's address reviewed the educational facilities offered to students in photography from the time of Sir William Abney's course at Chatham in 1868 to the present time, touching upon the several papers read before the Society in which photographic technical education was the theme. The government support extended to continental centres of teaching was contrasted with the lack of this support in Great Britain; and then followed an account of the good work which, despite this fact, was being accomplished here. The president then outlined the efforts made by this society as far back as 1890 to secure the support necessary for the starting and maintenance of a Photographic Technological Institute. The then Lord Mayor received a deputation on the subject, and the question of funds was discussed. This effort, although commending itself to Sir Henry Isaacs, failed to attain success, however, and the Society had up to the present only itself to thank for its flourishing condition. The advocacy of such an institute originated, it is believed, with Dr. Emerson in his Naturalistic Photography (1889), when he wrote: "We fondly hope that a college of photography may one day be instituted, where good art and science training may be obtained, where regular classes will be held by professors and regular terms kept, and where some sort of distinguishing diploma, such as Member of the Royal Photographic College, will be given to all who pass certain examinations." The necessity for such an institute has also been dwelt upon by many other eminent men since it was first mooted, and the president went on to enquire whether the iron was not now sufficiently hot for them to strike again, and so endeavour to obtain adequate recognition of our science and efficient means to pursue it. Finally, he hoped that next year, the Society's jubilee year, would be thought not an unsuitable time for the incoming president to lend his influence to promote such an end.

A vote of thanks was passed to the president.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

OCTOBER 9TH.—Mr. A. Mackie in the chair. Mr. A. L. Henderson passed round some excellent prints made about 1845, from negatives by Sir Charles Fellowes, to show the sort of work done in those days. The prints were on albumen paper and in good condition. Mr. Smith showed a splendid telephotograph of the dome of St. Paul's, taken from a distance of 2,000 feet with a magnification of 25 diameters. Mr. Thomas Illingworth gave an extremely interesting and practical demonstration on the carbon process, and after explaining the elementary stages, as to what the process is and what the tissues are, proceeded to show how simple the developing and transferring, both in single and double really is.

To those who only use the tissue in small quantities Mr. Illingworth recommended that the tissue should be purchased insensitive and sensitised as required, by immersing for two or three minutes in a solution of potass bichromate 7oz., water 1gal. Drying the tissue is most important, as on this the after quality of the picture largely depends. It must not dry too quickly, or take too long, four hours being about the average time, and the tissue must not be dried in a room where there are any acid fumes or gaseous odours. Mr. A. Haddon remarked on the formula given for sensitising, containing no ammonia, as the tissue is likely to become more insoluble with plain bichromate than if the solution is slightly alkaline. Mr. Illingworth agreed with this, and said they always add three drams liquid ammonia to each gallon of solution. Mr. J. E. Hodd remarked that in making some carbon transparencies he had noticed small black particles in the tissue, which interfere very much when making enlarged negatives. Mr. W. J. Ramsey suggested that no doubt these particles were due in the manufacture of the pigment, to the colour being insufficiently ground; as, especially in transparency tissue, the grinding must be very thorough. In regard to some difference on the opinion of the best actinometer, Mr. W. D. Welford said he considered the best form to be one which prints up to a certain number or letter, and can be left out without any attendance whatever until that number or letter is reached. Re the continuing action of light on a piece of exposed tissue, Mr. Henderson wished to know if this action could be imparted to a piece of unexposed tissue, by being placed in contact, under pressure, and put away in the dark for a time, and if so, how long it would take?

Mr. A. Haddon said it was quite possible for such action to take place, as the same way that this continuing action goes downwards in a carbon pigment, so it would go upwards if another tissue were placed in perfect contact.

Mr. Illingworth remarked that he did not think a picture could be produced in this way; but, at the same time, such action does go on, in a piece of partially exposed tissue, and becomes more quickly insoluble if allowed to get at all damp.

Mr. R. J. Beckett asked if drying the tissue after sensitising on ferrotype sheets, or like substance, was advisable, to which Mr. Illingworth replied that this method of drying the tissue he had found most satisfactory, and has numerous advantages, one being the fine surface that is obtained; and another, the less chance of fog from impurities in the atmosphere or unsafe light. Mr. W. J. Ramsey remarked that in his practice he had always dried the tissue on a collodion plate which, for making enlarged negatives, gave a very fine texture, and enabled a close contact to be obtained, thus ensuring absolute sharpness of detail.

A most hearty vote of thanks was proposed to Mr. Illingworth by Mr. S. H. Fry, seconded by Mr. J. E. Hodd, and carried unanimously.

CAMERA CLUB.

The following are extracts from the Club Journal for October:—Members, on their return to town after the vacation, will find that considerable alterations and repairs have been effected in the Club. In the case of the dining room, by the removal of the large bookcases, a considerable amount of much-needed space has become available for diners. The whole room has been re-painted and decorated, and other improvements which have been made there and in the service room will, it is believed, add considerably to the comfort of the members. The committee room has also been thoroughly done up, and when rearranged will probably be available for the use of members when not required for meetings. The studio has also been cleaned, and the cameras, etc., put in thorough working order, while the photographic department in the basement has received the attention it so much required. The library of the Camera Club contains a large number of very valuable books dealing with scientific, artistic, and photographic subjects. These it is proposed to remove to the late enlarging room, which, fitted as a library, will afford greater facilities for arranging and keeping the books in order than has hitherto been possible. This will also provide a snug and comfortable study for those who wish to consult the works upon the bookshelves. As regards the ordinary books of reference, space will be provided in the club room for those which are in constant use. It is hoped that these alterations and improvements will meet with the approbation of the members, and render the Club more attractive to them and their friends in the future.

PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

At the meeting of the General Committee held on 10th October, it was reported that, in view of the opinion that had been expressed at the previous meeting, that some members might not like to disclose the particulars of their insurance to the officials of the Association, an arrangement had been made with the Fine Art and General Insurance Company to receive applications direct from members, and to allow the agreed discount, provided the application be made on a form issued and signed by the hon. secretary of the Association.

Applications for membership were read and accepted from Messrs. Frank Bishop (Marion and Co.), London; J. Byron, New York, U.S.A.; and I. Saunders, Birmingham.

Correspondence was read referring to the proposed meeting in Birmingham for the purpose of forming a local branch of the Association. It was announced that Mr. Alfred Ellis (hon. secretary), and Mr. T. C. Turner (hon. secretary of Local Branches Committee) would attend the meeting to explain the objects of the Association, etc.

Several letters were read asking advice on questions of copyright, and the hon. secretary was instructed as to the reply. A letter from a member stating that the Plate and Paper Makers' Association had declined to acknowledge him as a dealer was ordered to stand over for fuller information. Letters were read referring to:—The right of photographers to the supply of electric current for photographic printing purpose in the daytime on the terms it is supplied for motive power: A suggested method of reserving copyright by notice on cards of terms, bill heads, and receipt forms:—The suppression of itinerants who obtain money for photographs which are never delivered. The subjects were ordered to be placed on the agenda for consideration at the next ordinary meeting in December, and also to be referred to local branch meetings. Notice of the committee was directed to an advertisement in a Birkenhead newspaper offering free cabinet portraits. The matter was referred to the Liverpool Branch.

SOUTHSEA PHOTOGRAPHIC SOCIETY.

The members of this Society foregathered in large numbers at the headquarters, Pembroke Road, on Wednesday last week, when the winter session was inaugurated with all the pleasure attendant on a musical evening. Mr. W. G. Lewis (the president) occupied the chair, and, in the course of a few introductory remarks, said that an excellent programme was complete in the printers' hands for the season, and would shortly be issued to the members. The work during the summer had been more or less of an individual character, and one gentleman had secured as many as 400 negatives. He had heard on all sides of the immense amount of work done by members during the holidays, and the exhibition which they were looking forward to in December would no doubt be a most successful one. The one last year was the most popular ever held in that part of the world, and he ventured to say that the forthcoming one would be quite equal to it, if not superior. Mr. F. J. Mortimer, the Society's courteous hon. secretary, had arranged a delightful programme. Mr. G. Washington Allen's humorous recitations and the comic ditties of Mr. Sam Bolt constituted the lighter element of the proceedings, while the banjo selections by Messrs. J. Holloway, P. R. Denham, and F. J. Mortimer were vociferously applauded. Mr. C. E. Pilcher's fine renderings of "Take a pair of sparkling eyes" and "A Soldier's song" gained undeniable encores, and in response to a similar compliment, Mr. F. J. Lawton substituted "Father O'Flynn" for "Long Ago in Aleala." Mr. C. Wyatt sang "Down the Vale" in tasteful style, and was heartily recalled, while other vocal items of much merit were contributed by Messrs. H. M. Schofield ("The Toreador" and "On the road to Mandalay") A. Debenham, Gilbert Wood, and J. Holloway. Mr. W. C. Coasby played "The Broken Melody" as a 'cello solo, and a pianoforte selection was given by Mr. M. Holloway, who admirably discharged the duties of accompanist.

SOUTHAMPTON CAMERA CLUB.

The members of the above club held the first meeting of their winter programme on the 13th inst., under the presidency of Mr. G. Vivian, when Mr. J. D. Haysom delivered an illustrated lecture on "A Visit to Germany." The lecturer cleverly conducted his audience on their imaginary trip on the Rhine, describing many of the charming old castle ruins with which it abounds, and giving several quaint and romantic legends connected with them. He also gave graphic descriptions of various beautiful monuments on the route, including that of the Emperor William at Coblenz, and the memorial to the Emperor Maximilian at Nuremburg. The tour included visits to Cologne, Mainz, Worms, Weisbaden, Munich, Lake of Constance, and Strasburg, and the lecture was suitably enlivened throughout by numerous lantern slides On the proposition of the chairman, Mr. Haysom was accorded a hearty vote of thanks for his interesting and instructive discourse.

BIRMINGHAM PHOTOGRAPHIC SOCIETY.

The following are extracts from the Report for the year 1901-2:—Your Council have pleasure in presenting the Eighteenth Annual Report, which covers a year of unprecedented change and advancement. The attractions of the new meeting room and dark room have proved more than sufficient to counterbalance the increased subscription, and have amply justified the new policy recommended by your Council. The number of members elected during the year is 45. Further improvements in furnishing and heating the meeting room will shortly be carried out, but the dark room is practically completely furnished, and is fitted with such a variety of apparatus that every member of our Society is placed on a level in the matter of the necessary tools wherewith to complete and carry out those processes which with insufficient apparatus form so great a bar to the average photographer. It is recommended by your Council that the policy of adding to the apparatus provided for members' use should be carried out as far as the financial position of the Club will allow. It is further their opinion that the Society should provide all apparatus necessary for use in the scientific side of photography, and not as has hitherto been the case, make provision for pictorial workers only. As a suitable path for further advancement your Council would emphasise the fact that at present no provision whatever is made for photomicrography, and that its study is practically neglected by the members.

The financial position of the Club still remains eminently satisfactory. On reference to the balance-sheet it will be seen that a sum of £122 1s. 8d. has been spent in furnishing, and that of this sum £72 5s. 1d. has been taken from the current account. To spend so large a sum from the current account in furnishing, without an adverse balance, augurs well for the future financial condition of the Society. Considerable legal expenses have been necessitated, but as by its employment the Society is relieved from a burden of about £15 per annum, the money has been well spent. The programme has been of the usual interesting description,

and commenced with the opening of the new rooms by Alderman Edwards, the Lord Mayor of Birmingham. Mr. W. T. Greatbatch, F.R.P.S., is to be congratulated on having for the third time won the medal of the Royal Photographic Society. This medal has been won by some member of our Society every year for the past six years, and we believe this establishes a club record. Under the able directorship of Mr. P. B. Rider, the club's portfolio has been re-organised, and with the most successful result; a large number of members contributing, and awaiting its monthly appearance with interest. Your Council are desirous of expressing the indebtedness of the Club to Mr. Whitworth Wallis, who has now fulfilled his year of office as president.

Your Council have pleasure in reporting the success of the annual exhibition, the number of pictures submitted and the number accepted being greatly in access of the previous year. Our thanks are again due to the Royal Society of Artists for their kind permission to hold our annual exhibition in their galleries. The financial result was also excellent, and largely contributed to by the energy displayed by members in disposing of tickets, the number sold being greatly in excess of any previous year. The attendance of the public was also about 1,000 more than in the previous year.

The inability, through illness, of our president, Mr. Whitworth Wallis, to open the exhibition was most unfortunate, and Mr. Wallis had the sympathy of the Society in being prevented from making any public appearance from so unpleasant a cause. Your Council at practically the last hour called on its chairman, Mr. A. J. Leeson, to perform the opening ceremony, and with the courtesy and kindness which Mr. Leeson has always displayed, he at once accepted the onerous duty. The best thanks of the Society are due to Sir J. B. Stone for the pictures to the number of 424 produced by him and loaned to the Society by the Board of Education, South Kensington, where they have been on exhibition. In the open section 460 pictures were received from 146 competitors, of these 237 pictures from 100 senders were hung, and included 59 pictures from 14 members, the rest being contributed by non-members. The lantern slides included 63 sets of 4, of which 60 sets were accepted. In the members' section A, 95, and in section B, 30 pictures were hung—70 pictures in all being rejected. In the Warwickshire Survey section, 291 prints were contributed by 18 members and friends.

The optical lantern is still maintained in thorough repair. For the future the enlarging lantern will remain permanently fixed in the dark room, and will always be available for use by any member who may desire to either enlarge or make lantern slides. This lantern is of excellent construction, and will enlarge or reduce either whole plate or the smallest film. The extreme simplicity of fixture should make its use very general among members, the only operation necessary being to turn up the light, insert the negative to be enlarged or reduced, and focus. The Society are indebted to Mr. A. H. Saunders for a set of slides of various subjects, contributed early in the year. Your Council desire to impress on members the necessity of increasing our present collection of lantern slides. These slides are loaned to members and are much appreciated, but new sets are sadly needed. The lantern curator will be pleased to receive gifts of slides at any time.

Warwickshire Survey (Curator's Report).—The survey work of the past season compares most favourably with that of previous years, both as to the number of workers and the quantity and variety of the photographic records obtained. The president of the Society, Sir J. B. Stone, M.P., and 15 members and friends, contributed to the grand total of 291 prints, all of which were shewn at the Birmingham Photographic Society's exhibition in February—March last. The subjects treated were varied, and besides those from the out-of-the-world corners of the County, scenes in Birmingham and the immediate neighbourhood were well represented. The old Theatre Royal, the City markets and fairs, and the interesting workings of the weights and measures department were exhaustively treated.

CROYDON CAMERA CLUB.

Mr. George Scamell, the wel-known hon. secretary of the National Photographic Association, on Wednesday the 8th inst., before a large attendance of members, gave an anecdotal lantern lecture, illustrating the utility of photographic surveying and recording, and the pleasure to be derived from its intelligent pursuit. The slides shown were from negatives, and prints from which had been accepted by the British Museum. Technically excellent, a most interesting series they made.

It is only possible to briefly epitomise the many historical, literary, archæological, and antiquarian points illustrated and referred to. The size of the prints Mr. Scamell considered of little importance, though whole plate was preferable. The prints themselves should, of course, be executed in a permanent process, either platinium or carbon. A saddened expression was observed to pass o'er the features of a prominent member at no mention being made of his favourite "bi gum," a permanent process in itself. Can it be that the lecturer thought that if this method of reproduction were employed tremendous changes in a locality might be indicated, when, as a fact, none had taken place.

Mr. Scamell strongly advocated the use of a scale in the picture, or failing that, the introduction of a figure. The points of the compass should also be indicated, and a correct description sent in with each view. He also recommended deeply sunk mounts to avoid damage to the prints by surface friction. In Warwickshire they had adopted a standard mount of this description, and upwards of 30,000 prints had been mounted thereon.

His own plan was to select a map of a county, or section of a county, and indicate the points of interest by dots, he subsequently, so to speak, "did the dots." In this way he had nearly exhausted Hertfordshire. It was a good plan to allot specified areas to various individuals to avoid clashing as far as possible. In seeking fresh fields to conquer he found the "Way About" series most useful, and the assistance of an archæologist should be obtained when possible. In conclusion, Mr. Scamell urged the members to look through their negatives, when probably some of value would be found.

Among the visitors present was Dr. Hobson, one of the photographic secretaries of the Photographic Record and Survey, who, in the course of the discussion which followed the lecture, dwelt upon the aims and objects of the Society he represented, and invited the aid of those present.

On the motion of the President (Mr. Hector Maclean, F.R.P.S.), a warmly-expressed vote of thanks was adopted.

Several of those present submitted their names for election to the National Photographic Record Society.

LEEDS CAMERA CLUB.

A special general meeting of the members of the above club was held on Friday last, the 10th inst., for the purpose of considering the advisability of removing the headquarters of the club.

It had been generally observed for some time that the rooms at the White Swan Hotel were insufficiently large to accommodate the large number of members attending the lectures, and a sub-committee was appointed recently to make enquiries with a view to more commodious quarters being secured.

The sub-committee having reported favourably on the accommodation to be found at the Athenæum, on the motion of Mr. Howe, seconded by Mr. Yewdall, a resolution recommending that the club headquarters be transferred to the Athenæum Buildings, of Park Lane, Leeds, was unanimously adopted, the removal to take place forthwith, the time of meeting to be as usual, viz., 8 p.m.

This step is only preliminary, it is understood, to securing exclusive club premises in the future.

A vote of thanks to the proprietor of the White Swan Hotel for his unfailing courtesy concluded the business.

LONGTON AND DISTRICT PHOTOGRAPHIC SOCIETY.

The first meeting of the session was held at the Sutherland Institute on Thursday, October 2nd, when a practical demonstration of enlarging, suitable for beginners, was given by the honorary secretary, before a goodly attendance of members. Mr. Mottershead, whose lecture was very helpful to those who engaged in photography, spoke of the convenience of making enlargements instead of taking large direct prints, and of the advantages of a small apparatus over big outfits. He demonstrated the methods of obtaining enlargements by daylight and by artificial light, and described the process of making enlarged negatives for carbon and platinotype work. He next pointed out the necessity of negatives being free from stain and free from excessive contrast; and dealing with developers and irritant poison of metol compounds, he quoted recipes from Dr. Grun. Using an apparatus employed for the first time, and demonstrating with negatives borrowed from members, Mr. Mottershead then gave a practical illustration of producing pictures, giving hints on "dodging" and "faking," vignetting, light, pencilling and shading.

News and Notes.

Messrs. J. and J. Brown, the Studio, Annan, writ: "Re your correspondent's enquiry for the Aristotype Co. in last week's Journal; Messrs. McGhie and Co., 75, St. Vincent Street, Glasgow, are the agents for this country.

Cripplegate Photographic Exhibition.—The fourth annual exhibition of the Cripplegate Photographic Society will be held from 24th to 27th February, 1903, at the Cripplegate Institute, Golden Lane, E.C. Entry forms will be ready shortly, and those exhibitors desiring a copy should send in their names to the hon. secretary, Mr. Alfred T. Ward, Cripplegate Institute, Golden Lane, E.C.

The Hove Camera Club's exhibition will be held on November 27th, 28th, and 29th. Entry forms are now ready. There are seven open classes, four for prints and three for lantern slides. The judges are Messrs. C. Job, J. C. S. Mummery, and F. Davey. Free conveyance of photographs will be given between Southampton, Hove, and Southsea exhibitions. The three societies also offer a special award (an artistically designed silver plaque).

That the number of people who write, or, in some cases, attempt to write, is very considerable is clearly evidenced by the success of the Writer's Year Book. This publication, which is a commercial directory for professional writers, photographers, and artists, only came out in July, but the demand for it has proved so great that a second edition has been found necessary and is now ready, and to be obtained from the publishers, at Granville House, Arundel Street, Strand.

Nottingham Camera Club (Mechanics' Institute).—The hon. secretary of the Nottingham Camera Club writes: "I have much pleasure in forwarding you a copy of the winter programme of the Nottingham Camera

Club. You will see that our exhibition is fixed for February 12th, 13th, and 14th next, when gold, silver, and bronze medals will be offered for competition in the open classes. The prospectus, which will be ready next month, and full particulars may be obtained from the exhibition secretary, Mr. Arthur Black, 9, Bower's Avenue, Nottingham."

THE Royal Photographic Society of Great Britain.—The following is the programme of lantern lectures to be given at the New Gallery, 121, Regent Street, on Monday, Thursday, and Saturday evenings at 8 o'clock:—Saturday, October 18th, "Colour Photography," by E. Sanger Shepherd, Esq., F.R.P.S. Monday, October 20th, "Swiss Glaciers, etc.," by Eustace Young, Esq. Thursday, October 23rd, "In Spanish and Portuguese Waters," by R. Child Bayley, Esq., F.R.P.S. Saturday, October 25th, "Mountaineering from a Woman's Point of View," by Mrs Aubrey Le Blond.

DEVONPORT Camera Club auspiciously opened its session in the large hall of the Technical School on Wednesday evening last week, when Mr. F. O. Bynoe (R. and J. Beck, London) delivered a popular illustrated lecture, entitled 'Photographic Facts," to an audience numbering nearly four hundred. The lecturer outlined the principles of pinhole photography and simple lenses, and explained in detail the difference between a cheap lens of the ordinary type and the highly-corrected instruments of modern production. A large number of lantern slides were exhibited, the subjects ranging from lightning flashes to Mr. and Mrs. Cronje at St. Helena and Mafeking Day scenes in London. Mr. Bynoe emphasised the importance of photographers joining a society, where they might meet others of kindred tastes and obtain criticism and advice.—"Western Morning News."

ONE of the advertisers in our "Almanac" writes: "Does not the enclosed strike you as being very funny? Our 'Almanack' advertisement has brought us many enquiries from abroad, but we do not remember anything approaching this. If you think it good enough for the BRITISH JOURNAL you are welcome to use it":—"I take the liberty of addressing you with the view to enquiring if you would care to have photographs of the Coronation Durbur, to be held on the 1st of January next at Delhi. I may mention that I am an amateur photographer, and will be on special duty with the Foreign Secretary at Delhi during the Durbar, and will have special facilities for taking photographs of the Durbar functions. The chief among these will be the Viceroy's State entry into Delhi, accompanied by the Duke and Duchess of Connaught and the Indian nobles, all mounted on elephants; the Proclamation in the Durbar Amphitheatre of the Coronation of His Majesty as Emperor of India; the grand review of 40,000 troops; the fireworks; investiture of the Orders of the Star of India and Indian Empire; Indian Art Exhibition; International hockey, polo, football, and cricket matches, etc., etc. In the event of your caring to have phtoographs of all these functions, I shall be prepared to supply you with as many copies of each, on the following terms, viz.:—That you supply me, free of cost, landed in India, with a high-class half-plate Film Kodak, fitted with a good lens and shutter, and with spools sufficient for 100 exposures, I supplying all the other necessary materials, such as developers, paper, etc. After the Durbar all the negatives will become your property. References permitted to——. If you are agreeable, please send camera out as soon as possible, by Parcel Post, insured, and specify how many copies of each photograph you would like to have, and if of any particular subjects. If you are agreable to the proposition, please be careful to see that the camera and fittings are of a superior class, as the better the camera the better the pictures."

THE Scientific and Technical Exhibits at the Royal Photographic Society's Exhibition.—This section of the Royal Photographic Society's exhibition appears to be rather smaller than on the two previous occasions, that is, since the larger accommodation of the New Gallery made it possible to represent adequately this side of photographic work. We hope that this is not an indication that the section is receiving less attention and is likely to suffer extinction, the fate that we regret to observe has overtaken the apparatus section, except, indeed, so far as concerns the trade stalls and a few exhibits that appear to be out of place in any of the existing departments. The most striking novelty in the Gallery is a "parallax stereogram" shown by Mr. F. E. Ives. No details are furnished, but we believe that the photograph is taken by means of a lens of large diameter obscured except for two apertures, one on each side, so that it acts in a similar way to the two lenses of the ordinary stereoscope camera, but that the two images are superimposed. In front of the sensitive plate there is placed a screen with vertical lines on it, alternately opaque and transparent, at such a distance that each image will impinge upon the plate in narrow, vertical strips, and in the shadows of the opaque lines cast by the light transmitted by the other opening in the lens. The two images are thus received on the plate in narrow, alternating strips. For viewing, the eyes take the place of the openings in the lens, the lined screen remaining in position to keep the two images separate. The correct position for the eyes is indicated by two holes in a board, no other apparatus being necessary. The effect is perfect. The only example of colour photography by the Lippmann process is a photograph of the spectrum of the arc light by Mr. Edgar Senior. This is an improvement on Mr. Senior's previous noteworthy results, being taken with a narrower slit, but still the colours shown are not quite the same as those which one sees in the direct spectrum. It seems not unlikely that the differences are inherent in the process. Of other prints in colour, Mr. Brewerton contributes some in which the blue print is in Prussian blue, and the red and yellow superposed carbon prints, and Miss Acland some copies of miniatures by a modification of the Sanger Shepherd three-film process. These results are admirable, but they are not convincing. It would be better if an object were used less valuable than a precious miniature and more convenient than a landscape, so that the object and the copy could be exhibited side by side. It is well known that very good results can be obtained; we want now to see how near they are to perfection. Mr. Hort Player exhibits some splendid examples of his method of copying engravings by superposition. The ordinary relative positions of the engraving and the sensitive paper are reversed, the light passing through the sensitive paper before it illuminates the engraving. A yellow screen is used, and potassium iodide is added to the developer. The whiteness of the ground, the blackness of the lines, and the sharpness of the detail are excellent. Photomicrography is well represented. The most notable examples are a series of photomicrographs taken in connection with the bacterial treatment of sewage, exhibited by Dr. Clowes. The enlargements vary from about natural size up to three thousand diameters. These fifty or more photographs may well be accepted as a model of what this kind of technical work should be. Mr. Ives has twelve photomicrographs made with a small and simple apparatus that is not described. The results would do credit to any apparatus, and show what may be done by care and skill without elaborate conveniences. Among the other work of this class that deserves commendation is a series of microphotographs of etched alloys by Mr. Ernest A. Lewis. Astronomical and spectroscopic photography is well represented by very fine work from Sir Norman Lockyer, Captain Hills, the Greenwich Observatory, and others. Some of the spectra have no wave-length scale attached, or any other indication of the part of the spectrum represented, and others bear no indication of the facts sought in their preparation or of the facts that the spectra demonstrate. If a little information of this kind were invited by the Society's officers and incorporated in the catalogue, the exhibits would gain vastly in interest. This want of information is also manifest in the "multiple lightning flash," fourfold, by Mr. J. Howden Wilkie, presumably taken with a swinging camera, and in other cases. There are many other exhibits that deserve more than a passing mention. Snow formations, huge "caps" and "mushrooms" are illustrated by Mr. Vaughan Cornish. Balloon photographs, Rontgen-ray work, the photography of animals and meteorological photography are represented by collections of good and in some cases unique examples.—"Nature."

A SPYING Machine.—I see that one of the big cinematograph firms is putting on the market a new kind of photographic clock. The idea is so simple that I wonder it has never been thought of before. You put the clock on the mantelpiece in the usual way, and every time it strikes the hour and half-hour it also takes a living picture, so to speak. A shutter opens, a film is exposed, a sharp click is heard, and then if you have been careful to go out of the room just before, you can see for yourself whether after all it is the cat that nips the whisky down an inch at a time, or whether it's the new cook. The clock not only takes the photograph, but it developes and "fixes" it all at one go. So that after cook has solemnly protested by the ashes of her fathers and the temples of her gods that she is a strict teetotalarian, you have simply to produce the ace from your sleeve, as it were, and scoop the pool. One does not like to think much about a mechanism of this sort, which after all is hardly fair cricket. Still, in modern times what with the scramble for the chips and the rush for unmerited social distinctions, I should hesitate to say that there will be no demand for it. Merchants who keep a staff of people to do work while they themselves are taking up a systematic course of drinking will doubtless rush for a mechanism that will secretly record what was taking place in the office at the stroke of every half-hour. If at 10.30 the photograph shows that Smith was not in his place, and at each succeeding half-hour the same phenomenon is to be observed up to one o'clock, the pain of a stormy personal interview will be spared to both sides. Mr. Smith will simply receive a little note suggesting Saturday as a convenient day for parting, and his employer will have no need to reproach himself with injustice. Of course, the long and vexed question as to whether your haughty neighbour, Mrs. de Tomkings, really does take breakfast in her curl-papers or not can now be settled. In the fierce rush of social rivalries there is no room for mercy. All that there will be room for is one of these new patent clocks. You make Mrs. de Tomkings a present of it, and say you'll come in again at the end of the week and show her how to wind it up. At the end of the week you call again and scoop out the pile of finished photographs from the internal clockwork. And if you have had the rare luck to get a picture not only of Mrs. de Tomkings in neglige breakfast attire, but also of Mr. de Tomkings in his shirtsleeves disdainfully throwing the ham and eggs across the table, your hour of triumph will have come, and the supremacy of these upstarts will be gone for ever. Young ladies who have waited for years for a likely beau, and have got one at last, will be able to make sure of him under the new system. It will be all very well for the young man to write a cold, harsh letter a month or two later, and deny that he ever entertained any such ridiculous thoughts, and to protest that he cannot allow these ungenerous insinuations to be made against him. As I say, that will be all very well, but it won't fill the bill so completely as it did in the old times. If the young lady has played the game skilfully, she will have been careful to see that the young man was in an imploring attitude on his knees just on the chime of 10.30, when the new patent clock had got its little eye cocked on the scene. And if the young man on being confronted with the photograph should say in an off-hand way that it merely represents him in the attitude of politely attempting to borrow half-a-crown till Saturday, the matter may be left to the jury with confidence. The damages could hardly be less than a clear thousand, anyway. The vexed question as to whether or no the housemaid entertains a strange policeman in the kitchen and regales him on the balance of yesterday's mutton and a considerable instalment of to-morrow's beer, can be easily settled with one of the new patent clocks. If, when Mary is taxed with the surprisingly consumptive appearance of the mutton bone, she alleges that the shrinkage is due to the weather or the cat, her confusion will be assured by the production of the usual automatic photograph. If there is a faithful picture of

the kitchen with a policeman seated expectantly at the table, while Mary is seen to be scooping an able-bodied helping out of the family joint with her own fair hands, I don't see that she will have any case. And if the next photograph should show Mary seated on her admirer's knee, it will be a clear call for a month's notice in lieu of wages, without the option of a fine. This new invention will work a lot of mischief unless it is taken in hand in time. I can quite see that. Ladies will arrange to have one of them fitted up at their husband's clubs; and if on that evening when he was kept so late at the office and came home so tired and talking so thickly, the photograph record shows him at the club card-table raking in the pool with a joyous smile, he will probably come to hear of it. There is, of course, the prospect of a still greater tragedy in the contingency of a man arranging to go down and spend the evening at his club, while his wife sits up for him at home. So far, all will be well. But if it should subsequently turn out that all the periodical photographs taken of the club-rooms that evening did not include the absent one on any occasion, the interesting if troublesome question of whereabouts will arise once again with a dismal emphasis. I think we shall have to form a syndicate and buy this invention up before the inventor gets a better offer from the ladies.—Arnold Goldsworthy, in "Black and White Budget."

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

THE R.P.S. EXHIBITION.

To the Editors.

Gentlemen,—There is never any lack of criticisms of exhibitions, but they are usually so obviously tinctured with a sense of personal aggrievement, with an undercurrent of "Why was my splendid work rejected?" that their value as criticisms is seriously impaired. The criticism of "M. R. P. S." is of quite a different character. It seems suffused with a redolence of collodion and iron developer, and is pleasantly reminiscent of dark tints and head rests, of pinholes, comets, and lines in the direction of the dip; in fact, of the good old days when a negative, without spot or blemish, was something to be proud of. And yet there is internal evidence in "M. R. P. S.'s" letter that he can have known but little of these delights of the past, for twenty years ago the old order of things had already given place to the new.

A criticism, to be of any value, must be the opinion of one possessed, at least, of two qualifications, knowledge and impartiality of judgment. As "M. R. P. S." writes under a pseudonym (which he is perfectly entitled to do, and I intend to follow his example), before his opinion can be taken seriously, it is necessary to form an estimate from whatever evidence there is available of his competence to judge. As to his impartiality, his statement that "he is not an exhibitor, and has never exhibited," is not conclusive, though there is not the slightest reason to doubt its truthfulness. As to his knowledge, he tells us he has had twenty years' experience, that he is photographer to practically the largest firm in London, and adds that if he turned out work similar to 75 per cent. of the pictures (?) hung his place would not be worth twenty-four hours' notice. I do not know which is practically the largest firm in London, or which firm turns out the largest amount of work, but I am acquainted with the work of several firms who are among the largest, and if his firm should happen to be one of these I can quite endorse his statement; but it is also the fact, and probably it has never dawned upon him that if he *could* turn out work similar to 75 per cent. of that hung he would be in a position to command an income far beyond the salary that even the largest firm in London can afford to pay.

But the clearest indications of "M. R. P. S.'s" capacity and his powers of observation are afforded by the three pointed questions he asks, and I shall probably best perform the analysis by answering the questions, although I may not answer to the description, "some competent artist." He asks (1) why are fuzzy wuzzy (or out of focus) photographs considered artistic? They are not; neither are well defined photographs considered inartistic. The finest definition and extreme diffusion of focus are equally compatible with artistic merit. (2) Are there any professional photographers exhibiting in the pictorial section? There are. How about H. Walter Barnett, Jas. Auld, Miss Catherine Edmonds, Wm. Gill, Fred Hollyer, Dudley Hoyt, John Moffat, Furley Lewis, John H. Gear, Chas. Sweet, R. N. Speaight, R. Fellows Willson, and W. M. Warneuke? Surely the names, if not the work, of some of these must be familiar to the photographer to practically the largest firm in London. (3) Would any photograph absolutely in focus be accepted and hung? Certainly it would. There are dozens of pictures absolutely in focus on the walls.

Seriously, such a criticism as that of "M. R. P. S." is absolutely unworthy of notice, but it is instructive, as showing the incapacity of the average photographic operator to appreciate anything outside the groove in which his own work runs. The pictorial section of the exhibition of 1902 is, unfortunately, not a representative one. It is admitted on all hands that it is the worst the society has held for years, and there are ugly rumours afloat as to the impartiality of its management, but at its worst there is ample material for useful study for those who are intent upon learning. The ordinary portrait photographer has to work to please his clients, and, as a rule, his clients are commonplace people, and prefer commonplace and conventional work. Perhaps it is not his business to educate their taste, but that is no reason why he should not educate his own. That among the cultured class there are many who appreciate, and are willing to pay adequately for, work of a higher standard than the so-much-a-dozen photograph is evidenced by the fact that so many of the most frequently respected names in the ranks of professionals are those of men whose output is small, whose charges are high, whose incomes are good, but whose work is possessed of that artistic merit and individuality which are incompatible with wholesale production and ordinary commercial methods. It sounds very well to despise the amateur and to scorn his methods, but it is not commonsense, and therefore not business. We cannot abolish him, neither can we extinguish his influence. It is he who lines the walls of our exhibitions, it is his work the visitors come to see, and it is the impression of his work they carry home with them. If "M. R. P. S." wants proof of the far-reaching influence of amateur work he can find it where probably he would least expect to—in the professional section of the present exhibition; it is there, but it may require more observant eyes than his to recognise it.—I am, yours, etc.,

A MEMBER OF THE PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

October 15th, 1902.

To the Editors.

Gentlemen,—I am dealing fully with Mr. Bennett's letter in this week's PHOTOGRAPHY, which kindly gave me the opportunity of replying in the same number which contains Mr. Bennett's attack.

The following particulars should be sufficient to disprove Mr. Bennett's statements, but should any of your readers require more, I must refer them to PHOTOGRAPHY. The selection committee on the first day numbered eleven members, all but three unknown to me.

They had all the photographs before them for selection, the names of the authors being withheld. It says little for Mr. Bennett's commonsense that he should suggest the possibility of collusion on the part of eleven men mostly strangers to one another. Some of my work was accepted almost unanimously, some of it was thrown out with equal decision, the same in the other cases mentioned. As nobody voted on their own work, and as the committee did not know whose it was, the bona-fides of the committee should be obvious to even a rejected contributor.

Mr. Bennett complains of Dr. Morgan and my having the "overwhelming number" of five frames, and Mr. Croft's having six. In 1900, when Mr. Bennett himself had six, Mr. Croft had ten, with a totally different hanging committee. Mr. Bennett would throw out good work if it were contributed by the committee; he will find few to agree with him. He accuses by insinuation some members of the Postal Camera Club, who were on the committee, of partiality towards their club. The P.C.C. contributes annually one-sixth and one-seventh of the whole R.P.S. Exhibition. This year it has forty-seven frames, two years ago, allowing for change of membership, about sixty. Next time Mr. Bennett finds a mare's nest, perhaps he will think twice before sending it to three photographic papers.—Yours, etc.,

J. C. WARBURG.

21, Pembridge Gardens, W.

To the Editors.

Gentlemen,—Doubtless the statements made by Mr. Bennett in your last issue are quite correct, but "'twas ever thus." A similar state of things has existed for very many years, and will, in all probability, continue to exist until the judges and members of the selecting and hanging committee are debarred from exhibiting, in Section I., either for competition or otherwise, and not more than two pictures (in this section) are accepted from any exhibitor.

This new departure might deprive the Council of the assistance of some of its present members, who happen also to be members of the selecting and hanging committee; but it would tend to restore the confidence of the exhibiting members generally, and give some of their excellent work a reasonable chance of being accepted.—Yours truly,

DROP SHUTTER.

To the Editors.

Gentlemen,—I read with some interest the remarks re. hanging of exhibition pictures. The best way to get at the respective merits of the "hung" and "unhung" pictures would be to organise an overflow exhibition of the pictures that were refused by the hanging men. I venture to say that such an exhibition would be most interesting, and would probably be more "photographic" than the "photographic" exhibition at the New Gallery, and that probably most subjects could be recognised without having to look for their meaning in the catalogue. I would myself gladly share in such an exhibition.—I am, Sirs, yours faithfully,

F. R. P. S.

October 13th, 1902.

THE SOUTHERN EXHIBITION.

To the Editors.

Gentlemen,—Our forthcoming exhibition, I am in hopes, will be the finest and biggest ever held in the South. Last year's record will be hard to beat, I know, but, as no doubt you are aware, Southampton and Hove are both co-operating this year, and the "triple award" should prove a great draw. Intending exhibitors should make haste and write to Southampton Camera Club (hon. sec., S. G. Kimber, Oakdene, Highfields, Southampton), Hove Camera Club (hon. sec., A. R. Sargent, 55, The Drive, Hove), and Southsea Photographic Society (hon. sec., F. J. Mortimer, 10, Ordnance Row, Portsea), for entry forms and particulars. There is a generous array of awards, and a special silver plaque I am designing will be awarded by the three societies to the exhibitor of the best work through the three shows. The three societies are also paying all carriages between the exhibitions, which will be a great saving to the exhibitors. The dates are: Southampton, November 13-19; Hove, 27-29; and Southsea, December 15-20, inclusive. We have now opened our winter season in earnest, and started last week with a highly successful smoker. Altogether, I hope we shall have a very progressive time in the South this season.—I remain, yours truly,

F. J. Mortimer.

Southsea Photographic Society, Pembroke Road, Portsmouth.

KEEPING PLATINUM PAPER.

To the Editors.

Gentlemen,—In your issue of January 31st last you inserted a note from me on the above subject, but it elicited no comment, so I write again, enclosing two prints, illustrating my point, which was, that platinum paper would keep almost indefinitely if good quicklime were used instead of the ordinary calcic chloride. All that is necessary is to place in the reservoir at the bottom of the calcium tube three or four lumps of good hard stone lime, and leave it there till it falls to powder, then replace with fresh lumps; this will only be necessary after some three or four months. Do not fill the receptacle too full, as the lime expands as it absorbs moisture. One great point is, that with lime there is never any liquid produced, as may be the case with calcic chloride, which deliquesces, and may get on to the paper and ruin it.

One of the prints sent (from a rather thin snap-shot negative) was produced from paper stored with lime before my last note, and therefore at least eight or nine months old, and you will see that the whites under the mark are really white, while the other, stored with calcic chloride since July 1st, i.e., only three and a-half months, yields only degraded whites. Both prints were made to-day, and developed together. To those who only use platinum paper occasionally this ought to be a serviceable hint, as I know of several who have given up the use of this paper because of the difficulty of keeping it long enough.

If properly kept and properly used, I consider that nothing beats platinum paper for a certain class of negative, and that with ordinary care fewer failures should result from its use than with any other form of printing-out paper, to say nothing of its beauty and permanency.—I am, yours faithfully, J. H. Baldock

Croydon.

October 13th, 1902.

MESSRS. BECK'S LANTERN LECTURES.

To the Editors.

Gentlemen,—We propose to send round to the photographic societies in the United Kingdom the enclosed letter, and as there may be a number of societies the addresses of which we may not be able to obtain, we think a notice of this letter in the columns of your valuable Journal would be of great interest to many of your readers.—Yours faithfully, R. and J. Beck, Ltd.

68, Cornhill, London, E.C.

October 9th, 1902.

[Copy.]

BECK-STEINHEIL AND TELEPHOTOGRAPHIC LENSES.

Dear Sir,—In view of your winter gatherings, we think you might like to have a set of our lantern slides for exhibition to your members. They are in many ways unique; they are not the common run of landscape photos or speed examples—beautiful, perhaps, but which depend more on the light and the plate used than on actual optical excellence.

They are examples of definition, both in ordinary and telephotographic work, which are outside the pale of the snap-shot photographer.

Incidentally, they show that English manufactured lenses are not one whit behind the imported foreign article, but are, to the critical observer, ahead.

If these slides would interest your members, we shall be pleased to receive a note as to what date would suit you best.—Yours faithfully, R. and J. Beck, Ltd.

THE WASHINGTON ANCESTRAL HOME IN NORTHAMPTONSHIRE.

To the Editors.

Gentlemen,—Absence from town has delayed attention to the reports, which, I find, have been so industriously circulated during the past few weeks, to the effect that the management of the Universal Exposition, St. Louis, 1904, have made overtures, to owners or agents, for the purchase and removal of the house known as Sulgrave Manor, the ancestral home, in Northamptonshire, of one branch of the Washington family. I therefore bespeak space in your columns to say that no such thing has been so much as thought of or suggested, much less seriously considered. Perhaps I may be permitted to assure the public that the Exposition authorities do not contemplate the transfer, from England or any other country, of buildings or monuments which have become interesting, either by lapse of time or by association with men and events.

Even if the management were inclined thus to proceed with the Sulgrave Manor House, they would, I fear, scarcely have time, before the close of the Exposition, to enter upon the prolonged discussions and contentions, or to decide the disputes and doubts, apparently inevitable when the Washington genealogy is involved. If they should muster courage to enter upon such a course, they might face the necessity, from time to time, for adding another building to their list. As Pope's interrogatory line suggests that there is a tendency among doctors to disagree, so the student, with an interest, however slight in heraldry, is forced to conclude that the same conditions are not wholly wanting in the genealogists, who, drawn from all quarters of the globe, deal with the origin and history of the English Washingtons. I am, Sirs, yours very truly,

George F. Parker,

Commissioner in the United Kingdom of the Universal Exposition.

Sanctuary House, Tothill Street, S.W.

October 11th, 1902.

THE KODAK DEVELOPING MACHINE AND TIME DEVELOPMENT.

To the Editors.

Gentlemen,—We beg to advise you that we are now prepared to arrange dates with photographic societies for our representative to attend and give an address and demonstration in connection with the above subject.

The developing machine has created a very strong impression amongst all classes of photographers. It makes the Kodak daylight system complete, and, from the point of view of popularising photography, is so efficient that we think it marks a step comparable only in importance to the introduction of the daylight loading Kodaks.

The uniform quality of the results obtained with the machine, even when very considerable variations in exposure exist, cause general surprise, and we are desirous of making arrangements, so that all should have an opportunity of seeing the appliance at work. The machines can be seen in operation at our branches, and we shall be pleased to provide an interesting demonstration at any meeting where a fair number of people are gathered together. With this end in view, therefore, we shall be obliged if you will kindly give the matter publicity in the columns of your esteemed Journal.—Thanking you in anticipation, yours faithfully, Kodak, Limited.

43, Clerkenwell Road, London, E.C.

October 13th, 1902.

*** Notice to the Trade, Wholesale Agents and Booksellers.—*A Contents Bill is issued with each number of the* Journal, *and copies may be had on application to the Publishers.*

*** Notice to Advertisers.—*Blocks and copy are received subject to the approval of the Publishers, and advertisements are inserted absolutely without condition, expressed or implied as to what appears in the text portion of the paper.*

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Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY, 24, *Wellington-street, Strand, London, W.C.*" *Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

PHOTOGRAPHS REGISTERED:—

J. R. Jones, 161, High Street, New Brompton. *Two photographs of the New Brompton Football Club*, 1902-3.

G. H. Stanford, 190, Christchurch Road, Boscombe. *Two photographs: arrival and departure of H.R.H. Princess Henry of Battenberg at and from St. John's Church, Boscombe.*

J. Hourston, "The Studio," Govan, N.B. *Photograph of United Free Church, Barr, Ayrshire. Photograph of Kirkdandie, near Barr. Photograph of Village of Barr.*

H. J. Unwin, 42, Commercial Road, Hereford. *Photograph of group of Freemasons.*

A. J. Ashbolt, 29, High Street, Southampton. *Photograph of Mark Bell.*

UNDECIDED.—As you seem to have no practical knowledge of professional photography we should advise you to stick to teaching—particularly as your prospects seem so promising in that direction.

LIPPMANN PROCESS.—"ROM" asks: "Could you inform me if any other metal than mercury could be employed in the process of colour photography by Lippmann, or is it that mercury alone will produce the half-wave length?"—In reply: No other metal will answer the purpose.

FLASH LIGHT PHOTOGRAPHY.—"PYRO" asks: "Where can I obtain full particulars and instruction in flash light photography?"—In reply: So far as we are aware there is no book published on the subject. Some who are working with flash lights will, probably, give you instruction in their use, for a fee.

VIEWS OF THE CORONATION.—H. K. (British Columbia) asks: "Can you oblige me with the address of some photographer from whom I can get some 8 by 10 views of the Coronation, and at about what price for unmounted prints?"—In reply: Messrs. Spooner and Co., Print Publishers, Strand, W.C., will supply views of the Coronation procession, but we cannot say the actual prices, but they are very moderate. Better communicate with them.

HYDROCHLORATE OF TEREBINTH.—"A WESTBURY READER" says: "I saw in 'The British Journal of Photography' some weeks ago that hydrochlorate of Terebinth or artificial camphor is commercial in France. Can you give me any information as to where I can obtain the same, as I have tried many chemists in England without being able to get the right thing?"—In reply: It is possible that it may be had from Hopkin and Williams, Cross Street, Hatton Garden, E.C. If they do not supply it we do not know where it is to be had.

COPYRIGHT.—H. MASON says: "May I ask your opinion on the following case? A certain paper reproduced one of my photographs in their illustrated paper, for which they paid the usual fee of 10s. 6d. for one reproduction, but after using it themselves they sold it again to some tobacco people, who reproduced it in their cigarette cases. Am I not entitled to an action for so doing?"—In reply: If the picture is copyright and you sold the right, stipulating that the picture should be used for only one reproduction we should say that you have cause of action.

FLASH LIGHT.—F. E. G. says: "Can you oblige me with the constituents of a practically instantaneous flash powder, and proportion of each, also where obtainable? I think I saw an advertisement in JOURNAL two or more years ago. Of what is Maloni's powder made?"—In reply: Numerous formulæ have been published for flash light compositions, but they are all more or less dangerous to compound, and use. We should advise you to use either magnesium or aluminium powder alone with one or other flash lamp or else the Flash-axe candles sold by Messrs. Fuerst Bros., Philpot Lane, E.C. Mr. Maloni, we believe, keeps his formula as a trade secret.

STAINED FILM—PERPLEXED says: "The enclosed negative films, together with several others, were developed with pyro-soda, and prior to fixing were good negatives. However, when placed in a hypo bath of full strength which had previously been used for fixing bromide prints developed with amidol, they were all more or less stained red. Can you explain why, and suggest a remedy?"—In reply: The stained portion seems to have been exposed to light before it was fixed, and that has set up a reversed action. Part of the film is a negative and the other part a positive. The remedy is, not to expose the negatives to light until they are fixed.

STUDIO.—"PERPLEXED" says: "I am about to have a wooden studio built, and have been in negotiation with the builders of the removable studios advertised in your columns. I find, however, that in submitting plans to the local authorities, they would not pass them unless covered with galvanised iron; could you, therefore, give me the address of any firm who make a speciality of studio building?"—In reply: If the local authorities will not permit a wooden studio to be erected, we should advise you to have one covered with galvanised iron. This any local builder will construct for you if you furnish him with the design that will suit your requirements.

VIOLET BLACK TONES.—TONE says: "Would you kindly give me a toning bath formula for violet black tone on Paget P.O.P., as enclosed portion? I toned this myself about two years ago on Paget paper, but forget the formula. I think it is a borax and gold bath, but do not know the proportions. I can get the same tone with ordinary sulphocyanide bath, but it uses too much gold."—In reply: Here is a formula for a borax toning bath: Water, eight ounces, borax, eight grains, chloride of gold, one grain. But whether that will yield the tones you desire on that paper we cannot say. Whatever bath you use will require a good quantity of gold to produce black tones.

VIEWS IN SOUTH AFRICA.—THE PHOTOCOL COMPANY write as follows: "Having had an enquiry for a series of views of places of interest in South Africa, we should be glad to know whether you could put us in communication with a firm or person who holds good negatives capable of enlargement of, say, 24 by 18, of places of geographical, historical, or natural interest in Cape Colony, Orange Free State, Transvaal, and Natal, and if so, whether you can let us have in the first place a list of such subjects, together with some idea of approximately the cost of loan of same for re-production purposes, which may be obtainable."—In reply: We regret that we cannot give the desired information. We suggest that you communicate with some photographer in South Africa, say Messrs. Duffus and Co., Cape Town.

COPYRIGHT.—A. WEBSTER writes: "(1) Could you kindly give me the following information re registering photograph. Explaining my position you will see it means a saving to the town man, and a great loss to me. Nearly all my work is out in the country, so, of course I always take the views when the light, trees, etc., are best. I find a mean fellow in town has copied several of my best pictures, and I intend stopping him. Can I register a photograph of a hall without permission even if several copies are sold? (2) Also, is it best to register photographs before any copies go out of the shop? In future I intend to register all my best negatives. (3) Do I send two unmounted prints and 1s. 7d. for each view? If you will answer this I shall esteem it a great favour."—In reply: (1) you can register at any time, but that will not protect prints sold prior to the registration. (2) Yes, certainly. (3) If you send us two unmounted copies, and 1s. 7d., we will effect registration for you.

RESIDUES-COPYRIGHT.—"COPYRIGHT" asks: "(1) What is the best chemical to precipitate the gold in old sulphocyanide toning bath? (2) My best plan to recover in the following instance. Recently I photographed a local celebrity. I was not paid for doing so, and I copyrighted the negatives, to be the more sure of the right to the negatives. The sitter has since died, and a newspaper firm in the town where he lived have brought out a little 1d. book or booklet, with his portrait from my negative on cover. The sale of these has not been great, perhaps four or five thousand at most, but I consider I have lost over the sale of his cabinet portraits, as many would be content with the reproduction and would not order from me."—In reply: (1) The gold may be precipitated with liver of sulphur—or by a solution of sulphate of iron, after the addition of a little sulphuric acid to the toning bath. (2) The best plan will be to sue the newspaper for damages or for penalties—or both—and if the case be as you state you will certainly recover. Better place the matter in the hands of a solicitor well versed in copyright law.

DAMAGED PLATES.—"DEDIJMUS" writes: "I should be obliged if you will kindly answer the enclosed query. I ordered a dozen dry plates of a local dealer. When they came in I noticed that the box seemed injured at the corners, and pointed this out to the dealer. On opening the box in the dark room I found the box so defective that I only placed one trial plate in the slide, and transferred the others to a light-tight box to return to the dealer, if, as I found to be the case, the trial plate was fogged (half-way across the plate). The dealer sent the box and plates back to the maker, who admitted the plates being fogged, but said it was through the box being cut with a knife at the wrong place. This was not the case, the box being opened in the usual way; and, even had it been so, being done in the dark room, would not have affected the trial plate. I may mention that the plates were merely laid in the box without any wrapping of paper of any kind, so that when the box received any injury in transit, or otherwise light reached the plates and partly fogged them. Does not this imperfect packing render the maker liable, though, I suppose my remedy would be against the dealer of whom I bought them?"—In reply: Your remedy is, of course, against the dealer who supplied the plates, and not against the makers. We, ourselves, should certainly have refused to purchase plates in a damaged box.

ALBUMEN PAPER QUERIES.—P. J. HUDSON asks: "Will you kindly answer me the following questions? A few years ago I used to do a little photography, and it was nearly all albumenised paper used for printing. I was compelled through circumstances to leave photography alone, and now, on resuming it, I find it is all P.O.P., which I find certainly very troublesome in toning, etc. First of all, I get so many scratches on the film, then uneven toning. I enclose two prints with small spots on them; I may say the spots were partly visible before entering the toning bath. I used (according to Mr. Watkins' suggestion) a weak salt and alum in the first washing. Can you tell me the cause of failure? 2.—Is there any advantage in P.O.P. over albumenised, excepting the glossy surface? I mean, can albumenised paper be toned to give as good regular results and colour as P.O.P.? 3.—Are there any professionals still sticking to albumen and turning out good work? 4.—Is there any advantage in the use of isochromatic plates in portraiture?"—In reply: 1.—The cause of the yellow stains is that the prints were allowed to stick together while in the fixing solution, and the cause of the spots is particles of foreign matter in the water in which the prints were washed prior to toning. 2.—None. Albumen paper will yield as good, or better, tones than P.O.P. 3.—Yes, certainly. 4.—In some cases yes, as when the sitter is dressed in bright colours, and a coloured screen is used.

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*** *The Editor can only be seen by appointment.*

*** *We do not undertake to answer letters by post.*

THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC FOR 1903.

Edited by Thomas Bedding, F.R.P.S.

The forty-second annual issue of The British Journal Photographic Almanac will be published early in December next. This year's Almanac reached a total of 1,560 pages, and the entire edition of 20,500 copies was sold out a fortnight before publication. Of no other photographic book ever issued can two such unique facts be recorded.

The edition for 1903 will be increased to 25,000 copies, a large number of which are already ordered.

The striking favour with which past Almanacs have been received is the surest proof that the lines upon which the publication is produced meet the requirements of its readers and supporters. Upon such lines we propose compiling the volume for 1903. At the same time, we shall be pleased to receive and consider suggestions for increasing the value of the Almanac in directions which may occur to our readers as susceptible of improvement.

The Almanac for 1903 will appeal to photographers all the world over as a daily reference guide in practical work. The standard matter and formulæ will be revised and added to where necessary, and the latest departures in theory and practice will be chronicled. The year's advances will be recorded, and wherever practicable new features of an informative nature will be added.

Secretaries of societies will oblige us by promptly forwarding lists of officers and other details for inclusion in the directory of photographic societies. We shall also be glad to receive any additions that may be made to the list of telegraphic addresses of the trade, etc. As usual, a section of the Almanac will be devoted to notices of the latest introductions in photographic apparatus, etc. Those firms who wish to take advantage of this feature should communicate with us not later than Ocober 31.

The publishers ask us to remind advertisers that the advertisement pages of the Almanac are nearly all filled up; a few remaining positions will be available until the 27th instant. To secure insertion orders and copy should be sent without delay.

EX CATHEDRA.

Movement of Stars shown by Photography.

Sir David Gill, some little time since, suggested that the brighter stars, as a whole, had a movement in regard to the fainter stars, as a whole, and Mr. Carpenter has recently been examining, the last seven or eight years, Oxford stellar photographs, to ascertain if they lend any confirmation of this movement. Mr. Carpenter's results were looked upon as so important that the whole of the Oxford staff were deputed to examine a certain belt of stars, and they found that there was a movement to the extent of 0.002s. per year per magnitude, but in an opposite direction to that found by Sir David Gill. This result offers such important cosmic considerations that we may be sure it will lead to further photographic research.

* * *

A new Light-Sensitive Material.

A writer in a recent number of *Nature* (P. G. Nutting) gives an account of his experiments upon the action of light cyanin, which show it to possess a very pronounced sensitiveness. A freshly fused sample of this chemical was exposed to light, and it was changed from a deep metallic bronze to a plum colour, and, thirdly, to a steely blue-black. Less than a minute of direct sunlight sufficed. It was found, too, that the effect was purely brought about by light and not by heat; the lantern, indeed, had the opposite effect: it reversed the colouration brought about by light. An interesting part of Mr. Nutting's letter is his statement that by an exposure of thirty hours he had obtained easily recognisable photos of small, well-illuminated objects. A remarkable point about the light action was the fact that its maximum lay in the yellow region. A spectrum taken from a Nernst lamp was thrown on to a piece of ground glass washed over with fused cyanin. The effect was "very strong in the yellow, just perceptible in

the adjacent red and green, and imperceptible in the blue and violet.

* * *

The Bremer Arc Lamp. An important consideration in choosing an electric lamp is the comparative cost of the light per unit of time, and this form of lamp compares most favourably with any other. The French periodical *Electric Lighting* for the 4th inst., gives an account of some photometric experiments recently made by M. Laporte in Paris and Professor Wedding in Charlottenburg, thoroughly discusses the results obtained, which, it may be said, do not very closely coincide. With regard, however, to the particular point we are treating, the relative cost, both observers agree as to the superiority of the Bremer pattern over any other form of arc lamp. The peculiarities of the construction and working are first, in the carbons, which are saturated with certain chemicals, which volatilise and become incandescent in the arc; and, next, in their position: instead of being placed end on, as it were, they lie almost parallel, and are provided with a reflecting board. The makers claimed an efficiency three times greater than that of any other form, and the experimenters named agree as to the great amount of superiority—0.6 Watt per spherical candle, and 0.4 per hemispherical candle (with a 400 Watt lamp), as against 1.1 and 0.65 respectively for ordinary lamps. The distribution of the light is also very favourable—for an angle of 50deg. on each side of the vertical it was nearly uniform.

* * *

Cost of Various Lights. A valuable contribution to the cost of other forms of lights will be found in the following table by Professor Lommer, exracted from the *German Export Review*:—

Source of Light.	Price of Material in Marks.	Per Hefner-candle and Hour.		
		Consumption.	Pfennig.	Penny.
Incandescent gaslight.....	1,000 *l* =0·13	2 *l*	0·026	0·0031
Incandescent petroleum light	1,000 *g* =0·23	1·3 *g*	0·03	0·0036
Bremer light	1,000 *w h.* =0·50	0·4 *w.h.*,0·6 *w.h.*	0 02, 0 03	0·0024, 0·0036
Arc lamp without glass bell..	1,000 *w.h.* =0·50	1 *w.h.*	0·05	0·0060
Incandescent acetylene light	1,000 *l* =1·50	0·4 *l*	0·06	0·0072
Petroleum	1,000 *g* =0·23	3 *g*	0·07	0·0084
Incandescent spirit light ...	1,000 *g* =0·35	2·5 *g*	0·09	0·0108
Arc light, glass bell.....	1,000 *w.h.* =0·50	1·4 *w.h.*	0·07	0·0084
Nernst light	1,000 *w.h.* =0·50	2·0 *w.h.*	0·10	0·0120
Common incandescent light..	1,000 *w.h.* =0·50	2·8-4 *w.h.*	0·14-0·20	0·0168-0·0240
Acetylene light	1,000 *l* =1·50	1 *l*	0·15	0·0180
Gaslight (round burner).....	1,000 *l* =0·13	1 *l*	0·13	0·0156
Ditto (split burner)	1,000 *l* =0·13	1·7 *l*	0·21	0·0252

l = litre; *g* = gramme; *w* = watt; *h* = hour.

* * *

Solubility of Glass. In considerin~ the occasional unexpected and somewhat erratic behaviour of sensitive films, a factor which cannot be ignored, is the possible solubility of the glass supporting medium, and a paper read before the British Association meeting by Professor Frank Clowes, D.Sc., throws some light upon the subject. He was treating the question of the action of distilled water on lead, and had found that if ordinary aërated distilled water was freed from its dissolved gases by being boiled in glass vessels, and then allowed to reaërate itself by exposure to air, it did not regain its original power of acting on lead. Professor Clowes found this to be due to the inhibitive power of silicates dissolved from the glass, and the inhibitory power varied with the degree of solubility of the glass, when vessels composed of different kinds of glass were employed. It is, however, to be observed that the contact of cold distilled water with cold glass did not produce a similar effect. Still, the fact of the solubility of glass is a fact always to be borne in mind, especially in view of the popular idea of the complete immunity of glass against the action of chemicals.

* * *

Enlarged Negatives. The majority of amateurs now-a-day rarely take anything but small cameras into the field, relying on making enlargements from the negatives at some future time, which is sometimes done, but more often not. In most instances, if an enlargement is made by the amateur himself, it is on bromide paper, as rarely can he obtain, even from the same negative, half-a-dozen or less results of equal merit. At a recent meeting of the Longton and District Photographic Society, the method of making enlarged negatives for carbon or platinum printing was described. It has always been a matter of surprise to us that amateurs, and some professionals for that matter, so much neglect this method of working. When once an enlarged negative is made, it may be used for printing by any process, and one can get prints in any colour and on any surface paper. Furthermore, the negative, when obtained, can be re-touched or "faked" to any extent, which the amateur can do for himself. The neglect of this method of making enlargements is the more surprising seeing that no more trouble is involved in making the enlarged negative than there is in making an enlargement on bromide paper, beyond making a transparency. If the enlarged negative is made on paper, and there are now some negative papers on the market that are practically free from grain, the cost is little more than that of bromide paper. When these papers are employed the negative may be used for carbon printing by the single transfer method, the simplest of all processes for amateurs to employ, and one that particularly lends itself to any amount of modification or "faking," in the development. Such negatives can, of course, be used equally as well for the platinotype process, or for printing on P.O.P., or any other paper. Therefore, it does seem strange that this method of producing enlargements is so much neglected.

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The Royal Arms. Notwithstanding all that has appeared in these columns with regard to the use of the Royal Arms, and those only who are entitled to use them on their circulars, bill heads, price lists, etc., there is, evidently, much misconception on the subject, as evidenced by the queries we are often called upon to reply to in the "Answers to Correspondents" column. Here is one just to hand. In effect the writer says: "A few years ago I took to the order of a nobleman here a group, a shooting party, including the King, then Prince of Wales. To make sure that the Prince had a copy I sent him one, and have an acknowledgment of its receipt with thanks. Am I entitled to put the Royal Arms on my shop front and price lists, seeing that the King was only Prince of Wales at the time?" Now our correspondent's letter is very similar to others we received during the late Queen's reign. One would have surmised, after all that has appeared in our pages on the subject, that under these circumstances no one can be so entitled to use the Royal Arms, or to style himself photographer to the King. Even supposing that photographers are called upon by His Majesty, or any of the Royal Family, to execute work for them, that does not entitle them to use the Royal Arms. If they do so they render themselves liable to a penalty of £20, also for using any arms so resembling the Royal Arms such as are calculated to lead other persons to believe they are carrying on business or trade under such authority. To use the

Royal Arms in any form the Royal Warrant to do so must first be obtained. One often sees on shop fronts and on letter headings and the like "By official appointment to the Queen," with the Royal Arms attached, and it is a question as to whether tradesmen are now entitled to use these words. The announcement implies by appointment to the present Queen, an honour they may not possess. Of course, they are entitled to use the arms and to say by appointment to the late Queen, etc. Even were "late" not added, we surmise that in a case of prosecution, if one were instituted, the penalty would only be quite a nominal one. Still, it would seem, from a legal point of view, that although one may have held a warrant from the late Queen, that does not entitle one to still say by appointment to the Queen, unless a new warrant has been formally granted enabling one to do so.

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The Spy Scare Abroad. It may be well to once more call the attention of those who may be contemplating wintering on the Continent, that in many places a camera in any form is looked upon by the authorities with suspicion. We read from a Cherbourg telegram, one day last week, that the Special Police Commissioner attached to that port visited the room of a German officer, who was about to embark for America, and seized a number of photographic plates, which were alleged to concern the French national defence. It appears that the officer was not further interfered with, and was allowed to embark, but all his plates were confiscated. The spy scare is not confined entirely to France, but exists in other Continental countries as well. For example, His Majesty's Consol-General at Genoa has just forwarded to the Foreign Office a translated copy of a decree of the Prefect of the Province of Genoa, regulating the police service in the neighbourhood of fortresses, fortified places, or places of defence in that province. It will be seen from this decree, a copy of which will be found in another paragraph, that it is more stringent than in most places on the Continent. For instance, it is forbidden to stop for any reason whatever in the vicinity of fortifications; or to proceed along the branches of roads which give access to fortifications, or make photographs or sketches from any place whatever within a very wide area. Travellers with photographic cameras, it seems, who wish to go to places within the prescribed area will have to leave their cameras with some representative of the military authority, such as policemen, gendarmes, excise guards, etc., who will tell them where they will be returned to them. It is to be hoped that those Italian officials with whom the apparatus is deposited are of a less inquisitive turn of mind than is the case with some in whose hands photographic apparatus have been temporarily placed, as some have found to their after annoyance. We would advise all those who propose visiting the prescribed districts to leave their cameras safe under lock and key at their hotels rather than have to entrust them to the keeping of policemen, gendarmes, and the like.

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Travellers Italy. His Majesty's Consul General at Genoa has forwarded to the Foreign Office a copy of a decree of the Prefect of the Province of Genoa, of which the following is a translation, regulating the police service in the neighbourhood of fortresses, fortified places, or places of defence in that province:—

"Decree:

"Article I. It is forbidden (a) to stop for any reason whatever in the vicinity of fortifications; (b) to proceed along the branches of military roads which give access to fortifications; (c) to take bearings or photographs of, or to make sketches or views of, or in any way to study, the naval station of Spezia either from merchant ships anchored in the port, or on the island of Palmaria, or from any place whatever included within the perimeter of the following line:—Levanto, Monte Gualterola, Monte dei Vagi, Borghetto di Vara, Brugnato, Rocchetta di Vara, Calice di Cornoviglia, Monte Alpicella, Monte Castellaro, Il Poggio (above Bolano), Monte Grosso (above Caprigliola), Monte Carbolo, Monte Pizzacuto, La Pizza, Monte Sagro group, the heights of Carrara, Avenza.

"Travellers with photographic cameras who wish to go to any places within the said line must deposit their cameras with some representative of the military authority, such as military posts, Royal Carabineers (gendarmes), policemen, excise guards, and forest guards. The officials entrusted with this surveillance and who receive the cameras will, on each occasion, inform the owners of the cameras where they will be returned to them. The photographic cameras to be deposited by travellers do not include those packed in trunks or those that are not in working order.

"Article 2. Persons infringing this regulation will be reported to the judicial authorities in accordance with Articles 140 of the Law on Public Safety and 434 of the Penal Code. Police officers, gendarmes, excise guards, nd forest guards are entrusted with the execution of the present Decree.

"Given at Genoa on the 19th day of September, 1902.

(Signed) "Garroni, Prefect."

SOMBRE PICTURES.

Most of the best photographic pictures have a touch of sombreness about them. This is partly due to the fact that the conditions which lend themselves best to pictorial photography are ones struck in a minor key. Plain expanses relieved by a simple, salient object, the whole in a low light, are the usual and conventional elements. They are Gray's "Elegy" kind of pictures, with a pronounced "tolling curfew," "weary ploughman," and "parting day" air about them. The result is pleasing, but rather monotonously so after a while. It is like too regular porridge for breakfast, nourishing and digestible food enough, but in time one gets to long for the smell of broiling ham, or the tasty flavour of sardine.

The absence of colour is another condition making for dulness. We, or our children, will probably gain this, possibly after all with a tincturing of sorrow at having gained too much, for unregulateable excess of colour will be worse than the present excess of detail. It is pretty certain that when the full and true colours of nature are expressed in a photographic picture, without their having been first mixed in an artist's brain, we will not be overpleased with the result. But colour must, for the present, be left wholly out of the question.

Is the sombre tone of the photographic picture inevitable? We think not, but that it is due in a great measure to convention, governed by the consideration of higher worth instinctively felt as associated with the subdued and the grave. We are in an age which takes serious views of things. Whether it be due to advanced mental culture, to touchy nerves, enlarged livers, over-sensitive stomachs, knowledge of microbes, current literature, the income tax, or a mixture of them, one cannot very well say, but it is certainly the case that a sober picture of a serious subject is thought to require more in the making than a breezy and joyous one. This is not confined by any means to photographic pictures, but will apply all

round. We say nothing against the value of the serious and the grave, but would like to point out also the worth of the cheerful and the gay. Life should not be regarded as painted throughout of a chocolate brown unrelieved by a lighter colour. Life in itself is quite good enough to enjoy, and even if a man is disposed to postpone his larger enjoyment till he gets to a future world, how is he to sufficiently value the brightness and colour he always pictures as its chief features without having gained something of a power to do so in the apprenticeship of the present life and world? Pictures in particular can help in this and have a cheery effect, and cheery pictures are photographically possible. They are harder to make than dull ones. It is easier to photograph storm than sunshine, the sedges and the still marsh pool than the hurrying, twinkling ripple of the mountain brook.

It is, of course, essential that the would-be producer of a bright picture should be himself of a bright disposition, be of a psychological piece, as it were, with his subject. There are more dull and heavy men than bright, still there are plenty of the latter who produce sombre-toned pictures because they have hesitated to climb over the palings that bound in the region of orthodoxy. Let them venture to do so, and strike out confidently into the wide and sunny stretches outside. Many a man has had a flash of inspiration as to a picture, that with care and thought in execution might have turned out a great success. But it has been so much at variance with the run of good pictures that he has seen, appeared to lend itself so grudgingly to the usual photographic procedure, that the idea has been allowed to die. Now these sudden flashes are not likely to occur when one is not in good spirits, and are generally of a cheerful complexion. They are not suggestions of funerals, tombstones, fadings, and ebb tides. These indicate liver trouble, which in its mental effects in other directions than the photographic, do not "make for righteousness."

Let a sunny glimpse of a quaint corner of the sea hamlet be tried, the childish defender on the ramparts of the sand castle on the beach, the harvester taking his welcome long draught of cider, the carrier yarning from his cart with the cottager in the lane, a breezy breadth of heathery moor, with a jolly-looking keeper with his gun and dogs in the foreground, and so on, anything as long as it is cheerful.

To come down a little in practical working it is largely a question of hand camera, a large stop, quick exposure, cautious development, and intensification.

But even in portraiture, and with a stand camera, surely the men in the photographer's window and show case are not all of the same depressing, grave order, the women all so stately and dignified, the maidens so sedate. Their faces must relax often into kindly smiles, or at least into expressions a little less suggestive of the seriousness of life. They merely need a little encouragment to be natural, and to display their happiness.

Why not try it on these lines? He who could double the blades of grass in the world has ever been regarded as an acknowledged, though impossible, benefactor. There is an equal reward awaiting him who can double the smiles in the world, and he is a possible, possibly photographic, benefactor.

Stirling and District Photographic Club.—The first annual exhibition will be held in Carson's Hall, Port Street, Stirling, on Wednesday and Thursday, 28th and 29th January, 1903. The judges will be Miss Harvey and Messrs. Robert Kidstone and William Rodgers. The following are the open classes: F.—Landscape and river scenery; marine studies. G.—Portraiture and figure studies. Exhibits should be sent to Mr. J. Cargill, 7, George Street, Stirling, not later than January 21st, 1903.

THE EDUCATION OF PHOTOGRAPHERS.

[Presidential Address to the Royal Photographic Society.]

The past fifty years of the society's work is obviously the theme of your next President's address, for the year 1903 will commemorate the Society's Jubilee, and we can but hope inaugurate a successful future of greater national importance in its work and undertakings.

The past year has not been remarkable for any striking advance in either the science or practice of photography. The most notable achievement is due to the skill and patience of Mr. Edgar Senior, whose success in preparing and taking Photo-micrographs of sections of Lippmann colour photographs of the spectrum, has demonstrated experimentally the truth of the theory that the various colours are due to "stationary waves" of different periods of vibration, and is in itself a further confirmation of what is known as the wave theory of light.

Our membership is steadily growing, and thanks to the organisers of the Affiliation Scheme, we are in touch with nearly every Photographic Society in Great Britain and many in the Colonies, and last, but not least, the society itself offers greater facilities for the performance of work in this building than it has hitherto afforded. It seems to be an axiom, in this country at any rate, that for an institution to obtain the support of public bodies in furthering any branch of technology, that institution must first be an independent success; we ourselves can at present only increase our sphere of usefulness and become recognized as a "success" by a greatly increased membership, for it is only the lack of funds which has prevented this society in the past from taking its proper place in carrying out efficiently the work of one of the most important branches of technology.

The educational facilities which are offered to students in photography in this country have considerably increased of late, but are in the main chiefly elementary and seldom afford opportunities for research.

So far as I have been able to trace the first systematic instruction in this country was given by Sir W. de W. Abney in a course at the Chatham School of Military Engineering in 1868. The syllabus used was embodied in Abney's first edition of "Instruction in Photography" (published in 1871) and consisted of notes printed at the school for the use of the class and officers of the corps. The theory was taught in the laboratory and the practical work in the Photographic School; the lectures were accompanied by experiments to illustrate them, and the class worked at the practical part experimentally as they went along.

The publication of Abney's volume was a great stride in raising the young science from the qualitative to the quantitative stage. The keynote of research was, as in all sciences, accurate record of experiment followed by scientific and practical deductions. The rapid progress of our knowledge of photography has done much to upset the popular fallacy that laboratory work and practical achievement seldom march together. So much are they bound up together that every institution for the teaching of photography should provide means for original research.

In following up the facilities for public instruction in photography we find that in November, 1891, the late M. Leon Warnerke contributed a paper to this society on "Photographic Technical Instruction on the Continent of Europe," and described very fully the advantages which were offered in photo-technical education at Berlin under Professor Vogel at the Royal Technical High School founded in 1881, at the Royal Educational and Testing Establishment for Photographic and Printing Processes under Dr. Eder at Vienna, and also the technical instruction in photography given at Brussels, Ghent,

and St. Petersburg. In each case the funds for teaching were contributed by the respective governments. One felt very keenly how greatly such an institution, offering splendid opportunities for scientific and technological research, would benefit this country, if a similar step had been taken by our Government.

In June, 1892, Mr Howard Farmer contributed a very interesting paper to the society, in which he pointed out M. Warnerke's omission of the mention of the Regent Street Polytechnic and of the great and valuable work it had carried out despite the fact that the school was founded by the private enterprise of Mr. Quintin Hogg, and supported by fees paid by the students. This institution was founded in 1883, and has continued to have an uniformly successful career in teaching students in both theoretical and practical work, and in preparing them for the examinations held at the City and Guilds Institute. Special courses of training are now given to those taking up (*a*) Portraiture as a profession; (*b*) Photo-engraving and tri-colour work as a profession; (*c*) Retouching, finishing in black and white, and colouring as a profession.

In addition to this Polytechnic School of Photography at Regent Street, there are in London a number of other schools which include photographic education in their prospectuses.

The London County Council School of Photo-engraving and Lithography at Bolt Court is devoted to the training of those who are engaged in business in any branch of photo-mechanical, photographic, designing, lithographic engraving, printing and book illustrating crafts, but no provision whatever is made for amateurs. The school is under the direction of Mr. A. J. Newton (successor to Mr. Gamble), who is glad to welcome students who wish to carry out research work in photography or in any branch of artistic reproduction, and to give personal supervision. The principal himself has facilities for original work which might be expedited by the aid of assistants.

The Battersea Polytechnic, the Birkbeck Institution, the Borough Polytechnic, the Chelsea Polytechnic, and the Woolwich Polytechnic, all include courses of lectures on the practical and theoretical aspects of photography under the direction of Mr. Edgar Senior, and are arranged to suit the requirements of both amateur and professional students, the course covering the ground included in the examination of the City and Guilds Institute.

The Goldsmiths' Institute is under the direction of Mr. W. T. Wilkinson, and includes a course of practical instruction open to amateurs and professionals.

The Adys Road Continuation School, East Dulwich, is under the direction of Mr. G. G. Lewis, and includes two courses, "a combined course of chemistry and light bearing on photography," and "a practical course in chemistry and light as applied to photography."

At the Cripplegate Institution an elementary class is held by Mr. C. W. Coe, and a more comprehensive general photographic class is conducted by Mr. John H. Gear, who is also a lecturer in pure photography to the Thornton Heath Branch Polytechnic under the Corporation of Croydon.

The Acton and Chiswick Polytechnic conducts a photographic department presided over by Mr. G. C. Laws, and is conducted on similar lines to the Regent Street Polytechnic.

The London Chamber of Commerce has recently undertaken examinations in both the theoretical and practical aspects of photography in connection with the Commercial Education Department, but at present offers no special inducement for research work.

The Northampton Institute, Clerkenwell, under the direction of Dr. Walmsley, offers the greatest facilities for the study of optical appliances used in photography. This institution, which is largely supported by the Technical Education Board, has hitherto worked in close co-operation with the school at Bolt Court, and the instruction and practice of experimental physics required by the students of tri-colour work have been provided in the laboratories and by the staff of the Northampton Institute. It is now proposed by the governing body to establish a new department for advanced opto-technics, and a report on the subject has been submitted to the Technical Education Board of the London County Council (under the direction of Dr. Garnett), with a request that the Board will assist in the provision of the funds necessary for the equipment and maintenance of the department. If this department meets with the Board's approval, facilities for research work in connection with all matters relating to design in optical instruments, including photographic lenses, will be provided in this institution.

I have endeavoured to give a complete list of the institutions in London where photographic classes are held. In the provinces, I am only aware of the Leeds Technical School, the Northumberland County Council Technical Education Committee at Hexham, the School Board of Aberdeen and the Municipal School of Technology at Manchester. I may mention incidently, that I understand the Prime Minister will open a new branch of this latter institute to-morrow which, will include opportunities for the study of photographic technology such as have not yet been approached for completeness in this country. It will be directed by Mr. Gamble, formerly of the London County Council School at Bolt Court.

So far as I am aware, the examinations held at the City and Guilds Institute take the highest standard as a test for photographic efficiency, and I believe that nearly all the students who receive general instruction in photography at the institutions I have enumerated can be specially prepared to take these examinations.

I need not remind you that success in these examinations is the chief recommendation to the Fellowship of this Society. The necessity of establishing a single and satisfactory portal for admission to the Fellowship has long been in the minds of your present and past Councils, and it is hoped that at no very distant date a scheme may be submitted which will be satisfactory to both the Fellows and Members of the Society.

In setting forth the opportunities which are available for instruction in photography I have throughout had in mind the position which this society ought to take. It should be pre-eminently the leading institution in photographic technology. A very earnest attempt to form such an institution was made by this society in October, 1890, when Mr. Kenrick B. Murray, Secretary to the London Chamber of Commerce, accompanied by Mr. Glaisher, Captain Sir W. Abney, Dr. Lindsay Johnson, Colonel Gale, Sir Henry Trueman Wood, and Messrs. England, Robinson, and Bird accepted an invitation from the Lord Mayor to discuss the question of a proposed Photographic Institute. It was then stated that this society was desirous of initiating and supporting such a scheme if there was any likelihood of the necessary funds being available.

The project commended itself to the then Lord Mayor, Sir Henry Isaacs, and it was thought that a well-considered scheme would not only have had his support, but that a sum of ten thousand pounds might be forthcoming. The following were the main divisions of the work proposed:—

1. Science.
2. Education.
3. Art.
4. Industry.

As you are aware, gentlemen, this effort unfortunately proved unsuccessful, and the society has up to the present time only

itself to thank for its more flourishing condition, which is due to the guarantee and financial aid of its own membership.

The idea of forming such an institution was first promulgated, I believe, by Dr. Emerson in the first edition of his "Naturalistic Photography" (1889), where he writes:—

"We fondly hope that a college of photography may one day be instituted, where good art and science training may be obtained, where regular classes will be held by professors and regular terms kept, and where some sort of distinguishing diploma, such as Member of the Royal Photographic College, will be given to all who pass certain examinations. . . ."

In February, 1892, Professor Meldola contributed a paper to the society "On Photography as a Branch of Technology." There is no doubt that the prophecy which he quoted from the "Edinburgh Journal" of 1843, "that photography would take the highest rank among the inventions of the present age," has been realised. There is not a science, art, perhaps scarcely an industry in which photography has not played a most important part, often indeed being the pioneer process of investigation. Perhaps the least important of its applications are the most popular ones, namely, the taking of portraits and landscapes, although the pleasure derived from the practice of the art and its commercial value must not be overlooked. Being a branch of technology of the first order of importance, and appealing as it does to both the arts and sciences for recognition it should also appeal to the nation at large. I have not attempted to present to you a picture more vivid than that portrayed by Professor Meldola in 1892, indicating the necessity for such an institution, but merely ask you members of the society, the thousands of members who are affiliated to our Society, the London Camera Club, the Photographic Convention of the United Kingdom, the National Photographic Record Association, the Professional Photographers' Association, and the nation at large, which owes so much to photographic technology, whether the iron is not now sufficiently hot for us to strike again, so as to obtain adequate recognition of our science and efficient means to pursue it.

The occasion of the Jubilee of the Society will be a most fitting one, and I venture to hope that my successor, whom we have every reason to believe will be one who has rendered pre-eminent services to photography and to this society, will lend his great influence to promote a fresh effort in this direction.

THOMAS R. DALLMEYER, F.R.A.S.

YORKSHIRE Union of Artists.—A lecture will be delivered on Saturday, November 1st, 1902, at the City Art Gallery, Leeds, by Mr. E. Rimbault Dibdin, entitled, "The Magic Carpet," with photographic lantern pictures taken chiefly by the lecturer. The following is the synopsis: The lecturer's text is taken from the pleasant tale of "Prince Ahmed and the Fairy Pari Banou"—The True Magic Carpet and the weaving of it—Water and life inseparable—A river the visible embodiment of the wonderful system by which life is made possible—Our love of rivers, and their unfailing charm—The course of a river to be preferred by the seeker for beauty, to the most approved tourist route—The source—The river's infancy and childhood—The first dwelling—A digression upon dogs—The haunt of the water nymphs—The lost poet—The boundary of Pan's dominion—The first chapel—The first bridge—The property-owner and his devices—The first town—Up-river towns and their characteristics—Canals, with a digression upon canal boats—Country churches and graveyards—The market cross—A river's tributaries—The Lost Poet's curious allegory—The varying characters of rivers; their stupendous powers—Intimacy of streams with rural life, and all that is most beautiful in it—Rural homes, past and present—Onward and downwards towards the estuary, through ever-changing scenes of beauty—Ponds, lakes, and tarns—Winter metamorphoses of water, and their part in Nature's business—Winter in colder regions—Our protection from extremes by one of the great rivers of the ocean—The glacier, the solid river of snowlands—Niagara and its wonders—Subterranean rivers—Intimate relation of rivers and clouds—The glorious return of Spring—Wreckage on the shores of Time—The Lost Poet once more——"A vision of the Gods"—Conclusion. The chair will be taken at 7.30 p.m., by Mr. W. Edwin Tindall, R.B.A.

PHOTOGRAPHY AS APPLIED TO ILLUSTRATION AND PRINTING.

[Cantor Lecture, delivered at the Society of Arts.]

III.

TRICHROMATIC photography and three-colour printing is the latest and by far the most important development of photography in the whole range of processes of illustration invented or evolved during the past half century, and it is a subject that I approach with some diffidence. It has been dealt with in this historic hall on several occasions by giants in the world of modern research, men who have devoted years of investigation to every theory and every detail. I hope that it will not be considered presumption in me to attempt to raise my voice on such a matter and in such a place. I am invited to place before you my version of these processes, and I will to the best of my ability endeavour to explain the principles and working of the three-colour process from the practical point of view of a worker, but I will not try to put before you or to make you understand the formidable theories surrounding and enveloping the whole question of colour analysis, of Fraunhofer lines, molecular swings, the undulating theory of light, or the like; not that I, for a moment, wish you to understand in this art or science of the photographing of colours that theory goes for little, or that practice is everything; without theory the process as it now stands would be a vain thing, and we workers have no other feeling than gratitude towards those patient investigators who have found out and established rules and measurements for every operation, the exact spectrum colours to be used, the proper methods of sensitising plates, the relationship between spectrum colours and pigments, the tabulating of exposures for each colour and light condition. In almost every problem which may be presented to the experimentalist or workman, all these things are recorded, and are to him who reads, power.

Having stated this much, I must explain that the general principles upon which trichromatic or three-colour photography is based are as follows:—It is an accepted theory in the case of every object in nature or art exhibiting colour in any form or combination, that colour or colours result from the three primary colours which form white light, alone or in combination. These primaries I may name roughly, red, blue, and yellow. [Mr. Symonds will now, by means of the photo-spectroscope, make a photograph before you of the spectrum of a beam of light given by the electric arc; the little experiment will be instructive in two ways: it will enable you to see the spectrum on the focussing screen of the camera, and the result of the photograph will show the effect of the different colours and their colour values on the photographic plate.] I may as well say at once that the three colours named now as the primaries are not scientifically red, blue, and yellow; they are, to be more exact, red, green, and purple violet; but these latter spectrum colours cannot be employed successfully in the form of pigments in the printing press, and as that is the principal object in view in this paper, it will simplify matters if I speak of these primaries all through as red, blue, and yellow. It is known to all of us that the white light of daylight or the sun is composed of, and is the result of a combination of, coloured light; analysis by the spectroscope shows it to be composed of all the colours of the rainbow, yet all these colours may be reduced to three, the ones I have roughly named, red, blue, and yellow. If three glasses are coated with films of the three primary colours, and by means of a triple lantern are projected on a white screen, the three discs, on being superimposed, will produce white light—that is to say, the three separate colours projected one over the other will give us pure white. It is interesting to note, and necessary to remember, that the same

colours in the form of a pigment or ink, superimposed or printed over each other on paper, form not white, but black.

The principles of these interesting phenomena of light were laid down in 1861 by Clerk-Maxwell, and they have been elaborated since by many investigators. A French scientist named Ducos du Hauron early applied the principle to photography, and since his day we have had Ives, of Philadelphia, Vogel, of Berlin, Lippmann, of Paris, Wood, in America, and in this country, Abney, Joly, Sanger Shepherd, and many others.

Having established the principle that all combinations of pigmental colour in, say, for instance, a painting, are formed out of the three primary colours, the next step for the photographer is to obtain negatives from the painting, which, so to speak, automatically dissect out from the original each separate colour mentioned, and so make three distinct photographic records of the reds, blues, and yellows entering into the composition of the subject. This result has been attained by the employment of plates which are so sensitised as to be affected specially by two only out of the three primary colours. The action is controlled in photography by the use of what are known as light filters, which are transparent screens of coloured pigment, placed before or behind the lens, which admit at will any two of the three primary colours to the sensitive plate, and absorb the other one. The rationale of the process may be described thus:—The negative used for printing the red colour sensation is made to see yellow and blue combinations, and is colour blind or insensitive to red and its combinations. The blue plate sees reds and yellows only and their combinations, and is colour blind to the violets, and the yellow negative sees red and blue only, and is colour blind to yellow. Having obtained these negative records of the colour analysis of the subject, and, supposing the exposures are correct, and the colour value in each properly balanced, it only remains to convert the three photographs so obtained into printing surfaces by any process rendering half-tones, say collotype or half-tone blocks, and from this printing surface to reproduce the separate colours impressed in printing ink in their own colours on paper. The block representing the yellow is printed first in yellow ink; over this picture is accurately registered the block representing the red, and printed in red ink; and finally the block representing the blue is printed over the yellow and red impression with blue ink; the result will be found closely to approximate to the original in all its colours and combinations of colour, from the palest tints to solid black.

This, shortly stated, is the whole process of trichromatic reproduction. I will now try to explain in a little more detail how these results are arrived at. The process is yet young, and though the theory is perfect, the practice is not altogether so. Many difficulties have to be contended with, amongst which, I may mention that we have yet to discover plates and sensitisers which will respond accurately to the spectrum curves laid down for each colour sensation. We have also still to find light filters which will effectually stop the action of light rays which are not wanted. Then the interposition of the grained screen required for the production of a surface-printing block degrades and flattens the gradations for the picture, rendering skilled artistic aid necessary in the etching of the plate. The selection of standard printing ink colours is a further element of trouble, because inks of great purity and brilliance are necessary, and it would seem as if pigments of the requisite quality are difficult to obtain, unless more or less fugitive colours are employed. There is hope in this direction, however, and our best ink makers are making laudable efforts not only to supply a reliable standard, but are gradually nearing the ideal as regards purity and permanence of colour.

I have stated that the plates used for trichromatic photography must be specially treated, so that they may be more or less sensitive to light from different sections of the spectrum. Ordinary plates sensitised with bromide of silver are affected principally by the blue violet rays, and a great deal of patient research has been devoted to the finding of substances which will control and vary this action so that other rays may exert an equal reducing influence on the salts of silver. It has been found that certain dyes added to the collodion or emulsion have a controlling influence in the required direction, and this idea has been followed up until there are now a number of colour sensitisers and colour sensitive plates on the market, prepared on scientific principles, and answering most requirements. As just mentioned, ordinary untreated photographic plates are most sensitive to the blues and violets of the spectrum. A solution of erythrosine dye renders the plate sensitive to green and yellow, and a solution of cyanine dye alters the range of sensitiveness through the orange up to the red. The spectrum plates made by Messrs. Cadett and Neall and the orthochromatic plates prepared by M. Lumière, also the collodion emulsions supplied by Messrs. Penrose and Dr. Albert, are all excellent for the purpose of trichromatic photography, and it is not now so necessary for the experimentalist to sensitise his own plates, as was the case some few years ago.

The light filters for making the separate colour negative may be in two forms, liquid or dry. The liquid or wet filters are made of dyes in solution held in tanks or cells of optically flat glass. Dry filters are made of similar dye in a solution of gelatine or collodion, with which optically worked glasses are coated, dried, and sealed with a cover glass to prevent injury. The latter are found most conventient for working, though it is held by some experts that superior results are given by the wet filters. The dyes and pigments used for making light filters are numerous, and no particular standard has yet been settled; each plate manufacturer and operator recommends or adopts some modification which suits his particular working, and in their hands the end seems to justify the means. In my experience, I have found that dyed collodion filters, if carefully made, answer every purpose.

A collodion is made containing five or six grains of pyroxyline to the ounce of mixed alcohol and ether, and the dyes are dissolved in alcohol, and are added to the collodion until the solution is deemed of sufficient strength for coating the plates. Dyes that will not dissolve in alcohol are dissolved in water, and the glass plates, coated with plain collodion and washed, are dipped in a bath of the aqueous dye until the film of collodion is saturated with the requisite strength of colour. It is generally necessary to coat two separate glasses for each colour filter, and to cement the two together face to face with Canada balsam. Sometimes coloured glass is used in combination with dyes, but there is no particular advantage in doing so, because the dyed films are less liable to interfere with the action of the lens than glasses which are coloured right through. In practice, for three-colour block printing, the filters are varied in the colours and strengths, so as to adapt them to the particular standard of printing ink used for printing the blocks.

The following dyes or their equivalents form a basis for most filters for three-colour work:—

For the red printing negative	2	Brilliant yellow.
	1	Brilliant green.
For the blue printing negative ...	1	Cochineal red.
	2	Brilliant yellow.
For the yellow printing negative...	2	Napthol green.
	1	Methyl violet.

Glasses are coated with each of these colours, and cemented together in pairs in the order given. One colour usually pre-

dominates over the other; for example, the green used in the red record is the dominant colour, and the red used in the blue record dominates the yellow.

The sensitive plates used with these light filters may be either collodion emulsion or gelatine dry plates, modified, as I have already stated, in their scale of colour sensitiveness so as to be specially active to only two of the primary colours in each case.

The plate for use with the "green-yellow" screen must be sensitive particularly to the green and yellow rays, and not at all to the reds, which are not required in this record. The plate for the "red-yellow" screen must only be active to those rays and not to the blues, whilst the plate for the "violet" screen must see blue and red, and be colour blind to the yellows.

I have mentioned that there are several excellent grades of commercial plates available, which fulfil with fair accuracy the theoretical conditions just named, as regards colour and sensitiveness. They are all carefully made, and provided they are not stale, the operator is safe with almost any of the makes —Cadett's, Lumière's, Ilford Chromatic, or Edwards', or collodion emulsion may be substituted if the dark-room conditions are complied with.

I do not propose to go through the operations of photographing, more than to say that in addition to the precautions ordinarily taken with rapid dry plate work, there are others to be observed in consequence of dealing with plates which will instantly fog if exposed to the rays of the customary ruby dark-room lamp. Only the faintest red light must be used for the red and yellow printing plates, whilst, for the development of the blue plate, a green light must be used, and very little of that. The best means of all is to develop in the dark, first carefully working out the exposures and developing time by Hürter and Driffield's tables of factors. I would also commend Sir W. Abney's colour sensitometer to those who are testing or working plates and screens of unknown quantity. It is a *sine quâ non* that the development of three-colour plates should be exactly right; intensifying and reduction afterwards may be resorted to to correct under or over development, but this course is never quite satisfactory, the proper balance of colour value is disturbed, and troublesome corrections may be necessary before the printing plates are deemed satisfactory.

It is, of course, one thing to prepare plates and colour filters which will work accurately with spectrum colours, but it is another matter to deal with the reproduction of objects or pictures containing compound colours (sometimes two or three painted over one another). In the case of water-colour drawings it is frequently puzzlingly difficult to account for the apparently false effects given in the colour negatives, though photographed under conditions which seem perfect; but a little consideration shows how possible it is for errors in colour values to be recorded. White light is always present in photographing any object, and it is reflected in a greater or less degree from every colour, there is also the paper or canvas on which the drawing is made, giving out white light in proportion to the strength or weakness of the wash or colour upon it; this agency will always cause a disturbance of colour values, and has to be reckoned with in the most perfect process of colour reproduction. So that, save in exceptional cases, you will understand why it is necessary to aid the colour plates by careful retouching and etching. This artistic assistance applies more particularly to the preparation of blocks for the printing press.

The camera for three-colour photography should be constructed with a view to the greatest rigidity and fixed to a solid stand, which, when in position, can be securely fastened down to the floor of the studio. The lens must be of the most rapid type, and for direct working on plates through a half-tone screen will require a prism attachment to reverse the image. The colour filter may be behind or in front of the lens combination; in front is most convenient, and a simple slide arrangement attached to the hood of the lens or prism is all that is needful.

Having succeeded in making a set of trichromatic negatives, the next important step is to obtain prints from them on paper or glass in the proper colours, and to superimpose one over the other, in order that the reproduction of the subject photographed may be complete. Happily it is not necessary for the amateur or experimentalist to have a photo-engraving installation to attain this desirable result, and we have to thank Mr. E. Sanger Shepherd and M. Lumière for having devised methods of printing from three-colour negatives on their films of sensitised gelatine, which are afterwards dyed with the primary colours. When these films are dried and cemented together (the whole process, I may say, is at once simple and ingenious), the finished results are in every way interesting and charming. The processes are within the reach of anyone possessed of true photographic patience, and I cordially recommend them to your consideration.

The process of translating three-colour negatives into blocks for the printing press, and the subsequent production of copies of the subject in colours on paper, is already a scientific industry both in this country and abroad, and it marks a new epoch in artistic illustration. There are two methods in vogue for the making of colour blocks from the negative records. The first is called the "indirect" process, and differs from the "direct" process, in that the colour negatives are made without the interposition of the mechanical screen grating, consequently transparencies on glass must first be made of the three separate negatives. From these transparencies negatives with the indispensable grain are made, and are printed on copper or zinc for etching in the ordinary way.

In the "direct" process, the original colour negative has the half-tone screen placed in position before it during the exposure, and the result is a grained negative which can be printed direct on metal, without going through the operation of preparing transparencies and grained negatives from them. The advantage of the "direct" method is a saving of two operations, and the disadvantage is the increased exposure caused by the interposition of the screen grating.

It is necessary to explain that the mechanical ruled screen cannot be used at the same angle for all the plates. The usual angle is 45 degrees for an ordinary block by the half-tone process, but if all three negatives were printed with the grating at the same angle, two disagreeable things would occur. First, the colours of the three separate printings would be, so to speak, entangled, one dot of colour would be printed over the top of the other, and would be lost (to get the colour-value in the tones of a picture in dots it is essential that the spots of colour should be side by side, and not superimposed); second, there would be a curious *moiré antique* pattern introduced by interference which would utterly spoil the picture. These troubles are avoided by arranging the angles of the screen grating each about 30 degrees to the other, one at 15 degrees, another at 45 degress, and the third at 75 degrees.

The negatives are printed on copper in enameline, and etched in relief by the half-tone block process already explained. The etching of the plates is carried out by artists who not only know how to deal with the mechanical portions of the work, but have a knowledge of colour and colour values, and on their skill and knowledge much depends as to the ultimate success of the reproduction.

The printing of the blocks is carried out in the ordinary printing press, and the plates are treated in all respects as

the usual type block, but it is requisite that the printing press used for this purpose should be of the very best construction, and capable of being made to register one printing over the other with the utmost accuracy. The block for the yellow printing is first arranged in the press, and impressions are taken in yellow ink on paper having a fine texture and surface. The red printing block is next fixed in the same position in the press as was occupied by the yellow, and is inked with red ink. The impression is made over the previously printed yellow, and is registered, so that it fits exactly over every part of the yellow picture, the result being an impression containing all the yellows and reds of the original. The blue printing plate is next placed in position in the press, and the same precautions observed as to the registering. After inking the plate with blue ink, the impression is pulled over the two printings in yellow and red already made, and the result is the complete picture containing every shade of colour of the original, no matter whether the original is from nature, a painting, water-colour, object of art or commerce.

J. D. Geddes.

SOME ASPECTS OF PROFESSIONAL PHOTOGRAPHY.

[A Lecture delivered at the Opening of the Polytechnic School.]

Long experience as a teacher and conversation with many young professionals has convinced me that they frequently fail to grasp some of the elementary conditions which lead to success. The keynote of this lecture is the hope that a hint or two may be useful. And first, what is a professional photographer? When we speak of a professional photographer, we usually refer to someone whose calling or employment is photography; but the term has two other distinct meanings, and it is these to which I intend referring. The word professional means pertaining to a profession; and a profession is defined as a calling, or employment, not mechanical, and requiring some degree of learning; it is also defined as the collective body of persons engaged. For example, when we refer to a doctor as a professional man, we mean not only that he earns his living by his prescriptions, but also that he is learned in the same; and further, we speak of the profession of medicine, because there is a collective body of persons contained in it. Leaving the first meaning of the word (that it implies learning) for the present, let us turn to the second one. If we look up the directories and see what proportion of professional photographers are engaged on different classes of work, omitting from consideration photo-engravers, who form a distinct calling of their own, we find that they are almost exclusively portrait photographers, or that the work they do is for portrait firms. In the London and suburban directories there are about 600 photographers, and we find the vast majority are portrait artists, only about a dozen being general workers. In country districts the proportion of portrait artists would be found still greater. Again, in the case of the Professional Photographers' Association, of which our Chairman to-night, Mr. William Grove, is the President, I do not know whether there is any special reservation made, but probably it would be found on inquiry that at least ninety-five per cent. of the members are portrait photographers. Yet again, we find in the advertisements for assistants in the trade papers dozens of retouchers, operators, printers, and others, who work for the portrait photographer, to one who is wanted for general work. Again, at the professional section of the Exhibition of the Royal Photographic Society, the exhibit is almost entirely portraiture. This truth is on the surface very remarkable, as an enormous number of photographs of other objects than human faces must be taken daily, and yet we find they are represented by very few firms engaged exclusively in general work. Obviously, portrait photographers themselves do a large amount of this general work, but only as a fraction of their business. Let me illustrate this in another way: It is extremely difficult to open and run a business as a general worker unless in conjunction with trade printing or enlarging, or with some special mode of photomechanical printing, or something of the sort; there are, it is true, exceptions, such as photographing paintings, architecture, and others where men with unusual abilities and aptitudes have by the mere force of their superiority become very successful specialists. But what I wish to be understood is this—that in these sections of work there is no collective body of persons engaged; that, while they are included in the craft, photography as a profession is in the main limited to portraiture. It will be useful to indicate what I believe are some of the reasons of this. One is that in a great many cases the public do not criticise general work, and are satisfied with or accept photographs which require comparatively little skill in their production. In the case of a seaside resort, a sharp view of the beach from the pier, looking east, and showing the Grand Hotel; another looking west, and showing the bathers; and a third of the pier from the promenade, with a steamboat approaching, are usually all that is expected. Another reason is that this work can be done without special premises or appliances; a carriage has to be photographed; it is simply taken outside the coachbuilder's shop, and any objectionable parts of the background are blocked out in the negative. A third reason is undoubtedly the universal practice of amateur photography. A fourth that no idealising, by which I mean retouching or finishing, is necessary. It is, indeed, surprising how many subjects in general work are idealised out of all recognition, simply by plain, unaided photography.

Now the opposite of these conditions holds in the case of portraiture. In the first place, the sitter, so to speak, is nervously conscious and critical, and it is of the first importance that he should both respect and have complete confidence in the taste and skill of the photographer; even then both he and his friends are hypercritical and difficult to satisfy. In the second place, a specially designed studio, with appliances, is essential. In the third place, you all know the flattering (?) remarks the ladies make concerning the photographs of themselves taken by their amateur friends (there are, of course, exceptions). Fourthly, in portraiture you have to idealise somewhat with very skilful retouching and finishing; it is, indeed, a perfectly fair statement to say that retouchers have made the names of many portrait photographers, especially in their first beginnings. Here, then, we have the two sides—the portrait photographer, with his exacting clients, his special premises, and his skill in idealising; and, on the other hand, the general worker, who suffers from untrained competition, and very frequently also from want of appreciation of really skilful work on the part of the public.

Now I would ask you young professionals who want to get on and to become independent, to recognise these differences, and the conclusion they lead to. I want you to understand that while as young men you may be perfectly happy as craftsmen in any section of work you undertake, that when you get older you will probably have further responsibilities, and require more comfort and freedom from anxiety. That, speaking broadly, when you reach forty or more, a position as a general worker or assistant in photography is not usually an over-remunerated or enviable one, that the real profession of photography by which you can in any part of the world, where openings occur, start in business and become independent, is portraiture.

Further, I would ask you, having recognised this fact, to act upon it while you have the privilege of living in a great city like London and the energies of youth to help you—advantages, I am afraid, you will never fully realise until you lose them—and acquire in your own person all the knowledge and skill required for the practice of portraiture, not forgetting the little needful put by to provide necessary appliances. Also to those assistants who have no present idea of going into business on their own account, I would say, without in any way injuring yourselves in your special work, you will probably find that a knowledge of all the sections into which portraiture is divided sufficient to undertake them if required, will be of great and permanent service to you some time or other. Please do not think I am endeavouring to advertise this school. We can, in any case, only give you a small part of your requirements, and this small part I would just as soon that you gained it from your chum in the next department where you work, or that you went to some other school—sooner, if they teach you, or treat you better. But if you are without any obvious opening in a special line, do not rest until you have acquired the essentials which will enable you to take full advantage, when the opportunity comes—which it nearly always does—to gain independence and the satisfaction arising from being the controller of your own life.

Opening or Buying a Business.

I am sorry I cannot give you any statistics as to how many portrait studios are opened in this country yearly—but the number must be very considerable, I should say not less than one hundred, probably a great many more, and you as workers in London have far greater opportunities of taking advantage of these openings (except possibly in the matter of capital) than any others. You have the prestige of working in the great city, you have the best chance of getting employment and therefore training in many of the leading firms, you have endless possibilities at exhibitions, society meetings, galleries, art schools, shop fronts, etc., of examining and criticising and comparing other work with your own and of raising your own work to the highest standard. You have the facilities for study and association with other workers afforded by this and a dozen other photographic schools. You are trained in the most up-to-date and energetic business methods which exist in England. You have unrivalled conveniences in the way of cheap travel and excursions for finding out where openings exist, besides advantages in many other ways. Could you but fully appprehend the enviable position you occupy, both in fact and in the eyes of many isolated workers and thousands of others in poorer countries, you would go home from here to-night new men in thought, feeling and purpose.

If you asked me to give you something more definite, if you want, in fact, a formula as you would for developing plates, I would state, make up your mind while yet young—say 25—how you intend earning your living when you are 40 years of age or thereabouts, and whether you think of striking out for yourself. Don't think it is so far off that you can neglect it, for not only do the years pass with ever increasing rapidity, but the power of acquiring skill and knowledge also diminishes with equal rapidity. Begin, therefore, at once by saving a little, never mind how little, but put it by regularly. You will be sorely tempted at times, but whatever you do, do not spend it—the value of this saving is not so much to accumulate money as to teach you discipline and that you are master of yourself. At the same time work things along, by which I mean get the necessary knowledge and experience as opportunities occur. At first and for some while, perhaps a few years, everything may seem against you, then if you have kept to your purpose and to your duties to your employers, things will begin to come easier, and by the time six years have elapsed you will find yourself master of the situation, and will certainly want no advice from me. There are many circumstances which give rise to new openings for starting in business. A better position in town or street to attract custom. Better work. A special line or new style. A new suburb or place where there is no opposition or it is inappreciable. Greater personal attractiveness. Better business methods. In several places in Australia many people have their portraits taken at least once every year, giving a percentage of business in proportion to the population vastly greater than holds in England. The use of capital in fitting up more pretentious premises and developing a proportionate business. There is also a very considerable amount of buying and selling studios going on, more especially in the suburbs and Provinces. The chief points to mention in connection with buying a business beyond those which are obvious to everyone is that of being extra careful in respect to a very new business or a very old one, a most notable tendency existing for new businesses to go remarkably well the first season or so, and then, if they have not been founded on real excellence of work, or a real want, to die away. In the case of a very old business it is possibly in a state of decay beyond restoration. It is perhaps hardly necessary to mention these various points, any worker who has, through several years at least, been steadily preparing himself, not being likely to strike out either rashly or without proper inquiry and foresight. It is the man who suddenly thinks he will start in business and who has made no proper study or preparation who usually comes to grief.

Studios: Their Design and Position.

We next have to consider studios, and in order to do so in a sensible manner, must not only bear in mind the purpose for which they are to be used, but also the fact that they are part of a scheme for attracting business. If you wished to work amongst the well-to-do in any town, you would not build your studio in a dirty street, although the rent, the light and the structural condition of the place might be better than the best you can get in a more suitable locality. The first consideration therefore which you have to bear in mind is that the position of your studio is not only a good one, but the best possble; if it is not the best possible or approximately so, you at once invite competition. Therefore, in looking for premises or a position to build, do not be discouraged by the apparent impossibility of getting where you wish into starting at an inferior place. Sooner or later if you stick to it you will get where you want and what you want; or, if after long trial you really cannot get where you wish, start somewhere handy and let your fitments in your own private intentions be temporary for the purpose of moving when the opportunity occurs.

Next to locality you have to decide on the position and character of your studio, in relation to its affording facilities for conducting your business, and increasing your reputation. In country places, where land is cheap and the surroundings open, studios are generally built on the ground or first floor, and no fault can be found with these positions; but in large cities it has become customary to build studios on the roof, or close to the roof. We will, with your permission, trace the cause of this custom, as I consider it has been largely a case of follow my leader, and what may have been very correct, because necessary, twenty years ago, has become quite unnecessary and even fatal to success at the present time. When portraiture was first started, some sixty years ago, the Daguerreotype process and the lenses then in vogue necessitated the person whose portrait was required having his or her head

jammed into an instrument of torture, and keeping it there quite still for half-an-hour or so, and this, too, in bright light out-of-doors, the long exposure determining this procedure. After a while the Daguerreotype plate became, with the aid of bromine, more sensitive; also the Calotype, and later the collodion process, came along, the latter bringing with it a great increase in sensitiveness; but still the exposure in dull weather was very considerable, and this in my view determined the conservatory as the form of studio, and its position on the roof in towns as being a desire to obtain the maximum quantity of light; but as a place to conduct a lady in evening dress, or for the general convenience of business, one can hardly imagine anything less suitable. Consider only the difficulties with smoking chimneys all round in keeping the place clean and presentable, in keeping it at an equable temperature, and watertight. Consider the difficulties of a low roof, in order that the studio may withstand wind pressure, and the abomination put up with in the form of a multiplicity of blinds, in order to control a mass of glazing, handy, perhaps, for growing tomatoes under, but hardly the ideal place for practising modern portraiture, or raising the public estimation of the photographer as an educated man. Probably most men will agree with these sentiments, but is it really essential that photographers should spend their lives with the smoke, up among the chimney stacks, instead of on the ground, among their fellows in business? Take a plate and under expose it on a sitter in the studio. In nine cases out of ten it will give what is called a hard or chalky negative. This means that the high lights are still sufficiently exposed, but the shadows under exposed. Repeat the experiment with one-half or one-fourth the usual exposure, and the same result will probably happen. Try another experiment: take a piece of clean white blotting paper, pin it on the studio reflector or the wall opposite the window, and photograph it, with part of the reflector or wall included. You will find that the reflector or wall, although white or very light in tone, will photograph as black against the white blotting paper. What do these experiments mean? They mean, in the first place, that the reflector and studio wall, although white or light in colour, are slightly yellowed by the light and the smoke and dust to which they have been exposed, and that, therefore, they reflect a very small fraction of the actinic rays—that is, photographically speaking, they are as black as ink. They also mean that in such a studio nearly the whole effect of lighting is obtained by direct light coming through the windows or blinds; or, to put it backwards, it is owing to the lack of reflected light that the large extent of window area is essential. Try another experiment. On the shade side of a sitter place a big reflector covered with clean blotting paper, and take a photograph. You will now get a horribly flat picture, although the correct exposure is reduced maybe to one-fourth of what it is without the new reflector. Now close in your direct window light, take another photograph, and brilliancy is again recovered, combined also with very quick exposures. We may discover in this way that there are two distinct methods of lighting, one in which all except the darkest tones are obtained from the skylight, and the other in which all except the lightest tones are obtained from reflected light. In the first you have an interior which is nearly all glass; in the second comparatively little glass. I am afraid you are already beginning to perceive that I am forgetting myself, and rapidly falling back into an ordinary Tuesday's class lecture, for these things are A B C to the many talented photographers who are helping us with their presence to-night, and to them I offer my sincere apologies. But I am anxious to give the ill-shaped roof studio and the conservatory studio a bad name to-night, and to give the young members of the profession who later will be building studios of their own good reasons for departing from precedent, and making their studios decent brick structures, conveniently placed for business, a pride and a pleasure to work in, and comfortable and attractive to their clients. It was the late Mr. H. P. Robinson, our most talented artist photographer, who said the side-light studio will become the studio of the future. Should not Mr. Robinson's future now be the present, and is it not evident that with modern advances in plate manufacture, in lens construction, the necessity for so much skylight, and therefore the roof studio, is now a thing of the past? I have pointed out that a small glazed area (10ft. or 12ft. long by 8ft. wide) is ample, providing that proper and frequent attention is given to the surface of the reflectors and the walls of the studio; there is also no need for them to be a glaring white: they may be almost any tint of pink, purple, or blue, and yet retain their full power of reflecting the actinic rays. If, then, it is admitted that a side-light studio with a moderate window area is efficient, the whole argument which justifies the existence of the roof studio falls to the ground, for, with the aid, if necessary, of Chappui's reflectors for the low light, a studio light of the dimensions I have suggested can be obtained on the ground or first floor almost anywhere. Further, for the same reason, the glass or conservatory form construction can be dispensed with. Do not think I am speaking of these side-light studios from the theoretical point of view—there are now plenty of such in use, including quite a number of my own design, all of which, I believe, are giving complete satisfaction to their owners. We now come to our last heading—"Making a Reputation." Do we not all realise to-day that the practice of photography is becoming less and less a matter of lenses, cameras, and chemicals, and more and more a case of refinement in taste and treatment? I am not referring here to art. You may or may not be artists, but if you are honoured by a sitting from a king, your photographic reproduction should show someone who is every inch a king; your reproduction of a lady should be every inch a lady; and your reproduction of a soldier every inch a soldier. On the degree of power you possess in getting this quality in your work, combined with good taste and technical excellence, so will your reputation in the main depend. Everything, therefore, which will aid you in this respect should be thought out, worked out, and utilised—the significance of pose, the poetry of curve, and the magic of the light play should be a never-ending study. The invaluable help which can be given by a lady with good taste in the studio—a help never yet properly recognised—should be taken full advantage of. The art of the hairdresser and the dressmaker also should be requisitioned, for they are frequently the making of a difficult model. I do not mean that you should keep these specialists on the premises, but give the needful hint to clients. Besides this fundamental quality in your work, there are indirect ways of helping to make a name. During the past ten years or so, and contemporaneous with the growth of amateur photography, there has sprung up annual exhibitions of photographs in every part of the country; all these have classes open to professionals, which offer excellent opportunities for self encouragement and heightening a reputation. Again, publishing in a small way is very helpful. If there are one or two special views in your district, get good negatives, and have them reproduced and published in photogravure, which gives a quality quite unattainable by any purely photographic process. I referred in my opening remarks to a profession being a calling requiring some degree of learning. In almost every home nowadays one of its members practises photography, and wants help and advice. You ought to be the person whom he looks upon as the real authority, and to whom he comes for advice to take

him out of his difficulties. Not only should everything be done to encourage the public estimation of you as an authority in the subject of your profession, but everything should also be done which prevents or discourages such estimation. This is the great defect of the roof and conservatory studio—it is almost physically impossible to keep such a place really nice, the approach, the setting, and the surroundings being all formidable enemies: at its best a box of optical tools and a workshop, and I cannot close my remarks better than by expressing the belief that no one thing would do more to raise the reputation of the profession, both individually and collectively, than the general adoption of the side-light studio, a construction which enables the photographer to take as great a pride in the æsthetic decoration of his studio as he does in his work, and with equal benefit to himself—a decoration which, I need hardly say, should not be an ideal of stuffiness and mustiness, but one of actinic lightness, of neatness and of purity, of silver-grey distemper, white marble, and roses.

E. Howard Farmer.

Exhibitions.

PICTORIAL PHOTOGRAPHY IN YORKSHIRE.—EXHIBITION AT LEEDS.

Thoroughness is the chief attribute that Yorkshiremen lay claim to. Whether in the arts of peace or war, in matters social, political, or otherwise the native of the county of the broad acres possesses somewhat of the conceit of the Yankee, who has been known to boast that he can beat creation. As in the case of the Yankee, it is desirable, if one wishes to live at peace with those embraced in his immediate environment, to concede a large percentage of the Tyke's claims. Should one dare to go beyond that, he must confine himself to addressing the outside world in whispered humility. These ideas were borne in upon the writer when he paid a visit to the Leeds Fine Art Gallery at the opening of the Fifteenth Annual Exhibition in connection with the Yorkshire Union of Artists. On making one's way to the North Room, which has this year been devoted to exhibits of pictorial photography—so they are described, and it would be injudicious on the part of any self-respecting person to take exception to the description—the visitor is struck by the excellence of the work of the kindred spirits, the oil and water-colour brushmen, on the walls This, however, by the way. To come to the "Exhibition of Pictorial Photography," it may at the outset be stated that it claims to be international in its character, inasmuch as it embraces the work of British, French, German, and American artists. This is not the time or place to discuss the *raison d'être* of pictorial photography, which, as many people know, has its supporters as well as its opponents. Leaving out the arguments pro. and con. as to the general principle, it is safe to say that the Leeds Exhibition this year, so far as the art of photography is concerned, is decidedly interesting. In extent it has, we believe, perhaps been beaten by a neighbouring town; but it is only fair to Leeds to point out that the Bradford collection was not confined to the pictorial, while that in the West Riding metropolis is. Another excuse for Leeds—if excuse were needed—could be found in the fact that the present is the first exhibition of the kind ever attempted in the city, while some other towns in the north have previously, with more or less success, ventured upon similar lines. To summarise the results in a sentence, it would not be very incorrect to say that the British exhibits are characteristic; that the French are, both in subject and treatment, Frenchy—*très chic*; that the Americans have no very distinctive characteristic about them; and that, as to the German, there was an almost unanimous feeling that it were better had they been left to waste their alleged sweetness in the Fatherland. To deal with these last first, the Teutonic idea of pictorial photography, as represented by the specimens shown, is hardly likely to appeal to the taste of the ordinary sane Briton. Raphael, Dante Gabriel Rossetti, and Burne-Jones have their admirers, and rightly so too, because their work was largely idealistic; but sickly sentimentalism in semi-colour photography, especially when one fails to see what the artist is aiming at, is reducing the art dangerously near to the level of the grotesque. Our German neighbours are represented by a series of so-called lanscapes, which, to a Britisher, accustomed to ordinary photography, look, to say the least of it, decidedly queer. One instance will suffice to indicate the exhibits of Kaiser Wilhelm's subjects. There is a suspicion of a semi-coloured portrait of four trees, upon which the sun has had the remarkable effect of casting four elongated footpaths, with the weirdest of possible surroundings. Luckily for German art, these works have been grouped together, and one is inclined to suspect the Hanging Committee of having perpetrated a practical joke, inasmuch as they have been relegated to a corner which has to be carefully sought out lest they might be passed by. Some visitors may possibly have much to be thankful for.

Noblesse oblige—we next come to the works of our Gallic neighbours, who are represented to a large extent by figure studies, delicately and tastefully treated. Some of the most noteworthy examples of French production are those of Pierre Dubreuil, R. Demachy, C. Puyo, M. Bergon, and G. Grimpel.

There is no marked characteristic in the exhibition which would enable anyone to distinguish between the English and the American productions, and in order to economise space they may be embraced under the same category. Mr. J. Craig Annan has a clever character photo. in "The Etching Printer" (500); Mr. Clarence H. White produces two excellent ideas of "Spring" (502 and 513); Mr. Percy G. R. Wright has secured a thoroughly Dutch scene in "A Zaandam Windmill" (515); and Mr. F. Rust's "Murmuring Brook" (517) arrests one's attention.

Mr. Alex. Keighley's "Grace before Meat" (514) shows the masterhand in the selection of his subject; and Mr. Archibald Cochrane has several striking examples of his camera's work, including "The Sculptor" (525) and "The Quarry Team" (551). Exceedingly noteworthy are the examples of the work of Mr. J. H. Gash, a fine carbon worker; Mr. S. L. Coulthurst, Mr. J. Croisdale Coultas, Mr. Harold Baker, Mr. A. Horsley Hinton, Mr. . Rawlings, Mr. R. Bourke, Mr. W. T. Greatbach, Mr. C. Moss, Mr. F. Hollyer, Mr. W. R. Bland, and Mr. J. M. Whitehead. Mr. W. Thomas, a Yorkshireman, who spends most of his business time in London, has turned to excellent advantage the moments he can snatch between those devoted to his legal duties, a fact which is fully evidenced by several examples of his clever enlargements hanging on the walls.

Leeds photographic artists have sad reason to regret the death of Mr. W. J. Warren, who was devoted to the art, and was a leading spirit amongst the amateurs. His memory is revived by several striking specimens of his work, the last print executed before his death being "On the Quay" (662). Mention certainly ought to be made of a clever bromide enlargement of the entrance to the "Temple of the Tooth" at Ceylon, by Dr. Arthur J. Clayton, and of some character photos. by Mr. Percy Sheard, Mrs. Gertrude Käsebier, and Mr. J. Page Croft. Although numbering less than 400 photographic specimens, this section of the exhibition is well deserving of a close inspection, as it contains several features of interest alike to professionals and amateurs.

The frames are tastefully hung on a background of blue canvas, and the arrangement speaks well for the skill and selection of the Hanging Committee, Messrs. R. Bourke, J. C. Coultas, F. Rust, and Charles B. Howdill.

The Exhibition was formally opened on the evening of Tuesday, the 14th inst., at a social gathering by the Lord Mayor and Lady Mayoress (Alderman and Mrs. A. Edmund Butler) in the South Room of the building. The function was attended by a considerable number of artists and other professional gentlemen, many of whom were accompanied by ladies. The scene was of a brilliant character. In the Central Court an orchestral band, under the leadership of Mr. Irwin Sawdon, went through a very pleasing programme of music, which included excerpts from Wagner, Brahms, Edward German, Batiste, Chassaigne, Dvorak, Gounod, Rubinstein, and other composers. Light Refreshments were supplied in the North Room, which was hung with many of the chief oil-paintings on exhibition. Here the Lord Mayor was introduced by Mr. Edwin Tindall (Honorary Secretary of the Yorkshire Union). In declaring the Exhibition open, the Lord Mayor said: I have been asked on this occasion to address a few words of welcome to this Union of Artists, and I have great pleasure indeed, in my capacity as Lord Mayor of Leeds, in so doing. I am informed that this is the Fifteenth Annual Exhibition held in different parts of Yorkshire, and the third of them held in Leeds. You have only to go round these rooms and look at the works exhibited on the walls to understand that Yorkshire artists have no fear of being left behind in the race for honours. I bid you artists welcome here, and trust you may find the result of your artistic labours may meet with remunerative rewards as they deserve. I have again great pleasure in congratulating the artists in the Exhibition, and trust the results will be satisfactory to the Society; and I now declare this exhibition of pictures open. On the motion of Mr. E. Tindall, seconded by Mr. W. H. Thorp, a hearty vote of thanks was accorded to the Lord Mayor and Lady Mayoress for their presence that evening, which brought the proceedings to a close.

ROTHERHAM PHOTOGRAPHIC SOCIETY.

On Wednesday, Thursday, Friday, and Saturday (October 15, 16, 17, and 18) the Rotherham Photographic Society held its thirteenth

annual exhibition in the Rotherham Drill Hall, the largest public room in the town, and received a gratifying amount of patronage. There were eight competitive classes—viz., three open, four members, and one for local juniors; and the judging was undertaken by Messrs. C. Barrow Keene, F.R.P.S., and T. A. Scotton, of Derby. Their awards were as under:—

OPEN CLASSES.

A.—Photograph, any subject (previously medalled). Silver Medal. "Thoughts of Youth," Edward W. Strong, Windhill Vicarage, Shipley, Yorkshire. Silver Medal: "Leafless," A. W. Cooper, Preston.

B.—Photograph, any subject (not previously medalled). Silver Medal: "Norman Crypt," Thomas E. Carey, Gloucester. Silver Medal: "Ebb Tide," G. T. Harris, F.R.P.S., London. Silver Medal: "Cotton Grass," A. W. Cooper, Preston.

C.—Lantern slides (sets of four). Silver Medal: A. Bailey, Leicester. Bronze Medal: T. R. Bell, Acomb, Yorks (colour slides). Bronze Medal: S. Hughes, Sheffield.

MEMBERS' CLASSES.

D.—Photograph, any subject (Dr. Baldwin's prizes). Bronze Medal: "Genre," W. Firth. Bronze Medal: "Architecture," C. E. Davies.

E.—Lantern Slides (set of four). Silver Medal: J. C. Cox.

F.—Holiday Work (Miss Mary L. Egerton's prize). Silver Medal: "Architecture," H. C. Hemingway.

G.—Photographs from negatives less than ½-plate (six prints). Silver Medal: J. C. Cox. Certificate: J. R. Woodcock.

LOCAL CLASS.

Non-Members, age under 18 years.

H.—Four Prints ¼-plate or under. 1, G. H. Hatfield; 2, F. W. Shaw.

The opening ceremony was performed by Mrs. G. W. Chambers, of Clough House, and there was a representative company. Mr. E. Dale Hubbard, M.S.A. (the new president) occupied the chair. Each evening there were musical programmes and cinematograph and lantern-slide shows. The screens containing the photographs were lit by electric incandescent lamps, a special installation having been put into the hall for the purpose. So far as the entries went, there were seventeen in the "previously medalled class," ninety-nine in the "not previously medalled," and twenty-three sets of lantern slides. The members' section might have been stronger, and it was noticed that there was more versatility in regard to printing process and mounting.

EDINBURGH.

For the sixth year in succession the Edinburgh Industrial Exhibition has been held in the Waverley Market, Edinburgh. The exhibition comprises all classes of home work, and includes a photographic section, consisting of no less than 36 classes; it is questionable if any other photographic exhibition, far less photographic section of an exhibtion, has as many classes—which is a matter for sincere congratulation, at least from a reporter's point of view. The exhibition is run on popular lines, with the Royal Engineers' Band playing daily—the hall is spacious, and makes a delightful promenade—with the result that thousands visit it. The photographic section, that part of the exhibition with which we are particularly interested, is evidently not managed by experts, and it would be interesting to know the names of the members of the Hanging Committee, as their work is a powerful object lesson in "how not to do it." The list of entries contains very few names of well-known exhibitors—none of the local exhibition celebrities having entered. Amongst those from a distance might be mentioned W. J. Byrne, Richmond, who has some fine portraiture on show, including a series of Coronation portraits; Graystone Bird, Bath, who exhibits some of his dainty work; W. D. Brown, Lanark, who shows some good technique; C. E. Ross and J. Drummond Sheil, Edinburgh, also show good work; Thos. Kent, Kirkwall, shows some "small" work of a high order of merit; James Walker, Birkenhead, takes several "firsts" with work of rather unequal value. Miss Eames, Isa Llangollen; Miss McLauchlan, Edinburgh; Dan Dunlop, Motherwell, also show, but hardly improve their reputations. R. Readie, Edinburgh, gives promise of better work to follow some of the good work he has on exhibition; his "first" in Class 46 being a "true" rendering of a landscape. Although about 400 photographs are shown, the result can hardly be called inspiring. The prize awards were not all shown on the second evening of the exhibition, and what tickets were up were so large that they entirely obliterated many of the winning pictures.

The Photographic Club.—On Wednesday evening, October 29th, 1902, at eight o'clock, Mr. H. Snowden Ward, F.R.P.S., editor of the "Photogram," will give a lecture on the "Marvels of Photography."

Commercial & Legal Intelligence

The Austin-Edwards Monthly Film Negative Competition.—The prize camera for the current month has been awarded to Mr. Stanley Kemp Welch, jun., 57, St. George's Square, London, S.W., for his negative, "A Happy Little Mother."

In the recent compensation case of "Dalby v. The Woolwich Borough Council," Mr. Arthur Mortlock was retained as expert for Mr. Dalby, to give evidence as to disturbance, etc. He also settled the amount of fixtures, damage to stock, etc., with Mr. Bowen, of Messrs. Norman and Bowen, Covent Garden, and Mr. Scrivener, Surveyor (Messrs. Fuller and Fuller, 70, Queen Street, Cheapside, E.C.).

At the Stockton County Police Court, on Wednesday last, a man named Wilmot H. Turner was charged with embezzling several sums of money, the property of T. P. Cummings, photographer, North Road, Stockton. Several witnesses said they had paid the prisoner money for photographs, which they had never received. The man was seen at Eaglescliffe Junction by P.C. Dodds, who challenged him. The prisoner bolted and Dodds gave chase. A road sweeper upset the man with a brush, and the officer arrested him. He was committed to the Sessions. Prisoner was also committed to the Sessions for the larceny of 2s. 6d. from Mrs. Harrison, Eaglescliffe. He represented that he was the manager for Messrs. A. and G. Taylor, who were doing a cheap line. Messrs. Taylor said they knew nothing about him.

The following is the list of awards of the Warwick Competition for current month:—£1 prize, H. Avery, 319, Queen's Park Road, Brighton, "Country Life"; £1 prize, Miss A. Baird, Bellerive, Lausanne, Switzerland, "Chateau de Chillon"; £1 prize, R. A. R. Bennett, Walton Manor Lodge, Oxford, "Bargaining"; £1 prize, G. W. Clark, 1, Montholme Road, London, S.W., "Peasant going to Market"; £1 prize, H. B. Cookson, Kingswinford, Dudley. "Play!"; £1 prize, H. H. Lee, 69, Wandle Road, Croydon, "A Study"; £1 prize, F. Pinder, 245, Manchester Road, Burnley, "A Bit of Old York"; £1 prize, H. A. Roberts, Mostyn, Glossop Road, Sanderstead, "Fishing Boats, Lowestoft'"; £1 prize, A. F. Scott, The Nurseries, Knighton, Leicester, "Reapers"; £1 prize, T. Upton, 16, Aberdeen Road, Lewes Road, Brighton, "Studies at the Fish Market."

The Fine Art and General Insurance Company.—Statement of Accounts for the Year 1901.—The net premium income amounts to £69,966 17s. 2d., as compared with £66,374 8s. 1d. in 1900. The satisfactory increase in the year's profits shows the business has been well and carefully conducted. The revenue account of the year shows a net balance at credit of £11,634 5s. 6d., to which has to be added the sum of £745 5s. 1d. brought forward from 1900, making a total of £12,388 10s. 7d. now to be dealt with. Out of this sum the board recommend that a transfer be made to the reserve fund of £8,000, increasing that account to £35,000; that a dividend of six per cent., free of income tax, be paid on the share capital; and that the balance of £2,182 6s. 7d. be carried forward in account. The investments, which have been increased during the year by £10,000, are detailed in the balance-sheet, and have been taken, as usual, at cost price. The board have taken advantage of current rates to increase considerably the company's holding of British Government securities. The management of the Fine Art and General are to be congratulated on the profitable outcome of last year's working, the more so that, running their business on a lower rate level than the Tariff offices, they have managed to come out so well on the right side. They have, of course, had ample opportunity of criticising the results of the various Tariff offices, and are certainly entitled to a justifiable pride in the accounts they are able to present, and if we were to put words to unspoken thoughts born of friendly rivalry, we fancy that "they didn't know everythin' down in Judee," might be found simmering on the competitive side of the brains that so ably guide the fortunes of this free lance of the insurance world. It is evident, in considering the collective wisdom of insurance experts, that the business acumeun of the Fine Arts executive is a factor to be reckoned with, and the more general recognition on the part of the Tariff offices has done not a little to soften the asperities sometimes engendered by the keen competition of the younger office, and if the Fine Arts will, in its turn, contribute to the amenities, each side will discover that there is room for both, and that the action of one on the other is a tonic, bracing on the one hand and restraining on the other. The report for 1901, the first year in the second decade, shows an addition in net premium income of £3,600, and by a concidence the losses show a similar decrease, the total of the former reaching £69,966 and the latter £40,186, or 57.4 per cent. The expenses and commission, at £20,498, absorb 29.2 per cent., leaving as credit balance on the year's trading £11,643, which, with £745 from 1900, places at the disposal of the directors £12,388—£8,000 of this is bodily carried to reserve fund, thereby increased to £35,000, whilst the dividend of six per cent., an increase of one per cent., absorbs £2,200, and £2,182 is carried to the new year. No insurance man but knows that this is good business to come out of a year that has been notoriously bad, and although the accounts do not show how much is contributed by the burglary, contingency, and accident departments, we shall probably be correct in ascribing the growth in revenue and in profit principally to the fire department. The office has now arrived at a position when the separate workings of its various sources of income might be stated with advantage, and if the mention in the report that since the beginning of the current year the business has continued to show satisfactory progress is still upheld, the control will detract nothing from its high credit by severally stating the results of the business in which the company is

engaged. The Fine Arts are fortunate in having no serious competition in the non-tariff world, and as they are wise they will adhere to the policy of profit making, at which they are adepts, rather than fight for the residue of business they have hitherto let pass them. The following are the figures for the past five years:—

	Premiums.	Loss Ratio.
December 31, 1897	47,730	58.6
December 31, 1898	56,105	64.8
December 31, 1899	64,132	63.9
December 31, 1890	66,374	66.0
December 31, 1901	69,767	57.4

—"The Citizen."

ROYAL Photographic Society lantern lectures will be given at the New Gallery, 121, Regent Street, W., as follows:—The lectures commence at 8 p.m. Monday, Oct. 27th, "Round about Chamonix," by Mr. John Gunston; Thursday, Oct. 30th, "A Tour through Switzerland," by Mr. Samuel J. Beckett, F.R.P.S.; Saturday, Nov. 1st, "A Trip through Spain," by Mr. James A. Sinclair, F.R.P.S.; Monday, Nov. 3rd, "Camera Notes by an Amateur Field Naturalist," by Mr. Douglas English, B.A., F.R.P.S.

PHOTOGRAPHY as a Fine Art.—In its literary supplement on Friday last "The Times" published the following review of "Photography as a fine art" by Mr. Charles H. Caffin:—Can photography be reckoned among the fine arts? This is the question propounded by Mr. Caffin on the first page of his book. Almost everybody is an amateur photographer nowadays, and the idea is flattering to the general. Yet most of us will be inclined to return an instinctive negative to the demand. This handsome volume, however, is designed to prove by argument and example that photography is so to be reckoned, and if we are not convinced it is the fault neither of Mr. Caffin's letterpress, which is enthusiastic and eloquent, in the style of Corinth (U.S.A.), nor of his illustrations, which are for the most part excellently chosen and reproduced. Paul Delaroche, on seeing a daguerreotype for the first time, is said to have exclaimed "Painting is dead." This was too anticipatory. The camera has not yet quite superseded the palette, though it is impossible to deny the immense influence which photography has had for good and also for ill on the practice of artists, especially of draughtsmen. It has made for ever impossible a certain sort of loose drawing (Rowlandson; Phiz's illustrations to Dickens; Thackeray's to his own novels). It has raised in a sense the standard of precision. On the other hand, it has been responsible for a particularly stupid kind of drawing—null, void, unstructural, unselective, inexpressive, inhuman. Specimens are to be found everywhere. They have only a mechanical semblance of truth, without any of the interest or play of life; they are based on photography, and imitate where they do not actually copy it. Reputations (of a sort) have been founded on this misuse of the camera. No doubt the photograph can be, and has been, of much service to real artists, in whom it generally inspires a sentiment curiously compounded of admiration and aversion. Its capacities and its unintelligence alike fill them with despair. Nor are they likely, we think, to be converted by the persuasions of Mr. Caffin or the efforts of the "artistic" photographers which he reproduces. Many of these are charming in their way, and some are exceedingly clever. But no mechanical process, however much variety of manipulation it may admit, can be really a substitute for the work of the artist's hand and brain. A photograph, whether in or out of focus, however "large in conception and beautiful in feeling," however skilfully arranged as regards subject, scale, and lighting, however cunningly schemed to simulate the effects and mannerisms of particular painters, remains a photograph still. Cut and contrive it as you will, and give it whatever sounding label you like, it cannot take the place of a picture. It will always betray itself in over or under definition, in falsification of values, in the stolid emphasis it puts on the wrong things, in its blank omission of the very points on which the accents should be put. In his anxiety to avoid the natural fault of the photograph, which is to give far too much, the modern "artistic" photographer runs to the opposite extreme and swamps everything in a general monotone of fog. Even the best of Mr. Caffin's examples err in one way or the other, sometimes in both. Take a piece like Mr. Steichen's "Pool, Evening," one of the best of the landscape studies here; try to forget that it is a photograph and conceive it as a picture. Taken so, it is at once too empty and too detailed; parts of it are smudged away into nothingness, yet there are irreducible superfluities. Or take some of the portraits, Mrs. Kasebier's, for instance, extraordinarily dexterous and ingeniously put together to look like old or modern paintings, yet for all their pains deplorably irresponsible and unselective, overdoing this and missing that. Now "all painting," as Goya said, "is sacrifice and *parti pris*." To sacrifice for the photographer means to smudge and to efface. The children's heads in Mrs. Kasebier's "Sisters," on page 78, emerge hard and unchildishly grim from an abyss of blackness, "irrecoverably dark, total eclipse." In the most charming of her photographs, the portrait of "Miss D." the head is too black, the cheek and ear and hair disappear into a monotone, while the sleeve and scarf are far too much defined. Of the "manipulated" photographs, such as Mr. Eugene's "Nirvana" (described by Mr Caffin as "an interesting experiment; by the use of the brush and needle the sofa on which the model reclined has been converted into water"), and the "Portrait of a Child," in which "the dress has been etched, apparently to make an effective contrast with the face," we can only say that we dislike them heartily. Artistically speaking, the combination appears about as acceptable as a mediocre violin accompaniment to an excellent piano-organ. On the whole, it seems safest that the painter and the photographer should remain detached, each learning what he can from the other, but refraining from direct appropriation of his methods.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Oct.	Name of Society.	Subject.
24	Borough Polytechnic	*Lantern Slide Making by Contact.* Mr. F. W. Gregg.
24	Croydon Natural History	Exhibition of Home-made and New Apparatus.
27	Southampton Camera Club	*The Possibilities of a Modern Camera.* Mr Frank C. Wardell.
28	Birmingham Photographic	A Demonstration of *Bromide Enlarging.* By Mr. F. L. Ball.
28	Leeds Photographic Society	*Light and Lenses.* Mr. Edgar A. Heywood.
29	Leeds Camera Club	*The Motor Car as an Aid to Photography on Various Tours in Yorkshire.* Mr. Geo. Thistlethwaite.
29	Croydon Camera Club	*The Capabilities of a Universal Camera.* Mr. Frank C. Wardall.
29	Borough Polytechnic	*Sunny Memories of Normandy.* Mr. A. J. Reid.
29	Edinburgh Photo. Society	*The Camera; Exposure and Development.* J. F. Duthie.
29	Southport Photo. Society	*The Focal Plane Shutter.* Illustrated with Slides and Apparatus. Mr. Eustace F. Wallis.
29	Nottingham Camera Club	*What Can be Done with a Hand Camera.* Mr. C. P. Goerz.
29	Photographic Club	*Marvels of Photography.* Mr. H. Snowden Ward.
30	N.-W. London Photo. Society	Bi-Annual Competition. Mr. Styles. Medal is offered for the best Composition of a Landscape
30	Camera Club	*Sculptured Tympana of the English Norman Doorway.* Mr. Charles E. Keyser.
30	London and Provincial	*Suggestions.* Mr. W. Thomas.
31	Borough Polytechnic	*Development—in Theory and Practice.* Mr. Ernest Human.
31	Croydon Natural History	Demonstration by Messrs. Lumière on their New Colour Photography.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

OCTOBER 16TH.—Mr. T. E. Freshwater in the chair.

In regard to a theory brought forward at the previous meeting as to the continuing action of light on a piece of exposed carbon tissue, and such action affecting a piece of unexposed tissue if left in contact long enough, the result of an experiment on these lines was passed round by Mr. Featherstone, which proved that such action could affect a piece of unexposed tissue, although the image was very faint and too flat to be of any practical use.

Mr. A. L. Henderson, referring to toning baths, remarked that he was of the opinion that a better chance of permanence in a silver print would be obtained by the employment of silicate instead of sulphocyanide or other agents, in conjunction with the gold or platinum, as silicate of potassium would throw down the metal as a silicate of that metal, which in theory and practice would be a more perfect deposit than any other.

The subject of the "Henderson Award" was brought before the meeting by the chairman, and the hon. secretary made a proposition from the committee as to the best means of making the award. Numerous propositions and amendments were advanced and discussed, the meeting terminating with no decision being arrived at.

PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

EDINBURGH BRANCH.

A MEETING of the Edinburgh branch was held at 38, Castle Street, on Friday evening, 17th October, at 8 o'clock, Mr. Alex. Inglis in the chair. Present: Messrs. Inglis, Burns, Auld, Swan, Watson, Patrick Bibbs, Balmain, and Moffat.

The treasurer made his first annual report, showing a small credit balance. The chairman read a letter from the hon. secretary of the Association, in which the following subjects were suggested for discussion:—(1) Should the electric light committee of the town be approached with the view of their supplying electric power at motive rate to photographers for printing purposes. (2) The prevention of fraudulent practices by dishonest photographers. (3) Should photographers adopt the Kodak Company's principle of preventing their copyright photographs from being undersold by those to whom they supply them at wholesale prices.

The following questions were also discussed:—(1) Is it more profitable in a photographer's business to employ male or female workers? (2) Does the awarding of medals at exhibitions do good or otherwise to the professional photographer? The above subjects were fully discussed, and a vote of thanks to the chairman terminated the proceedings.

The date of the next meeting was fixed for Friday, December 12th. Subjects to be discussed: Plates; returned proofs.

LIVERPOOL BRANCH.

A MEETING was held on Friday, October 10th, 1902, at the Alexandra Hotel, Dale Street, Liverpool, Mr. G. Watmough Webster in the chair. The discussion was resumed on fire insurance, and it was decided that each member using the information gained should act on his own initiative to get his premiums at least one-third reduced, or bring the matter up

gain. The question of Post Office methods, etc., was discussed, and many useful ideas were ventilated. The chairman explained a capital system of stamp checking which had been used in his establishment a long time. It was proposed by the chairman, seconded by Mr. Dondew, and carried, that the hon. secretary be empowered, on his own initiative, to write to any photographer he might think likely to become a member, to invite him to join the Liverpool Branch of the Professional Photographers' Association. Mr. Vanderbilt proposed and Mr. Morris seconded, that a dinner be held at headquarters on Friday, November 28th, tickets to be 5s. each, morning dress. Mr. Warrington, Mr. R. Brown, and the hon. secretary were appointed the dinner and entertainment committee. It was decided to hold the next meeting Friday, November 14th, at 8 o'clock, when all business left over will be completed.

LEEDS CAMERA CLUB.

The opening of the new rooms of the above club at "The Athenæum," 9, Park Lane, on Wednesday last week, was inaugurated by an address on the above subject from Mr. W. Thomas, whose lectures are always well received, and whose presence brought a crowded audience together. Mr. Bourke, in introducing Mr. Thomas, referred in sympathetic language to the sad loss the art of photography had sustained in the death of Mr. J. W. Addyman, an ardent worker, and the secretary was instructed to forward the following resolution to the family: "That the members of the Leeds Camera Club now assembled respectfully tender their sincere sympathy to the family in their sad bereavement," which resolution was passed in silence.

Mr. Thomas, in opening his remarks, referred to the Leeds Exhibition, stating that he thought the collection of pictorial work shown there was one photographers need not blush for, and a visit to the Gallery would do them all good. They would be able to see what others in different parts of the country were doing, and enable them to understand the object with which they set about their work. He would suggest that the members of the Society and all others interested in photography would receive distinct advantage if they could be taken round the Exhibition in parties by arrangement, under the guidance of some leader who had made a life study of picture making, and he was pleased to be able to announce the names of four clever and highly-respected artists who were exceedingly well qualified for such a task, and who had kindly consented to give their time and services to such an object, viz., Messrs. J. W. Brooke, W. G. Foster, Lester Sutcliffe, and W. E. Tindall, and he ventured to think they would have a pleasant and profitable time of it. To hark back to the subject of his lecture, his first suggestion would be that they should arrange for a local painter to execute a black and white sketch of an accepted subject as a standard for members to work to, this sketch to be loaned out during the year to members, and at the close of the year an examination of the results produced by photography be made by the painter. It was immaterial for the purpose in view whether the sketch were true or false; what they had to do was to try by means of their photographic implements to get as near as possible an approach to the result the painter had given them.

His next suggestion would be that a quarter-plate negative of exceeding good quality should be obtained, and from that a good high-class bromide enlargement secured and exhibited in the Society's rooms, or loaned to such members as desired it, and he thought they would learn more about photography in a short time by adopting this course than in a year's result of work.

Again, he would pay great attention to the younger members of the Society, who were far more important to the continued life and prosperity of the Society than the "old fossils." It was by the new blood, by those that he might term "coming on," that photography would have to be carried on in the future, and it was an important element in a Society's life and work to keep them together and create the greatest interest in the work of the Society. He would further point out the advantages to the Society of taking some standard work written by those who had carried out investigations by pure photography, and devoting an evening to the reading of a chapter and afterwards discussing same; many pleasant and instructive times might thus be passed. Proceeding, in regard to developers he thought that if a series of plates of the same subject be taken, given the same exposure under standard conditions, developed to the same point by different developers under like conditions, and then passed into the hands of a small committee, they would find the results extremely interesting and of great value in their daily work as photographers. The lecturer afterwards read several extracts from Ruskin on the duty and necessity of observing nature's truths in art, and following a series of lantern slides was shown, illustrating the effects produced by out-of-focus conditions, and a most instructive and enjoyable evening was brought to a close by a hearty vote of thanks to Mr. Thomas for his presence there that evening being accorded with acclamation.

CROYDON CAMERA CLUB.

An unusually crowded attendance of members assembled on Wednesday, the 15th inst., to hear a lantern lecture by Dr. E. F. Grun upon the recent advances he had made in his now well known liquid lens.

In the course of his remarks on introducing the lecturer, the president (Mr. Hector Maclean, F.R.P.S.) described the lens as the most remarkable optical invention of the century, and stated it frequently happened regarding notable inventions, that they were first sneered at by specialists, next laughed at by the world, and finally pecksniffed by astute capitalists.

Dr. Grun, who spoke with lucidity and an invigorating freshness of style, as a preliminary asked his hearers to bear in mind that the lens system he had adopted was contrary to all the rules of mathematical optics. Academic men had told him that his system was an impossible one, and that on the lines he had laid down it would be impossible to get an aplanatic, anastigmatic, or even achromatic lens. For photographic work, the Doctor thought an absolutely aplanatic lens was not required, an opinion, we think, which will hardly be shared by the majority of photographers, who (except for special purposes) have a partiality for a lens capable of the finest definition at full aperture. The lecturer then passed on to a clear exposition of the action of crown and flint glass lenses, the effect of their curvatures, their limitations, and defects. The relationship between refraction and dispersion was next considered, and it was pointed out that the more diffraction and less dispersion one could obtain from any specimen of glass, the more valuable from an optical point of view that particular glass would be. The introduction by Messrs. Abbe and Schott of the Jena glasses, possessing high refractive indexes combined with low dispersive power, had enabled opticians to obtain lenses of great rapidity, with a flat field, and freedom from astigmatism. In his lens he had availed himself of oily and non-volatile fluids, free from turbidness, and had obtained a high initial intensity, with good correction, as the members might judge for themselves later. Objection had been raised as to the employment of liquids on the ground that an alteration of temperature would cause a great alteration in the system. This was not so in practice, no discoverable alteration took place between 40deg. and 150deg. Fah. Dr. Grun here had two grievances to ventilate, one against the modern lens makers for surrounding their lenses with a certain amount of mystery, the other in calculating the $\frac{U-1}{ND-}$, not from the total dispersion, but from the medium dispersion between the C and F lines. This might be all very well for telescopes, but for photographic lenses, between F and G was the most important part of the spectrum. The members looked quite sympathetic when the Doctor went on to say that this had "thrown him off the scent" for some time, as an amateur lens maker. He did not propose going into the question of spherical aberration that evening, but his audience had no doubt been somewhat interested in a question that had been recently raised concerning depth of field. In The British Journal of Photography for the current week, there was a paragraph querying the necessity for rapid lenses, and giving the old and fallacious statement that with a large aperture it was not possible to get depth. He strongly disagreed with such view, and subsequently, in answer to a question, said that depth of field, apart from aperture and focal length, was greatly influenced by the quality or nature of the glasses and construction of the lens. The more rapid the lens the better, but it must possess depth of field.

The address, which was interspersed wits humorous touches, extended over an hour, and was listened to with marked attention. This probably did not signify a complete assent to all that the lecturer had advanced. A large number of lantern slides, taken chiefly from the pits of various theatres, were then shown on the screen, and judging from the more recent slides, Dr. Grun is to be congratulated on the improvements he has made in his lens. The definition may fairly be described as good, and considering the conditions under which the photographs were taken, the results astonishing. The illumination being the usual stage lighting, a truer effect was obtained than if flash-light had been employed. The lens, a quarter-plate one, had an equivalent focal length of 6 inches, and an effective aperture of f/2.5. Exposures varied according to the light and circumstances; quarter second was frequently given, a momentary pause in the play being watched for. Some of the photographs had only received 1-50th second, but here, as might be expected, under exposure was apparent. Moonlight scenes were next shown, receiving about 15 seconds. In some cases this had proved more than sufficient, a daylight effect being produced. A striking slide illustrated the capabilities of the lens in combination with a telephoto attachment. An instantaneous exposure was given with a magnification of 6 diameters, at a distance of over a mile. Some experimental three-colour photographs of stage effects with ordinary lighting were next passed through the lantern. As attempts, if not very successful ones—they deserve notice. In answer to a question by Mr. G. W. Watson as to whether the fluid contained in the lens system, could be tinted so as to dispense with the necessity of a separate light-filter, Dr. Grun replied that it could be so tinted, and he had applied for a patent for the application of the idea. The Grun lens hand camera was then inspected, and created a favourable impression. The hon. secretary (Mr. E. A. Salt) in opening the short discussion which followed, deprecated the idea that any mystery attached itself to the modern anastigmat. These were patented and their formula open to all who understand them. As regards depth of field, for a given circle of confusion, and assuming all aberrations corrected, and the field flat, depth, he thought, purely depended upon the effective aperture, focal length, and position of the stop in reference to the nodal points. The last factor (apart from telephoto work) he understood, only became appreciable when working at close quarters, and might, in the ordinary way, be disregarded. He considered the slides shown capital, and was glad to hear that a non-volatile fluid was employed by Dr. Grun. It would be quite a new experience for an operator to have the back combination of his lens driven into his skull, together with fragments of the focussing screen, owing to a sudden rise of temperature.

Mr. C. E. Kenneth Mees said he was exceedingly pleased to have been present and to have heard so remarkable a paper. He dissented from a differentiation which the President had made earlier in the evening between "Scientists" and "Inventors." He knew of no important invention in which the discoverer was not a scientist, or had not shortly after become one. As to Dr. Grun's remarks about dispersion, he suggested that the dispersion from F to H might be proportional in all glasses, to the dispersion from C to F, and that the effect of a curve on the focal length might also be proportional to the difference in refractive index of the media it separated. He considered rapid lenses most desirable, and as the result of some recent experiments on the limits of exposure, wanted the fastest lens he could obtain. The peculiar field of the telephoto lens was a good

example of the effect of the construction of the lens on the depth of field.

Dr. Grun having briefly replied, the President, in felicitous terms, moved a vote of thanks, which was heartily seconded by the Rev. Henry J. White, and carried with loud applause.

Mr. A. E. Isaac ably handled the lantern as usual.

CROYDON MICROSCOPICAL SOCIETY.

On Friday evening last, Mr. Wardall, representing Messrs. Houghton, gave an interesting exposition of the Sanderson camera in its various forms, fully describing its uses, peculiarities as distinguished from all other cameras, and its capabilities, clearing up in the most satisfactory manner points upon which certain of the members were doubtful. He also demonstrated the Beck-Steinheil Tele-photo lens as applied to low, medium, and high power, lucidly explaining how to obtain the best results. The Beck-Harris colour screen was also shown and explained, and a most intellectual evening was brought to a successful close by the exhibition of a number of very beautiful lantern slides, illustrating what can be done with the above cameras, lenses, and screen. On the motion of Mr. Baldock, the chairman, a hearty vote of thanks was given to Mr. Wardall for his very successful demonstration.

LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

October 15th.—Mr. E. R. Dibdin (president) in the chair.

The lecturer for the evening was Dr. Llewellyn Morgan, who gave a practical demonstration of the platinotype process, dealing with the various means by which the print may be developed. The lecturer gave a number of very useful hints as to the keeping of the paper, temperature of the baths, etc. He also demonstrated the method of obtaining warm brown tones on platinum paper, which was recently published by Mr. C. F. Inston, another member of the Society, and developed several prints, which on being passed round the audience were much admired.

HILLSBORO' AND DISTRICT PHOTOGRAPHIC SOCIETY, SHEFFIELD.

The monthly meeting of the above Society was held on Wednesday, October 8th, in Makin's Schoolroom, Hillsboro' when a lecture by Mr. G. P. Goerz on "What can be done with a Hand Camera," illustrated with lantern slides, was read. The lecture was listened to with very great pleasure, and was both interesting and instructive.

After the lecture, several slides belonging to the members of the Society were shown through the lantern.

There was a good attendance of members, several new ones being proposed, bringing up the total membership to about 50.

Wolverhampton Photographic Society.—On Monday, the 13th inst., Mr. James Gale gave a lecture entitled, "An Introduction to Architectural Photography," his remarks being illustrated by some fifty excellent slides made by himself.

The Rontgen Society's ordinary general meeting will be held on Thursday, November 6th, 1902, at 20, Hanover Square. The chair will be taken at 8.30 p.m. Agenda: Minutes of last meeting; nominations; the President will open the session with an address.

We regret to learn of the death of Mr. H. J. Dalby, photographer, of Wellington Street, Woolwich. The deceased gentleman, who succumbed to an attack of pneumonia, was a member of the committee of the Professional Photographers' Association.

The Royal Photographic Society of Great Britain.—On Tuesday, October 28th, at 8 p.m., at 66, Russell Square, Mr. William Gamble will give a demonstration of the Sinop Collotype Process. The Society will be pleased to welcome anybody interested in this process.

The Lumiere North American Co., Ltd., of 4, Bloomsbury Street, W.C., inform us that they are willing to demonstrate the L.N.A. process of colour photography to approved photographic societies. Applications for dates should be made at earliest, and average attendance quoted in all cases.

The Thornton-Pickard 1902 Prize Competition.—We are asked to announce that, owing to the large increase in the number of entries, it has not been possible to publish the list of prize winners as early as in former years. The judges have, however, nearly completed their work, and hope to announce the names of the winners next week.

"How to Look at Pictures" is the title of a book which Messrs. Bell will publish immediately. The author, Mr. R. C. Witt, intends it for those who are interested in pictures and painting, but have no special knowledge of the subject; and from want of some such guide, fail to obtain the full enjoyment from their visits to picture galleries and exhibitions. It will be fully illustrated.

At the annual meeting of the Grangemouth Amateur Photographic Association, Provost Mackay and Rev. Mr. Hamilton were re-elected hon. president and president respectively. Dr. McGowan was elected vice-president: Mr. Marshall, hon. treasurer; Mr. Walter Bain, hon. secretary; and Mr. Maryon, asst. secretary. It was decided to hold a three-days exhibition in April, 1903, on dates to be announced shortly. In the open section there will be classes for (*a*) Landscapes and Seascapes, (*b*) Portraiture and Genre work. Silver and bronze medals will be awarded in each class, and there will be a gold medal for the best picture in the exhibition. The names of the judges, with whom arrangements have not yet been quite completed, will be a guarantee of the awards being according to merit. Full particulars will be obtainable shortly from the secretary for the exhibition, Mr. F. W. Maryon, Marshall Street, Grangemouth, N.B.

Correspondence.

*** *Correspondents should never write on both sides of the paper.*
notice is taken of communications unless the names and addresses the writers are given.

*** *We do not undertake responsibility for the opinions expressed by o correspondents.*

KODAK, LIMITED, v. THE PHOTOGRAPHIC TRADE.—A CLEAR STATEMENT OF THE CASE.

To the Editors.

Gentlemen,—The restrictive policy of Kodak, Limited, towards th photographic trade has now been before the public for nearly tw years, and among the many statements and counter-statements whic have been made it is to be feared that the real points at issue are i danger of being obscured. We, therefore, think that the time ha now come for a plain statement of the case.

Nearly two years ago Kodak, Limited, issued a circular to th trade threatening to refuse to supply any photographic dealer wit Kodaks and films who sold any roll-film camera or films not made b themselves. It is absurd for anyone to contend that this was not a attempt to secure monopoly. Thanks, however, to the opposition o the public and the trade combined, this attempt to restrict trad failed, and, after about twelve months, the objectionable condition were withdrawn.

This withdrawal was, however, only in order to create a monopoly by different means. Photographic dealers were then informed that they would not be refused supplies, but that their profit would be reduced to about one-half if they sold rival productions. To insure their usual profit they were required each month to sign a declaration that no roll-films or roll-film cameras had been sold or kept in stock except those made by Kodak, Limited.

Retail dealers, although resenting almost to a man this attempt to restrain them from free and open trading, have, many of them, especially the smaller ones, been obliged to accept the conditions. Even those who, upon principle, have resisted the objectionable conditions imposed, and have decided, rather than submit to them, to lose half their normal profit upon all Kodak roll-films and apparatus, are not left alone. Pressure is brought upon them in every conceivable way to induce them to refuse to supply all other roll-film apparatus than that sold by Kodak, Limited. This continual pressure upon the retailer is very difficult for him to resist, and it is in order to put a stop to such a state of affairs that the Photographic Trade Association have decided to appeal to the public to assist in defeating the evident aim of Kodak, Limited, to secure a monopoly for an American company for American-made goods to the exclusion of everything British. If the public insisted on having the particular make of roll films and roll-film apparatus they desired, the attempt at monopoly would be frustrated.

The next point to be considered is: What is the tendency of the policy of monopoly and restriction? The accumulated experience of all countries goes to show that although a patent to secure a monopoly for a few years is an advantage in order to encourage invention, monopoly of any permanent nature is most injurious to all concerned. All stimulus to invention goes; quality is not improved, and prices are not reduced without wholesome competition, and not only the trade but the public suffers from the effects of monopoly. Kodak, Limited, have done much in the past for the photographic public; but they have fully reaped the reward by making every possible use of the patent laws. Any further monopoly would bring about a state of stagnation that would ruin the industry.

In addition to this it may be confidently asserted that the attempt to restrict trading will not be confined to roll-film cameras and roll-films. A monopoly, being an artificial system of trade, it needs constantly bolstering up and adding to if it is to succeed. This has been seen in every monopoly and trust that has been put in operation, and will be the case with all attempts to monopolise any branch of the photographic trade. It may be pointed out in support of this statement that in America the Kodak Trust control the bulk of the photographic trade, with the exception of plates and chemicals, and that quite recently they have acquired an interest in the manufacture of plates, the object of which it is not difficult to guess. The logical outcome of the position is, that if the public allow themselves to be dictated to by Kodak, Limited, in the matter of roll-film cameras and roll-films, before long the only free articles left may be chemicals.

The Photographic Trade Association, which includes several hundreds of photographic dealers, wholesalers, and manufacturers in Great Britain is concerned in: The prevention of any monopoly; the giving a fair field and no favour; free trade for all.

To show that the Association is a thoroughly representative and influential body, a list of the Council is given below:—W. M. Ashman (Bath); A. H. Baird (Edinburgh); M. Ballantine (J. Lizars); George Barclay (George Barclay and Sons, Limited); C. Beck (R. and J. Beck, Limited); F. Bishop (Marion and Co., Limited); G. M. Bishop (Marion

and Co., Limited); Arthur C. Brookes (Editor of "The Photographic Dealer"); W. F. Butcher (Butcher and Sons); J. Christie (Sheffield); M. W. Dunscombe (Bristol); J. J. Elliott (Elliott and Sons, Limited); G. Frost (Alton); R. Green (City Sale and Exchange); J. Henderson (Aberdeen); George Houghton (George Houghton and Son); E. W. Houghton (Houghton and Son); F. K. Hurman (Newcastle-on-Tyne); L. M. Isaacs (J. Levi and Co.); L. Joseph (Charles Tyler and England Brothers, Limited); F. V. A. Lloyd (Liverpool); D. A. Lowthime (London); J. Lillie Mitchell (London Stereoscopic Co., Limited); H. F. Purser (Busch Camera Co.); A. S. Spratt (Spratt Brothers); C. Tyler (Tyler and England Brothers, Limited); C. H. Watson (Watson and Sons); J. B. B. Wellington (Wellington and Ward); Jesse Williams (Cardiff); J. Brooke Wilkinson, Secretary.

The history of photography shows that its steady advance has been due to the survival of the fittest of all the inventions and processes that have from time to time been introduced. Without a free and open market new methods cannot be put on their trial. It was not always those that promised best that have proved most successful. Actual trial is the only means of testing a new process; and it may safely be asserted that had any large monopoly existed in times past many of the valuable inventions and processes now in use could never have been tried.

The ultimate decision rests with the photographic public. British manufacturers have no desire to exclude goods of any make, whether British or foreign, from competition. They ask for nothing but a free and open market, and they have a right to expect the support of their countrymen in their British opposition to an American monopoly.—We are, yours faithfully.

THE PHOTOGRAPHIC TRADE ASSOCIATION.

89, Farringdon Street, London, E.C., October, 1902.

THE KODAK COMPANY'S REPLY.

To the Editors.

Gentlemen,—An opportunity has been afforded us of replying at once to a circular now being issued by the Photographic Trade Association. The circular charges us with attempting to secure a monopoly in rollable film goods, and contains further a statement of the objects of the Photographic Trade Association, and gives a list of the gentlemen forming its council.

Monopoly.—However absurd it may seem to the Photographic Trade Association, we simply repeat that we do not seek monopoly. In the first place, it should be clearly understood that, apart from our rollable film business, the whole of our goods are sold on precisely the same principles as those of any other manufacturer. With regard to our rollable film business, our conditions are framed to protect our customers from the many flagrant imitators of our products that are put upon the market by manufacturers who are endeavouring to make a trade by the aid of our prestige and our trade names. This cry of "Monopoly" is a device resorted to by such manufacturers and wholesalers, under the shield of which they hope to get facilities for diverting to themselves some of the vast trade we have created in rollable film goods. We intend to hold our own by good quality and good service, and the only monopoly we seek or care for is that which the public choose to give us. We have made the rollable film trade, and have in the past had from eight to nine tenths of it in our hands. Practically the same state of affairs exists now. Most dealers find it best worth their while to sell only rollable film goods of our manufacture on account of the world-wide reputation and uniform quality possessed by our products and the universal demand there is for them, and further to avoid complication of stock. What we want to point out is that they use their own discretion solely as to whether they shall sell only our goods or whether they shall sell imitations as well as our goods.

If any dealer states that he is not allowed to sell other rollable film goods than those of our manufacture he is saying what is not true. As far as this company or its conditions are concerned, it is open to him to sell just whatever he elects to sell. He can sell even those articles that everyone admits to be piracies, and at the same time he can stock and supply our products also, and net a discount from us varying from 14½ to 23½ per cent.—discount superior to what are secured on many staple articles in other trades. Extra discount on some items, amounting in all to more than 35 per cent., can be secured if he elect to sell our rollable film goods only. In such event there is no undertaking called for on his part. Any extra discounts he is entitled to he claims as a legal right. He is not bound by any engagement; he can change his mind and his practice at any time he pleases.

Anyone who takes the trouble to understand our conditions of sale will see that they are framed in the interests of the trade, and to protect to some extent the thousands of Kodak users—beginners and uninitiated—against the danger of their being deceived by other articles made up like ours being handled together with our goods.

As regards these imitations, all your readers are probably not aware that in every single instance the get-up of our appliances is closely imitated, and our gauges, special and peculiar to ourselves, are exactly and minutely copied. Not only is this so, but such imitations are actually offered to the public under the description of our registered trade names. Purchasers desiring our goods have over and over again, to our knowledge, been supplied with other products sold under our trade-mark descriptions. No doubt the great success of the apparatus we have introduced, and the enormous trade we have created, tempts the imitator. We wish it distinctly understood that we make no complaint of such a state of things. We look upon it as a penalty of our success. A few parasites may, after all, be good or us. We can leave this part of the subject to the public. As far as we can see, people are coming more and more to recognise the fact that imitations sold and pushed forward as being "just as good," are not to be relied on for quality or uniformity, and it is very questionable whether many people, upon reflection and full information, would desire to encourage such an imitative trade, or the practice of substitution, which is bound up with it. It is not, however, as we have said above, our desire to take exception to imitations provided they infringe no patents or trade-marks. It is only as far as they lead to substitution practice that we take cognisance of them; and, as competitors with the imitators, and to protect our Kodak users, we have simply framed our conditions to hold our own against them. The policy we have followed, and still intend to follow, is to do our best by the persuasion of good terms, good quality, and fair prices to get the trade and the public to favour our products.

A good deal has been made of the Kodak Company having ceased to use the channel of the wholesalers for distributing their goods. The reason of this will very easily be understood by business men. The wholesalers are middlemen, and the modern tendency is to do without the middleman and the factor. Both the retail dealer and the public benefit thereby in getting goods that are fresher, and securing the benefit in the cost of goods to them of such extra discounts as are in the habit of being taken by the middlemen.

The active element of the Photographic Trade Association is composed principally of these wholesale dealers, and their object in making the present stir is to secure sympathy for their substitution goods, which they have incited the imitative manufacturers in Germany and in this country to produce.

The association was brought into being with the express object of working up animus against the Kodak Company, and for no other purpose. The largest and most famous of the plate and paper making firms in the country are not in any way concerned in it.

The trade in the States.—As regards the conditions of Kodak trade in America the facts are these: The profits to the dealers on Kodak goods in America are larger to-day than at any previous time. The conditions in force there were voted for by 95 per cent. of the trade before they were instituted. Similarly, retail prices to the public have been considerably diminished and better value given with every step in the progress and improvement of production.

The association seeks also to mislead the public by playing upon a pseudo-patriotism. It is alleged that the Kodak conditions are made to secure monopoly for an American company. The impression sought to be given is that all our Kodak goods are made in America. This is by no means true. Some of our products are, it is correct, made in the States, but Kodak, Limited, is an English company, and is the largest British manufacturer of photographic goods, employing at its British branches and factories over 700 employees and hands, all British subjects. But even the American Kodak Company is not altogether the foreign concern our competitors would have the readers of this circular believe, for nearly three-quarters of the shareholders in that corporation are British.

In view of these facts, we think the prejudice of the Photographic Trade Association in this matter will be readily understood.—Yours faithfully,

KODAK, LIMITED.

43, Clerkenwell Road, London, E.C.
October 21st, 1902.

[The appearance of both the foregoing letters in the same number of the JOURNAL is due to a suggestion of our own that readers should have both sides of the controversy simultaneously presented to them. Our correspondence pages are open to the reception of letters on the subject; but our own comments on the situation are reserved until such time as we may think it desirable to terminate the discussion. It is, however, right to say that, during the last few weeks, efforts have been made by the editors of the photographic Press, acting in perfect agreement throughout, to reconcile the differences existing between the Photographic Trade Association and Messrs. Kodak, Ltd., but without success. The ventilation of the matter in these and other columns may, it is hoped, enable the photographic public to acquire a correct understanding of the present position as to the sale of roll films and cameras, and we are therefore open to receive expressions of the views of those interested.—EDS. B.J.P.]

THE BIRMINGHAM PHOTOGRAPHIC SOCIETY.

To the Editors.

GENTLEMEN,—We desire to call attention to the following points of importance, which may be of interest to other Photographic Societies, who, dissatisfied with present conditions, may desire to raise their subscription in order to provide increased facilities for members, but who hesitate to adopt such a course.

Twelve months ago the Birmingham Photographic Society were in occupation of rooms in a quarter of the city, which, to speak moderately, was not the most salubrious or the most fitting for a society of its standing and reputation. The sole conveniences were the use of a meeting-room, a second small room being used for the storing of exhibition plant. The apparatus available was an enlarging lantern, which required carting home before use, and an optical lantern, utilised once monthly, for members to test lantern slides.

The natural result of so slight advantages accruing to membership resulted in decreased numbers and slight excess of expenditure over income. At this critical period in its history, the society fortunately possessed a strong council, under the chairmanship of one of its oldest and most enthusiastic members, Mr. A. J. Leeson, under whose able guidance a bold and determined measure was agreed upon by the council, being no less than a recommendation to the society to increase its subscription from 10s. 6d. to 21s., the object being the provision of first-class accommodation in both meeting-room and dark-room, and the bettering of the programme of fixtures; entire dependence on such increased facilities being relied on to, if possible, retain the present membership, and also for the attraction of new members.

The society accepted this recommendation, and our annual report for this year shows most conclusively the wisdom of the course adopted, as during the year no less than 45 new members were enrolled, while the total resignations have been 25, of which 13 were due to members leaving the district, and 4 to illness.

The new rooms are facing the main central square of the city opposite the Town Hall, and are on the second floor, being reached by a lift, and consist of one meeting-room, 33 feet long, 24 feet wide, 15 feet high, and dark-room, 23 feet long, 10 feet wide, 15 feet high, also a general storing room.

The meeting-room is most conveniently and comfortably furnished and fitted with the electric light, while the dark-room, in which four members can work at the same time, is illuminated by eight electric ruby glow lamps, fitted with variable intensities of light, to suit different speeds and classes of plates and paper. There is also an enlarging table, 14 feet in length, and fitted with every desirable movement necessary for accurate and rapid work, and designed to enlarge from ¼-plate or whole plate to 24 by 20 in either plates or paper. This table is unique, being the first made of this size, to suit special club requirements, and is of teak throughout. By its aid the manipulation of large size plates is so easy that lady members are quite enthusiastic in its praise.

In addition, lockers, washing sinks, drying racks, hot water supply, and fixing table, together with two lead-coated troughs, 4 inches deep and each 7 feet long, are provided.

The society view with satisfaction the fact of every member having equal facilities for all classes of work, and the advantages above-mentioned were plainly evident in our last exhibition, when 51 members exhibited, in comparison with 34 the previous year.

The total cost of these alterations has been £122, and of this sum £72 has been provided from the current account without creating an adverse balance, while the remaining £50 was provided from the club reserve account, still leaving in hand a rent reserve of £50.—I am, yours very truly,

H. VOOGHT-CORNISH,
Hon. Sec.

October 16th, 1902.

THE BAUSCH AND LOMB COMPETITIONS.

To the Editors.

Gentlemen,—We enclose you a booklet relating to the 3,000 dollars offered by Messrs. Bausch and Lomb as prizes for photographs obtained with any cameras in which their lenses have been used.

We should esteem it a favour if you would kindly call the attention of the photographic public to this fact, stating that we should be pleased to supply any quantity of these booklets for distribution, if our customers would kindly favour us with their names and the number of booklets they would like.—We are, gentlemen, yours faithfully,

A. E. STALEY AND CO.

35, Aldermanbury, London, October 16th, 1902.

PHOTOGRAPHY AS A FINE ART.

To the Editors.

Gentlemen,—In your issue of October 10th, Mr. Herbert Ball refers to my notice in the "Daily Mail" as having been written by "a person who was ignorant of his subject, or else thoroughly in error." Although the opinion he holds of my knowledge is a matter of supreme indifference to me, I am glad to seize this opportunity for explaining at greater length a few points which the naturally limited space of the "Daily Mail" forced me to suppress. The range of the so-called Fine Art Photographer's ambition is such that it is next to impossible to speak of his absurd attempts in general. Let me, therefore, just choose a few striking instances.

Not even an indignant enthusiast, like Mr. Ball, will maintain, that the camera can idealise. But the most rabid realist, if he has any claim to the name of a painter, *will* idealise, whenever he attempts to paint the nude. His picture has the additional attractiveness of dexterous technique. With a few bold brushmarks he can suggest the lovely tones of the epidermis, of the blood coursing through the veins. In this idealising, and in this technique, lies the essential difference between the nude and the naked. A well-painted nude will never look—let us say it straight out—indecent. Now, the camera is incapable of producing a "nude." The photographer can do nothing but give a crude rendering of the naked form with all its accidental defects. The painter can render a more or less impersonal type; the photographer merely gives the portrait of a person so lacking in modesty, that she exposes her body to everybody's gaze.

Some modern "art photographers" have had the bad taste of giving photographic versions of sacred subjects. Here, again, the painter may use the model, but he only uses her as a basis upon which he builds his ideal of, say, the "Virgin and Child." The photographer who exhibits a "Virgin and Child," seen through the camera, is guilty of an offence which borders closely on blasphemy.

If a painter occupies himself with still-life, he will make his canvas attractive by his technical skill. If a photographer takes a snapshot of a heap of carrots and onions, and enlarges it to more than life size, until all outlines and forms get so blurred that one can hardly distinguish them, he shows neither taste nor dexterity, but is merely absurd. Who would care to own such a print, except a person who has been so mystified by the operator's pretentious "bluff" that he is shaken in his own sound conviction as to what is, and what is not, beautiful.

If a painter uses a rough canvas he can adjust his technique accordingly. He can use thick paint where he wants a smooth, flat surface. The photographer who prints his negative on canvas can do nothing of the sort. Light and shade, foreground and distance, objects of smooth or rough surface, appear cut through by the annoying little squares which look as mechanical as the dots and lines of a coarse half-tone block.

A photograph can only be artistic when the photographer is conscious of the limitations imposed by his process. And the same rule applies to all arts. A photographic print which has been "faked" until it looks like a very inferior charcoal drawing or etching is no more artistic than a marble statue of Venus painted in flesh-colour.

There certainly *is* such a thing as artistic photography; but nothing could be further removed from it than the presumptious Transatlantic fakes which have been foisted upon us lately.—I am, yours, etc.,

THE ART CRITIC OF THE "DAILY MAIL."

THE IMPERIAL COMPETITIONS.

To the Editors.

Gentlemen,—We shall esteem it a favour if you will put a short paragraph in your next issue to the effect that the last day for receiving entries in our Competition, for which we offer £500 in cash prizes, is the 31st inst.—Yours truly,

THE IMPERIAL DRY PLATE CO., LIMITED.

October 16th, 1902.

A CORRECTION.

To the Editors.

Gentlemen,—A curious error has crept into your report of the proceedings of the L.P.P.A. of October 9th. You say: "I passed round prints from negatives taken in 1845 by Sir Charles Fellows." It should have been by Sir Dominic Colnaghi. The former gentleman's name is quite familiar to me, but I do not know him personally.—Please correct the mistake, and oblige, yours truly,

A. L. HENDERSON.

Westmoor Hall, Brimsdown, Ponders End, Middlesex, Oct. 17.

THE R.P.S. EXHIBITION.

To the Editors.

Gentlemen,—The sentence with which Mr. Warburg ends his letter in the BRITISH JOURNAL OF PHOTOGRAPHY of October 17th indicates that he considers that he has effectually answered my criticisms. A careful consideration of this letter and his longer communication to your contemporary *Photography* will show that he has evaded rather than answered the crucial points at issue, and that he has, in fact, strengthened the position taken by my first letter. I propose to answer his two replies together, and quote from both indiscriminately.

Mr. Warburg says: "The selection committee on the first day numbered eleven members, *all but three unknown to me.*" The italics

are mine. What are the facts? About six months ago Mr. Warburg was corresponding with many of these men whom he now states were unknown to him, asking them to co-operate with him in an effort to control the selection of the pictorial section at the coming exhibition of the Royal Photographic Society. This was followed by the issue of a circular letter, signed "J. C. Warburg," to a large number of the members of that society, asking them to vote for him and a few of his friends, so as to give them the controlling influence in determining the character of the next exhibition. It was hardly dignified for Mr. Warburg to write begging the members to elect him but it succeeded in giving to him and the clique working with him a sufficient number of seats to have a controlling vote in most divisions of opinion. Can Mr. Warburg explain how these men were sufficiently well known to him six months ago to join with him in issuing this circular and at the commencement of the work of the selecting committee they met as strangers?

Mr. Warburg says further: "It says little for Mr. Bennett's commonsense that he should suggest the possibility of collusion on the part of eleven men mostly strangers to one another." I have not suggested "collusion on the part of *eleven* men," but I have just shown that some of these men were working together for a definite object for months before the exhibition, and that "strangers to one another" is a mere quibble. This "pictorial wing," as they called themselves, was able to control most of the decisions, and Mr. Warburg is well aware that the committee was far from unanimous, some of the acceptances and rejections were determined by a majority of one vote only. The members of the "pictorial wing" could almost always carry their point.

Mr. Warburg stated that I "accuse by insinuation members of the Postal Camera Club of partiality towards their club." I may inform your readers that Messrs. Bland, J. Page Croft, and Warburg, members of the selecting committee, are all members of the P.C.C., and I would merely add that these men have been working for months to secure a preponderance of the work for which their club is noted.

In each reply Mr. Warburg, almost as his first point, says that, in selecting, the names of the authors were withheld. I wish to call your attention to the fact that it was Mr. Warburg, and not I, who raised this question, and I do not propose to discuss it beyond pointing out that it cannot be necessary for the names to be written on their works in order that members of circulating clubs should be able to recognise each other's pictures. Mr. Warburg alludes to me as a rejected contributor. Will he kindly explain how he is aware whether I sent any work or not, if the author's names were withheld?

Mr. Warburg professes to quote from my letter that, "even if the work of individual members of the committee were the best in the room it ought not to be hung," and then proceeds to refute what he calls a pernicious doctrine. Of course, it is easy to confute a statement that has been distorted specially for contesting, but Mr. Warburg is well aware that I said something quite different. My argument was that, even if it were the best, if members of the committee accepted their own works *four times as liberally as those of others* they were not above suspicion, they could not claim to be impartial; a totally different statement from Mr. Warburgh's misquotation and an incontestable axiom. Mr. Warburg might, at least, have the common fairness to quote my arguments correctly.

Next there is a most refreshing exhibition of modesty on the part of Mr. Warburg. He defends the fact that the work of some members of the committee was accepted so liberally by saying that they "hung the best work." This is simply delightful! They hung their own work four times as liberally as that of others, because they knew that it was the best! Is further argument necessary to show the absolute unfitness of the "pictorial wing" for the delicate and important task of judging the competing works?

Mr. Warburg argues that because I and others have had a large number of frames hung in other years I cannot consistently criticise him and his friends for the number that they show this year. The two cases are not parallel. What I have criticised is men hanging their own work and that of their friends so much more liberally than that of others, a totally different matter. There are none so blind as those who will not see.

The facts that stand out in bold relief, the importance of which Mr. Warburg's reply has done nothing to lessen, are:—

1. The correspondence between certain men early in the year with the object of co-operating to influence the present exhibition.

2. The issue of a circular letter by Mr. Warburg asking to be elected with others, so as to form a controlling body on the selecting committee.

3. The acceptance of their own work by three members of the committee nearly four times as liberally as that of others.

4. The acceptance of works from the members of the Postal Camera Club, of which three members were on the selecting committee, twice as liberally as from other accepted exhibitors, while many well-known men had their work rejected, this making the proportion still more unfair.

5. The acceptance of work from the Postal Pictorial Photographic Club, which was also represented on the selecting committee, nearly twice as liberally as from other accepted exhibitors.

Pictorial excellence is not the distinctive quality of the members of these two clubs alone. There are now many men who are producing pictures by photography, but there can be no question that the work of one particular "school" only has received recognition from the pictorial wing. A selecting committee should be catholic in its tastes, and absolutely impartial and above suspicion in its judgments. Has the committee dominated by the pictorial wing conformed to this standard?

It would be interesting to hear how far other members of the committee, Messrs. Gunston, Ashby, Crooke and Gear, for example, support Mr. Warburg's views of its work.—I am, gentlemen, yours truly,

HENRY W. BENNETT.

October 20th, 1902.

[We append the "Pictorial Wing" Manifesto which Mr. Warburg sent to his fellow members of the Royal Photographic Society earlier in the year.—EDS., B.J.P.]

We, the undersigned fellows and members of the Royal Photographic Society, realising the importance to the Society's pictorial exhibition of capable, broad-minded judges and selection committee, who shall have the confidence of all schools of pictorial photography, have pledged ourselves to support the following gentlemen at the forthcoming election. In view of the fact that a large number of esteemed judges have refused to serve at the forthcoming exhibition, we have decided to collectively support only a small list. We ask your votes for the following candidates as being worthy of your suffrages:—

As Pictorial Judges:—W. R. Bland, Esq., F.R.P.S.; J. C. S. Mummery, Esq.

For the Pictorial Selection and Hanging Committee:—W. R. Bland, Esq., F.R.P.S.; J. Page Croft, Esq.; Llewellyn Morgan, Esq.; M.D.; J. C. S. Mummery, Esq.; J. C. Warburg, Esq.

We would urge on every member of the Royal Photographic Society, whether supporting our list or not, the importance to the society of voting for candidates who are capable and broad-minded.

J. T. Ashby, Loughton; J. S. Bergheim, London; W. R. Bland, F.R.P.S., late Vice.Pres. Derby Photo. Society; Evelyn Boden, F.R.P.S., Derby; Francis A. Bolton, F.R.P.S., Staffs; Robert Bourke, Past President Leeds Camera Club; S. R. Brewerton, F.R.P.S., Tunbridge Wells; S. L. Coulthurst, Vice-Pres. Manchester Amateur Photo. Society; J. Page Croft, Birmingham Photo. Society; Alice M. Dumas, Bromley; J. H. Gash, Leeds Camera Club; John Gunston, Wimbledon; Maude A. Craigie Halkett, Edinburgh Photo. Society; Elena Hellmann, F.R.P.S., London; Harold Holcroft, Wolverhampton; W. G. Jamieson, Aberdeenshire; Percy Lund, Editor "Pract. and Jun. Photo."; Hector Maclean, F.G.S., F.R.P.S., Pres. Croydon Camera Club; J. W. Marchant, F.R.P.S., Vice-Pres. North Middlesex Photo. Society; Llewellan Morgan, M.D., Past Pres. Liverpool Amateur Photo. Association; Harry Quilter, F. C. Shardlow, Editors "Photo. Art Journal"; Leslie Selby, Past Pres. W. London Photo. Society; Percy Sheard, Pres. Batley and District Photo. Society (Judge of the Yorks. Photo. Union); M. Thompstone, Manchester; Harry Wade, Manchester; Louisa Wakeman-Newport, Tenbury; J. C. Warburg, London; H. Snowden Ward, F.R.P.S., Editor "The Photogram"; W. D. Welford, F.R.P.S., London and Prov. Photo. Association; Jeannie A. Welford, London; T. E. Corney Wilson, Liverpool Amateur Photo. Association; Eustace Young, London; J. C. Warburg, Hon. Sec. R.P.S. "Pictorial Wing" Movement.

To the Editors.

Gentlemen,—In reply to the letter of Mr. H. W. Bennett, in which he accuses of bias a small and perverted section of the Selection Committee, and inferentially charges the majority with being "led by the nose" by such minority, I do not feel the pages of a paper offer the best medium for dealing with such assertions, offering, as they do, no means of arriving at a definite issue.

If Mr. Bennett really believes a tithe of what he states, it appears to me to be his bounden duty to the R.P.S., of which he is a member, to bring his charges formally before the Council, who would no doubt afford him every opportunity of producing his evidence, which—probably by an oversight—is omitted from his letter.

This is purely a personal suggestion; but I am not aware of any reason why the Selection Committee, having nothing to conceal individually or collectively, would in any way object to meet their traducer face to face.

I therefore challenge him to adopt this course.—Yours, etc.,

J. PAGE CROFT.

P.S.—I may perhaps be permitted to mention that my exhibits to the Exhibition numbered nine in 1899, ten in 1900, and four in 1901, when, owing to pressure of business, I did practically no photography. My representation this year is thus 20 per cent. below the average of the past three years.

CRISTOID DEMONSTRATIONS.

To the Editors.

GENTLEMEN,—I am now giving demonstrations on the development of cristoid films on Mondays, Wednesdays, and Fridays, commencing at 7.30 p.m. I ask you if you will kindly insert this in the columns of your journal, so that any of your readers residing in the North of London who may like to know how the cristoid films are developed I shall be delighted to show them, at 159, Stroud Green Road, Stroud Green, London, N. Thanking you in anticipation—I am, Gentlemen, yours faithfully,

J. B. CAMP.

93 and 94, Chancery Lane, London, W.C., 21st Oct., 1902.

A LOST COOKE LENS.

To the Editors.

Gentlemen,—May we call the attention of photographic dealers generally, particularly of those who do business in second-hand lenses, to the fact that a 5½in. Series 111 Focussing Cooke Lens, mounted in a 5 x 4 unicum shutter, has been stolen from the R.P.S. Exhibition some time during the afternoon of Thursday, the 16th inst. The number of the lens is 9.564, and its equivalent focus is 5.55 inches.

Should this instrument be offered for sale or exchange to any dealer we trust he will kindly communicate with us at once.—Thanking you in anticipation, we are, gentlemen, yours faithfully,

TAYLOR, TAYLOR AND HOBSON, LIMITED.

Stoughton Street Works, Leicester, October 17th, 1902.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY, 24, *Wellington-street, Strand, London, W.C." Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

PHOTOGRAPHS REGISTERED:—

J. Moffat, 125, Princes Street, Edinburgh. *Photograph of* 1903 *calendar.*

D. Hedges and Sons, Clifton Square, Lytham. *Photograph of Homing pigeon.*

W. H. Fischer, 19, Egerton Crescent, Withington. *Photograph of J. Scotson, M.A.*

J. G. (Tregoney).—Better send us a print to see. From your description we can offer no opinion whatever.

SEAL PORTRAITS.—A.E.N.S. wishes to know the address of a firm that make a speciality of doing seal portraits for the trade.—In reply: We are unable to answer this query, as we know of no one who does seal portraits for the trade.

SPOTS ON COLLODIO PAPER.—MATTE SURFACE says: "I would be very much obliged if you would kindly inform me the cause of the spots on the enclosed pieces of C.C. matt surface paper."—In reply: The spots are caused by the paper having been splashed with some chemical—possibly an acid.

ORTHOCHROMATIC PHOTOGRAPHY.—ORTHOCHROMATIC asks: "Would you kindly tell me what advantages orthochromatic plates have over ordinary plates in every day use?"—In reply: The advantage is that they translate colours into monochrome better than ordinary plates do, particularly when they are employed with suitable colour screens.

THE P.P.A.—J. A. LONGFORD writes: "I have recently returned from the United States, and have purchased the above business. Can you inform me if there is any association in this country to which it might be desirable for a dealer to belong?"—In reply: The Professional Photographers' Association. Hon. secretary, Mr. Alfred Ellis, 51, Baker Street, London. W.

ACETYLENE IN THE STUDIO.—J. A. writes: "Will you inform me what success is being obtained by the use of acetylene gas for lighting studios for night work, and if consistent, please state a reliable make of apparatus, complete?"—In reply: Acetylene can be successfully employed for taking portraits at night. Messrs. Thorne and Hoddle, Victoria Street, S.W., make a speciality of an apparatus for studio work.

BLACK BACKING PAPER.—BLACK BACKING says: "I herewith enclose you a few samples. What I want to know is what is put on the backs of the enclosed bromides to make black—it will not rub off not even if you wet it? It is done after I know it has been developed and dried."—In reply: The little pieces sent are not bromide paper, but ordinary black paper with an adhesive on it—probably gelatine. But we may say your query is by no means clear.

COLOUR PHOTOGRAPHY.—W. W. GRANFIELD says: "I read in the 'Westminster Gazette,' a few weeks ago, an article on a new process of coloured photography called, I believe, the L.N.A. process, and I am writing to ask you if you would be so good as to let me know where I could obtain further information of this new process."—In reply: Write to the Lumiere N.A. Co., 4, Bloomsbury Street, W.C. You will see their advertisement in last week's JOURNAL.

FOREIGN ENCYCLOPÆDIA.—"Having a brother in Java who wishes me to obtain for him a copy of volume (as advertisement enclosed), I will feel greatly obliged if you will send me one that I may send him. If you will kindly let me know cost of same, I will remit per return."—In reply: We do not supply books. You will have to get it direct from the publisher, or through one or other of the foreign booksellers. We regret that we do not, for the moment remember the price of the work.

STEREOSCOPIC PHOTOGRAPHY.—SILURIAN says: "I am thinking of taking up stereoscopic photography. (a) Would you advise me to buy a stereo camera? or (b) Would Brown's Stereo Transmitter, with my ordinary camera, act satisfactorily? (c) What are the disadvantages of the transmitter?—In reply: (a) We should certainly advise you to get a stereoscopic camera. (b) We have seen good results that have been taken with it, but we prefer a bi-lens camera ourselves.

LANTERN SLIDES.—J. SEATTER says: "I wish to learn how to make photographic lantern slides from illustrations in magazines, engravings in books, etc. Would you kindly tell me what kind of a camera I should get for that purpose, also what instruction books I should get?"—In reply: Any ordinary camera will do for making the negatives. For the slides a lantern slide camera will be the most convenient to use. Any of the dealers will supply one. Or by using dry plates no camera is necessary, as the slides may be printed by contact. As you appear to be ignorant of photography "Abney's Instruction in Photography" will be a good work for you to get.

STAMP PORTRAITS.—BIGRIGG says: "I enclose a quarter-plate sheet of bromide prints. Will you please say what you think of them under the circumstances? They are flash-light portraits taken in our kitchen at night. I have designed the printing frame they are printed with, and I can print same as enclosed, or four larger, or sixteen smaller, on quarter-plate sheets, from a negative the fourth of a quarter plate in size. Could I have it protected?"—In reply: The portraits are fairly good—about the average of flash-light work. With regard to the printing frame, if there is anything in it superior to others that are in the market it might be worth your while to secure a patent for it. That is the only form of protection you can obtain.

NEGATIVE REDUCERS.—W. B. GOWLAND writes: "In reducing negatives please say what I am to avoid in the prevention of marks, which completely spoil for printing. The Almanac recommends Farmer's formula. Burton says if negative is dry soak in hypo—usual negative strength—take out and add a few drops red P. of P. (saturated solution). Another formula is, 30 grains ferric chloride in 3ozs. water. Allow solution to act, then wash and place in hypo. I used an old mixture of hypo not used before; negative was soaked in water first, then placed in hypo and red P. of P. bath. Result: Spoliation. The red P. of P. was not saturated, but rather weak."—In reply: All the formulae named are good if used with judgment. In future we should recommend you to employ the Howard Farmer formula, as you cannot well go wrong with that, and it is a good reducer.

LENS.—STUDIO writes: 1. "Will you kindly tell me the angle of Goerz 12 x 10, Series 1 B. lens, double Anastigmat, the angle of Dallmeyer 12 x 10 rapid rectilinear, both lens without stops? 2. I have an unfinished studio requiring a sun shade on the top of ridge plate. What height should the shade be erected on the ridge, to cast a shadow over the glass on the midsummer day, when the sun is at its greatest zenith?"—In reply: 1. It is as we have often said before, strictly against our rule to make any comparison of different makers' apparatus. Better write to the manufacturers of the lenses. 2. The shade would have to be so high, to cast a shadow over so large an area as you desire when at its highest, that it would be very unsafe in windy weather, unless the studio was much more strongly built than the majority of studios are. Better deal with the sun by blinds.

*** Owing to pressure on our space, several letters, answers to correspondents, etc., are crowded out.

*** NOTICE TO THE TRADE, WHOLESALE AGENTS AND BOOKSELLERS.—*A Contents Bill is issued with each number of the* JOURNAL, *and copies may be had on application to the Publishers.*

*** NOTICE TO ADVERTISERS.—*Blocks and copy are received subject to the approval of the Publishers, and advertisements are inserted absolutely without condition, expressed or implied as to what appears in the text portion of the paper.*

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THE BRITISH JOURNAL OF PHOTOGRAPHY.

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*** *The Editor can only be seen by appointment.*

*** *We do not undertake to answer letters by post.*

THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC FOR 1903.

Edited by Thomas Bedding, F.R.P.S.

The forty-second annual issue of The British Journal Photographic Almanac will be published in December next. This year's Almanac reached a total of 1,560 pages, and the entire edition of 20,500 copies was sold out a fortnight before publication. Of no other photographic book ever issued can two such unique facts be recorded.

The growth in popularity of the Almanac is evidenced by the remarkable rapidity of its sales.

The 1900 Edition (20,500 copies) was sold within three months after publication.

The 1901 Edition (20,500 copies) was sold a fortnight after publication.

The 1902 Edition (20,500 copies) was sold a fortnight *before* publication.

The widespread interest in the Almanac grows steadily year by year, and in order to supply the increasing home, foreign, and colonial demand, we have decided to enlarge the 1903 issue to

25,000 COPIES.

The great addition to the circulation of this most popular annual (over 20 per cent.) undoubtedly enhances its value as an advertising medium, and the issue of the large number of extra copies will supply the wants of thousands of photographers, dealers and publishers who were unable to obtain the Almanac for the last three years.

The Almanac for 1903 will appeal to photographers all the world over as a daily reference guide in practical work. The standard matter and formulæ will be revised and added to where necessary, and the latest departures in theory and practice will be chronicled. The year's advances will be recorded, and wherever practicable new features of an informative nature will be added.

EX CATHEDRA.

Isochromatic Plates in Astronomical Photography. It would seem to the casual observer that there could be little scope for the use of isochromatic plates and a colour screen for such objects as the starry vault presents. Yet, at the meeting of the astronomical section of subsection A of the British Association there were exhibited photographs of star clusters so taken, which, according to *Nature*, were the feature of the evening of September 16th. These pictures were taken at the Yerkes Observatory with the 40in. visual refractor, the colour screen being in contact with the plates. There were also shown photos of the same objects taken on ordinary plates without screen by the two-foot reflector. With the former the densest part of the clusters are beautifully resolved and measurable. The photographs of nebulæ made with the two-foot are unsurpassed, and it is remarkable, says that authority, "how, though nearly all the detail they show can be found on the photos taken at Crowborough, and Daramona, and Greenwich, the general effect is quite different. It has been felt that astronomy was not sufficiently represented at the Association meetings, hence this particular subsection was formed at the Bradford meeting in 1900. The papers presented, however, were scarcely enough to justify its existence, so that cosmical physics were this year included." To a certain extent this was successful, but still it was felt that amendment was desirable. *Nature* suggests, with what seems like lightly-veiled sarcasm, that all papers in section A should be divided into "two classes—papers that are generally intelligible, and papers that are not. . . . It is not impossible that this might have beneficial results in more ways than one!"

* * *

Comet Perrine. Dr. Isaac Roberts has taken a successful photo of this object, and a reproduction appeared in *Nature* last week. The photo gives a striking record of the rate at which the planet is moving in regard to its place amongst the stars. It was taken with fifty-two minutes' exposure by his 20in. reflector. The comet was virtually kept stationary in the field of the telescope; yet, though the

exposure was under an hour the stars included in the field have moved relatively to the comet so much that each is represented by a long trail. The reproduction does not appear to be an excellent one, for the original, it is stated, has a multiple tail, two of comparatively large dimensions, and several smaller streamers. It would be difficult to detect them in the process-block print.

* * *

Solubility of Platinum. It is usually stated that metallic platinum is only soluble in aqua regia; but M. Camille Matignon has been making some experiments—recorded in *Comptes Rendus*—that go to disprove this belief. When the metal in the spongy form is placed in a concentrated solution of hydrochloric acid in contact with air at the ordinary temperature the metal goes into solution in the form of chloroplatinic acid. If the platinum is used in the form of foil no action takes place at the temperature of the atmosphere, but if the materials are placed in a sealed tube containing oxygen and heated for five hours at a temperature of 170deg the platinum is taken up. It would appear that platinum is, under the given circumstances, more soluble than gold, as we read that it needs a temperature of 10deg. higher to bring about solution of amorphous gold, which might be compared for physical condition to spongy platinum.

* * *

"Hypo" and Acids. Herr H. V. Attingen has been investigating the action of acids upon hyposulphite of soda, and the time taken before the precipitation of sulphur becomes visible. He finds that the time taken depends on the concentration of the hydrogen ions, and is the same for all isohydric solutions. An interesting portion of his communication will be found in his observation that when sulphite of soda is present along with hypo the time of precipitation suffers retardation. In applying a knowledge of these facts to the hypo-fixing bath it may be well to bear in mind the presence of the gelatine of the plate, for it is well known that the presence of this and other organic matters entirely inhibit many reactions which in the absence of these disturbing elements are very pronounced. An example of this is seen when a plate which shows urgent signs of pitting is placed direct into the alum bath, when it is evident that hypo must be retained in the body of the gelatine, and must there come into contact with the alum, yet no precipitate is produced, as would be the case after a while under ordinary conditions. An action in this direction whose explanation is not very clear has been brought under our notice by a well-known photographer. He tells us that when a newly-mixed acid hypo bath—made by adding acid to an excess of sulphite of soda solution, and putting a limited amount to the hypo solution, the whole being, and continuing, perfectly clear and free from turbidity—is first used for fixing plates, the latter when dry are so rough on the surface as to render fine retouching impossible. After being used a few times, however, this effect dies away. Meanwhile the bath has continued clear and translucent.

* * *

Death from Bichromate of Potash. Most photographers are familiar with the pernicious effects that some of the chemicals they employ have on the skins of some workers—metol, as used for development, and the bichromate of potash, as employed in carbon printing, to wit. These, like many other things, including our old friend "pyro," used in the art, are deadly poisons when taken internally. On Saturday last Mr. Coroner Drew held an inquest, at Hammersmith, on a woman who had committed suicide by drinking a solution of bichromate of potash. This is the first suicide we have read of by this substance, though we know of a case in which death resulted from accidentally drinking a solution of it in mistake for beer. It is a little surprising that there are so few accidents from the poisons used in photography, seeing the way that the solutions of them are sometimes left about; and the vessels, often tumblers and the like, they are frequently contained in, are not always kept in the dark room. A solution of bichloride of mercury in a tumbler, for example, is very like a glass of water, and one of bichromate of potash in a similar vessel, as in the case just referred to, might easily be mistaken for beer—and the mistake not discovered until too late. When poisonous things, such, for instance, as bichromate of potash, are so largely employed for industrial purposes, familiarity with them seems to breed, if not contempt, a certain degree of carelessness in their handling and keeping. If by chance some bichromate is swallowed, medical aid should be at once summoned, and, in the meantime, an emetic should be administered. Then the best antidote would probably be magnesia or chalk.

* * *

Magnesium Flashlight. Monsieur Albert Londe, in a paper read before the Société Française de Photographie, gives the results of some experiments he has made, which are deserving of note by those who have occasion to use flashlight mixtures. As might be expected, the amount of powder used affects the length of the time of combustion. This is shown by the following results:—

Weight.	Time.
1 Gramme.	120 thousandths of a sec.
3 Gramme.	140 thousandths of a sec.
5 Gramme.	160 thousandths of a sec.

The mode of ignition also affects the time of combustion, and it is best done by electrical fusion of a very thin wire. The condition of the powder likewise affects ignition and it is best to use the mixture as fresh as possible. A sample which ignited with a loud report and burnt rapidly when fresh, after keeping some time, burnt four times slower and without noise. The duration of the flash was determined by a camera with 12 lenses, the shutter giving successive exposures of 1-100sec. The flash was photographed against a black background. If less than 12-100sec., ignition and extinction were comprised within the exposures. As the speed of the shutter could be regulated, adjustments for longer or shorter exposures could be made. Illustrations of the stages of a flash are given. A very interesting illustration is given, showing the time it takes for a sitter to close his eyes after the commencement of the flash. During the first 1-100sec. the eyes are open and natural in appearance, but at the seventh exposure representing 7-100sec., the eyes are completely closed. The maximum actinism of a flash appears to be attained in 1-50sec. and lasts about 5-100 to 6-100sec.

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Sepia Platinotypes. Recalling his previous experiments, Hübl points out in "Eders Jahrbuch" that the sepia image obtained by using a palladium salt in the sensitiser for platinotype paper is but a brown modification of pure platinum, and that he had assumed that when mercury was used the same thing occurred. Further experiments have proved, however, that such is not the case. In all probability the sepia image given with mercury is a compound of mercury and platinum, as concentrated nitric acid or cupric-chloride solution immediately destroy the mercury image, whilst leaving the palladium image untouched. If a platinotype paper is sensitised with a mercuric oxide salt, such as the citrate, it is probably

reduced to the ous state, and is then reduced by the developer with the platinum in the black-brown compound. With mercuric oxide salts this can be readily effected with a cold developer, but with mercuric chloride in the sensitising solution a hot developer must be used to obtain the brown compound. If the mercury salt is added to the developer and not to the sensitiser, the ferrous oxalate formed by the action of the light on the ferric oxalate reduces it to the metallic state and not to a mercurous salt. If Hübl is correct in his statements as to the nature of the sepia images obtained by the use of mercury salts, it is an open question whether the process is worth general adoption, as it would seem more than probable that such an image would not be so stable as one of pure platinum.

* * *

Separate versus Combined Baths. The question as to the superiority of separate versus combined toning baths as regards permanency is likely to be always a vexed question. Adherents of the separate baths always point to the danger of sulphur toning and the consequent evanescent character of the prints. Advocates of the combined baths point out that one is quite sure that the tone obtained is not altered by any subsequent fixation, and further that at least one, if not two, operations are saved—namely, fixing and preliminary washing. Of all the arguments adduced for and against no one, so far as we are aware, has commented upon the quantity of gold deposited by each system; nor, for the matter of that, has it been established that an image containing a greater proportion of gold is the more stable. In this year's edition of Elder's "Jahrbuch," however, Herr Novak details his experiments in this direction, using albumen paper with a borax bath, and two collodio-chloride papers with the sulpho-cyanide and a combined bath. In each case a print was toned faintly, that is, to a brownish purple, and one also strongly toned to a blueish violet, and the ratio of gold to silver determined. For albumen this was 1:4.96 and 1:4.3. For the collodion paper A the ratio was 1:0.84 and 1:0.25. In the combined bath this paper gave 1:3.18 and 1:1.14; collodion paper B gave 1:3.2 and 1:0.85, and 1:4.7 and 1:2 for the separate and combined baths respectively. From these figures it is obvious that there is far more gold in the final image when the separate baths are used, although according to Herr Novak the appearance of the prints was the same. Of course, the total quantity of gold will vary with the composition of the silver emulsion, though from the experiments we have mentioned collodio-chloride papers require more gold than albumen, for the well-toned albumen prints contained 28 milligrammes of gold and 122 milligrammes of silver per square metre, whilst the collodion contained 122 milligrammes of gold and 31.2 milligrammes of silver per square metre.

* * *

Detective Photographs. When quick plates first made the hand-camera possible, it was the fashion to call such instruments detective cameras, for it was imagined that every policeman would carry one under his cape to the terror of evildoers. This, however, was a dream only capable of realisation if criminals had been in the habit of prosecuting their nefarious schemes in broad daylight. It is only under very rare conditions that a picture which can be remotely described as a detective photograph is produced. We know of one case in which a defaulter's portrait was taken on a solicitor's door-step from a cab which had been hired for the purpose, and doubtless this is not an isolated case of detective photography. The matter came up in a strange way the other day in the course of a law suit against the Great Northern and City Railway Company. The plaintiff, a waste-paper dealer, stated that owing to the construction of the defendants' railway tunnels damage had been done to one of his houses which had cost him £62 to repair, and cracks had appeared since the driving of the tunnels in another house of his. Having made this statement, the witness was confronted with a photograph which had been taken twelve months before the tunnels were made, and the picture showed a crack in front of one of the houses. His claim was finally demolished by Mr. Douglas Young, F.S.I., who stated that he acted for the company when the tunnels were about to be constructed, and, anticipating claims of this nature—oh! artful Mr. Young—he caused photographs to be taken of all houses on the line of route which showed cracks. The cracks shown in the picture were practically in the same condition now, and the work necessary to be done to the houses came entirely within the repairing clauses of the leases, and was not caused by the tunnels. Upon this evidence the jury returned a verdict for the defendant company, on the ground that the tunnels were quite innocent of causing any damage. Poor waste-paper dealer, the only satisfaction he will have will be that the various legal documents pertaining to the case will add somewhat to his stock in trade. How he must anathematise photography and all its works. Little did he dream of this child taking notes, and that the "prents" would take such a very inconvenient form. People who are about to make doubtful claims for damages will do well to ascertain first whether Mr. Douglas Young is retained by the other side.

* * *

Bichloride of Mercury used before Fixing. An interesting abstract of a paper by Dr. R. A. Reiss upon the use of bichloride of mercury appears in *La Photographie Française*. The writer states that it differs in effect when used as an intensifier before and after fixing the image. If the plate is washed for five minutes after development, then bleached with bichloride of mercury, well washed, re-developed, it will be found that the intensified image is finer in grain than if the intensification had been done after fixing the image. The fact is interesting, and may be of use in special cases, but as the operations have to be carried out in the dark-room the process is not likely to be generally used. A slight modification, however, gives a different result. If the plate after exposure be treated with a slow developer and the action stopped by washing as soon as all fine details have appeared, a positive may be obtained by immersing the plate in a solution of bichloride of mercury for ten to fifteen minutes until the image has almost disappeared, and then, after rinsing, again immersing it in the developer. The plate, still charged with mercuric salts, veils uniformly and the image cannot be seen by transmitted light. When immersed in the fixing bath a reversed image may be obtained, those parts which were not reduced by the first development appearing yellowish brown, which intensifies in drying. The non-actinic quality of this image gives it the properties of a positive. Colson has pointed out that chloride of mercury in the dry state, when brought into contact with a bromide emulsion, destroys the latent image and renders the plate insensitive to subsequent exposure. Dr. Reiss, on the other hand, has found that a solution of chloride of mercury does not destroy the latent image, but merely slows the emulsion considerably. To make use of plates which have already been exposed or fagged, they should be placed in a 5 per cent. solution of bichloride of mercury for ten to fifteen minutes. Wash in running water for ten minutes, dip in a solution of amidol developer, and wash

the plates again. If the plate is used wet, immediately after the final rinsing, it will be found about 150 to 200 times slower than it was originally. The image is faintly visible and development proceeds slowly. In the *Photographisches Wochenblatt* we find a further note upon the subject, stating the Dr. Reiss has made practical use of his researches for another purpose, the restoration of exposed or fogged bromide paper. This he immerses in a 2 per cent. solution of bichloride of mercury for fifteen minutes, and after well washing and drying it, obtains a very slow contact paper of exceptionally fine quality. The requisite exposure is thirty minutes in diffused daylight under a negative of average quality. Plates may be treated in the same way for obtaining transparencies.

* * *

Journalistic Portraiture. The man who distinguishes himself in any way is sure to find his portrait published in the newspapers, and from the persistence with which these pictures present themselves a few hours after the original has awakened to find himself famous one would think that editors kept the blocks ready made, and selected the most suitable to the case in hand. It cannot be said that the majority of these sketchy pictures are satisfactory, and it often happens that blocks supposed to represent the same individual, and appearing in different newspapers, have not the slightest resemblance to one another. Only a few days ago the portrait of the unfortunate Mr. Kensit appeared in a morning and in an evening journal on the same date, and while one represented a bald-headed man of about fifty, the other introduced us to a much younger man who still kept his hair intact. Now if portraits are not likenesses, what is the good of publishing them, unless there be an advantage in purveying that which is untrue? The competition in modern journalism is so stupendous that editors, we fear, are not always as particular as they might be with regard to accuracy, so long as the matter they print ministers to the desires, prejudices, and curiosity of their readers. Much the same thing happened in the long ago, when the making of a wood block was a serious business, and when photography was as yet unborn. It was common in those days for the same portrait to do duty over and over again for different persons. So it was, too, with the pictured "broadsides," the forerunners of the modern newspaper. Looking through a collection of these lately we found the same blocks appearing many times, on each occasion being labelled differently. They were mostly pictures of prize fighters, murderers, and hangings, and it was amusing to see how the same designs did duty for so many different individuals. Editors, nowadays, thanks to the cheap photo-process block, are not obliged to be so cheeseparing in the matter of pictures, and when they want a portrait they get a photograph, if possible, and have it turned into a line drawing. Failing the photograph, the artist draws as much upon his imagination as he does upon the cardboard upon which he works. The result is not always inspiring. A well-known professional man was, he told us, once on his way north to fulfil a lecturing engagement. When he arrived within a hundred miles of his destination he noticed, with some surprise, that his fellow travellers in the railway carriage stared at him as if there were something uncanny about him. It was the same when newcomers entered the carriage; their eyes left their newspapers, and were focussed on him. At last he found out what was the matter. One of the travellers left his paper on the seat of the carriage, and there, on the upturned page, was the portrait of our professional friend. And an awful production it was. "I know I am not a beauty," said he to us, "nor am I very particular as to my personal appearance, but if I was the hang-dog, cut-throat, hydrocephalous monster that that paper represented me to be, I should take a dose of prussic acid." He then asked us whether he would not be justified in prosecuting that northern editor for libel—to which query we gave the safe and sage reply that he had better consult a solicitor.

* * *

X-ray Examination. A most lamentable occurrence is reported from Cleveland, Ohio, which should act as a warning to those who are unaccustomed to interpret the readings of the X-rays. A certain Mr. Buettner, a wealthy contractor, awoke one morning with a sore throat, not by any means an uncommon experience with most of us. But at the same time he missed his false teeth, and at once jumped to the conclusion that he had swallowed them in his sleep, and that the pain in the throat was the result. A surgeon was sent for post haste, the X-rays were called into requisition, and by their aid he discovered, to his own satisfaction, the plate of teeth resting in the stomach. An immediate operation was recommended, and while it was in progress a relative of the patient found the missing teeth under his bed. She rushed to the hospital, but was too late. The patient died from the effects of the unnecessary operation. Now, it seems to us that in a case of this kind, the opinion of the surgeon should have been fortified by a radiograph before such a serious operation was ventured upon. With the X-ray apparatus at hand, the production of a negative would have been but a matter of a quarter of an hour or thereabouts, and such a picture would show clearly the plate and teeth if they had been there. If, on the other hand, as we presume was the method of procedure in the case adverted to, the examination is merely by fluorescent screen, there is ample opportunity for error. Such examination is often the only kind that can be made on the battlefield, but army surgeons are now so expert in the use of the rays, and a bullet is such an unmistakable "foreign body," that mistakes cannot easily occur. Anyone who has had the opportunity of making an examination by screen will at once appreciate the difficulties surrounding it. A hand, a foot, or a leg, or an arm, are easy enough to examine, and there is no difficulty at all in noting all the bones and any abnormal appearance which they may present. But when we come to place the screen in front of the torso there are many organs covered with layers of thick muscle that it is extremely difficult even to an anatomist to recognise the masses of shadow for what they really are. And this is the case even if tube, coil, and battery are all working at their best and in harmony under a skilled operator. There are several X-ray pictures in the present exhibition at the New Gallery, one of which shows how plainly a hat pin, which has lodged itself by some unaccountable mishap in the stomach, can be revealed by radiograph. Another shows a collection of needles in a man's knee-cap. It is evident that in either of these cases the surgeon would be justified by the evidence afforded by the pictures in cutting down towards the intruding bodies. The radiographs leave no room for fancy, there are the articles which have found such a strange tenement, and the sooner they are evicted the better. If such a picture had been available in the case reported from Cleveland, the sacrifice of a life might have been obviated.

A COMPETITION of special interest to photographers is at present running through the pages of "The Sunday Magazine." Every month a micro-photograph of some familiar object is published, and readers are invited to state what the picture represents, £5 being awarded to the successful competitor

THE CONTINUING ACTION OF LIGHT IN THE CARBON PROCESS.

At a Society meeting a few weeks ago, when the subject of carbon printing was under discussion, some doubt seems to have been expressed as to whether the action of light set up in an exposed carbon print could be continued in another piece of tissue kept pressed in contact with it. At another meeting, reported in our last issue, one of the members showed the result of an experiment which proved that such action did take place, although the image was very faint, and was said to be too flat to be of any practical use. The fact that the action of light set up in one bichromated gelatine film could be continued in another that had not been exposed by its being kept pressed in contact with it for a time was shown nearly thirty years ago, and also that good pictures could be produced in that way. This was practically demonstrated before the London Photographic Society, now the R.P.S., by the late M. A. Marion, nearly thirty years ago, a full report of which will be found on page 242 of our volume for 1873. In our issue for November 9th, 1900, Mr. E. W. Foxlee published the results of some experiments that he had recently been making with M. Marion's process—"Mariotype"—and how the time of keeping the two tissues in contact could be considerably shortened, from that necessary in the process as published by M. Marion, from eight or ten, to two or three hours. Since then Mr. Foxlee has shown in our contemporary the *Photographic News* that the action of light set up in a bichromated gelatine film could be communicated to and continued in other colloid bodies, such as gum, for example. Also that the presence of free bichromate in either film was unnecessary, as that could be all washed away and the print dried and kept for weeks before the second colloid body is applied. Furthermore, he has proved that the initial print need not be made in bichromated gelatine at all, as other colloids will answer the same end. Paper, for example, may be coated with a starch—arrowroot, for instance—sensitised, printed, washed, dried, and at any subsequent time coated with pigmented gum containing an acid, and again dried. In this state the print can be kept for weeks, to be developed at any convenient time. In this method of working excellent pictures may be obtained; but, of course, it entails more trouble and time than that involved in working the ordinary carbon process, notwithstanding that the picture is obtained the "right way about" without transfer, and the fact that we have a visible image to begin with. Still, the system is interesting from a scientific point of view, as illustrating the persistent action of light in bichromated colloid substances.

The Photograph of a Thought.—An elderly man in Cleveland ran in great suffering to a hospital, where he said that he had swallowed his false teeth. The X ray disclosed in his gullet a dark blotch that looked like the missing object, but when an incision was made no teeth were there. They had in fact fallen under the bed, where a servant later found them. The man had only dreamed of swallowing them. But what was the object which the X ray had photographed? That the doctors could not tell, unless "some psychological-physiological effect" was produced by the man's delusion which was actually visible through the fluoroscope. The belief that he had swallowed the teeth and that they had "stuck half way down" gave the patient such pain as the actual object would have done. Was that imagined object as real to another's sight as it was to the sufferer's own sense of feeling? If it was, here is an argument for those who hold that all pain, sight, hearing, and feeling are in the mind; though to the "man in the street" it is easier to suppose that the doctors were mistaken and saw neither teeth nor thought. At any rate, if X-raying a thought is possible, a photograph of the reflections of the patient's relatives on the whole affair would be interesting. For the subject of this absorbing inquiry died as the result of his needless operation.—"New York World."

TWO THOUSAND PHOTOGRAPHS.

Having taken part in the recent selection of pictures for the R.P.S. Exhibition, and having thereby received a lesson of considerable value, I feel that the knowledge of the experience there gained should prove equally valuable to exhibition workers generally.

The earliest feature to strike me was the extreme divergence of opinion of the Committee, which probably ranged pretty generally from one end to the other, and the feeling naturally followed that every so-called school was represented, thus ensuring recognition of every class of work.

At times when a picture of a controversial nature appeared, this difference of opinion was most markedly defined, but everyone, after vigorously and occasionally fiercely fighting for the principle which he felt was involved, accepted his victory or defeat with appropriate moderation, or good temper.

The usual plan was, of course, adopted of the frames being held on the table, and generally adjudicated upon in this way; but the smaller work was more closely inspected and passed along from hand to hand.

As hour after hour passed, and hundreds of the most ordinary, and even elementary, work passed along, anyone casting a momentary glance on the Committee at their task might be almost pardoned in concluding that the body was carrying out its work in a very lackadaisical and almost indifferent manner.

But the effect of the cry of "Rats!" to a drowsy terrier was not more electrical than the appearance of something out of the ordinary in the way of picture-making.

In a moment every member was on the war path, the picture was keenly discussed, argued and harangued, the appeal for the vote was promptly acted upon, the fate impartially settled, and the Committee again resumed its dreary task of picking the bits of coal from the ashes.

I say dreary advisedly, for, in the first place, it is not generally pleasing to sit in judgment on one's fellow man, and be compelled to condemn when it would be more gratifying to praise. One does not expect, and certainly would not desire, to see the undertaker conduct his operations with face wreathed in smiles, and can fully realise that the gentleman has probably not chosen his vocation for, vulgarly speaking, "the fun of the thing."

Consequently, it is not enlivening to return to obscurity that which has evidently given cause for much work and well-meant thought. As a proof, however, of the keeness which the Committee maintained right up to the finish, and the number to be adjudicated upon was very close upon two thousand, it may be mentioned that the keenest fight took place well after eight o'clock in the evening, when one might reasonably suppose there was not a kick left in the room.

For nearly a quarter-of-an-hour did the fight rage hot, members rising to address their fellows, or arguing the matter in twos or threes, with the greatest animation, before the particular point was finally decided.

However, I hold no brief for the Selection Committee, who neither desire nor require my advocacy; but the feature I want to press home is the lesson to be learned by the viewing of such a mass of work, and the remarks aforementioned are made rather to the probably some hundreds of disappointed exhibitors, to show the impartiality and thoroughness attempted. But all of us have been disappointed exhibitors at some time or other, and it is at such times that we are least amenable to reason.

'Tis not, therefore, so much the view of endeavouring to alleviate such disappointment, as by trying to give a few general

hints as to what appeared to appeal to the Committee, and what did not, and thus endeavour to avoid the recurrence of further disappointment. Selection Committees are but human, even if when they reject our pictures we think they are not humane, and are keenly anxious to pick out the best material at their command, to make as attractive a show as possible. Besides, their own reputations are at stake, as they will be subsequently judged by what they hang. One of their foremost desires is probably to relieve the exhibition from the ordinary; consequently anything removed from the beaten track, or suggesting novelty in idea or treatment, receives their closest study, and elicits their warmest interest. On the other hand, that which especially failed to appeal were the flat grey bromide prints of a generally commonplace subject—and there appeared to be acres upon acres of these, which repeated themselves with a persistency and monotony which was simply deadly. Of very little more interest was the good ordinary, clean, technical print, whose virtues lay entirely on the negative side, for which from their very number no one could raise sufficient enthusiasm to fight, and the best went into the "doubtfuls," from which probably they never emerged, thus receiving recognition at about their approximate value.

Another point which prevented many really good things from being hung was the atrocity in framing and mounting, many showing such a violation of taste, the hanging of which would be a studious insult to all work in the vicinity. The prints of many would-be-exhibitors seemed to suggest that as soon as the authors knew how to decently develop a plate and make a tidy print, they were entitled to recognition by having such hung. Some sent as many as from twelve to twenty frames, and one could not fail to anticipate with regret the disappointment which the compulsory rejection must entail, while at the same time considering how different the result might be were so much labour and thought concentrated on to, say, one or two of the subjects.

Taking the whole couple of thousand prints collectively, one could not help but be more than ever impressed with the fact that what is needed and should be striven for by those anxious to exhibit, is some individuality, to lift them from the rut of the mass, and some feeling and motive in treatment to remove them from the commonplace. This would probably more easily be accomplished by the serious attempt to learn from all, while slavishly copying none, and by a close study of the art side of picture-making, and by a concentration of thought on to a little endeavour to do that little really well, rather than perpetuate that which has been done as well before and will be again, and which brings no lasting satisfaction or interest, even after its accomplishment

J. PAGE CROFF.

THE Earth's Rotation.—The great pendulum which had been hung from the top of the dome of the Pantheon by the Astronomical Society of France to demonstrate by its oscillations the rotation of the globe, was last week set in movement at an inaugural ceremony, presided over by M. Chaumie, Minister of Public Instruction. The President of the Republic was represented by Commandant Roulet, and delegates from the Polytechnic and Normal School were also present. The official personages were received by M. Poincare, member of the Institute and of the Bureau of Longitudes, and M. Camille Flammarion, President of the Astronomical Society. They were supported by numerous other *savants*, mathematicians, astronomers, etc. M. Camille Flammarion, after reminding his hearers that it was in 1661 that the demonstration was first made in Florence by Galileo, referred at considerable length to the memorable experiment made in France by Foucault half a century ago, and of which the present was a repetition. M. Chaumie commented on the technical explanations given by the astronomer, and then, by burning with a match the string which held it, freed the pendulum, which commenced its majestic oscillations, the stylet marking clearly its passage over the sand.—Paris correspondent of "The Standard."

ON THE MOLECULAR STRAIN THEORY OF VISION AND OF PHOTOGRAPHIC ACTION.

[Presidential Address to the Photographic Society of Ireland, Delivered on Friday, 10th Oct., 1902.]

I HAVE felt a difficulty in selecting a subject on which to address you, because my knowledge of the processes of photography is limited to the ordinary routine of the amateur's work, but I have at various times studied scientific questions connected with photography, and I have thought it better that I should confine my remarks to a short account of a recent advance in photographic science which has come from an Indian scientist. I refer to Mr. Jagadis Chunder Bose, whose work has opened up a field of advance in photographic science, a field so promising that I think the members who are not already acquainted with it would be interested in an account of Mr. Bose's work.

You are, of course, aware that ever since the beginning of photographic science, as soon as chemists and physicists began to speculate upon what was going on in the photographic plate, it was recognised that the effects were partly chemical and partly physical.

Mr. Bose began his work a few years ago, in 1899, and, as in many other cases in science, he began working in an entirely different direction. You are, of course, aware of the leading principles of wireless telegraphy, and you no doubt know that, in order to carry out wireless telegraphy, one of the most important parts of the apparatus is, or till quite recently has been, the coherer. The coherer is, briefly, a little glass tube filled with iron filings. It is found that when such a tube is exposed to electric waves there is a variation in conductivity, and that in the case of iron filings the conductivity is increased, and it is by this increase of conductivity that it is possible to detect the waves.

In order to connect this matter with photography, I will remind you that these electric waves are identical with light waves, only that they are of greater length. Prof. Lodge suggested an hypothesis to explain the action of the coherer, and it was on the basis of his explanation that the term "coherer" became popular. He suggested that effects arising from the electric waves might cause the iron filings to become fused together at their minute points of contact, the idea being that the iron filings cohered, and in this way the resistance of the tube became diminished

Mr. Bose, in experimenting with different metals, in 1899, discovered that there were some metals that did not increase in conductivity when the electric waves impinged upon them, but that they increased in resistance or diminished in conductivity. Now, if the coherer hypothesis was correct, every substance should show an increase of conductivity; but here Mr. Bose had found that some substances, instead of increasing, diminished in conductivity, therefore the coherer theory must, according to Mr. Bose, be abandoned. Mr. Bose named as "negative" those substances which diminished in conductivity under the action of electric radiation, and "positive" those which increased in conductivity, the substance being in a state of powder when its conductivity is being examined. Among the first class are the metals potassium and sodium; among the second, iron, magnesium, zinc, and cadmium. Silver, the substance that the photographer is continually dealing with, may be sometimes positive and sometimes negative under the influence of the electric waves.

Mr. Bose, in a subsequent paper, designates the peculiar phenomena he is studying "electric touch," and expressed his belief that what he was observing was an allotropic modification of the substance under the influence of the electric radiation.

He suggests that such modifications are very general attendants on the activity of electric or luminous radiation; but only in special cases can their effects be observed during their continuance. Further observation revealed the fact that the same substance may sometimes react positively, sometimes negatively, towards electric radiation. It seemed partly to depend on the intensity of the electric radiation to which it was exposed. For instance, the substance arsenic is negative close to the radiator, but if removed a sufficient distance it becomes positive.

Substances exhibited also a phenomenon which he called "fatigue." This was, in short, a loss of sensitiveness to radiation. But before that state was reached a still more remarkable phenomenon became evident under continuous radiation: the substances may spontaneously reverse in sign. The radiation product may change from negative to positive, the action of radiation reversing the sign of the electric touch. This appeared to be distinct from the change of sign dependent on intensity of radiation, as the experiment in arsenic would indicate. The curve for the conductivity of such a substance as arsenic under continued radiation is a line alternately rising above and sinking below the level of mean or normal conductivity, and finally revealing the fatigue of the substance by the approximation of the curve to this level, the substance finally becoming almost inert and insensitive to electric radiation.

To account for these phenomena, Mr. Bose put forward a strain theory of such allotropic changes as he supposes to obtain in the substance under the influence of electric radiation. If the two forms of the substance be for clearness designated A and B, electric radiation in the first instance converts some of A to B. Now, if A is the + form, B is the — form of the substance. Further radiation to the substance must therefore be attended with lessened response, for A and B are acting antagonistically. There is, however, an "electric elasticity" attending the change, which may result in B rapidly reverting to A. This is "self-recovery." In this case a second trial may show the substance to possess its original sensitiveness. On the other hand, all may become B, and "reversal" result; or again, A + B may exist in such proportions as to lead to resultant insensitiveness or "fatigue." The conductivity curves of potassium, magnesium, and arsenic well illustrated these cases.

The audience would by this time perceive the connection between Mr. Bose's researches and photography. All are familiar with the phenomenon of solarisation. It was only necessary to photograph an arc light, giving an exposure of a few minutes, to get the reversals. In Mr. Bose's view these reversals were phenomena continuous with, or of the same physical nature as, those he dealt with in his experiments. The silver bromide molecule is "strained," and the strain-silver bromide responds to chemical actions differently to the unstrained molecule. The sensitiser's function is to retard the self-recovery from strain. Chemical action is in short a secondary phenomenon, and not a primary one attending exposure.

The successive phases of "solarisation" are represented in Mr. Bose's curves. When the curve of conductivity under the influence of radiation departs from the normal, the first negative is secured; but this conductivity cannot be continuously maintained. In the photographic plate the sensitiser forbids its annulment upon the mere stoppage of radiation. In the "coherer" tube, till fatigue or actual reversion occurs, there will be in general recovery (more or less complete) upon stoppage of radiation. But at length a point is reached when fresh exposure to radiation is attended with fatigue or reversal. The passage from the one state to the other may be said to depict the photographic phenomenon of the first positive; for at some point in this transition the photographic effect causing the negative has been annulled. In Mr. Bose's experiment this passage may be attended with an interval of inertness towards radiation. (Reference was made to the case of Mr. Bose's specially prepared negative silver). After this the sign is reversed. Light, or radio-activity, involves a fresh strain; and the second negative is obtained, and so on. It would appear that a final state of fatigue or inertness attends on continual radiation to the "coherer." On the photographic plate the intervals lengthen, far more light being required to produce the second negative than the first. But this may not be the corresponding phenomenon to "fatigue." Is such fatigue finally reached in the photographic plate short of the appearance of a visible image?

Although it is difficult to correlate the two phenomena with exactness, there is much in the character of the observed changes of conductivity which may be paralleled with photographic actions, and when along with this it is taken into account that the agent inducing the surface changes in the particles in the tube is the same agent which affects the molecules or aggregates of silver bromide, one cannot help regarding the strain theory as most suggestive. That ultimate chemical decomposition may attend continuous light action may not be denied. Many instances can, of course, be cited, and, as I read Mr. Bose, he probably would not deny that light ultimately effects chemical decomposition of the silver haloid in the sensitive plate. But within the range of reversal phenomena the strain theory appears to lend itself in explanation of many effects only awkwardly explained by chemical actions. Chemists apparently do not like to admit merely loosened bonds; strains, on the other hand, may be reasonably supposed to exist in any degree short of disruption of molecular grouping, and, in the other direction, to the minutest beginnings.

Directly in harmony with a strain theory is the well-known fact that mechanically made impressions on the plate are developable. But perhaps the most striking fact supporting the strain theory is the continued sensitiveness of the plate at temperatures so reduced as to inhibit orthodox chemical actions. Readers of Professor Dewar's address to the British Association this year will recollect his reference to this phenomenon. At so low a temperature as that of liquid hydrogen, about 10 per cent. of the original sensitiveness remains. It is now many years ago since I photographed the spectrum on ordinary and isochromatic plates, backed by solid carbonic acid and ether. While the waves of low refrangibility in general had at this temperature lost much of their effect (the loss being most marked on the isochromatic plate), the rays of high refrangibility were little reduced in activity. The action of the dye appeared affected after the manner of chemical reaction, leaving the normal photographic sensitiveness of the plate, to the blue, violet, and ultra violet rays, almost unaffected. But this reminds me that I have more to say about Mr. Bose's work, and must not more digress from my original intention of placing a simple account of his experiment before you.

A photo-electric experiment of Mr. Bose's, analagous to those of Professor Minchen and others, revealing features in common with conductivity experiments, must claim our attention for a little. Two strips of silver which have been exposed to bromoni vapour are immersed in a water-cell and examined as to their variations of electric potential under exposure to flashes of light and to continuous illumination. The phenomena of a maximum effect attending continuous illumination, of self-

recovery, of reversal, and even indications of fatigue are obtained. Other similarities in the forms of the curves are observable.

The connection here is evident. Potential differences will arise under molecular alterations; conversely, potential differences may be taken to indicate molecular strains or alterations. The experiments indicate, therefore, molecular effects similar in many features, arising under light action and arising under electric radiation. The resemblance of the course of events in each case is certainly striking.

The last experiments I have to tell you about were designed to connect the radiation effects with undoubted strain effects, and so support the hypothesis of the former being indeed purely of the nature of strain. In the "strain cell," a very interesting and simple piece of apparatus is presented to us. Two wires cut from the same length are stretched vertically between ebonite supports, and above are attached to binding screws; one of these is capable of being rotated. The "electrolyte" is water, and a sensitive galvanometer of D'Arsonval type is connected to the binding screws. Whatever P.D. there may be in the first instance between the wires at once becomes modified on applying a torque to one of the wires. It may be annulled or increased. A potential difference is, in fact, generated while twisting, and thus straining, one of the wires.

It was found that most of the metals become negative while under increasing strain—i.e., the current in the cell is from the strained to the unstrained wire. With successive turns the effect during each turn grows less. When the twisting is stopped there is recovery showing a time rate resembling the recovery from electric radiation and light radiation. It is remarkable that silver often exhibits an opposite electromotive effect to that generally shown by metals under twist.

Mr. Bose, finding that the electromotive effect is not dependent on the direction of twist, whether clockwise or counter-clockwise, arranged to produce continuous molecular disturbances by conferring a vibratory character to the twist—i.e., arranging so that the wire is twisted alternately through certain definite angles first in one direction and then in the other. This generated a P.D., the magnitude of which depended on the amplitude of twist. We now find in his curves—rapid recovery under a short stimulus, a maximum effect under continued vibration, followed by recovery; and reversal in some cases under intense stimulus or under long continued stimulus. These are the most important points.

The course of experiments is summarised in Mr. Bose's final paper on "The Strain Theory of Photographic Action."

I have not left myself time to touch on the chemists' side of the question, which, from my inability to speak with authority in that direction, I do not entirely regret. What is chemical and what is physical may well be asked. One answer would be that short of disunion and re-arrangement of atomic or molecular bonds between dissimilar substances, we agree to call atomic or molecular disturbances "physical." If this be assumed, there is much known about photographic actions which suggest that the light effect is at least primarily physical. The increased sensitiveness obtained by increasing the size of the silver bromide aggregates (ripening) can hardly be a mere resonance phenomenon. It more directly suggests the building of a system sensitive to molecular strain. So far as chemical action goes, the smallest and the largest aggregate are alike in chemical composition. The image in the silver iodide of the Daguerreotype film may be developed with water vapour.

Moser, and more recently Major-General Waterhouse, produced images directly visible or developable by mercury vapour on clean silver surfaces, exposed in contact with air; and the latter obtained an image developable by water vapour on a clean glass plate. Mere molecular strain effects are certainly suggested by such experiments; but it must not be lost sight of that oxygen and other gases of the atmosphere are present in these experiments. Nor can we entirely side with a strain theory of recurrent reversals till we get some explanation as to why the presence of atmospheric oxygen would appear to be a factor in the phenomenon of solarisation. Professor Meldola suggested that it acts upon the sensitiser, diminishing its halogen absorbing capacity. Those who favour a strain theory may argue that such a chemical alteration of the sensitiser may affect its influence on "self-recovery."

In this sort of obscurity we at present move. But Mr. Bose has conferred a service on photographic science by suggesting alternative views to those long held by many workers in this field. He has opened wide vistas of study, and this is always good, whether the pioneer's deductions are sustained or not. The most dangerous state is that of contentment—a frame of mind never meant for man, however much moralists may advocate its cultivation.

PROFESSOR JOHN JOLY, D.Sc., F.R.S.

COLOUR Photography.—On November 3rd, the Lumiere process will be illustrated by Mr. T. K. Grant at the meeting of the South London Photographic Society, held at Hanover Hall, Hanover Park, Peckham. Photographers interested are invited to the meeting, 8 p.m.

WOLVERHAMPTON Photographic Society.—A demonstration of platinotype printing was given by Mr. T. Henry Cox before the members on the 22nd inst. Prints were developed by Several methods, including the employment of glycerine as a restrainer. Mr. Cox also dealt very fully with the chemical side of the process in a most entertaining manner.

DEVONPORT Camera Club met on Tuesday under the presidency of Mr. R. J. Lamb. Five new members were elected. A large number of excellent slides, lent by Messrs. A. J. Catford, J. F. Coombes, J. Trouern Trend, W. H. Lamb, and R. Maw, were shown. They dealt with marine subjects, Continental views, Dartmoor, Lynmouth, and Ilfracombe. On November 4th Mr. J. Trouern Trend will give an "enlarging" demonstration.

MRS. CARRIE NATION Hoaxed.—The New York correspondent of "The Yorkshire Post" is responsible for the following:—Mrs. Carrie Nation, who has just concluded a visit to the Yale University for the purpose of inducing the students to give up drinking and cigarette smoking, was tumultuously received. At her lecture the Glee Club sang "Down with Alcohol, Drink it Down," and "Good morning, Carrie." The famous saloon-smasher yielded to importunities to sit for her picture, holding a glass of water in her hand as an emblem of teetotalism. In the resulting photograph Mrs. Nation is represented holding a glass which, owing to the mysteries of the dark room, is capped with a crown of foam. Around her are the students, one drinking from a whisky bottle, another lighting a pipe, others smoking cigarettes, and two apparently in the last stages of intoxication. Mrs. Nation intends to sue the University for libel.

"AFTERNOON Tea at a Photographer's."—Tuesday and Wednesday, Oct. 21st and 22nd, were the two days set apart as show days at the new photographic studio recently opened by Mr. J. W. Beaufort in Birmingham. The invitations were sent out in a neatly printed and artistic booklet, and many ladies and gentlemen called to view the suite of rooms and studios, where they were received by Mr. and Mrs. Beaufort, whilst the assistants, some dozen or more, conducted the visitors over the premises. Afternoon tea was served in the orthodox manner in the reception room, and on leaving, each visitor was presented with a souvenir, consisting of the first number of "Achievements," containing a portrait study by Mr. Beaufort, entitled "Contemplation," a charming effect, the subject being a well posed female figure, soft, well graded and modelled, and admirably translated in sepia carbon. Mr. Beaufort says in his elegant publication: "Picture making by photography, particularly when in relation to figure studies, is the most fascinating hobby for the patient photographer, providing, of course, the worker possesses the necessary skill and accomplishments. The work has a peculiar charm of its own. The sudden inspiration, the eagerness to secure the effects, the disappointments on developing to find some unnoticed object has taken upon itself certain prominence which destroys the value of the rest of the tones, all tend to lure the enthusiast on to achieve the ideal. For several years, in my old studio in Colmore Row, I tried in vain to secure certain effects which were almost impossible owing to the unsuitability of the studio. Now with a studio built to my own design, as my present one is, such effects in lighting and the true rendering of tone values are under absolute control." We congratulate Mr. Beaufort on a marked advancement in his aims, ideals, and work.

GLEANINGS FROM OLD LONDON DIRECTORIES.

Among the pleasures of life may be counted the perusal of old books. If the subjects or the places to which they refer appeal to the reader, the most prosaic of volumes acquire a fascinating interest. A duller volume than a London Directory can scarcely be imagined, yet time invests even such with a peculiar attractiveness. Three old Directories of the Metropolis recently passed through our hands. They were for the years 1798, 1839, and 1848, and a most interesting study they proved to be Their relative size at once appealed to the imagination as suggestive of the expansion of this vast city. The oldest volume contained some 300 octavo pages, but in the year 1839 their number had increased to about 1,400, whilst the most recent volume of the three contained about 2,000 pages, of usual size, for the Commercial and Court sections. The oldest volume contained about 9,000 addresses, and we wandered through them instinctively, in search of opticians and others who may have been connected with that branch of industry. In 1798 we found Peter and John Dollond were located at 59, St. Paul's Churchyard. At 20, Cornhill, resided Edward Nairne, optician to the King. Dring and Fage were hydrometer makers at 6, Tooley Street, Southwark. Jesse Ramsden, a noted optician, whose name is still associated with eye-pieces, was established at 199, Piccadilly. From another source we gather that his connection with optics dated back to 1764, and that he married the daughter of John Dollond. William Cary, mathematical instrument maker, was at 182, Strand. John and Edward Troughton, also mathematical instrument makers, were in business at 136, Fleet Street. At 42, Lothbury, was John Lister, wine and brandy merchant, probably the father of Joseph Lister, who interested himself very much in the improvement of the microscope, whence the name of Lister Works, given to their factory by Messrs. R. and J. Beck, of Cornhill. The celebrated surgeon, Lord Lister, was son of Joseph Lister. Spencer, Browning, and Rust were mathematical instrument makers at 66, Wapping. In 1839 they were wholesale dealers in bunting for ships' colours also. Was the Browning here referred to the predecessor of the celebrated spectroscope maker of the Strand? Another interesting name, in a different sphere of life, was Benjamin D'Israeli, merchant, 26, Broad Street Buildings. We looked in vain for Newton and Co. in the oldest volume, but in 1839 there was a firm, Newton and Berry, globe makers and land surveyors, 66, Chancery Lane. In 1839 Andrew Ross was established as mathematical instrument maker at 15, St. John's Square, Clerkenwell; but in 1848 he was an optician at 2, Featherstone Buildings, High Holborn. Carpenter and Westley were located at the Microcosm, 24, Regent Street. Smith and Beck, in 1848, were opticians and microscope makers at 6, Coleman Street. In the same year Richard Beard was in business at the Photographic Portrait Rooms, Royal Polytechnic Institution, 309, Regent Street; 34, Parliament Street; 85, King William Street, City; and he also had a factory at 18½, Wharf Road, City Road. Whose names will appear a hundred years hence as links with the opticians and photographers of to-day?

Leicester Literary and Philosophical Society.—Messrs. Taylor, Taylor and Hobson most kindly invited the members of the photographic section to inspect their works in Stoughton Street on Thursday, October 23rd. A party of twenty-five ladies and gentlemen availed themselves of the offer, and were shown round by Mr. Smithies Taylor, and other members of the firm. The whole process of manufacture of a lens was explained, and the intricate machinery employed examined. The visit lasted two hours, and at its conclusion tea was kindly provided. Mr. Councillor Squire expressed the thanks of the visitors for the kind hospitality extended to them, and a most enjoyable afternoon was thus brought to a close.

THE BARD'S TRIBUTE TO HIS PHOTOGRAPHIC SOCIETY.

[We perceive by the October number of the Edinburgh Photographic Society's Transactions that one of its members, like Mr. Silas Wegg, has dropped into poetry. We append the lines, and congratulate the Society on having inspired such grateful emotions.—Eds. B.J.P.]

With mingled feelings I recall those days when forth I hied,
A novice, with my half-plate in a satchel by my side;
Resolved on "taking" somebody, or something, you may guess,
But, lackaday! I knew not then the good old E.P.S.

To drive the crowd of urchins back, who gathered quite in force,
Upset one, and the dark slide I forgot to draw, of course;
And ofttimes two exposures on one plate (which is excess)
Produced effects more wonderful than charming, I confess.

Sometimes the cap I would forget still firm upon the hood,
While, I, with air of one who knows (but inward trembling), stood;
And, watch in hand, the rubber ball most deftly would I press,
Then came a glad, expectant dream—words cannot here express.

'Twas in the dark-room vivid thoughts of latent gems would rise,
And phantom landscapes oft beguiled one's weary, watchful eyes;
Till roused by some home critic—"What a horrid, splashy mess!
Why don't you learn from others. Go and joint the E.P.S."

On progress bent, with firm resolve, and by a friend proposed,
I proudly was admitted *nem. con.* (that is, unopposed);
Now, while I live, I surely that auspicious day shall bless,
When I became a member of the good old E.P.S.

Here genial, kindred spirits one can meet with by the way,
And all his wrongs have righted, and made clear as an X-ray;
Those little peccadillos need no longer now distress,
For everything goes smiling when you've joined the E.P.S.

So now I sally forth, rare gems to gather as I go,
And e'en have ventured to exhibit at the Photo Show;
Success has crowned my efforts. If you'll call at my address,
You there can see my trophy—Bronze Medallion, E.P.S.

Karr Bonne.

The Blairgowrie and District at their monthly meeting added three members to the roll. The "Hand Camera Work" competition (A class) was won by D. G. Monair; and B class by L. Falconer, junr. The R.P.S. lecture on "practical Landscape Photography" was read.

A meeting of professional photographers will be held at the rooms of the Birmingham Photographic Society, Norwich Union Chambers, Congreve Street, on Thursday, November 6th, at 7.30 p.m., to consider the advisability of forming a local branch of the Professional Photographers' Association. Mr. Alfred Ellis, hon. secretary of the Association, and Mr. T. C. Turner, hon. secretary to Local Branches Committee, will be present. All professional photographers of the district are cordially invited to the meeting.

An Historic Photograph Accepted by the King.—His Majesty the King has just accepted of Mr. Horace W. Nicholls, of Windsor, late of Johannesburg, South Africa, a panoramic carbon photograph of the great Peace Thanksgiving Service at Pretoria in June last. The King, in accepting the picture, commented on its interest. Viscount Kitchener has also sent Mr. Nicholls a letter in reference to the same subject, in which he states that it is quite the best photograph he has seen of the historic ceremony, showing so well the great mass of troops present. He requested Mr. Nicholls to send him some copies of it. The picture is rather remarkable from the fact that it shows over 7,000 troops, and is 36 inches long.

The Glasgow Art Galleries.—The building in Kelvin Grove, Glasgow, which housed the fine art and the archæological and historical collection during the recent international exhibition, was last week dedicated to its permanent purpose as the home of the collections of fine art and of natural scientific and industrial objects belonging to the corporation. The building is the outcome of the Glasgow Exhibition of 1888, the £40,000 surplus derived from that undertaking serving as a nucleus for its erection. To this amount a considerable sum was added by public subscription, but there is still a large balance of the £170,000 which the building has cost to be provided, no doubt out of the rates. As the galleries have been finally arranged sculpture occupies the great central hall. The eastern pavilions on the ground floor are devoted to natural history, science, zoology, and mineralogy, whilst industrial exhibits and historical memorials and remains are located in the Western Pavilions. The upper floor of the building is entirely devoted to pictures and objects of art, the latter being displayed in the balconies.

STATISTICS CONCERNING THE TRAINING OF CHEMISTS EMPLOYED IN ENGLISH CHEMICAL INDUSTRIES.*

(Reprinted from "The Chemical News")

THE Committee decided that the best method of obtaining the desired statistics concerning the training of the chemists employed in English chemical industries was to send a circular-letter, with a form for reply enclosed, to all those members of the Society of Chemical Industry who, so far as could be judged from the designations given in the list of members, occupy a position as manager or chemist in a works. This method was adopted because the great majority of the chemists engaged in technological work in this country are members of that Society, and because no other means of obtaining the information seemed practicable. The result of the inquiry was that more than half of those addressed sent replies to the circular. It is probable that a considerable proportion of those who did not reply are not engaged in chemical works, and therefore the accompanying statistics may be considered to give a fair idea of the present position.

Information concerning their course of training was received from 502 managers and chemists employed in English chemical industries. Of these, 107, or 21 per cent. are graduates, and 395 have not taken a degree; 111, or 22 per cent. are Fellows or Associates of the Institute of Chemistry.

The following figures give more detailed information:—

Number of graduates of a British university	59	
Number of graduates of both a British and a foreign university	16	
Number of graduates of a foreign university	32	(*a*)
	107	
Number of non graduates trained in a British university or university college	137	(*b*)
Number of non-graduates trained in a British technical college	165	
Number of non-graduates trained in a foreign university or technical college...	8	
Number of non graduates trained in evening classes, analysts' laboratories, works' laboratories, or otherwise	85	
	395	

(*a*) Thirteen of whom studied also in a British university or technical college

(*b*) Twenty of whom studied also in a foreign university or technical college.

The distribution of the chemists among the principal industries is shown in the accompanying table:—

Industry.	Graduates— Of British university.	Of British and foreign university.	Of foreign university.	Non-graduates, trained in— University or university college.	Technical college.	Foreign university or technical college.	Evening classes, &c.	Total.
Acids, alkalis, inorganic salts	9	3	5	20	19	2	20	78
Metallurgical (various)	1	—	4	19	13	—	14	51
Explosives	6	—	1	4	28	1	6	46
Dyeing and printing...	3	—	—	13	16	—	5	37
Oils, fats, soaps, candles	2	1	3	11	9	1	5	32
Colours, pigments, oils, varnishes	8	1	2	6	5	—	6	28
Brewing and distilling	3	—	4	8	12	—	1	28
Fine chemicals, pharmaceuticals, confections	7	—	—	9	6	—	4	26
Sugar, starch, glucose	3	2	1	2	8	—	3	19
Cement, tiles, pottery	—	1	1	5	10	—	1	18
Aniline colours	2	3	7	2	2	1	—	17
Tar distilling	—	—	—	5	8	—	3	16
Paper, paper pulp	—	—	2	3	3	—	—	8
Glue, gelatin, size	—	1	—	4	2	—	—	7
Paraffin and paraffin-oil	—	—	—	3	4	—	—	7
Dyewood and tanning extracts	—	—	—	5	2	—	—	7
Cyanides and ferrocyanides	3	1	—	—	2	—	—	6
Glass	2	—	—	2	1	—	1	6
Coal-gas	—	1	—	—	3	—	2	6
Miscellaneous	10	2	2	16	12	3	14	59
Total	59	16	32	137	165	8	85	502

* Report of the Committee, consisting of Professor W. H. Perkin (Chairman), Professor H. E. Armstrong, Mr. G. T. Beilby, and Professor G. G. Henderson (Secretary).

THE MANCHESTER SCHOOL OF TECHNOLOGY.

[Abridged from the "Times."]

THE school has been seven years in building, and represents an endowment of nearly £300,000, largely, but not entirely, of municipal origin. From one point of view, the school is the latest development of the Manchester Mechanics' Institute, founded in 1824, and in 1883 transformed into the Manchester Technical School. By 1883, Mr. Forster's Education Act of 1870 had wrought a diffusion of elementary knowledge which virtually superseded the voluntary effort of Birkbeck and Brougham, of their coadjutors and their disciples. The common-school system was giving the people the leaven of primary teaching, the want of which on their part had to a great degree rendered the offer of technical instruction at mechanics' institutes futile. Meantime, also, investigators, such as the late Mr. Slagg, Sir Henry Roscoe, and Sir William Mather, had traced to its root in foreign methods of technical teaching the growth of foreign industrial competition. It was in these circumstances that the Manchester Mechanics' Institute availed itself of the assistance of the City and Guilds of London for the establishment of specialised courses of instruction. In 1892, however, the local movement received an impulse beyond that of even the most munificent private benefaction. The Whitworth Institute of Art and Industry had been a projected supplement to the splendid gifts of the Whitworth legatees to Manchester; but in 1892 the promoters of that scheme joined forces with the municipality in the application of the ways and means for technical schooling which the Acts of 1889 and 1890 had put in municipal hands. Four thousand six hundred square yards of ground, formerly the site of the Whitworth Engineering Works, are included in the contribution of the Whitworth Trust, and to this area above 2,000 square yards have been added by the Corporation of the city. A sum of £44,000, representing the profits of the Jubilee Exhibition at Manchester in 1887, swells the composite subscription of Imperial, local, and philanthropic funds. The product is a School of Technology on a scale of equipment which qualified judges have said is unsurpassed.

Both day and evening classes are provided for in the syllabus of the school. The following are the day courses of study, together with the names of the heads of the departments:—Preparatory course, Mr. J. E. Holden; pure and applied mathematics, Professor J. P. Wrapson; mechanical engineering, Professor J. T. Nicolson; electrical engineering and technical physics, Professor A. Schwartz; sanitary engineering, Professor J. Radcliffe; pure and applied chemistry, Professor W. J. Pope; textile industries, Professor T. W. Fox; photographic and printing crafts, Mr. C. W. Gamble. The municipal school of art is in a separate building, and has a department for architecture, to which a lecturer, Mr. A. E. Corbett, has been appointed. There are also classes for German, dressmaking, and millinery, and other subjects.

The electrical and physics department is an important division of the school. The various rooms and laboratories spread over four floors. Dynamos and electric motors of many descriptions have been laid down, and there is a great abundance of testing and recording instruments. In the hands of Professor Schwartz and his staff we may hope that this complete equipment will lead to the elucidation of many unsolved problems in the application of science to electrical industry. A special feature is an experimental tramcar truck, the wheels of which, being

driven by electric motors, can be run on rollers. The load can be varied, and other adjustments can be made for experimental purposes. There is also an arrangement for producing an artificial gradient. It will give an idea of the completeness of the arrangements in the electrical laboratory to state that current measurements can be made up to 4,000 amperes, and pressures up to 100,000 volts.

The chemistry department might be aptly described as a school in itself. There are lecture-rooms, laboratories, and offices of various kinds, all most completely fitted. The largest laboratory is one of the finest rooms in the building, and will accommodate 180 students. One detail of apparatus, amongst many, may be mentioned as showing the influence exerted on practice by researches which at first appear to have no bearing on a subject. The importance of distillation under very low barometric pressures is a prominent feature in modern chemical research, but the presence of aqueous vapour has been a difficulty which has given much trouble. In order to get over this, Professor Pope hit upon the ingenious expedient of causing his air pump to draw through a glass vessel cooled by immersion in boiling liquid air, thus freezing out the vapour.

It is the purpose of this article to describe only the school and its equipment, but in writing on the subject one cannot avoid speculating on the use to which all this elaborate and costly plant will be put. Reference has been made to research, but research is not exactly the same thing as teaching, although it should form an important element of higher technological education. It is a question for Manchester to decide whether the plant of the schools, and the time of the teaching staff, should be devoted chiefly to the instruction of the average student who does not soar to very great heights in the rarefied atmosphere of science, or whether it should be more especially utilised for the select few who are to become the leaders in applied science, the originators and inventors who will raise the industry of the country to a higher level—such men, in short, as the country cannot do without if it is to hold its own with other nations. To some extent, it may be possible to provide for both classes, but the combination is beset with difficulties. If research work, which involves the training of students who can play a useful and intelligent part in such work, is to be the main feature, it will result in the production of comparatively few—though perhaps sufficient—highly trained men, and will also be a most potent means of raising the industries of the district to a higher scientific level, directly through the medium of the work done in solving problems submitted by the manufacturers. If quantity rather than quality of output is to be the aim of the school, it may supply to the country a larger contingent of mediocre men who will be useful in their proper spheres, but whose function it will be to follow rather than to lead.

This problem appears to be the chief that technical educationists have now to solve; but, in any case, the chance should be given to every man or boy who has the ability to climb to reach the top. We cannot afford to waste a single grain of the talent which the country produces.

THE members of "The Linked Ring" were at home to their friends at the photographic salon, Dudley Gallery, Egyptian Hall, Piccadilly, on Tuesday evening last. The programme included "smoking, and its usual accessories; accompanied by a little music."

THE Goldsmiths' Institute Camera Club.—The Hon. Secretary writes: I beg leave to inform you that "The Goldsmiths' Institute Camera Club," which was established in 1893, has recently been reconstituted in one or two minor matters, and will in future be called "The Goldsmiths' Institute Photographic Society."

IT is with great regret we ("Invention") chronicle the demise of Mr. Albert Alston, of Burnley, on the 6th inst. Deceased was the inventor (*sic*) of the popular and beautiful system of "crystoleum" painting, by means of which such artistic results are obtained in photographs.

WE regret to have to announce the death of Dr. E. C. Fincham, which took place on the 22nd inst. The deceased gentleman, who was 39 years old, was an accomplished amateur photographer. He took a leading part in the "reform movement" of the Royal Photographic Society last winter, and was elected a member of the Council in February of this year.

NATIONAL Photographic Record Association.—A meeting of the National Photographic Record Association will be held at the Midland Grand Hotel, St. Pancras, on Tuesday, November 4th. Afternoon tea will be served at 4 o'clock. A report of the work will be presented, and a discussion will be invited as to the best means of carrying on the work. A series of Sir J. Benjamin Stone's photographs of the Coronation ceremonies, and some other recent contributions, will be on exhibition.

MESSRS. Mawson and Swan offer the following prizes for competition by amateurs only for transparencies made on the Mawson "Lantern" plates which have been purchased since September 30th, 1902: One £5 5s., two £3 3s., one £2 2s., ten £1 1s. The transparencies to be sent in not later than February 1st, 1903. The awards will be issued about one week later. For further particulars apply to Messrs. Mawson and Swan, Mosley Street, Newcastle-on-Tyne, and 33, Soho Square, London.

New Books.

"Photographische Bibliothek." Vol. 14. "Die Architektur—Photographie." Hans Schmidt. Verlag von Gustav Schmidt, Berlin.

This volume on "Architectural Photography" is written by a well-known German amateur photographer of considerable skill, who has devoted much time to the study of optics. The instructions given as to selection of apparatus will be found reliable and sufficiently comprehensive to meet all requirements. The chapters on perspective, the use of the camera, and the necessary photographic manipulations will also be found very useful by those who are new to photographic work. A series of well executed illustrations exemplify the text and mostly represent well selected views of Germany's city of classic art—Munich. A very fine specimen of tele-photographic work is given on page 112, which shows the immense control of focal length the photographer has with a tele-photo lens.

"Artificial Light for Portrait Photography." Illustrated. Price 6d. Published by Human Limited, Newcastle-on-Tyne.

The half-tone reproductions in this little book supply a high testimonial to the practical efficiency of the Morgan system of electric lighting which the anonymous author briefly describes. The group and the portraits are faultless specimens of studio work. At this season of the year, when so many questions reach us on the subject of artificial lighting in the studio, we have pleasure in directing the attention of our readers to the book, the second part of which consists of a chapter entitled "A Study of how to make the most of Dry Plates for Portrait Photography." We append a brief description of the Morgan system, which the professional photographer would do well to study in its entirety. "The first and most important feature is the large area of illumination which is made available to the artist, ranging from 80 to 120 square feet—or even more—of equally illuminated surface. The next important feature in the system is the actinic quality of the light, which is rich in violet rays, making well exposed negatives possible with an exposure of less than half a second (lens at f. 3.), and groups perfectly covered in six seconds (lens at f. 7). The general appearance of the Morgan lamp is that of an ordinary daylight window, divided by the usual astragals, and glazed. There is no appearance of mechanism, and any person entering the studio while the light was in operation would be led to believe that he had entered a room lighted by soft diffused daylight. The size and angle of the apparent window is, moreover, such as one is accustomed to see in all daylight studios; and in the treatment of sitters for different effects of lighting, the usual blinds and screens used in daylight work are employed. Another important feature is the simplicity of manipulation. A switch is moved, and the room is instantly flooded with soft white light. Should more be required a lever is pushed forward, if less it is pulled backward. There is no noise, and the actinic value is registered by a graduated scale showing the quantity of electric current passing through the carbons in amperes. The economy of current—an important factor—has been carefully and fully considered, and waste has been reduced to the lowest point. The light is obtained from powerful arcs fed automatically, and where the current used is continuous, noiselessly. All the light, both direct and reflected, is utilised, but the direct light is so broken up by reflectors and diffusers that all the light, both direct and reflected, is thrown into the studio, and on to the subject, in a broad diffused mass the full size of the window aperture."

"The Science Teachers' Pocket Book and Diary, 1902-3." 100 pp. Price 1s. Published by James Woolley, Sons and Co., Victoria Bridge, Manchester.

Enumeration of the principal contents of this pocket book will show that it contains a mass of information likely to be of use for reference not merely to the student of chemistry and physics, but also to that comparatively rare personage, the scientific photographer. Here are the subjects:—Weights and Measures; Atomic Weights; Specific and Atomic Heats; Atomicity of the elements; Periodic Law; Specific Gravity Tables; Freezing Mixtures; Boiling Points; Fusing Points; Solubility of Salts; Precipitating Powers of Reagents; Various Useful Data (Chemistry); Various Useful Data (Electricity); Standard Wire Gauge; Lanternists' Reference Table; Common Names of some Chemical Substances; Directions for Making Test Solutions; Science Examinations, Evening; Science Examinations, Day; Scientific Societies. There is a list of scientific societies which might with advantage be lengthened in future editions of the pocket-book; and there are also spaces for diary records. We have found the book of assistance in refreshing our memory on many points of chemical nomenclature; and here and there it is interesting as indicating how greatly chemical theory in some of its aspects has been changed or altered. Thus, in our school days, heptads found no recognition in the valency of the elements.

MR. DOWNEY, M.V.O., of 10, Nevern Square, South Kensington, has had the honour of receiving the Coronation Medal from His Majesty the King.

New Apparatus, &c.

A New Double Transfer Paper. Manufactured by the Autotype Company, 74, New Oxford Street, and Ealing Dean.

Hitherto in carbon printing, if the picture is desired on a rough or matt paper, it has had to be made by the single transfer method, for which a reversed negative is required, unless one is content with a reversed (as regards right or left) image. The reason for this is the difficulty of getting perfect contact with the rough surface of the paper and the image, while on its temporary support in the final transfer. The Autotype Company, however, have just put upon the market a double transfer with a matt surface, with which this difficulty is avoided, and they have been good enough to send us a couple of samples—white and cream toned—which, upon trial, we find work admirably. The method of using it is similar to that of the ordinary smooth double transfer paper. Here are the directions issued with the paper:—

"Cut pieces, which should be a little larger than the prints, are soaked in clean cold water about an hour before they are required for use.

"The prints developed on temporary support, having been alumed and dried in the usual manner, are placed in a bath of warm water 70 degrees to 90 degrees Fahrenheit Now remove a piece of the final support from the cold water and place it in the warm water until the coated surface becomes slimy to the touch. When this has occurred bring the coated surface in contact with the picture on temporary support, lift both out together and lay them, support upwards, on a level rigid surface, such as plate-glass or zinc-plate.

"A very light application of the squeegee suffices to remove excess of water and to secure absolute contact. Now hang them up, and when thoroughly dry they may be pulled apart."

With the matt double transfer paper, the company send us a single transfer print on a "pyramid grained" paper, as well as an excellent photograph of their exhibit at the R.P.S. The pyramid paper seems to give great softness to the picture, with little or no loss of detail, and for this reason it will no doubt commend itself to many workers of the carbon process.

Commercial & Legal Intelligence

Re Frederick Thomas Harris, Photographer, 137, Whiteladies Road, Bristol.—The public examination of this debtor was held at the Bristol Bankruptcy Court on Friday last, before Mr. Registrar Harley. Full particulars have already been published in the British Journal of Photography. The examination was upon the application of Mr. Sloan, who appeared on behalf of the debtor, ordered to be closed.

An adjourned inquest was held at Woolwich on Wednesday last week on the body of Thomas Lewis, a Woolwich Dockyard foreman, who died from the effects of injuries received in an explosion in Woolwich Dockyard on September 23rd. Captain Lapham, Army Service Corps, said that in consequence of waste in the shipment of gasoline to South Africa, used in making search lights, Lieut. Chase, with the approval of the dockyard authorities, decided to make some experiments with regard to the expansion of gasoline when shipped to hot climates. It was thought that the basement of the dockyard wine cellar was the most suitable place for testing the gasoline. A drum of the fluid was placed in hot water, and exploded. Lewis was so much injured that he died, and Lieut. Chase, who was conducting the experiment, and a labourer named Soloam were so severely burned as to be still in hospital, and unable to attend to give evidence. The authorities had no idea of the extreme inflammability and danger of gasoline, or they would not have sanctioned the experiment. The inquiry was adjourned for another month, in the hope that Lieut. Chase and Soloam will then be able to attend. We regret to learn that Lieut. Chase has since died. It seems strange indeed that the authorities at Woolwich were not aware of the great inflammability, and danger in the handling, of gasoline.

Season in Advertising.—Is it not questionable whether the unaided general advertiser always conducts his operations, or lays out his plan, with reference to season? A perhaps not unreasonable paraphrase of Lincoln's celebrated opinion would read thus: "You may sell your goods to some of the people all the time, and to all the people some of the time, but you won't sell all your goods to all the people all the time." This points to the conclusion that the people are creatures of mood, and the facts prove that such mood is greatly the creature of season. Courageous modern continental philosophers incline to the belief that a man may so train himself by investigation of the trend of events in the past, as to be able to define, with tolerable accuracy, how the future will order itself. But the training would appear to be a large matter, necessitating the abandonment of most of the purposes of life. The shrewd man of business, however, should have little difficulty in anticipating, well in advance, a substantial proportion of the wants of season. And yet in the pages of the newspapers, the magazines and other advertising publications, are to be seen, year in year out, announcements modelled upon one unvarying method, conveying some colourless unconvincing intelligence, as wearisome as the fact that the earth is somewhat round in shape, or that water continues to persevere with dogged obstinacy in finding its level. Certain classes of goods may possess few but undoubted merits, and those well within the public knowledge. Perhaps, in such a case, the mere mention of the names of the goods may in an advertisement be all-sufficient to acquaint the people, year in year out, with the claims of such goods to patronage. But surely, it were wisdom to refresh the public occasionally by a reminder that, just at the moment, those goods have a peculiar and forcible demand upon the public recognition. If a food, a medicine, a beverage or a toilet preparation is suitable for use all the year round and in any climate, the mere repetition of the facts may soon weary the world into indifference. If any one of the mentioned commodities is useful in summer, winter, autumn and spring, then let the why and wherefore of its usefulness be told in reference to season. If a meat extract exhilarates, comforts and nourishes at a time when the vagaries of autumn unhinge the human mechanism, we shall be more impressed with the virtues of the speciality if we are told of them in connection with the season. It is, perhaps, not a fine stroke of prudence to wait for the rain before you advertise an umbrella. The clothier who put out the announcement, "Sooner or later it will rain and you'll want an overall," told us a truism, but there was a certain touch of sly humour about his advice, suggesting the unwisdom of ignoring that should appeal to everyone. The old draper looked in June through the almanac for September, and when he was reminded that the partridge became uncomfortable about the first of that month, he set his wife and daughter down to knitting heather stockings. Let the advertiser constantly think over his present and prospective stock. Not confining his reflections to the time and the hour; but looking well ahead, for what will be wanted by and by, and let his announcements, wherever possible, be made with reference to the season and its demands.—"Practical Advertising."

The Patent Law Amendment Bill.—Last week, in the House of Commons, on consideration of this Bill as amended by the standing committee, Mr. Caldwell (Lanark, Mid) moved the following new clause:—"An invention covered by any patent granted on an application to which section one of this Act applies shall not be deemed to have been anticipated by reason only of its publication in a specification deposited in the Patent Office pursuant to an application made not less than 50 years before the date of the application for a patent therefor, or of its publication in a provisional specification of any date not followed by a complete specification."—Mr. Gerald Balfour (Leeds, Central) accepted the clause, which was agreed to.—On Clause 2, Mr. Cawley (Lancashire, Prestwich) moved an amendment, the effect of which, he said, would be to enable the Board of Trade not only to dismiss petitions for patents or to refer them to the Judicial Committee of the Privy Council, but to grant them outright, a course which under the present law they were not empowered to take. His amendment was designed in the interests especially of the small manufacturers in the colour trade. That trade had been largely transferred to Germany mainly, he contended, owing to the operations of the Patent Laws of this country.—Mr. Brigg supported the amendment on the ground that anything that could be done to help the small inventor, so that the industry of the country might be promoted, deserved the consideration of the Board of Trade.—Mr. Gerald Balfour said the particular modification desired by the hon. member for Prestwich was very fully discussed in the committee upstairs and rejected, as he thought, for excellent reasons. What the Bill proposed was that applications should, in the first instance, be made to the Board of Trade, who could then act the part of conciliator between the patentee and those who were seeking for a licence. If the parties were unable to come to an agreement with the assistance of the Board of Trade, the Board of Trade might, if in its opinion there was a prima facie case, refer the petition to the Privy Council, and the Privy Council decide at once and for all. Until the petition was referred to the Privy Council no expense of any kind was involved upon either of the parties, but he imagined that, in the case of the small manufacturers of whom the hon. member spoke, it would be possible for the Board of Trade to bring the parties together in the majority of instances at all events. The effect of the hon. member's scheme, if it were carried, would be this. The Board of Trade would not accept the task of deciding upon matters in which very great pecuniary interests were constantly involved without referring them to a tribunal constituted ad hoc. There would be an arbitration, whose expenses would have to be paid, and there would be the expenses of counsel, and the result would be that, where a case was carried from the decision of the Board of Trade to the Privy Council, so far from the expenses being diminished, they would be doubled. The object of the amendments which the Government introduced into the Bill in committee was to diminish the expenses as far as possible, and with that view they had arranged that there should be only one trial of these matters before a Court, and that from that Court there should be no appeal. He believed they could not get a better Court for the purpose than the Privy Council, and it was for that reason the Government substituted the Privy Council for the High Court. His own belief was that under the procedure which the Bill now contemplated they would get at once the cheapest and most satisfactory procedure available.—Mr. Caldwell thought the Board of Trade should take upon itself the responsibility of giving a decision when there would be, if the necessity arose, an appeal to the Privy Council. The probability, however, was that the parties would come to an agreement before the Board of Trade.—The amendment was negatived without a division.—The Bill was then read a third time.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

ov.	Name of Society.	Subject.
.....	Royal Photographic	*A Trip Through Spain.* James Sinclair, Esq., F.R.P.S.
.....	Southampton Camera Club	Lantern Slide Competition. *Landscape.*
.....	Photographic Club	Annual General Meeting.
.....	Croydon Camera Club	Lantern, 8.30.
.....	Leeds Camera Club	*The Magic Carpet.* Mr. E. Rimbault Dibdin.
.....	Borough Polytechnic.....	*Gum Bichromate Printing and Developing.* Mr. J. R. Gotz, F.R.P.S.
.....	North Middlesex Photographic	Tenth Lantern Slide Competition.
.....	Edinburgh Photo. Society	*Mounts and Mounting.* Illustrated. J. W. Eadie, Airdrie.
.....	London and Provincial	*Ramble Round the Tower of London.* Mr. A. Bedding.
.....	N.-W. London Photo. Society	Social Evening. *Voyage to Algiers.* Mr. J. S. Fairfoul!.

ONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

'OBER 23RD.—Mr. W. G. Barker in the chair.

'he meeting of the previous week was continued in reference to the inistration of the "Henderson" award, and a resolution of the com-tee was read, to the effect that a list of eligible papers had been wn up, but in the opinion of the committee some of these were med of sufficient merit. It was therefore proposed that a die should struck which would cost about £5, so that if in the future any winner the award should prefer a medal instead of cash, a suitable gold dal could be made to the value of the award, and, as £10 was already hand, the balance could be held as a fund to defray any expenses connection with the award, so as not to interfere with the funds of Association. A lengthy discussion followed with numerous amend-nts and propositions. Eventually the original amendment of the com-tee was put to the vote and won by 11 for and 5 against, the amend-nt reading:—

'hat the £10 be treated as a special fund to be devoted to:—

st. To providing a special die from which medals may be struck in d, silver, or bronze.

nd. To the future administration of the award for special postage l other expenses.

Mr. R. P. Drage proposed a very hearty vote of thanks be given to chairman for the efficient manner in which the difficult meeting had n carried through. This was seconded by Mr. A. Mackie, and carried animously.

PHOTOGRAPHIC CLUB.

DAK, LTD., demonstrated their new developing machine for roll film the 22nd inst. "Five minutes with the Company's standard developer, espective of temperature, was the time he gave the film for develop-nt, and he invariably obtained good all-round negatives," said demonstrator. The No. O F.P.K. was also shown.

CAMERA CLUB.

E winter session, by which is meant the lecture season, has now com-nced at the Camera Club, and the members met on Thursday last ek to find the premises swept and garnished, several small attractions ving been made in the appointment of the rooms to add to their mfort and convenience.

The lecture was by Mr. Hepworth, and was entitled "The Evolution an Illustrated Newspaper," special attention being directed to the eat revolution in block production, which has been brought about the help of photography. The particular newspaper treated of was e "Daily Graphic," which can boast that it is the first illustrated daily wspaper established in this country, although we believe that tempts in the same direction had been made in America before its vent. The "Daily Graphic" office appears to be a most comprehensive ace, for the whole of the work of production is carried on there. large staff of artists is engaged in the studio, whose duty it is to duce all the pictures sent in to line form. These drawings then ss on to the photographic studio, when they are turned into reversed gatives, under the beneficent beams of the electric light, for it would ver do to depend upon the fickle aid of Fleet Street daylight for work hich must be produced with any regularity. The same light is employed transfer the lines of the negative to the bichromatised zinc plate, after hich the plate is etched in rocking baths, and finally mounted type high metal blocks. The whole of this process was illustrated by lantern ctures from negatives taken by the lecturer at the office of the "Daily raphic."

Another section of the lecture was devoted to the making of the paper upon which the newspaper is printed, and here again explanation was much helped by a series of photographs taken at two different paper mills in the heart of Kent. One of these mills was of the old picturesque type, where a water wheel affords the motive power, and where paper is still made by hand. At the other mill, known as the Horton Kirby Paper Works, everything is done by machine, and the contrast between the old and the new methods is most interesting. In the time that it takes to make a single small sheet by the first process, several yards are reeled off by the second. And whereas rags form the staple material for the hand made paper, esparto grass and wood pulp are most largely used by the big mills. The process of making paper from rags is still employed for the finer descriptions of material, such as that used by artists, and for the finest book work, but had the paper maker no other source of supply than rags, his occupation would be almost gone, and we should have no cheap literature.

After removal from the machine upon which it is made and reeled, the paper is calendered so as to give it a smooth surface, after which it is cut into sheets, or wound by the mile upon reels according to the purpose for which it is destined. For finer descriptions of work, the sheet form is employed, and for newspapers the reel form is imperative. For such reels are attached to the printing machines, and are run through them automatically, the printed sheets being cut off and folded ready for delivery to the newsagents, as they pass through.

Not the least interesting portion of the lecture was that which illustrated the gradual evolution of the illustrated newspaper from those very roughly adorned sheets of news hawked about the streets at one time under the name of broadsides. Collections of these may be seen at the British Museum and elsewhere, and a strange feature about them is that they mostly deal with episodes of a morbid character. Any particularly atrocious murder was illustrated in this manner, and generally a rough portrait of the murderer added further zest to the lurid description of the crime. Another broadside would, at a later stage, minister to the popular love of the horrible by depicting the murderer hanging from the fatal beam, with the clergyman by his side, administering spiritual consolation to the unhappy man. Wood cuts were so difficult to procure in those days that the same pictures did duty over and over again for different criminals, and in order that they should have as wide an application as possible, the figure hanging on the scaffold was so clothed that it was quite impossible to say whether it represented a man or a woman. It thus served for a criminal of either sex.

The "Observer" was the journal which gave its readers the most frequent illustrations, and two of these were of interest in showing that the motor-car craze is not quite so new as some people would think. In 1827 Mr. Gurney's steam carriage was shown running in St. James's Park. The new vehicle excited such apprehensions that another picture was published showing the carriage in the act of blowing up and scattering its unfortunate passengers in fragments. A later wood cut in the same newspaper showed the house in Cato Street where the famous conspiracy was hatched, which aimed at general anarchy in London.

Mr. Hepworth's lecture closed with a brief reference to the work done by artists in time of war, and he showed how the necessarily rough sketches executed at the front were turned into presentable pictures by artists at home.

In the discussion which followed the lecture, various questions were raised as to the influence of the German school of wood engraving, as represented by Albert Durer, upon similar work in England, and with regard to technical matters in connection with block production. The usual vote of thanks closed the proceedings.

LEICESTER AND LEICESTERSHIRE PHOTOGRAPHIC SOCIETY.

THE eighteenth winter session of the above society was opened on Wednesday, Oct. 22nd, by Mrs. Catherine Weed Ward with a lantern lecture entitled "Shakespeare at Home." Mrs. Ward is an American, and this accounts for the thorough manner in which she has photographed Stratford-on-Avon and district. No people enthuse so much over the "Immortal One" as do the Americans, and nothing of Shakespearian interest amenable to the camera has been too insignificant for Mrs. Ward, and he who would go to Stratford with the intention of doing one better has a tough task indeed. Much of the lecture might be more or less conjecture, but the pictures were very real and good, and that is the most interesting part to the members of a photographic society.

Songs were sung at intervals by Miss Edith Winn and Mr. James Trotter, and thus the winter's work of the L. and L.P.S. was fairly launched.

CROYDON CAMERA CLUB.

ON Wednesday, the 22nd inst., the members of this club, for the nonce abandoning matters photographic, gave a Cinderella dance and soiree, which went off with every indication of success.

Nearly two hundred members and friends assembled at the Small Public hall, where dancing was indulged in from eight p.m. to twelve, to the strains of Mackinnon's Orchestra. In addition to the dancing, various other attractions had been provided. The president (Mr. Hector Maclean, F.R.P.S.), in a commendably short speech, gracefully welcomed all, and indicated the general arrangements for the evening.

Mr. Chick recited in humorous fashion, Messrs. Aris, in the best burnt cork, and delightful "make-ups," sang, and looked so well, that it seemed almost a pity that the exigencies of everyday life should compel them to

alter their complexions and costumes. The hon. secretary conjured, and did all sorts of impossible things, which are expected from him on these occasions, and Mr. W. Best played the violin with such feeling and expression as to score a genuine success.

At one end of the hall an elaborate and most interesting installation of Messrs. Muirhead's beautifully finished instruments for working long submarine cables was shown in actual operation by Mr. R. W. Edgar, assisted by Mr. Sutton. In the annexe, Mr. H. E. Whittaker controlled a ping-pong tournament, and the indefatigable Mr. W. H. Smith gave startling electrical and chemical experiments, including X rays. Mr. Glanville was busy throughout the evening taking portraits, chiefly of ladies in festive attire, by the aid of the Platinotype Company's oxy-magnesium lamp, which proved admirably adapted for the purpose.

A hearty vote of congratulation must be tendered to the genial "general manager" (Mr. S. H. Wratten) for so skilfully arranging and piloting the entertainment through.

ISLE OF THANET PHOTOGRAPHIC SOCIETY.

The following are extracts from the fourteenth annual report:—Commencing the year with a roll of 68 (one member who had sent in his resignation withdrawing it), 19 new members were elected, making a total of 87. Of this number 4 are in arrear and 3 have left the town, so that the year ends with an effective strength of 80, which is so far the record. Notices of resignation and removals will reduce this numbed by 10, so that the new session will open with a roll of 70. The number of members outside the town of Ramsgate is still very unsattisfactory. This may be partly accounted for by the wretched service on the local railways.

It is a matter of regret that it has been found impossible to hold the proposed exhibition of prints, or to organise any practical work during the summer season; but the committee hope to be able to arrange an excursion to the Photographic Exhibitions in London, as for the first time in the history of the Society a member's work has found a place therein. The committee feel sure that every member congratulates Mr. L. Longfield on his success in getting his work accepted at the R.P.S.

The annual lantern slide competition was very successful, no less than 42 sets being sent in, and the judge in his report says "They contain certainly a higher average of work than in those I have previously seen from the Society." The competition for the medal offered by Mr. Blower was not taken up with much heartiness, but the evening devoted to it was one of the most pleasant meetings of the whole session.

As will be seen by the balance-sheet, the year ends with a small balance in hand, but a glance at the figures and the items will at once show that it is a very serious question whether the Society is justified in continuing with such a nominal subscription. After eight years of ungrudging work for the Society, Mr. Forwalk finds himself unable to continue to occupy the post of hon. lanternist. His resignation at once raises the important question of apparatus and gas for efficiently carrying out the programme. Hitherto lantern, screen, and gas have been all provided by him without any expense to the Society, and it is therefore apparent that had it not been for his action the balance must have on the wrong side, and this is still more strongly shown by the fact that the annual lantern slide exhibition added no less than £4 6s. 10d. to the funds. This question ought tor eceive both immediate and careful consideration, and the committee trust that members will attend the annual meeting, when a proposal will be made to them on this point.

The library has been more used during the past session, but the committee regret that it is so little considered and that no additions have been made during the year. The red book has been issued for the third time and the affiliation committee have spared neither expense nor trouble in bringing out a book which it is hoped justifies its issue.

BOURNEVILLE CAMERA CLUB

On Wednesday, October 15th, the above club commenced its winter season with a visit by Mr. W. A. Sims, of the Rotary Photographic Co., Limited, London.

Mr. Sims gave a demonstration on the use of bromide papers.

During the evening he handed round specimens of the Rotograph Negative Paper, together with prints made from same. These were much admired by the members, several of whom expressed their intention of giving the negative paper a trial.

The demonstration given by Mr. Sims was much appreciated by the members, and at the conclusion he invited them to try their skill, two of whom availed themselves of the opportunity, and were much delighted with the ease with which good results were obtained in each instance.

NEWCASTLE-ON-TYNE AND NORTHERN COUNTIES' PHOTOGRAPHIC ASSOCIATION.

The twenty-first annual meeting of the Newcastle-on-Tyne and Northern Counties' Photographic Association was held on the 27th inst., at the Y.M.C.A., Blackett Street. The following officers were elected for the ensuing year:—President, W. E. Cowan; Vice-Presidents, C. E. B J. S. B. Bell, C.E., T. M. Clague, W. S. Corder, J.P.; Council, Jas. Thomas Bulman, W. Dotchin, A. B. Gardiner, J. P. Gibson, Job Gibson, G. Hastings, Walter Scutt, Wm. Thompson, John Watson; Treasurer, Alex. Marshall; Hon. Secretary, J. H. Harbottle, 5, Ben Crescent, Newcastle-upon-Tyne; Hon Assistant Secretary, F. Mill Hon. Lanternists, J J. Kirkwood, E. G. Lee; Hon. Auditor, T. M. Cl The programme for the ensuing session promises to be very intere and instructive. The next meeting will be held on November 11th, will be of a social and musical character, with a lantern exhibition.

WOOLWICH PHOTOGRAPHIC SOCIETY.

The tenth annual meeting of the Woolwich Photographic Society held on October 16th, when continued satisfactory progress was repo The Society made a strong forward movement during the past which added largely to its members. The winter meetings have menced, and there is every promise of continued prosperity. Mr Churchill, F.R.P.S., was re-elected president for the third time, suppo by the following officers:—Vice-Presidents, W. H. Dawson, J. Desfor F. W. Machen, and J. Borthwick Panting, F.R.P.S.; Council, J. Cre A. E. Harris, S. Hughesdon, S. A. Saffron, W. F. Slater, F.R.P.S., H. G. Weekes; Librarian, Alex. Lees; Lanternist, G. W. Tapp; I Secretary and Treasurer, W. H. Nichols,30, Heavitree Road, Plumst Common; Affiliation Delegates, Messrs. Churchill and Nichols.

News and Notes.

Bath Mutual Aid Photographic Club.—It has been arranged to st a photographic club in Bath on the principle of mutual aid. Th who are interested in the practice of photography as an art, and making it a hobby, are cordially invited to apply to the honorary sec tary pro. tem. (Mr. H. Roland Bateman, 9, Nelson Villas), who v be pleased to furnish them with all particulars as to the club and invitation to the next meeting. It is the intention to arrange for instr ion to be given (free) in the various modes of printing, developing, et also to include enlarging and lantern slide making. For a nomi subscription a member will have the full use of all club property, and endeavour will be made to equip the club rooms with every requis in the way of home photography. It is also intended to make the stu of this fascinating art as pleasant as possible. Ladies are specia nvited to join.

Individuality.—Individuality counts for a great deal in business. Ju is there are lots of people who can talk fluently who cannot sit dow o write anything without immediately becoming someone else and expres ng thoughts, aims, and ideas that are entirely foreign to their true natur so there are in the commercial world many who do not do themselv justice for the same reason. Every business that rises above the ordina portrays in many of its features the individuality of the governing spir back of it. Somebody connected with the business has not cared wh other manufacturers or merchants in the same line thought abo running such a business, but has followed his own best judgment wi implicit confidence that if the result was not successful it would at lea be such as to suit his ideas of how it should be conducted. The gre trouble with the average man who copies the methods of others is th he very often gets poorer ideas in this way than he has himself, if only sets his own mind in motion along the proper lines. After all, wh should anyone copy after some other fellow when he can create metho for himself which are more appropriate, more natural; that are more part of himself? Of course, it is well enough to look about you an try to learn by observation, but learning and copying are entirel different. Probably no manufacturer who copied the styles of anothe ever made such a good copy as the original was, and the great trouble is that, after all, it is only a copy, and as such advertises the goods o the originator of the style more than itself. There is room for originality in every department of business. What if somebody else or a whole army of people have been in the habit of doing things a certain way, that does not make it the right or only way, by any means. A business man should strive after correct originality as he would to find a priceless treasure, because it attracts the attention of the buying public as nothing else will. Originality in every sphere of life is at a premium, and though people may criticise it, they still pay homage to it. The men who have made great successes in business have been the originators. They have broken away from the shackles of conventionalism and have set themselves apart from the great mass of humanity who are followers and not leaders.

The Prime Minister on Technical Education.—At the opening of the Manchester School of Technology, Mr. Balfour referred to the change from the pre-scientific to the scientific stage of industry. When England or Great Britain first obtained its great manufacturing monopoly, it was not too much to say that the relation between science and industry was of the feeblest character. There was always, of course, the closest connection between mechanical ingenuity and invention and the great growth of our industries, but the intimate correlation between the discoveries of the laboratory and the processes of the workshop was not in existence, and it was because we had been a little slow to discover

his country how intimately speculative research is connected with ufacturing progress that we were, in some branches of our work at events, behind our neighbours, who in this respect, although not in y others, had proved themselves more ready and more apt to learn lesson than we had ourselves. And if anybody wanted a proof of truth of the proposition he was laying down they had only to recall kind of meaning which the average man attached only a few years to the phrase "technical instruction." In the phrase "technical ruction" there was, in the minds of the people of whom he spoke, scientific tinge or flavour whatever, but some kind of knowledge of ual dexterity, some opportunity for learning the uses of machinery, so forth. But the fact on which he was venturing to insist, and which the very existence and justification of an institution like that Manchester depended, was that henceforth and evermore there would a closer and closer connection between the most remote and abstract ntific study of the chemist, of the physicist, of the electrician in his oratory, and the great industries of the community of which he was ember. He wished he could be quite sure that even now, and even he more cultivated parts of the community, there was a more perfect reciation of two capital facts which he would like to impress upon who heard him. One was that education was, and must be, an organic ole, and that it was perfectly vain to spend vast sums upon buildings l equipments unless the student who went to those places went quately prepared to learn the lesson they could teach. He had not slightest intention of over-exalting or over-praising foreign nations the expense of our own, but it must be admitted that they had grasped ch more fully and much more firmly the great truth on which he was isting—namely, that a man really to profit by the scientific training ich he could get in these institutions and to be able himself to turn learning he acquired to the purpose of original discovery, it may be ginal research of his own, had to go there, not a raw product, but at events a half-prepared human product. He should go there, not ly anxious to learn, but ready to learn. Another great truth was that, er all, the persons who were responsible for the manufactures of the untry were the manufacturers. It was perfectly vain and useless to rn out highly-trained and capable servants if there were not to be ployers for them when they were turned out. He did not in the least ow whether in Germany, for instance, they might not have overdone e matter; he had not sufficient evidence on the point, but he was ite sure something must be very wrong when he saw the extraordinary ference in the practice of the great German and in some, at all events, the English firms. He was speaking on a subject which he only ew at second hand to people who knew the whole thing at first hand; it, unless his information erred, they would find, if they went to Ger any, at all events a few years ago, and studied the equipment of one the great German industrial concerns, electrical, chemical, optical, or hat not, a proportion of scientifically trained students in the German anufactory enormously in excess of anything commonly thought neces ry in this country. There was not the least use in the Manchester rporation turning out competent students if those students were not find employment when they were turned out. With the naturally con rvative instincts of our nation, the tradition of the great manufacturing tablishments would rather tend to make people say that the best, ie only place in which to learn was not in the lecture-room, but in ie shop, not at the feet of skilled professors, but actually among the tisans who were carrying on the industry, and he did not deny there as a great deal of truth in that, and that probably we gained a great eal by our extreme anxiety to make industrial training a practical aining. But he felt confident that they drove that truth too far, and ow, however sound the instinct might be which lay at the bottom of it, ney were working it too hard at the present time, and that, if they ally did mean to turn the brains, and the muscles, and the enterprise, nd the energy, and the inventive skill of their countrymen to its best urpose, it was absolutely necessary to place among the directors of ndustry those who had not merely that admirable and necessary practical nowledge which consisted in seeing things done from day to day by ne people who had to sell the article when it was finished, but, in ddition, they must give that complete scientific training which had ecome more the basis of our whole industrial fabric.

Lantern Slides on Process Plates.—Lantern slides from diagrams, aps, drawings, etc., are often required, and present many difficulties o those who are unaccustomed to prepare them. It sometimes seems uite impossible to get the lines dark enough without degrading the rilliancy of the whites. Of course, to the old collodion worker it is uite easy by means of redevelopment and intensification to produce a opy of a plan with sharp black lines (really black, not a dirty brown), with perfectly clear glass spaces between them. But as the collodion worker scarcely exists outside conservative process block, or professional lantern slide makers, we need not consider him. The everyday photographer is often at a loss when he is asked to make such slides, and probably they give him so much trouble that he becomes discouraged. To such a man Ilford Process plates should be a "boon and a blessing," for they will help him to do the work with ease. In the first place, his negatives should be made on Process plates, the black lines should be clear glass and the white spaces nearly opaque. If the drawing to be copied is too weak to give an ideal negative, much can be done by intensification. The exposure for Process plates must be full, if good density is to be obtained; it is useless to give a short exposure and expect to get a vigorous result. In a good light, with f/32 the exposure will be from thirty seconds to a minute, the developer should be sparingly diluted with water, and should contain a fair proportion of bromide; but any developer which gives density will give good results. The image should begin to appear quickly, say within thirty seconds or less; development should be prolonged until the white parts of the drawing appear on the back of the plate, and if the dark lines are slightly veiled it does not matter. If on examination the dark lines appear much veiled in the negative, reduction with very weak ferricyanide reducer will clear them without, apparently, affecting the denser parts. If the plate has been over-exposed, or over-developed, the very fine lines will sometimes be blocked, and may even almost disappear; here again very weak ferricyanide will effect a cure. When the drawing is soiled or creased it is almost hopeless to obtain a negative which will give a good slide on a lantern plate; but by using a Process plate for making the slide excellent results can be secured from decidedly poor negatives. A hydroquinone developer should be used, and the slide may be slightly over-developed and cleared with very dilute ferricyanide and hypo. Most of the creases and dirt on the original drawing will be absent from a slide treated in this manner. In making the negative a full exposure must be given, under-exposure produces flat weak negatives. Title slides are often useful for a lantern evening, and it is more restful to the eyes if they are made with the letters showing light on a black ground. Slides with black or coloured letters on a clear glass ground are very trying to an audience if they come after a series of ordinary lantern slides. The former are easily prepared. The words should be written or printed in the deepest, dead black on a smooth white card; this card is then photographed on a Process plate 3¼in. by 3¼in., but the exposure must be under rather than over, as there must be no deposit of silver on the spaces representing the black letters. The slide should be developed carefully so as to obtain the fullest density in the spaces round the letters, but the letters themselves must be represented by "bare glass." It is almost impossible to get sufficient density in the background by development alone, and development must be stopped as soon as the letters show any sign of veiling, as it is more essential to have clear letters than to have a dense background. The exposure is of the greatest importance, as it must be sufficient to give fair density in the background, yet not enough to veil the letters. A perfect slide is scarcely ever obtained by development, so recourse must be had to intensification. After thorough washing, the slide must be bleached right through with mercury, and after another thorough washing, blackened with dilute ammonia. The slide should not be dried in spirit, as this tende to damage the clearness of the letters. When dry the letters may be tinted various colours. One method of doing this is to superimpose slips of coloured gelatine, but a better result is obtained by staining the film with the liquid colours sold for tinting photographs. Three colours will be sufficient, red, yellow, and blue. A special brush should be kept for each colour, and the red brush should never be put into the blue bottle, and so on. The colours may be washed right over the letters, as the background should be so dense as to be disregarded. Two or more coats may be necessary, and if it is desired to produce more than three colours, several other shades can be obtained by washing a word over with blue first, allowing the colour to be absorbed by the film, and become half dry, when a wash of yellow over it will produce green; red on blue will produce violet, while red and yellow will give scarlet or orange. Different greens and violets can be produced by using the two colours in different proportions. The colours should never be mixed together before putting them on the slide, but each colour should be washed on separately. If, for instance, green is desired, we may begin with a faint wash of yellow, followed after a few minutes with a wash of blue; this may be rather too blue, and a second wash of yellow can be laid on, or vice versa. Mixing the colours before applying them produces muddy, dirty results. The letters on the slide will be reversed, but this can, of course, be put right when it is placed in the lantern. It is not necessary that the dark parts of the slide should be absolutely opaque. Those slides which show best on the screen, even when electric light is used for projection, are those in which the letters are quite clear, and the dark parts not dense enough to prevent showing where the colour has been washed over the letters when held in the hand; such a slide will show the letters quite bright on a pure black ground. A pretty title can be made by putting black letters over a landscape. This is done by writing or printing the title on smooth, pure white card, or Bristol board, using Stephens' Ebony stain for ink. A negative the proper size is made from this on a process plate in the usual way, and a slide also on a Process plate is made from it. A lantern slide of a suitable subject is then made, but it should be delicate in character, so that it may not obscure the black letters of the title, this slide is used as a cover-glass to the black letters. Another method, which scarcely comes within the scope of this article, is to make abromide enlargement of a suitable subject and fasten upon it rustic letters made of moss-grown twigs. These may be attached to the enlargements with needle points such as are used by cabinet makers.—Harold Baker, in "Photographic Scraps."

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

KODAK, LIMITED, AND THE TRADE.

To the Editors.

Gentlemen,—For a long time I have followed, with wonder not unmixed with amusement, the bickerings between the Photographic Trade Association and Kodak, Limited, but have not till now been able to focus my attention on the arguments used by the two parties.

The latest development that meets our notice is a manifesto by a trade association, the ruling body of which is a number of men known in photographic circles as wholesalers, dealers, or rivals of Kodak, Limited. As I see from Kodak's letter that that firm has "ceased to use that channel for distribution of goods," the position of the wholesalers is plain enough. No less is the anger of the rival manufacturers easily understood. Why the ordinary dealer complains I do not understand, if what Kodak says about the terms to dealers is true, and that firm dare not make a statement of figures that, if false, could at once be disproved. Kodak says that dealers are at perfect liberty to sell whatever goods they please; that whatever goods the dealers sell Kodak still gives them what is certainly a handsome discount on such Kodak products as they may sell; and if they sell no other goods in certain lines, specially the province of Kodak, it gives still further discount.

Now, I am at a loss to conceive anything fairer than this. Surely any trading concern has a right to offer inducements, of an open and honest nature, to dealers, to give special, or even sole, attention to a line of goods which the trading concern has made its own speciality, at enormous cost of money and labour. I have not the fortune to be a trader or a dealer, but this seems to me sound sense. I notice that the association in its manifesto uses the word "profit," or "profits," throughout; they fight shy of the word "discount," no doubt, because discount is a voluntary allowance made by a vendor to a purchaser who is going to distribute to the public; its essence is its voluntariness. Discount is given to induce the distributor to take more goods, and if the manufacturer goes one better and offers extra discount for taking his goods only, and if it pays the dealer to accept this, I absolutely fail to see any reason against it, from the dealer's or the public's point of view, though less enterprising or less able manufacturers may not like it.

The next thing I do not understand is the cry of "monopoly." Apart from the fact that Kodak disclaims all intention of monopolising anything, I have as yet seen no signs of their wishing to do so, and it is no use for the Trade Association or anybody else crying out about what they say is going to happen. To point out with such innuendo that the Kodak Company in America has "acquired an interest in the manufacture of plates" is the most awful rubbish, for ever so many English platemakers have "acquired an interest" in the manufacture of films, printing papers, and who knows what else, without any outcry about monopoly.

If these tearful ones of the trade association would dry their eyes and start something of their own that would meet the public wants, as Kodak things do, it would be a vast deal more "British" than wringing their hands, or, still worse, flooding the market with apparatus deliberately and glaringly imitations of Kodak cameras and films. At the beginning of these complaints a great deal of nonsense was written about "un-English" methods, but what was un-English was the fact that every paper was full of figures of cameras hardly to be distinguished from Kodaks; and we have makers of film actually using spools made to fit Kodaks, and often called by names forestalled in their use by Kodak. If it is true, as asserted by Kodak, that other products are palmed off on customers as Kodak goods, when they are not Kodak, then the matter is ten times worse. No; this is not the best nor the highest way for the Trade Association to retrieve their position; the only true plan is to strike fresh wells, to do something original to catch the public, and to benefit themselves. British work and British workmen are quite as good as any that have ever come out of America. By the way, it is not fair to suggest that all Kodak goods are made in America, for I have seen a very large factory at Harrow, visible from the railway, and no doubt a great amount of photographic products are made there, probably an enor amount.

And as to monopoly! Kodak says it does not aim at monopoly, it did, what chance has it of getting it? When for centuries has a succeeded in establishing a monopoly? Why does the Trade Ass tion stop short of chemicals? Why not extend the coming I monopoly over lenses, shutters, light screens, microscopes, teles nay, clothes and boots to go photographing in? Kodak can effect a monopoly of photographic goods, and for my own part I s a grain of evidence that they wish to.

A weaker production than this manifesto of the Trade Assoc I never saw, and one thing which puzzles me, as it must puzzle thinking member of the public, is that certain trade papers, viciously attacking Kodak, Limited, for its mythical crimes yet committed, should accept and display (for mere lucre) the perni advertisements of this malevolent monopoly. This is "running the hare and hunting with the hounds" with a vengeance.

This letter voices much of the sentiment that is quite commonl pressed by members of the public, amateur photographers, and the who probably do not think it worth while to protest against the noise of those who, instead of facing the battle, hold up the white and raise all sorts of imaginary bugbears to frighten those who a timid as themselves.—Yours,

BRITO

October 27th, 1902.

To the Editors.

Gentlemen,—Referring to the reply of Kodak, Limited, to our l kindly inserted by you in your last issue, the company state that seek no monopoly. If this is so, why should they not withdraw t conditions by which they seek to induce the retail dealers to l themselves to sell no competing article? Kodak, Ltd., also as that they intend to hold their own by good quality and good serv and that the only monopoly they seek is that which the public ch to give them, and further, that they rely upon the policy of g quality and fair prices to get the trade and the public to favour t products. Why, then, is it necessary for the company to bolster their cause by adopting a principle which, if successful, must to a monopoly, whether intended or not? We are told that it is the benefit of the public, but the British public can generally be trus to look after its own interests without the assistance of the best-int tioned philanthropic business house.

If, as Kodak, Ltd., state, the retailer is not bound by any enga ment, why seek to get signatures to an agreement which practica binds the retailer for nine months unless he elects to lose part of profit on his sales for the whole of that term? It is true that by sac ficing about half his profit on Kodak cameras and roll films, the pho graphic dealer may hold an independent position and sell anythi which the public requires; but in doing so he renders himself lia to receive letters from Kodak, Ltd., of which the following extract i specimen:—

> "We have always been glad to have your business, and think you will fully consider the matter you will admit that the con tions we lay down, although arbitrary—as all rules must necessa be—are favourable to you. The agency for leading makes of pla and papers which are handled by you may in time pass into hands. We feel sure that if you consider the question you will that it is far more favourable for you to work with us."

We may safely leave the public to judge whether this is an attem at monopoly or not.

Some of the "large and famous plate and paper makers" referre to by Kodak, Ltd., are represented on the council of this associatio and others are members. It is possible that it may shortly be prove to Kodak, Ltd., in an unmistakable manner, that the opposition to th present methods of trading has the entire support and sympathy of th whole of the plate and paper manufacturers.

The patent laws are specially framed to protect the rights o patentees, and, apart from such protection, there is nothing to preven competition. That some of the so-called "flagrant imitators" an "parasites" have introduced improvements cannot be denied, and a open market provides the best means for still further advancement.

The question of using the registered names of Kodak, Ltd., forms we believe, the subject of impending litigation. As the matter is, therefore, sub-judice, neither the company nor the association are in the position to pre-judge the question.

Whether or not the wholesaler is necessary is not a matter which wi interest the public, but the fact that he exists in almost every branch of industry is sufficient proof that he is an important factor in trading.

It is scarcely likely that an association that represents the most important firms in the photographic trade should have been created

a no other purpose than to work up animus against Kodak, Ltd., her would the members have taken up this question unless they had l reasons to believe that Kodak, Ltd., were endeavouring to create onopoly. At least, one half of the council of the association are ilers, and practically the whole trade is in full sympathy with the on of the council. The association was formed to watch over the rests of the trade, and abuse will not deter it from carrying out its ct.

he assertion by Kodak, Ltd., that nearly three-quarters of the eholders in their Corporation are British does not contradict the ement that Kodak, Ltd., is an American company, and that by far largest portion of the capital is held by the minority of shareholders, reside in America. Neither does it alter the fact that the com- y's roll film cameras and roll films, about which this controversy arisen, are made in America. Did not the directors themselves say Cannon Street Hotel that by transferring the English concern to American concern the major portion of the dividends would not be ject to income tax?

he photographic societies of Great Britain came forward about a r ago and assisted materially in getting the first restrictive terms of lak, Limited, withdrawn, and they will doubtless lend their aid he present occasion. The individual support of every photographer olicited in the endeavour to secure a free and open field for British ductions.—We are, yours faithfully,

THE PHOTOGRAPHIC TRADE ASSOCIATION.

9, Farringdon Street, London, E.C.
October, 1902.

To the Editors.

Gentlemen,—In the note appended to the polemics of the Photo- phic Trade Association and Kodak, Limited, you invite expression opinion by those, who may be interested in the controversy, as rs of photographic material. I should be heartily in sympathy with Trade Association but for the fact that the principle upon which y base their case is flagrantly violated by a number, if not all, of the nbers of the council of the association. If this be true, as I shall ceed to show, the arguments of the association are characterised by e rhetoric than consistency. At the same time I must say that the y by Kodak, Limited, notwithstanding its clever treat- nt, is equally unconvincing. The plea of the Trade As- ation is briefly put in the seventh paragraph of their er: "The prevention of any monopoly; the giving a fair l and no favour; free trade for all. This is a sound English iness principle, but is it practised by the photographic trade? Are the retailers of photographic material compelled to sign under- ings to charge certain fixed prices, and refused goods if they will ? Is this the prevention of monopoly? Is it a fair field and no our? Is it free trade for all? It is true that Kodak, Ltd., also ers the trade in the same way, but it is futile for the Photographic de Association to appeal for the support of the public when they ow the practice of restriction of trade, of which the present action Kodak, Ltd., is but another development. The battle, consequently, ne between tweedle-dum and tweedle-dee.

Kodak, Ltd., affirms that the cause of the present struggle is their ng without the wholesale dealer. This may be so, but the public efits nothing by the change, for there has been no reduction in the e of rollable film, nor of Kodaks.

For the past few years the retail photographic trade has had a fat a merry time. In proportion to the amount of capital requisite carry on the business, the large establishments, such as the Army Navy Stores, must have made enormous profits. The small man has had a golden harvest, but those happy days are coming to an . It requires little capital to start a small retail business, and we shops for photographic material being opened in all directions. The le is being scattered by the rush for the monopoly profits fostered this policy. With such a band of weak-kneed persons, can the otographic Trade Association hope to fight a well organised business, ch commands more capital than it needs? Their chance of success only in a compact band of strong, enterprising, retail traders, this can only be created by the removal of restrictions, which pre- t the concentration of business in the hands of keen energetic men.

ome of the Kodak imitations must be good, else the firm would not te that "the get up of their appliances is closely imitated, and their ges, special and peculiar to themselves, are exactly and minutely ied." If men were permitted to enter the trade and push these ds at competition prices, instead of big profits, the weakness of the cy of Kodak, Ltd., would soon manifest itself. At present Kodak, n opening shops, seeks the most commanding positions, but these ôts would have to be multiplied, if the retailer offered similar cles at competitive prices, and it is a well-known fact that business can only be extended at diminished profit. Increased expenses, or a reduction in prices, would absorb the exceptional profits of Kodak, Ltd., and a healthier state of the trade would be brought about.

Genuine free trade should be the policy of the Photographic Trade Association, and unless it is adopted Kodak, Ltd., will succeed. The public do not care a straw for a dispute between men who have combined to exploit them.—Truly yours,

X. Y. Z.

To the Editors.

Gentlemen,—As you open your pages to correspondence on the Kodak monopoly question, may I venture to offer one or two remarks on the letter from the Kodak Company, which appeared in your last issue.

If, as the company allege, others imitate the get-up and appearance of their goods in such a manner as to deceive a purchaser into the belief that he is buying Kodak goods, whereas he is buying other goods, the Kodak Company has a remedy at law; so, too, if their trade marks, or patents, or trade name, are used. But every person, no patent barring his way, has a right to sell the same class of goods provided he does not act as above described. It is this right which the Kodak Company seek to limit, in other words, the right of the trade to sell and the purchaser to buy goods, the manufacture of which infringes no private right. This I and others resent, and intend to resist. Accordingly, since this attempt was first made I have purchased no goods whatever emanating from the works of the Kodak Company, and until it is abandoned I shall observe this rule. My negatives and my prints have, I am glad to say, suffered no deterioration in consequence, and others who adopt my rule, will, I am sure, be as satisfied in this respect as your obedient servant,

AN AMATEUR.

"PHOTOGRAPHY AS A FINE ART."

To the Editors.

Gentlemen,—I read the article in last week's JOURNAL by the *Daily Mail* art critic with interest. A much more appropriate title for his subject would have been "The Limitations of Photography."

I certainly do not agree with him when he states that the nude is beyond the artist photographer. If delicately treated by a photographic artist, who takes the picture for the picture's sake and not for sale, I do not see any reason why the result should not be beautiful and free from any objectionable taint. Of course, I am taking for granted that he has a good model (he can get one for the paying), and understands artistic anatomy.

I may say that since last writing I have been further convinced in my opinion by hearing a painter, who employs photography to aid him in his painting, say, some of the photographic pictures he has seen, could only have been produced by artists, and that the mechanical must have been over-ruled to get results so beautiful and technically perfect. He further said that by his experience he should feel safe in calling photography an art. I was very pleased to hear the above opinion so frankly expressed by a painter.

There are certainly two remarks in which I agree with the *Daily Mail* art critic. That sacred subjects are, as yet, beyond the scope of the photographic artist, and that the excessive faking and indistinct results, so much in favour at present, cannot help or strengthen the "Art of Photography," but must have an opposite effect.—Yours faithfully,

HERBERT BALL.

THE R.P.S. EXHIBITION.

To the Editors.

Gentlemen,—The charge of favouring themselves and their friends that has been made against some of the members of the Selecting Committee is one of so serious a nature that it should not have been brought without incontestable evidence to support it. A much more charitable and reasonable way of accounting for the presence of so large a proportion of pictures, in which sentimentality is the only noticeable feature, is that these gentlemen are not sufficiently educated in art matters to recognise and appreciate those qualities which are necessary for pictorial effect. We may safely take the pictures exhibited by Messrs. Page Croft and J. C. Warburg as examples of what they admire. I mention these two names, as they are the two most directly pointed at in the course of this correspondence. If these eleven works are studied first and then attention is turned to the remainder of the exhibits, it will be found that the same characteristics are constantly present. The work is just of that type one finds in the members' classes of a small society which has just reached the stage of recognising that something is possible in photography beyond chance snapshotting. One could hardly find a more perfectly typical representative of the ordinary society members' exhibit than "The Park Palings," by Mr. Warburg. In our suburban shows during the next few months one

will be able to find dozens of photographs of a similar character—quite appropriate where they are, but not so on the walls of our representative exhibition. Then take Mr. Croft's gum attempts. If they were passed round at a society meeting to illustrate the difficulties of a process one could understand their seeing light, but where they are they proclaim the fact that, in Mr. Croft's opinion at least, they fairly represent his standard of pictorial photography. To suggest that these two gentlemen hung their own work, knowing it to be as bad as it is absurd. The only reasonable interpretation to put upon the matter is that they do not know any better. I prefer to think that they were perfectly honest, but mistaken. The society has to suffer for their mistakes, inasmuch as there is a general disappointment at the kind of work that has been selected as representative of that of the year, but no doubt greater care will be taken in the future to secure properly qualified men to fill the responsible posts.—I am, etc.,

P. P.

To the Editors.

Gentlemen,—Having confuted most of Mr. Bennett's allegations already, I need not follow him when he brings the same or other charges, even less courteously than before. There is, however, one little point I would like to advert to. I wrote: "The bona-fides of the committee should be obvious to even a rejected contributor," and Mr. Bennett promptly puts the cap on his own head, which, sooth to say, it would seem to fit admirably. I must however, disclaim any knowledge as to whether he sent up work or not; and if, as a member of the committee, I did know, I should certainly not divulge the fact in a newspaper.—Yours, etc.,

JOHN C. WARBURG.

21, Pembroke Gardens.
October 27th, 1902.

FOR THE P.P.A.

To the Editors.

Gentlemen,—I have received an order to copy a photograph taken by a London firm, which photograph is marked "Copyright."

On inquiry I find that the customer, whose portrait it is, visited the studio privately, and not by invitation; also, that he paid full price for, and obtained, one dozen copies.

As the word "copyright" was on the photograph I had refused the order.

But now I think the London firm had no right to mark "copyright" upon the photograph. Is this not so? Also, I would like to know your opinon of firms who thus send out photographs marked "copyright" when they are not so. Another item for the P.P.A.—I remain, yours, etc.,

J. C. RUDDOCK.

"Castle Studio," Bendgate, Alnwick.
October 24th, 1902.

THE RIGHT TO USE THE ROYAL ARMS.

To the Editors.

Gentlemen,—I notice the many inquiries to you respecting the use of the Royal Arms. Very few really seem to know that the right to use the same by any person can only be by those who have received, and still hold, the Royal warrant of appointment. In your article in last week's issue you state, which is quite correct, that anyone, even if called upon to photograph the King, Queen, or any member of the Royal Family, cannot style himself photographer to the King or use the Royal Arms. I have on various occasions photographed the King, Queen, and the late Queen Victoria; but, without holding the warrant, could not, as you say, do so. But you fall into an error—a very natural one—when you say that those who held the warrant to the late Queen, "of course, they are entitled to use the Royal Arms, and to say by appointment to the late Queen, etc." This they cannot do unless their warrant has been endorsed for use during the present reign. I received a notice from the Lord Chamberlain stating that my warrant would be void three months after the death of the Queen. This I regretted, as it was given me by special command of the Queen. Shortly afterwards I received a notice to return the warrant, that, by command of the King, it would be endorsed for use during the present reign. Usually at the demise of the Crown warrants become void, but owing to the exceptional length of the last reign many firms had been permitted to retain their warrants to her late Majesty, and to continue to use the Royal Arms, but not to fly the Royal standard during the present reign; but unless such warrants bear endorsement to that effect they are void, and the right to the use of the Royal Arms has elapsed, and the person using the same is liable to the penalty. My endorsement says, "The persons named herein are permitted to use the Royal Arms, and to style themselves 'By Appointment to the late Queen.'" Many of the warrants have not been endorsed. I take the list of the first twenty names; thirteen of these held warrants to the late Queen in various trades, nine of these only have been endorsed. It may interest you to know that the total number of photographers holding warrants to the King, Queen, or late Queen is twenty-five, twenty-one of these in England, Ireland, Scotland, and Wales, and four on the Continent.—I remain, truly yours,

HORATIO NELSON KING.

October 28th, 1902.

NEW YEAR'S ENTERTAINMENT TO LONDON CHILDREN.

To the Editors.

Gentlemen,—Will you once again permit me to bring to the notice of your readers the fund which it is my privilege annually to raise for a two-fold object, that of providing a New Year's entertainment for about 1,200 poor children of the Ragged School Union in the Guildhall of the City of London, and the accompanying distribution of Christmas hampers to 4,000 or 5,000 little cripples?

His Majesty the King has for several years contributed to the list of subscriptions, and this year I am again honoured by His Majesty's support.

General Sir Dighton Probyn, Keeper of His Majesty's Privy Purse, writes me: "I am commanded by the King to send you the enclosed cheque for £10 10s., as a donation from His Majesty to the Poor Children and Cripples' Christmas and New Year's Entertainment Fund which you so kindly organise on their behalf."

The Court of Common Council have, as in previous years, accorded the use of the Guildhall, and many members of the Court warmly and actively assist me but as the poor and suffering children of the metropolis, as a whole, are participants, I confidently extend my appeal to London at large.

No one who has witnessed the reception by a home-tied cripple of a hamper at Christmas can over-estimate the good done by the timely gift, and the Guildhall banquet is a source of never-failing pleasure.

Mr. W. H. Pannell, C.C., chartered accountant and honorary auditor has signed the balance sheet, which shows that last year £1,644 8s. 6d. was collected, and the list of donors indicates that the movement has lost none of its popularity.

Contributions, large or small, to the "Children's Fund" should be addressed to me at 69, Ludgate Hill, E.C.—I am, Sirs, yours truly,

W. P. TRELOAR, Alderman.

69, Ludgate Hill, E.C.
October 22nd, 1902.

KEEPING QUALITIES OF ALBUMENISED PAPER.

To the Editors.

Gentlemen,—Some week or two since my brother sent me the enclosed print, of which a description may have some interest to your readers. As you will see by his notes at back, the negative was taken upon a Liverpool plate in 1869, with an exposure of five minutes to a Ross wide-angle lens. A print was taken from this on August 18th, 1902, using some paper he had since 1869 or 1870 called "Garrier's sensitised albumenised paper," and had been kept since he bought it in red blotting-paper. He bought form Solomon, then of Red Lion Square. "The toning bath is chloride gold, chloride ammonium, and water. Fixed as usual. Further, my brother adds, with regard to the paper, that, in toning, the picture nearly, or in some cases quite disappears, and then gradually re-appears. When the tone you desire appears, stop the toning and fix."—I am, gentlemen, yours truly,

W. T. F. M. INGALL, M.R.I.

THE FUNNY PART.

To the Editors.

Gentlemen,—On page 827, of the BRITISH JOURNAL OF PHOTOGRAPHY, you publish a letter after the heading of, "One of the advertisers in our ALMANAC writes, etc.," and you or he calls the letter very funny. Would you call me very inquisitive if I should ask you why this letter is very funny? Is it because of the writing to an advertiser in your ALMANAC, or is it that the proposal is in itself funny? If it is the answer itself I have nothing to say, as I do not know the advertisement to which the writer refers, but if it is the proposal itself I fail to see

ıe funny part of it. Of course, I admit in all this that the party competent, and, knowing what he talks about, can take good ictures, as he gives references. Therefore, I cannot see the difference ı a party asking an outfit of a certain value in exchange of his work and urrendering of valuable negatives; or the asking of a certain amount f money. To the contrary, it seems at first sight quite reasonable. 'he outfit, etc., would probably cost, if first class, £16 or £20, which, ›r 100 half-plate negatives, would make 3s. to 4s. each, which would consider cheap enough; of course, one can make good use f them, and which would make the proposal quite acceptable (always f the operator is good). The only funny part of the transaction would ›e that the party ordering the work to be done was obliged to pay n advance, and therefore obliged also to take the negatives at the price ›aid for, and not quarrel ultimately about price agreed upon on account ›f quality of work, etc., as is too often the case when no deposit is left ıs security of good faith in ordering the negatives. This case happens ›ften enough, as your police courts and others can testify in your "News and Notes." I had this happen to me not long ago, with an English firm ordering views from Paris, and I have even now another ›ne pending. Please tell me the funny part of it, and oblige, yours very ruly,

ALBERT LEVY.

Asnières (Seine).
October 20th, 1902.

[Perhaps our original correspondent will tell Mons. Levy where the fun comes in.—EDS. B.J.P.]

THE COLUMBIA OPTICAL COMPANY.

To the Editors.

Gentlemen,—The photographic and optical business carried on by the Columbia Optical and Camera Company, at 42, Goswell Road, has now been entirely discontinued. We have to thank you for the many kindnesses in the way of notices and so forth during the continuance of this business, and inform you now of this change, so that you may strike our name off the list of papers for distribution. The photographic business is entirely given up, the stock having been sold off in several large deals, one to Messrs. Levi and Co., who bought all the Columbia sets; one to the City Sale and Exchange, who bought all the American folding cameras; "Pectos" and "Centuries," to Mr. W. E. Dunmore, of the Tella Camera Company, who bought a very large stock of sundries for his auction business, and other details too small to particularise.

The optical business, principally in American gold-filled and other goods, will be carried on under the direction and name of Mr. S. Pulzer, at 33, Holborn Viaduct, just opposite Hatton Garden, where he will continue his own agencies of the Philadelphia Watch Case Company, the United States Watch Company, the Standard Watch Company, and others, together with the optical agencies formerly held by the Columbia Company.

Once more for the very kind notices you have given our goods, our competitions, etc., we thank you.—Yours truly,

F. E. BUCKLAND,
Columbia Optical Company.

42, Goswell Road, London, E.C.
October 24th, 1902.

COPYRIGHT IN SOUTH AFRICA.

To the Editors.

Gentlemen,—I am forwarding herewith for your information a copy of a circular letter which we are sending to-day to a number of British publishers.—Yours very faithfully,

A. JAS. FULLER.
Hon. Sec.

Cape Town Photographic Society, P. O. Box 470.

Cape Town, 8th October, 1902.

Sir,—As you are most probably aware, there is at present no copyright protection in this colony for paintings, drawings, photographs, and works of fine art.

The only Copyright Act in existence here at present being one relating to books, and this is a very imperfect and unsatisfactory one.

This want has been felt to a very large degree, and has resulted in heavy pecuniary loss to artists and photographers generally. Quite a number of firms exist in the colony, which obtain their livelihood almost entirely by piracy, and quite a small army of hawkers are employed in carrying on the business.

The Cape Town Photographic Society took this matter up some three years ago, but owing to the outbreak of the war were not able to get any measure introduced. The society, in combination with artists and photographers throughout the colony, are now making a very determined effort to induce the Government to bring in a Bill this session; the joint committee appointed have had a Bill drafted, which is now being considered by the Government, and there is some prospect of a move being made, and should the Bill not get through for want of time this session, there is every prospect of its going through next session.

Considerable expense has already been incurred, and it will, of course, be necessary to expend a much larger sum before the measure becomes law.

The committee feel that as you would no doubt be interested from a business point of view, in the passing of this Act, you might possibly like to forward a donation to the fund required in securing its passage through the Houses.

The committee have also had under consideration the advisability of forming a Copyright Union for protecting the interests of artists, photographers, and publishers, and I should be glad of an expression of your views on this matter, as it will depend to some extent upon the replies to this as to whether it is felt that it would be of sufficient value and help to British publishers to include that branch in the formation of such a union.—Yours very faithfully,

A. JAS. FULLER.
Hon. Sec.

P. O. Box 470.

SOUTHAMPTON, HOVE, AND SOUTHSEA EXHIBITIONS.

To the Editors.

Gentlemen,—As a slight misconception exists regarding the matter, may I say that, although exhibitors may enter for either of these exhibitions in the usual way, those exhibitors desiring to compete for the special award and to have their exhibits conveyed between the exhibition free of charge, must enter for all three exhibitions.

Entries close November 5th, and entry forms will be forwarded upon application to, yours faithfully,

S. G. KIMBER,
Hon. Sec. Southampton Camera Club.

Highfield, Southampton.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY, 24, *Wellington-street, Strand, London, W.C.*" *Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

PHOTOGRAPHS REGISTERED:—

UNRETURNED SPECIMENS.—H. MASON: We know nothing of the man. We should advise you, without delay, to write to the superintendent of police, Aberdeen, stating the case fully to him.

ADDRESS WANTED.—W. A. S. writes: "Please give me the name and address of makers of Royal Sovereign Camera half plates, their address is I believe in Jersey or Guernsey."—In reply: We do not know the address inquired for. Indeed we may say we have never heard of the plates. Possibly some readers may help our correspondent.

LECTURES ON LENSES.—H. R. BATEMAN writes: "Could you inform me of any names and addresses of firms who send out lectures to photographic societies, such as lectures on lenses, their making, etc., so that I could write them?"—In reply: Messrs. Beck, 68, Cornhill, and Messrs. Goerz, Holborn Circus, send out such lectures, we believe.

LENS QUERY.—J. B. SMITH asks: "Would you kindly answer this question. In order to take a quarter-plate size or carte de visite with half-plate camera, are you obliged to have a lens to cover the size required, or can the half-plate size be used if placed further back?"—In reply: A half-plate lens will do as well as a quarter-plate one, if the camera is taken further from the sitter. Indeed, it will do better, as the definition will be better towards the corners of the plate.

COPYRIGHT.—R. M. GORDON says: "I have made some negatives from prints in the possession of a friend. The prints are over a hundred

years old. Would I be safe in printing and selling copies of same? My friend has no objection to my doing so. Also could I get negatives registered?"—In reply: As the prints are so old there is probably no copyright in them, in which case you will be quite safe in selling copies of them. You can also make your reproductions of them copyright.

INSTRUCTION IN RETURN FOR SERVICES.—AMBITIOUS writes: "I am in a high class photographer's shop as retoucher and finisher, but have no opportunity to learn operating; and as I wish to become an operator, do you think any good firm would have me in house and teach me operating in return for my services as retoucher and finisher in B. and W., for about six months?"—In reply: We should say that some houses would make such an arrangement. The best way would be for you to advertise stating what you desire.

PRINTS FOR PROCESS BLOCKS REGISTRATION.—TERRANT says: 1. "I am making some photos for a gentleman who tells me that he will be sending one away to have a process block made, and I would like to know what kind of printing paper would give the best result (matt or glossy, etc.). 2. I have two photos that I wish to have made copyright. Would you please let me know the cost, if sent to you?"—In reply: 1. Glossy prints will be the best for you to supply. 2. One shilling and sevenpence each. You must send us two prints of each subject.

FORMULA WANTED.—FORMULA asks: "Could you give me the formula for making the mixture that the enclosed tintype plates are coated with? If you cannot tell by the plates, perhaps you can from the printed directions for working the same, which I herewith send you. Kindly return 'printed directions,' for which I enclose stamped addressed envelope.—In reply: We cannot say, by merely seeing the plates and reading the directions for their use, how they were prepared. They are evidently coated with a collodion emulsion, and we can tell you nothing beyond that. The directions have been returned as requested.

TINTING EMULSION.—A. D. says: "I want to tint my chloride emulsion mauve and rose. What it is done with, and how to add it? Must it be added before the silver or after, and what quantity will it take?"—In reply: Any of the coal tar colours, soluble in spirit (we presume you refer to collodion emulsion) may be employed. The proportion of colour is dependent upon the depth of tint desired, which you will easily arrive at by experiment. We may tell you it is not usual to tint the emulsion. Better get some paper in which the baryta coating is tinted. That is what is used for all the emulsion papers.

BROKEN NEGATIVE.—J. R. G. writes: "I have cracked the glass of a ¼ plate negative, but the film is not broken. I cemented another glass on the back, but it has not dried even, so that to print it now would print markings. Can you tell me if you know of any one who could successfully remove the film and transfer it on another piece of glass without spoiling the film or damaging it?"—In reply: We should imagine that one or other of the professional photographers in your town would transfer the film to another plate for you. If not, we suggest that you communicate with the Autotype Company; they may perhaps undertake the work.

PORTRAIT WITH AUTOGRAPH.—INVERTED writes: "I herewith enclose a print with sitter's own signature printed in white with own portrait. Will you kindly let me have full particulars how to work this process, as I am desirous of adding same to my business? Of course the difficulty is to get the name on the right way."—In reply: There are different ways of doing the pictures. This appears to have been done by double printing. The negative is masked so that only the head is printed, the other portion of the paper remaining white. The autograph, written probably on thin paper, is then taken and used as a second negative, a mask being fixed on to it to protect the part already printed. The portrait has been returned.

MOUNTING CARBON PRINTS.—W. H. STAPLEY asks: "Can you tell me a method of mounting carbon, or other prints, on vellum mounts, so that they do not cockle up and crease when taken into a warm atmosphere? I have been in the habit of mounting carbon prints dry with starch paste; but in a few days they curl up, and pressure will not bring them back to their original flatness. I enclose sample of vellum."—In reply: It is very difficult to mount prints on such thin paper as the sample sent without their cockling. The best way is to cement the prints only by their edges to the paper. On page 1,092 of the ALMANAC you will find a formula for a mounting solution, that does not cause the prints to cockle. You should try that.

FACTORY ACT.—INQUIRER says: "One of His Majesty's inspectors has called upon me with a view of inspecting my workshops, contending that a mounting room and frame-making business (also retouching) brings me within the meaning of the Act. I should like an expression of opinion from you before admitting as much, as I told him I should so obtain it. He contended that in other towns photographers had been obliged to submit. Our hours of work: 9 to 6, mounting room and frame-making 8 to 7, Fridays only, 8 to 8."—In reply: We should say that your workshops decidedly come under the Factory Act, and that you will have to comply with it. You can get an abstract of the Act by writing to the office of the Factory Inspectors, London, S.W. That will give you all information.

CARBON PRINTING.—ARTIST asks: "Will you kindly answer following questions: 1. In what proportions shall I mix gelatine and chromate of potash for carbon printing, to give the most hard, clear, and sharp results? 2. Are there any other substances used in sensitizing carbon paper than potash; if so, what are they? I wish to get, if possible, a 'hard' result, i.e., with great contrast, and outlines clearly and sharply defined, and shall be very much obliged if you will put me right."—In reply: 1. It is the bichromate, and not the chromate of potash, that is used for sensitising carbon tissue. The weaker the solution is the stronger will be the contrasts. If very strong contrasts are desired, use a bath of one or one and a half per cent. 2. The bichromate of ammonia may be used, but it offers no advantages over the potash salt.

COPYRIGHT QUERIES.—PHOTO asks: "Will you kindly answer me the following questions: (1) If I send you a P.O. (please say how much), can you find out if two photos of two different gents are made copyright? (2) If a person has been asked by a photographer to sit to him, and the photographer has given that person some photos for his trouble, if the said photo has not been made copyright, can I copy the said photo and make an enlargement, and sell it to the sitter's friends? Do I run any risk if the said photo is made copyright after such time as I have copied it?—In reply: (1) We do not undertake to search the register to find out whether certain pictures are copyright or not; that would be quite without our province. (2) If the picture is not copyright you can copy it, but whether you would be acting honourably in doing so is another matter. If you copied it against the sitter's wish, he could, we surmise, restrain you from making any use of the picture for your benefit.

PREPARING POSTCARDS.—POSTCARD writes: "I shall esteem it a favour if you will help me out of a dilemma by answering the following queries: I have an order for a quantity of pictorial postcards from local views. In the B.J.P. ALMANAC for 1899, I read a formula for preparing postcards as follows: Use equal parts of a 9 per cent. solution of metabisulphite of potassium, and a 25 per cent. solution of ammonio citrate of iron. Queries: 1. Is this a sensitising solution? 2. Should it be kept in the dark? 3. Is it green ammonio citrate of iron that is meant? 4. Will the solutions keep well if mixed together, or must they be kept separate, and only mixed at the time of using?"—In reply: 1. Yes. 2 and 4. We should advise the solutions to be kept separate and mixed as required. 3. The ordinary will answer. As postcards, ready for printing, are now supplied at such a low price, we should recommend you to use them. They will yield better results than you will probably get on cards of your own preparation.

STUDIO BUILDING.—E. L. F. says: "I shall be glad of information on the following: 1. Am about to erect a portable studio 28ft. by 14ft. by 12ft. or so, ¾ span, as per enclosed diagram, to face N.E., for private study. Could I better this pattern or dimensions? Smaller size would suit pocket better. 2. Am about to erect in allotment in Borough. Will it be necessary to get consent from local authorities—and especially for wooden studios—seeing it? will be what is called the portable class. And as I am not having water or gas at present, should I be liable to a rate for the structure? Rates very high here. 3. Could the landowner of whom I rent the garden have any claim whatever should I require to remove studio, if it was portable, and not fixed in the ground? 4. What book would you recommend on the studio pose? 5. Have got an offer of a studio, 30ft. by 10ft., 9ft. high, 8ft. back. Would this be good size?"—In reply: 1. The design and dimensions are good, but we should suggest that the glass be carried down to one foot nearer the floor. Four or five feet at either end may be as well made opaque. 2. We cannot say, as the bye-laws in different districts vary so. A local surveyor or builder will give you information on this point. 3. If the building is in no way fixed to the ground the landlord has no claim upon it. 5. Yes, but it will be rather narrow.

*** NOTICE TO THE TRADE, WHOLESALE AGENTS AND BOOKSELLERS.—*A Contents Bill is issued with each number of the* JOURNAL, *and copies may be had on application to the Publishers.*

*** NOTICE TO ADVERTISERS.—*Blocks and copy are received subject to the approval of the Publishers, and advertisements are inserted absolutely without condition, expressed or implied as to what appears in the text portion of the paper.*

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*** *The Editor can only be seen by appointment.*

*** *We do not undertake to answer letters by post.*

THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC FOR 1903.

Edited by Thomas Bedding, F.R.P.S.

The forty-second annual issue of The British Journal Photographic Almanac will be published in December next. This year's Almanac reached a total of 1,560 pages, and the entire edition of 20,500 copies was sold out a fortnight before publication. Of no other photographic book ever issued can two such unique facts be recorded.

The growth in popularity of the Almanac is evidenced by the remarkable rapidity of its sales.

The 1900 Edition (20,500 copies) was sold within three months after publication.

The 1901 Edition (20,500 copies) was sold a fortnight after publication.

The 1902 Edition (20,500 copies) was sold a fortnight *before* publication.

The widespread interest in the Almanac grows steadily year by year, and in order to supply the increasing home, foreign, and colonial demand, we have decided to enlarge the 1903 issue to

25,000 COPIES.

The great addition to the circulation of this most popular annual (over 20 per cent.) undoubtedly enhances its value as an advertising medium, and the issue of the large number of extra copies will supply the wants of thousands of photographers, dealers and publishers who were unable to obtain the Almanac for the last three years.

The Almanac for 1903 will appeal to photographers all the world over as a daily reference guide in practical work. The standard matter and formulæ will be revised and added to where necessary, and the latest departures in theory and practice will be chronicled. The year's advances will be recorded, and wherever practicable new features of an informative nature will be added.

EX CATHEDRA.

Uralite. The art of the photographer has now so many branches, that things seemingly quite outside his province are often of interest to him. And it was this train of thought which urged us to procure samples of a recently-introduced material known as "Uralite." This substance is now being manufactured at Higham, Kent, at the works of the British Uralite Company, and its principal use is as a fireproof material to take the place of wood in the construction of walls, ceilings, and roofs. It is a mixture of asbestos and other materials which, after being pulped, are formed into sheets in a machine like that used for the manufacture of paper. These sheets are afterwards treated with silicate of soda, and pressed together into thicker sheets. Uralite is made in two varieties, the one hard and looking very like china, and the other soft and flexible. Its price is about threepence per square foot, and it can be procured in sheets which measure 6 x 3 feet. From our examination of uralite we are inclined to think that the softer variety would be an admirable lining for the optical and other kinds of lantern; while the harder kind would prove valuable for the manufacture of large dishes for use in photography. Such dishes could, we imagine, be made for half the price of those made of celluloid or papier maché. There are a number of other uses to which uralite can be put, for it will take a nail, or a screw, just like wood, but will not split. It goes without saying that it would be invaluable in studio construction, for it is not only incombustible, but is a bad conductor of heat.

* * *

Drawing for Process. It is always interesting to hear from a good craftsman how he sets about the work which brings so much delight to his fellow mortals, and when that work happens to be pen and ink drawing, it is of special interest to photographers, for the usual fate of such a work is to be translated into a process block. Mr. Harry Furniss, in the current number of the *Magazine of Art*, takes us behind the scenes and tells us all about it. He gives us examples of the way in which a line should be drawn and in which it should not be drawn; of the

direful results of crossing lines while the ink on the under ones is still wet, and what much cleaner work results by waiting until that lower layer is dry. He even tells us how he maps out his drawing in outline, thus:—"First, with a few hieroglyphics I mark the size of the figure, its position, whether sitting or standing; long or short coat; style of tie, collar, etc.; and then I draw in the head completely and carefully in pen and ink." Then it is that the model comes upon the scene, and in a triplet of masterly sketches he shows the model—a very ordinary person—and how that individual is by an expanding process turned into Lord Salisbury, and by a shrinking method converted into the present Prime Minister. Mr. Furniss feelingly says that it is an easy matter to reproduce drawings, but quite another thing to print them. Of course he is safe enough when such a well-printed periodical as that in which he writes is concerned, but the rotary press, with its output of thousands per hour, plays havoc with a drawing, unless it is executed in the boldest possible manner. Mr. Furniss seldom uses a lead pencil in his work, and then only for the most sketchy outlines, for the rubbing out of such lines inures the fine surface of the Bristol board upon which the drawing is made, and the ink lines, too, are liable to be degraded in such rubbing. He uses water-proof Indian ink, and for fine lines, on the face, a crow-quill pen known as Gillott's No. 659, but for the rest of the drawing he employs the same pen as that with which he writes, namely, Perry and Co.'s No. 39 fine, which will under persuasive pressure make either very fine or very broad markings. We give these details in the hope that they may be useful to those of our readers who are wishful to vary their photographic pursuits with a little practice in pen and ink drawing. One curious comment Mr. Furniss makes in deprecating the method, common with many black and white artists, of making a correction by pasting over the faulty part a piece of plain paper, and redrawing. He writes:—"The sticking of paper is unwise, as the paper is on a different plane, although slight, to the rest of the drawing, and the camera, in photographing the drawing for reproduction, will not have the same focus equally all over." We presume, from this, that Mr. Furniss is more familiar with microscopic objectives than he is with photographic lenses.

* * *

Village Photography. There is something about "the village" that appeals to the imaginations and sympathies of most men. The attraction is probably in part instinctive, and due to blood and race. Affection for the village is characteristic of the English stock. The earliest accounts that we have of our distant ancestors, the German tribes of Tacitus, show them to have been fiercely jealous of the independence of the small village communities in which they lived. History proves the same feature to have been characteristic of the villages of Saxon and Mediæval England. The manorial village was a self-contained and self-ruling unit, and we are now instinctively returning to the same form of government, as far as we reasonably and safely can, with our rural and parish councils. But outside of this consideration, the calm and quiet of a village is so complete a contrast to the noise and bustle of the town, that we naturally turn to it and its suggestions as a restful foil to over-sensitive nerves and harassed minds. The attraction takes us to villages for our holidays, the pleasant remembrances of which still further tend to strengthen our regard. Everybody has a favourite, or favourite type of, village. One is in love with the highly rural village with its low, grey church tower and bridge-spanned brook, its blacksmith's forge, wheelwright's shop, and cottages set in gay, sweet-scented gardens, built at varying angles to the road, the whole compactly and artistically packed together in a gentle turn of the smiling valley. Another prefers the high-lying village, more scattered and exposed, framed in ample spaces of gorse and heather, whilst a third will have the domination of the sea in his village, and the insignia of lordship in boat, net, and creel scattered here and there throughout it. He likes to lean against the capstan at the end of the breakwater, and chat with the brown-armed mariners in the evening.

* * *

The Value of Suggestion. In most cases where the liking is keen, there must be a desire to have a picture to suggest the pleasant spot at city, home-keeping times, and to act as a tonic to the spirits in dull seasons. The village as a whole is impossible in a photographic picture. It cannot be got into the compass of the plate. Even if it could, it would be a mistake to record it. It can only be suggested, but the suggestion can be made stronger than the full measure of the reality. The artist, although he may be able to paint the whole is far too wise to do so. He knows the value of suggestion and pictures a characteristic bit. So should the photographer. It resolves itself in a great measure into artistic feel. At the same time technical knowledge is necessary in picking what is photographable. The view must always be regarded with half the thought upon the camera and its limitations. The best view is useless unless it pass this qualification. If the fact were borne in mind there would be less disappointment as result, oftentimes, amongst artistic amateurs. Still there is plenty of room left for the highest photographic work. In the first essential place, a characteristic feature should be selected, and not a peculiar one. The more expressive the particular is of the general, of a type, the higher it ranks, and the more permanent and sustained will be the interest in it. The gentler, too, the emotions aroused in looking at a picture, the better. To take an instance to illustrate the two points, if it be the fishing village, a brown-sailed smack gently drifting down the harbour as a central object, will prove far more satisfactory in the long run than the launch of a lifeboat on a storm-beaten beach. We say nothing, of course, against pictures of the lifeboat and of storms, but they must be placed in other, and special, classes. The going out of the lifeboat is an occasional event, and the emotions aroused at seeing it, or a faithful and telling picture for the first time, cannot be called up each time the picture is looked at. The result is, that there is a sub-conscious sense of lack of proportion in some way or other, and the picture loses its force and attraction. The slow drift of the fishing boat, on the other hand, is a common-place event that can be seen every day, and the associations connected with it being softer, and making no strong drain upon the emotions, the response to its appeal and suggestion is fuller and more pleasurable. The instance chosen may, perhaps, be a little strong, for the lifeboat goes out but rarely, and when it does it is, as a rule, in a winter's storm, and at night, when the chances of successful photography are very poor. But the strength of the illustration may serve to impress its value, and it will apply in less or greater degree everywhere. A rippling sea is better than a smooth, or a stormy one, for it is the usual sea; a crowd in a village street lowers its pictorial suggestive value, because

it is so rarely that a village street is crowded. Even if there be an unusual building in a village it should not be included in the picture. Somebody's "Folly," whether ancient or modern, reduces the desired breadth of suggestion, and throws the picture further from the aim at being typical.

* * *

Treatment of the Subject. It is impossible to indicate in any detail what to take in a rural, upland, or fishing village, but whatever it be it should be characteristic and common-place. It should also be treated as broadly as possible. It is of the utmost importance that there be as much space of sky, moor, or sea as possible shown. To this end the foreground should not be too pronounced. The artist can arrange his foreground as falsely, but as pleasingly, as he likes. Unfortunately the photographer cannot, apart from the picture as a whole. He must trust to wise selection and careful composition, judging his picture as a suggestive whole upon the screen. The best lens to use will be the one with the longest possible focus. When a telephoto lens with a wider angle of view, and permitting of a rapid exposure is evolved, it will be just the thing. If the conditions will admit of the use of the present telephoto lens with its limitations, it certainly should be used, for it gives far better proportion, and higher possibilities of an artistic setting, than the ordinary lens. The best time for working is undoubtedly either early in the morning, or as late as possible in the evening, for the sake of gaining the expressive long and soft shadows. Personally we prefer the evening, towards sunset, according to the season of the year. Our best results have been obtained with a plate of medium rapidity, and an exposure of a half to one second, at F/16. Finally, work should be done with plenty of time to spare, and an hour or two after a meal. Haste and an empty stomach have spoilt many a good picture. Rather prosaic, perhaps, the last condition, but things generally have a marvellous knack of turning out to be prosaic when analysed. However beautiful and elegant the edifice, the bricks that have gone to build it up are, after all, but small squares of baked clay.

* * *

Uniformity and Simplicity in Sizes. Whatever may have been the origin of the various conventional sizes of plates and papers used for photographic purposes, there appears to be no fixed rule which governs their proportions, as the ratio of length to breadth varies considerably in different sizes, without at the same time offering in return much scope for choice of alternative shapes of about the same area. This becomes very apparent in the case of enlargements, where the sizes of printing paper are often found to have very different proportions to the negatives from which the enlargements are required, thus involving more or less waste. It is not perhaps very likely that these commercial standards will now be superseded by any more rational system, and it is, therefore, rather as an academic inquiry that we here present these suggestions for a more uniform plan of proportioning the various areas of paper plates and films. What appears to be a suitable form to adopt as a standard is one in which division by successive halving would result in smaller sizes retaining the same proportion of length to breadth. A simple, mathematical investigation will show that the object may be accomplished by adopting a shape in which the ratio of length to breadth is as 1.414 (equal $\sqrt{2}$) to 1, the required length being divided, or the breadth multiplied, by the former figures, to obtain the respective breadth or length. Adopting, for instance, as a starting-point, a length of 24 inches—dividing this by 1.414, gives a corresponding breadth of 17 inches (neglecting small fractions). Division (across the breadth) of this area into two equal parts results in two pieces of 17 x 12, which will be found to possess the same relative proportions of length and breadth as the original area. Further, such divisions will lead to a series of diminishing sizes also bearing the same proportions, and we obtain the following list: 24 x 17, 17 x 12, 12 x 8½, 8½ x 6, 6 x 4¼, 4¼ x 3, 3 x 2⅛; capable of extension to larger or smaller sizes. These figures give a good average shape for most purposes, and will be seen to correspond nearly with many of the old dimensions, but to have the advantage that each size may be cut without waste to a smaller one, and the latter be found to be of the same proportion as the other, so that an enlarged image will fit a sheet of larger size than the original without superfluous margins of length or breadth. If intermediate sizes are desired, they may be obtained in a similar way by beginning with a length of say 20 inches, the breadth corresponding to this will be found to be 14 inches, giving an additional list as follows:—20 x 14, 14 x 10, 10 x 7, 7 x 5, 5 x 3½, 3½ x 2½, 2½ x 1¾, etc., again varying little from sizes at present in use.

* * *

Simplification of Formulae. Another department of photography in which a delivery from the burden of unnecessary complications is desirable is that of formulae for solutions, which are frequently given in such a way as to render an intricate calculation necessary to discover the actual proportions of the ingredients in any quantity of the solution except that mentioned. Many apparently differing formulae, also, contain practically unimportant variations in their ingredients. It would not be difficult to reduce to a small compass the innumerable formulae for developers, which occupy so much space in our photographic literature, and to adopt a uniform system of expression which would give a much clearer conception of the relative quantities and efficiency of the chemicals used. A friend of our acquaintance has, for instance, drawn up for his own use the following general formulae for some ordinary developers, principally obtained from analysis of those given in various books and journals. It is probably open to correction in some of the amounts mentioned, but will serve to show a method suitable for a clear view of the nature of the solutions, and for convenience in preparing and using different developers. A standard developer for ordinary purposes may be made as follows:—Water 1oz., sodium sulphite 1-20=24grs., sodium carbonate 1-20=24grs., or potassium carbonate 1-40=12grs., potassium bromide ½gr. To this add any of the usual developing substances, for instance:—Pyro, metol, hydrokinone, or ortol, 3grs.; eikonogen, 8grs.; amidol, 2½grs. per oz. (omitting for the last, the carbonate); or mixtures of two or more may be used. The developer may be made more concentrated if desired, or may be diluted, and the carbonate might be increased for very short exposures. It may be convenient to make up the carbonate in a separate solution, in which case each solution may be made double strength, and combined either in equal parts for ordinary purposes, or the relative proportions varied as desired. It would, perhaps, however, be best to use, in both solutions, sulphite in the

proportion of 1-20 as given above, and to double the other ingredients in the respective solutions; in this way the amount of sulphite per ounce in the mixed developer would remain constant for different amounts of carbonate, the proportion of pyro, etc., varying inversely as the carbonate; this would tend to correct results. A general formula of this description with a few special ones arranged in a similar form for some chemicals (as, for example, when a caustic alkali is desirable), and some notes as to the peculiarities and special uses of the various substances, would enable the photographer to use them intelligently, and with much more convenience than by the trial of a multitude of the ordinary formulae.

MOUNTING PHOTOGRAPHS ON THIN PAPER WITHOUT COCKLING.

If there is one subject in connection with photography that has been more written about than another it is, probably, the mounting of finished pictures. Still, correspondents are continually asking for further information upon it, at the same time detailing the difficulties that sometimes beset them under certain conditions. The most frequent queries have been with reference to mounting prints in albums or scrap books without their cockling the leaves. Since so many photographers have adopted Japanese, and vellum, papers as mounts for their work, the queries in this direction have increased proportionately. Last week a correspondent detailed his difficulty in mounting carbon pictures on the latter, by reason of the mounts cockling when they became dry, which after rolling did not overcome.

Only a short time ago we dealt with this question from a theoretical point of view, and pointed out that the cockling was due to the expansion of the paper by the aqueous nature of the mountants, a difficulty that could only be avoided by the employment of a cement that is entirely free from water. There is, unfortunately, no cement that fulfils this condition that can be successfully employed for mounting photographs. Many years ago a thin solution of indiarubber was introduced for mounting photographs with, and admirably it answered its purpose, as prints mounted with it, even if on thin paper, were perfectly free from cockling. Unfortunately, however, after a time, often a very short one, the rubber perished—became resinised—and the prints left the mounts. Alcoholic solutions of resins—shellac and the like—which, of course, are free from water, have from time to time been tried, but with little or no success.

The most successful mountant, as avoiding cockling of the mount, is the solution of a suitable gelatine in which alcohol is made, to a great extent, to take the place of water. A formula for this has appeared regularly in the Almanac for several years past. Although this is the best cement yet introduced for the purpose, it does not entirely get over the difficulty, even when thick mounts are used. It only ameliorates it, and reduces the cockling to a minimum. There is, it is true, the dry system of mounting, which was introduced by Mr. A. Cowan some years ago. In this method the adhesive—starch or the like—is applied to the back of the print and allowed to dry. The mount is then slightly moistened with water, and the two passed through the rolling press, when perfect adhesion is secured. But it is manifest that this method cannot be applied to mounting prints in albums, unless the books are taken to pieces, and, after the prints are mounted, rebound. If this system were adopted in mounting on some of the papers now used as mounts—Japanese or vellum, for example—the damping of the paper would quite destroy the peculiar sheen on the surface, and this is one of its principal features, and no amount of after rolling or pressing would restore it to its pristine condition.

Here is a method we saw, a few years ago, in use in a large Continental house for mounting carbon pictures. The mounting of the print, and the India-paper on the plate-paper, as well as the titling of the picture, was done in a single operation, and without the slightest after cockling of the paper. The system is somewhat similar to that of Cowan. The back of the print is first coated with an adhesive—such as starch—and allowed to dry. It is then trimmed. The India-paper is very slightly damped between blotting paper. A steel, or copper, plate with the title engraved upon it is heated and inked up after the manner of copper-plate printing. The India-paper is then brushed on the back, as is done in printing on India-paper. The print is then laid on the heated plate, on that the India-paper, and on that the plate-paper mount. The whole is then passed through the copper plate press, with several thicknesses of blanketing between the plate and the roller. The work is then complete—the cemented print adheres to the damp India paper, and that, by reason of the brushing, adheres to the plate-paper the same as it does in ordinary copper plate printing. This method, however, is better suited to large establishments than to the requirements of the ordinary photographer.

Here is a method that will commend itself better to them when the prints are to be mounted on the thin papers now much in vogue. It is this. Only the edges of the print are attached to the mounts, and it is the plan that it is now generally followed by those who make a speciality of pictures on Japanese and similar papers. The trimmed print should first be rolled to get it perfectly flat. Then an adhesive, preferably that given on page 1092 of the Almanac, is applied for a quarter-of-an-inch round the edges, and the print placed down on the mount, and well pressed in contact. It may then be rolled or not as desired. When this method is employed the print can at any time be removed and another a trifle larger be substituted. This is a great advantage in the case of albums, also in the case of costly mounts, which can be used again if the first picture is not satisfactory. In the early days of photography, it may be mentioned, most large prints were only attached to the mounts at their edges.

There is one precaution that has to be taken, even in this method of mounting, if cockling is to be entirely avoided, namely, that the print and the mount should be as nearly as possible in the same hygroscopic condition. A little consideration will show that if the former is in a damp and expanded state when it is mounted it will contract as it dries, and that will drag the mount into a cockled condition. If the mounting be neatly done it will be difficult to detect that the picture is not entirely cemented to the mount, unless it be bent or doubled.

Camera Club for Watford.—A very successful meeting was held at the Watford Public Library on Saturday, the 18th ult., to discuss the advisability of forming a camera club for Watford, and after Mr. F. Roberts had explained what had been done in the matter and what were the proposed lines on which the club was to be constituted, it was unanimously resolved that the club be formed. Upwards of forty names of those desirous of becoming members were handed in, and it was decided to hold the next meeting at the Watford Public Library on Saturday, November 1st, at 8 p.m., to receive the names of new members and to elect officers, etc. Any further information can be obtained from Mr. Frank Roberts. "Winslade," Cassio Road, Watford.

BROMIDE PAPERS.

In most photographic establishments I believe it is the usual rule to look upon bromide printing as a very valuable ally in an emergency; a method, as it were, of competing against time where circumstances demand the quick delivery of orders. No doubt it does, in this respect, put into the photographer's hands a means of accepting contracts that would be absolutely impossible without it. In this it stands alone, and has no competitor—probably never will have. This point scarcely wants elaborating. I suppose there is no professional reader of this who has not taken advantage of it at one time or another, perhaps many times. When an urgent order comes in, his thoughts immediately and naturally fly to bromide paper. But, with the majority, at all other times the process seems to have no attractions. Unless there is a tearing rush for some prints in the quickest possible time, bromide paper is never thought of. Now, is this fair treatment for a really beautiful method of reproducing photographs? For, no matter how simple a process may be, there are always points in the working that need consideration to obtain best results.

Perhaps the neglect explains the neglect. This may read somewhat strangely, but it expresses my meaning tersely. Setting it out in fuller detail, I will instance the man who neglects bromide paper as a regular method of printing when it might hold a very important—perhaps even the very first—place among the processes he offers to the public. The urgent order comes in, and he utilises bromide, not because he finds it a very simple process to work; not because the results are beautiful, not because of its adaptability to all classes of subjects in the matter of surface, etc., not because of the permanence of the results; but purely and simply because of the great speed of production capable by its agency. This man completes his urgent order, and by reason of his very occasional and intermittent acquaintance with the process he, generally speaking, does not make the best possible results, and he therefore fails altogether to appreciate the advantages set out above, and in consequence he does not trouble further with it until another urgent case arises. The neglect in the first place causes second-rate work in the emergency, which in its turn causes further neglect.

Let us look at some of the advantages bromide paper printing possesses, and try to find out why the occasional worker just manages to miss them. The result may be to convert him into a habitual worker. Simple it certainly is. On the face of it, anyone who can expose and develop a plate coated with gelatino-bromide of silver, and thus make a good negative, can surely expose and develop a piece of paper coated with a similar emulsion, and thus make a good print. But—and it is a fairly big "but"—the conditions are not precisely the same. The two emulsions, although similar, are not identical. The plate is probably coated with a fairly rapid emulsion, and the paper with one much slower. The results desired in the two cases differ, hence the method of working must differ. The plate is developed with the idea of producing a negative image, the colour of which is an unimportant matter, to be used by transmitted light; whilst the paper positive, the colour of which is all-important, is to be judged entirely by reflected light.

It is well known that a slow emulsion allows of much greater error (sometimes wrongly called "latitude") in exposure than a rapid emulsion, and here is a possible stumbling block. A bromide print may be greatly in error as to the exposure given, and yet be a passable print. But there is only one correct exposure for a given negative, and that is the exposure that gives the best possible result—anything short of this best is not worthy of a serious worker. The colour of the print is also governed to some extent by the exposure, but is much more dependent on the developer used and the length of time development is continued. It is an easy matter to make constant the latter two conditions by selecting a suitable formula (the one given by the makers is probably the best for the particular brand of paper in use), and by deciding the time in which the surface image reaches full strength. This time will, of course, vary with the temperature of the solutions and surrounding atmosphere, but I take it that any photographer nowadays who is seriously endeavouring to do good work has already learned that lesson in other departments than bromide printing, and that as a natural course every precaution is taken to minimise the effects of our peculiar climate.

The limit of time that a bromide print should remain in the developer seems to be one that will include the point where there is no further development of surface detail or density, and at the same time will not include any chance of fog from protracted development. Herein lies the great difference between negative making and bromide printing. To get the best results as a negative development will of necessity be stopped at an earlier stage than the plate is capable of developing, and the least exposed portions (the shadows) should show appreciable light action under the developer. To get the best result out of bromide paper development must be pushed to the extreme in every case, whilst the least exposed portions (the high lights) must be absolutely clean and free from any apparent action of light. The makers of one popular bromide paper would seem to have this idea in mind when recommending the metol formula. They say: "Development will be completed in about two minutes." Personally, I find three minutes a better time either with metol or amidol. It is probable that other developers may each have a time best suited to each one. In any case, no absolute rule can be given, because the amount of bromide present and the strength of the solution will both make a considerable difference. Each worker must find by experiment what time is best suited to his developer, and having decided this, it should be a fixed standard that every print shall have that amount of development. He will then have two unvarying factors in printing—the power of the light (artificial light, of course) and the duration of development.

These two items being standardised, only one remains to be considered in determining the correct exposure, viz., the character of the negative. And here all the judgment and experience of a photographer will only enable him to arrive at an approximate estimate. The printer whose everyday work is confined to P.O.P. and similar processes with a visible image would certainly be able to classify his negatives roughly as quick, medium, and slow printers. But ask him the exact proportion of difference between the amount of light action necessary for two negatives of different classes, or even two of the same class (particularly dense ones), and he will be entirely at sea. This is perfectly natural, because his work has never called for such discrimination. But even those with considerable experience with development papers will find it hard to form an exact judgment without verifying it by a trial exposure. I believe there are on the market contrivances for judging the exact printing strength of a negative, but even these cannot take into account the variations of colour in negatives, which materially influence the exposure required. To me, personally, looking through a negative is not a good method of estimating exposure. I find the best way is to lay the negative, film down, flat upon a piece of white paper, and from its appearance thus, by comparison with one of which the exposure is already known, I form something like an idea of how long to expose. A trial print is now made with three different times on

three portions of it—one the estimated exposure, one about 25 per cent. more, and one about 25 per cent. less. Development of this will usually settle the matter; if not, a further trial exposure is made. These trials are always made at one fixed distance from the illuminant, viz., 12in., and the negative is then marked with the number of seconds required at that distance.

It is usual to lay down a law in bromide printing that all exposures shall be made at one fixed distance. I find, in practice, that it is much more convenient to have a fixed time for the exposure—say 10 seconds—and to vary the distance from the illuminant. When printing from thin negatives, anything less than 10 seconds is somewhat difficult to manage with exactitude, and with dense negatives any longer exposure seems to be waste of time. Again, a thin negative will give a brighter print if removed further from the light, and the equivalent exposure given, whilst a dense negative will yield a softer result by the more brilliant illumination of a shorter distance and proportionately less exposure. Of course, you know the law of proportion in such cases—the exposure increases, or decreases, in the ratio of the squares of the distances. But such sums are not easily worked by mental arithmetic, and the dim, religious light of the dark-room always seems to add greater mystery to the problem. Hence I decided to mark out an exposing board measured in inches and half-inches, but marked with the equivalent exposures, as follows:—

4in. distance is marked	90
4½ ,, ,, ,, ...	72
5 ,, ,, ,, ...	58
5½ ,, ,, ,, ...	48
6 ,, ,, ,, ...	40
6½ ,, ,, ,, ...	34
7 ,, ,, ,, ...	29
8 ,, ,, ,, ...	22
9 ,, ,, ,, ...	18
10 ,, ,, ,, ...	14½
11 ,, ,, ,, ...	12
12 ,, ,, ,, ...	10
13 ,, ,, ,, ...	8½
14 ,, ,, ,, ...	7⅓
15 ,, ,, ,, ...	6⅓
16 ,, ,, ,, ...	5⅝
18 ,, ,, ,, ...	4½

These numbers approximately represent the equivalent exposures at the respective distances, giving in each case the standard exposure of 10 seconds.

The figures are not mathematically correct, decimals being ignored, but I find them practically correct, unless the flame of the illuminant is a very large one. It is only fair to state also that a reflector will upset the figures very much; in fact, with a true parabolic reflector and the light at its focus, Dr. Just has calculated that doubling the distance will increase the necessary exposure very little—in the proportion of 40 to 37 are his figures! The effect of doubling the distance without any reflector would necessitate an increased exposure in the proportion of 4 to 1.

The exposure made correctly, development should proceed mechanically, as previously suggested. The print is immersed in the devoloper for the standard time; if too dark or too light when fixed, the exposure is at fault, and nothing else should be altered.

A good bromide print is second to no other print (no matter what the process) in colour or gradation. The manufacturers have placed within our reach a marvellous choice of surface finish; for speed it is unrivalled; as to cost, it is very little dearer than P.O.P. as far as materials are concerned; there is a considerable gain in time, and as "time is money," therefore it is probably the cheapest printing known, excluding ferro-prussiate; for permanence it is miles in front of P.O.P., and carefully made prints should rank with platinums and carbons In fact, there seems so many advantages, that it is a puzzle to me why it is not more practised. It has been suggested before, and I would like to repeat the suggestion, that a professional might do much worse than make it his staple product, showing proofs to all sitters next day, and orders within three days.

I have made no mention here of gaslight papers. The results are much the same, the underlying principles of exposure and development are identical, although the formulæ differ. Gaslight papers are more convenient when large numbers are wanted, by avoiding any need for confinement in a dark-room, and although necessitating longer exposures, development of one print and exposure of another can proceed simultaneously, thus levelling up matters. Gaslight papers, however, give somewhat harsher prints than are desirable for portraiture, unless from suitable negatives. Probably the thoughtful worker will utilise both processes, thus reaping the advantages that either may offer under certain circumstances.

W. E. A. Drinkwater.

PERSPECTIVE.

[Reprinted from "The Journal of The Camera Club."]

My difficulty is to know how to go into the subject of "Perspective" in the short time allowed me. I shall suppose that you know nothing about it, and begin with the word itself, though it seems somewhat superfluous to talk about perspective to gentlemen who practise photography, seeing that their "perspective" is always so excellent—so perfect. "Perspective" means a seeing through, but perspective is not seen through a magnifying glass, but through a plane glass, and one of its conditions is that all straight lines remain straight in their perspective appearance, horizontal lines remain horizontal, and vertical lines remain vertical.

[Here Mr. Storey, by way of ocular demonstration, exhibited a rectangular frame, shown in Fig. 1, fitted with a pane of glass, and crossed, as shown, by two tightly-stretched strings, from the intersection of which depended two loose strings. This intersection represents the point of sight, or the point exactly opposite the eye of the spectator.]

Continuing, he said the piece of glass represents the picture; it is called the picture plane, and the front cross string is the horizontal line.

[Here Mr. Storey placed behind the glass a cube, and instructed gentlemen to take one of the loose strings, and hold it at right angles to the glass, and look along it. Then, with the other loose string in the other hand, by applying it to the glass, so as to coincide with the retreating lines of the cube, they would see that these same lines, being at right angles to the glass or picture plane, all converged to the point of sight.]

This was further explained by reference to a diagram, reproduced in Fig. 2, as to which he said, alluding to the two lines marked A S and B S: You see these two lines are going to a point. In perspective these two lines are parallel. You say parallels do not meet at a point, but they appear to do so. There is always at the other end of that perspective an infinitesimal representation of this line (the line A B in the diagram), and A B S is a very long parallelogram, the other end of which gets gradually smaller and smaller as it goes away into the distance.

The lecturer next measured off upon the horizontal line a

distance, S D, equal to the distance of the observer's eye in front of the perspective plane, and described the point D as the point of distance. Next, drawing the line A D, he drew from the point *d*, where it intersected the line B S, the horizontal line *c d*, and referring to the lines A *c*, *c d*, *d* B, and B A, he said:—These lines are the four sides of a square, and are all equal. The four angles are right angles, and the line A *d* is the diagonal of the square. We learn from this that all lines of 45 degrees are drawn to the point of distance, and all lines which are at right angles to the base are drawn to the point of sight, and in these two very simple rules, we really have the great principle of perspective.

Now, I want to show you how it is that the diagonal of the square decides the point of distance. For this purpose take the following figure (Fig. 3), and assume that it shows a plan view of the top of the table on which the perspective frame stands, so that the line S D D represents the top edge of the frame seen from above. Then, if I place the square at any distance, as shown, in front of the plane, and with one edge pointing to the point of sight, and another edge parallel to the plane, and if, with the square in that position, I draw its diagonal, and prolong it until it meets the plane, the point D, in which it meets the plane, will always be distant from the point of sight by a distance equal to that of the forward edge of the

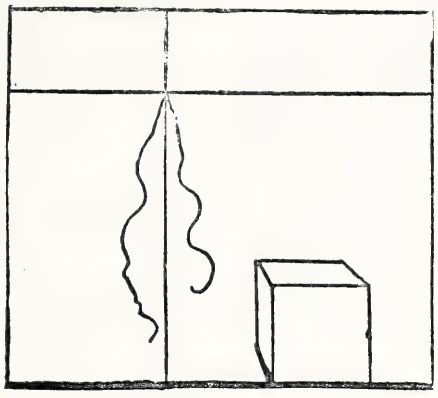


Fig. 1.

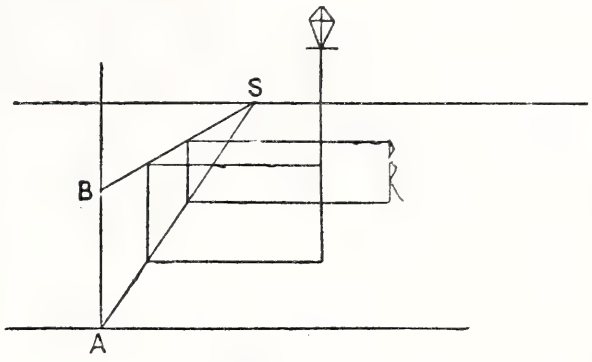


Fig. 2.

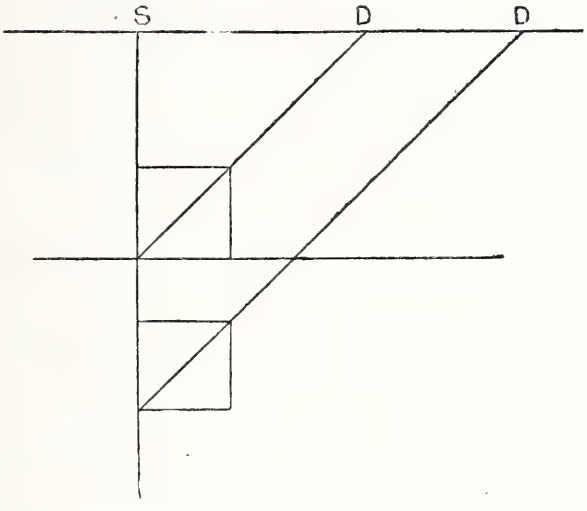


Fig. 3.

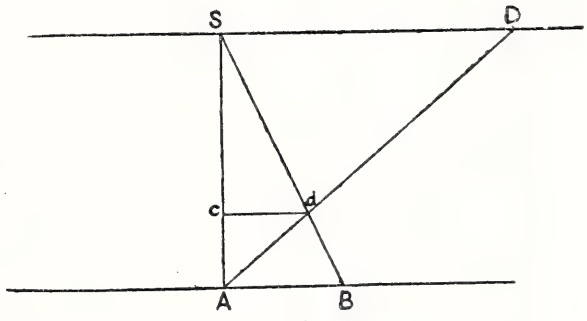


Fig. 4.

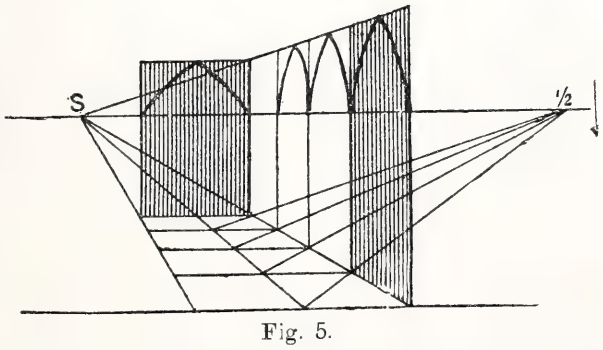


Fig. 5.

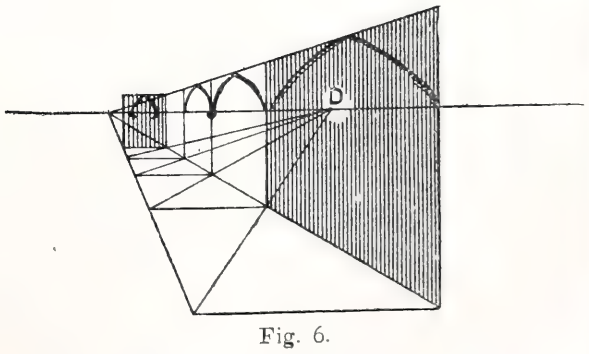


Fig. 6.

square from the plane. Hence, by measuring off a length upon the horizon line equal to the distance of the observer's eye from the perspective plane, we can at once determine, as in Fig. 2, the point of distance to which all lines must be drawn that make an angle of 45 degrees with the plane of the picture. The plane on which all these lines are drawn, and which extends from the lower edge of the picture to the horizon line, is called the perspective plane.

This perspective plane is perfectly even—as flat as any billiard table. But if it be desired to depict any erect objects upon it, that can easily be done. Fig. 4 shows how this may be done. Suppose, for example, that it is desired to delineate, somewhere in the midst of the perspective plane, a wall 4ft. high. From the point A upon the bottom edge of the picture we draw a perpendicular line, and set off the height, A B, say, 4ft., to scale. From A and B we draw straight lines to the point of sight, or any other point on the horizon, and thus obtain a measure of our 4ft. height in every part of the picture. The wall can now be introduced at any depth by simply drawing horizontal lines to meet the A S and B S at the desired position. Similarly, if we desire to introduce a lamp-post 15ft. high, it can be drawn by proportioning it according to the scale so found. In like manner, if I desire to measure a width instead of a height, I proceed in the same way: lay out the width to scale upon the bottom edge of the picture, and draw the perspective parallels to the point of sight. Thus I can measure the height and breadth of any object seen by these simple parallels.

In conclusion, Mr. Storey pointed out the bad effect upon perspective of the use of an excessively wide-angled lens, and illustrated his observations by Figs. 5 and 6. Fig. 5 represents the true perspective of an object seen through a plain sheet of glass. Fig. 6 shows the same object depicted by a wide-angled lens. The effect of the lens is to shorten the interval between the point of sight and the point of distance, thus bringing the spectator much nearer, as it were, to the plane of the picture, and proportionately exaggerating the change of scale due to perspective. It is for this reason that the moon and other distant objects come out so small in photography. In Fig. 5 the point marked ½ represents, not the true point of distance, but a point half-way to the point of distance, to which lines drawn from the half of the base of square converge. The expedient of taking such a half-way point of distance as the point from which diagonals may be drawn is convenient, inasmuch as it shortens the length of horizon, which is included in the construction of the picture.

G. A. Storey, A.R.A.

Discussion.

The Chairman: This is a very interesting lecture, one which I am sure will be very useful to many in this very intelligent audience. We have many members who would like to discuss points.

Mr. Asbury Green: What does Mr. Storey consider the correct focal length of a lens?

Mr. Storey: I can tell you the angle—not the focal length—what is called the angle of vision. We see in a good many books on perspective the authors make that angle 90 degrees. They make it more than three times too wide to see anything with comfort; 28 degrees is a very good angle—i.e., 14 degrees on each side. An angle of 90 degrees is very much like trying to put a quart of wine into a pint bottle. The longer you make your point of distance, the flatter becomes your drawing; the floors look level, and the buildings look upright, and so forth. On the other hand, when the point of distance is too near, you get distortion — you will acknowledge that this photograph [showing] does show distortion.

Captain Nash: I should like to express my extreme gratitude to the lecturer for his most concise and most interesting lecture. There must be many here who, like myself, take an interest not only in photography, but in sketching landscapes. I should like to ask Mr. Storey whether, if you have the measured details of your subject, that under these mathematical rules you can make a mistake in drawing the perspective? When you want to draw a tower, and do not know the height, how are you to use these rules for reproducing perspective in your picture?

Mr. Storey: If you want to draw an object at a certain distance, I will show you. There are means of finding out how far that object is away.

Captain Nash: But you must have the distance given or the height.

Mr. Storey: Yes, it is very difficult to find it out if you do not have it given. By means of a square on the foreground, you can find the point of distance and the horizontal line, so that you gradually construct the whole thing backwards.

Mr. T. C. Hepworth: One question—we may suppose that Turner understood these rules, and why, understanding them, did he draw the cliffs of Dover and of Hastings three or four times the height they ought to have been?

Mr. Storey: Because he thought they would look very much better. There is such a thing as idealising. Turner idealised everything. Turner's pictures are not supposed to be exact representations of everything he saw, but they are very beautiful ideals. That is the reason they do not appeal to our everyday sense of correctness and exact measurement. They appeal to the mind—to the far-extending imagination. They result in something that is beautiful. I went to Honfleur, having seen one of Turner's pictures. I thought what a dream of a place it must be—what a lovely place to be in—those trees towering up half a mile over the river, and the lighthouse shedding its lustre a hundred miles! I saw but a few squat trees and a squat lighthouse. The dream was gone, but I preferred Turner.

Mr. R. Inwards: One question—Mr. Storey was kind enough to tell us he thought 28 degrees or 30 degrees was a very good inclusive angle for a picture. To attempt to represent 90 degrees or 100 degrees in one picture is an enormous stretch. It is a very good thing for photographers to avoid these large angles. Mr. Storey told us the point of distance at which a picture would naturally be viewed. If you are dealing with 30 degrees, it would require a great length of camera. If there is a way of dispensing with this distant point, and using a nearer distance point, it would be a most useful rule.

Mr. Storey: This is very easy in perspective drawing, but I doubt if it can be done with the camera, unless you have a telescopic lens. Where a whole wall has to be decorated, the artist takes two, or even three, points of sight, and arranges his perspective so that it looks right, and as long as it looks right it is sufficient for all purposes. If you cannot see the whole of the picture as you move along, it is more reasonable to suppose that the point of sight might be shifted also. If you produce a cylindrical picture, such as a panorama, your station point is at the centre. The effect of that perspective is marvellous.

Mr. Smith Williams: If you take a wide-angle picture, and cut out a bit, giving a narrow angle, and enlarge that bit up to the size of your drawing, would that give you the same?

Mr. Storey: It would, to a certain extent.

Mr. Middleton: Mr. Storey asked me to bring an instrument here known as the centrolinead [showing]. If one of these forks is placed above the horizontal line, and the other an equal

distance below, it gives lines converging to a point very often far off your board. You can set this to any angle, and so obtain lines converging at any distance that you like.

Mr. H. E. Davis: If you had a battery of lenses costing several hundred pounds, perhaps the perspective would be quite as right as it is in the drawing.

The Chairman, in proposing a vote of thanks to the lecturer, said Mr. Storey started with the maxim that the essence of all good work was to act on the square in more ways than one. I presume the reason why our photographs do not look as truthful as they might is that we take our pictures with the photographic eye—i.e., the lens. If you take a wide-angle picture (and the wide-angle lens is a very good friend, after all), and look at it, putting your eye as far from the picture as your ground glass was from your lens, you will find that it does not look untruthful, a point which engravers recognised many years ago. Then there is our old friend the moon, in regard to the size of which artists very often take unwarrantable liberties, and make the moon twenty or thirty times the size it is. With regard to the converging of vertical lines. As to the reason why some of the old Greek workers made their pillars to bulge a little in the centre—it has been offered as a suggestion that two high vertical lines are not really seen as two quite parallel lines, but as they get higher or lower they would appear to be more or less curved.

Mr. Storey: I would like to add this—there is a certain amount of error in the estimation of sizes when you are dealing with brilliant objects, by the effect of irradiation. If an artist draws on his picture plane, let us say, 30 degrees, the size of his moon, and he takes a photograph with a lens of 30 in focal length, I venture to say the difference will not be very serious.

THE CONSTRUCTION OF ANASTIGMATS WITH NORMAL GLASSES.

[A Reply to the Article by Herr K. Martin.]
[Translated from the "Central Zeitung fur Optik und Mechanik."]

As I have been travelling during my vacation, I have been prevented from giving an immediate reply to Herr Martin, but I now hasten to comply with his request.

Herr Martin does not appear to have grasped the full significance of the words "normal" and "abnormal," as applied to the glass of which an objective is constructed. In the protar patent specification No. 56,109, of the firm of Carl Zeiss, reference is only made to "normal and abnormal pairs of glasses," and not to normal and abnormal glasses in general. The normal glass pair is formed by the opposition of two glasses, one of which possesses higher dispersion and lower index of refraction. In the formation of an abnormal glass pair for the purposes of a photographic objective, a Baryta Crown with high index of refraction has hitherto been necessary, and this is still the case.

Herr Martin withdraws. He expressed himself incorrectly, but wished to say, with reference to the German patent specification 92,313, example No. 1, that anastigmats hitherto presupposed glass of the "new" Schott descriptions in general, instead of the new Baryta glasses. It is claimed that his anastigmat was the first computed with "old" varieties of glass.

This explanation is also beside the mark. In the first place, Herr Martin does not give any precise definition for the words "old and new," and it is not quite clear what should be understood by them.

For instance, the glasses used in example 1, Fig. 2, of the planar patent, No. 92,313, are not newer in a higher degree than those used in the Martin anastigmat. In example 1 of the German patent specification No. 92313, the following specimens of glass are used, and are thus described in Schott's catalogue:—

0.154.—Light silicate flint. Sold by other makers prior to Schott.
0.144.—Boro-silicate crown. Introduced by Schott in 1886.
0.608.—Crown with high dispersion. Introduced by Schott in 1888.

For the anastigmat by K. Martin, we have, according to the Austrian patent specification No. 8,364, 1902:—

0.802.—Boro-silicate crown. Introduced by Schott in "1892."
0.318.—Ordinary light flint. Made by other manufacturers prior to Schott.

If, by new glasses, those in general are understood, which Schott, since 1886, has placed at the disposal of opticians for the first time, it follows that Herr Martin has used a "new" glass of still more recent date than both the "new" glasses used in example 1 of the planar.

If, then, my colleague, Dr. von Rohr, says that the planar is a further example of the necessity of using the new Jena glasses for correction of Seidel's four aberrations of definition, it is evidently meant that the Baryta glasses are included in the "new" glasses, as this statement is made with reference to example 2, Fig. 3, patent No. 92,313, and not concerning example 1, of which alone I have spoken in reply to Herr Martin. To understand the words of Dr von Rohr as meaning that an anastigmat could not be constructed with old varieties of glass implies an extraordinary faculty of imagination. The considerations put forward by Dr. von Rohr in the "Photographisches Central Blatt," vol. 6, No. 7, p. 146, refer to anastigmats of the doublet type, with halves consisting of two or more cemented elements, and Herr Martin has also recognised the necessity of glass with high refractive index and low dispersion for the construction of these. The objectives instanced by me in the communication to No. 14, vol. 23, of the "Central Zeitung für Optik und Mechanik,"* have, however, three and four components, separated from each other.

The reason why I have not utilised example No. 1 of patent No. 92,313, with its more limited means, as compared with example No. 2, must be clear to everyone who has not forgotten that the latter is four times more rapid than the former.

The aggressive remarks of Herr Martin also compel me to refer again to the relationship between the Clark lens, planar and Busch anastigmat.

Herr Martin has not been able to detract from my assertion that the Busch anastigmat does not differ materially from Clark's lens, excepting in the radii and thicknesses. He simply confines himself to the statement that the Busch anastigmat is better corrected for astigmatism. But if nothing more is done than carrying the correction of a lens a little further, what foundation is there for speaking of an epoch-making improvement? It is true that a well-known American firm ascribed extraordinary covering power to Clark's lens in their catalogue for 1890, and the same weight may be attached both to this and the analogous announcement of another firm of very recent date.

In making a comparison of the planar with Clark's lens, it will be seen that by its special means of achromatic correction it has exceptional intensity, combined with particularly small residual errors of sphericity and astigmatism, and this is expressly emphasised in the patent specification No. 92,313. The planar claims a relative aperture of $f.3.6$, whilst Clark's lens

* See "British Journal of Photography," Aug. 1, 1902, p. 601.

has an aperture of *f*.7.5. The planar consequently has more than four times the rapidity of the Clark lens. The Busch anastigmat has the same aperture as the Clark lens, and Herr Martin has not exhibited a specimen yet with an aperture of *f*.3.6.

In the following examples the radii and thicknesses have been calculated proportionally, in such a manner that the three objectives are of the same value for r_1 (equivalent to r_1 of Clark's lens). It was impossible to correlate them to the same focus, as the data of the glass used in the Clark lens are not at my disposal, and the comparison would have suffered.

	Clark's Lens. U.S.P. 399499, 1889.	Planar. G.P. 92313. Example I.	Martin's Aust. Pat. 8364, 1902.
Radii	$r_1 =$ −2·4	−2·4	−2·4
	$r_2 =$ −3·4	−4·6	−4·56
	$r_3 =$ −6·3	−33·3	−41·8
	$r_4 =$ −2·05	−3·64	−3·6
Thicknesses	d 1,2 ; unknown	0·66	0·65
	d 3·4 ; unknown	0·81	0·61
Kinds of glass n_D	L 1, 2 ; perhaps 1·620 old	1·57 old	1·60 old
	L 3, 4 ; perhaps 1·510 old	1·51 new	1·49 new

The radius r_3, 4 of the planar, which lies between r_3 and r_4, is not given in these data. It has no perceptible effect upon chromatic correction, as affecting the goodness of the lens for ordinary purposes, since the spherical errors of the first order are not touched by it. The glasses cemented together at r_3, 4 are almost identical in their refractive indices (1.5116 and 1.5111), and therefore this contact has no perceptible refractive power.

All three objectives resemble each other in the form of the lenses of which they are constructed, as well as the order in which they are placed. The radii of the more recent planar and Busch anastigmat objectives differ from that of Clark's, but, on the other hand, the agreement between the former two in their radii and thicknesses strikes the eye immediately. The small difference in radii r_3 is explained by the fact of a small deviation in the difference between the refractive indices of the crown and flint glass used in these two objectives.

The improvement in the Clark lens, to which Herr Martin lays claim, was therefore already embodied in the planar, and the reason for my not having attached special value to it at the time is to be explained by the fact that a much more rapid lens than the Clark, with very small zones of spherical aberration, could be made by means of the peculiar method of chromatic correction and the use of the heavy Baryta Crown, referred to in the German patent specification No. 92,313, example 2.

The selection of the kinds of glass is left perfectly free in patent specification No. 92,313. They have only to comply with the conditions there laid down. If we refer to the catalogue of Schott and Gen for the purpose, we find a large number of suitable pairs of glass for the construction of a positive lens, with reduced chromatic error, in accordance with example 1 of the German patent No. 92,313, and amongst them some pairs composed of kinds of glass used before the year 1886. For example, we have :—

0·40, ordinary silicate crown.
$n_D = 1·52 \nu = 60·9$.
0·144 Chance Bros. soft crown.
$n_D = 1·52 \nu = 56·6$.

The only consequence of using this pair of glasses for L_2, L_3, in example 1 of the German patent No. 92,313, would be that radius r_3, 4 must have a stronger curve. In consequence of the refractive indices being the same, this has no effect upon spherical aberration. As an old variety of glass is used for L_1, we should thus have a lens made of old kinds of glass, as defined above, if it were of consequence to attach any value to this incomprehensible condition. The collective lens, L_3, L_4, with diminished chromatic error, in example 1, German patent No. 92,313, is described by Herr Martin as a "hyperchromatic dispersive lens," and he thus gives us another drastic example of the thoroughness and reliability which characterise his remarks in No. 14 of this paper.*

The Taylor objective, without heavy Baryta Crown, to which I referred, has a relative aperture of *f*.4, and is consequently four times more rapid than the Busch anastigmat. Herr Martin is evidently not aware of the fact that the difficulty of obtaining anastigmatic flatness of field increases very rapidly with the relative aperture, for which the objective must be spherically corrected. So far as it may concern us, however, the degree to which definite correction has been accomplished is unimportant, as Herr Martin, so far as I am aware, has confined himself to general statement, and not given publicity, quantitatively, to any remarkable efficiency in his anastigmat. For all that, the Taylor lens referred to is very well corrected spherically, and has very good anastigmatic flatness of field up to an angle of 25 degrees.

I have only refuted the principal mistakes Herr Martin has made, and think this is quite sufficient to show that I have no reason to alter a single word of my remarks in No. 14, vol. 23, of the "Central Zeitung für Optik und Mechanik."

DR. P. RUDOLF, Jena.

MORE PERSONAL PARS AND NEWS NOTES.

Of course, I knew quite well that those sample Personal Pars would be a success, but still the electrical sensation which they created is none the less gratifying. Since they appeared I have mostly stayed indoors, but (with my usual temerity) I ventured to go to the R.P.S. soirée. Had it not been for the fiery false red beard and green spectacles which I then wore, I think I should hardly have passed scatheless through the posse of notorieties who lay in wait for me beyond the turnstile. So effective, however, was my disguise that I was enabled to mingle with the throng uninjured, and had the pleasure of hearing—myself unnoticed—not a few comments on my own literary efforts. The tone of those comments (especially when they were made by personages referred to in the Personal Pars) left no room for doubt that the feature was the most successful which had appeared in any photographic journal for years past. Such being the case, I confidently take my pen in hand to write some more Personal Pars. (That any new ones could be more personal than the last is obviously impossible. But you all know what I mean.) So sit tight, and read on.

Of course, the absurd story which credits the design on the Salon plaques with being a compliment to the fair custodian of the gallery is wholly without foundation. This is only the second season of the desk-lady; *not* the tenth. Besides, Mr. Emanuel is above puns.

It is stated on good authority that the Linked Ring had to lay in a fresh store of red "sold" seals, Mr. Charles Job's picture, "Return of the Flock," having wholly used up the usual stock. By the way, so enormous were the sales at the Dudley Gallery that I am told that the lady who affixed the seals to the frames frequently went without lunch, the nourishment from the gummed side of the seals being sufficient for her wants.

* Vide "British Journal of Photography," Aug. 22. 1902, p. 672.

The wording of the invitation card to the Salon "smoker" was held in some quarters to be very significant: ". . . . The Linked Ring will be at home at *their* photographic salon. . . . ." and so on; which would seem to indicate that the said group of gentlemen desire no mistake to be made on the point of the ownership of the show. But they need have no fear. It certainly *is* theirs, and nobody else's. An inspection of the pictures would convince even the most sceptical that there is no mistaking the fact.

Further on, the card offered the inducement, "Smoking, *and its usual accessories.*" What did this mean? Surely the Ring did not intend to provide such strong cigars that——? And could the "little music" mentioned next be a rude way of——? Banish the thought! Then did this obscure utterance refer to the sort of anecdotal conversation which is generally associated (in the vulgar mind) with the term "smoke-room?" Some experience of salon smokers places me in a position to absolutely negative both these repulsive theories. The "usual accessories" need never be feared—unless you've got a weak head and take a glass too much of them.

A rumour is going the rounds that there was some really good work at the Salon. Mr. Warburg and Mr. Bernard Moore are so far the only people who have seen it. A movement is on foot, I am glad to be able to say, to provide step ladders for the more average-sized members of the public.

The statement that the whole of the Linked Ring are going to start wearing Jaeger turn-down collars as a mode of expressing a delicate compliment, and, thanks to Mr. Bernard Shaw for his recent boom, is wholly without foundation. Nor is it true that Messrs. Cadby, Craigie, and Holland Day are about to open a studio in Bond Street under the name of Velasquez and Co

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I was gratified to observe the same porter at the Camera Club two days running last week. This is surely a record length of time for that official to hold his post. I trust he received some testimonial in return for his constancy. Long periods of faithful service are too rare nowadays to be allowed to pass without due acknowledgment.

The Camera Club dining-room's renovation is now complete. The wall-paper meets with universal approbation. Several members have been overheard to remark that its severe straight-line pattern is—after dinner—an enormous improvement on the eye-irritating curls and leaves of the former paper.

I saw Mr. Harry Quilter at the R.P.S. soirée (I mean *the* Quilter of the "P.A.J.," *not* the mere art critic). He was conversing affably with all the leading lights of the photographic world. Behind his smiling face, however, was hidden quite a quantity of carking care. The tightness of money at the present moment and the criminal indifference of the public to the advantages offered by a certain company prospectus are heavy loads for any editor-cum-financier to bear. It is pleasant to be able to record, however, that somebody has at last begun to advertise in the "aesthetique" little paper, with the result that the "This space £2 10s." gaps have visibly diminished. Long may our friend H. Q.'s pen continue to dip in his poetic inkpot!

Dr. Grün's attempts to colour-snap the entertainment at a certain well-known music hall have been crowned with success, notwithstanding all difficulties. His three-colour process worked excellently, in spite of the fact that (owing to the nature of the subjects) blue predominated.

It is untrue that Mr. Cruwys Richards has disposed of his picture, "Anticipation," to a well-known firm of shaving soap makers. The charming old personage in the print is a lady—and not Barnum's bearded lady—so the notion that she is feeling the stubble on her chin in anticipation of its removal is quite off the mark.

To judge by the afore-mentioned run on Mr. Job's "Flock" picture, mutton is in demand at present. American meat, however, does not seem to be finding a very ready purchase. Mr. Steichen may take *his sheep* to the market, but he cannot make them sell. At least, up to the time of writing, the red badge of courage had not yet blossomed on his frame. But perhaps a buyer has been awarded it for his temerity.

It has been suggested (and the idea is one well worth serious consideration) that a "fruit and fish" section should be inaugurated at next year's R.P.S. show, for the benefit of the Mattos Chemical Company. Mr. Bernard Shaw, who admired the said company's pictorial exhibits so much, would no doubt show his approval by taking a season ticket.

Mr. Warburg, I hear on good authority, has had the nib of his fountain pen renewed.

Dropping into a Strand A.B.C. shop recently, I discovered Mr. Snowden Ward and Mr. Brown indulging in the luxury of tea and a boiled egg apiece. They explained their conduct by stating that Mr. Robert Barr had bought the *Idler*. Congratulations to all parties concerned. I understand this is the first time anybody has bought the magazine in question since ——. But Fleet Street gossip is out of place in a *causerie* such as this. Besides, those boiled eggs give the lie to all slanderous tales.

Mr. A. L. Henderson is on the wing again This time his destination is Egypt. Three steamers have been chartered to take his cameras, lenses, and plates to the land of the Pharaohs. I hear a rumour that the keeper of the Mena House Hotel has refused to allow Mr. Henderson to stack his negatives in the neighbourhood, on the ground that they would dwarf the Pyramid.

Mr. Sandell, I am told, was horrified to find the other day that the shutter of his hand camera was open. The camera had evidently lain on his laboratory shelf in this condition for quite three weeks. Fortunately, however, one of the eminent inventor's own films was in the front carrier, and on development yielded a negative, showing less traces of over-exposure than some one-twentieth sec. snapshots taken on accompanying films in the same apartment.

The new Kodak daylight developing machine has had a large sale, and is, I understand, in use in nearly every photographic household's kitchen. As a blancmange shape it is unrivalled—so the wife of an eminent amateur tells me. Universal application is always the sign of a truly great invention.

Carping critics whisper that the celebrated writer in a contemporary on the use of a certain portrait lens for landscape work was ill-advised to entitle his effusion "Photography in a Wood," or, at any rate, ought not to have given tongue till he was out of it.

The exceedingly moderate price placed by Mrs. Carine Cadby upon her charming nasturtium leaf print at the Salon has attracted considerable attention. Envious personages have hinted that it is this moderation which has caused the work of art's large sale. Whether this is true or not, will be proved next year, for Mrs. Cadby is going to charge 7s. 6d. per leaf for her studies, and not 5s., as heretofore. Twigs will be counted as "leaves," but pine-needles will be reckoned per dozen.

Apropos of this, a circular has recently fallen into my hands advertising—in advance—the appearance of a volume, entitled "Dogs and a Doggerel," by the famed leaf-study lady, and her no less famed portraitist husband. The testimonials to their photographic efficiency, which accompany the prospectus, are weighty, both in number and matter. The *Sunday Times*, for September 27th, 1896, remarks (I notice) that "both these artists know how to coat a plate with brains." Comment is needless. If Mr. and Mrs. Cadby were already coating plates with brains as long ago as 1896, their stock of that all too rare commodity must be extraordinarily unexhaustible—even for Links.

. . . . . Several persons armed with clubs are making such a noise

outside my house that I must stop writing. I shall go out for a walk (by the back door). In the meantime, au revoir from

SOLOMON SAGE.

Exhibition.

DONCASTER.

On Wednesday, the 29th ult., a photographic exhibition, promoted by the Wheatley Photographic Society, was opened by Mr. F. W. Fison, M.P., in the Dolphin Chambers, Doncaster. The show included pictures from all parts of the country, sixteen silver and bronze medals being awarded, the judges being Mr. Percy Lund, of the "Practical Photographer" and "Junior Photographer," and Mr. W. E. Tindall, R.B.A., of Leeds.

In opening the exhibition, Mr. Fison claimed acquaintance as a very old photographer, and said he had spent many happy years in the pursuit of the art. He related some interesting reminiscences of a journey made from the Baltic to Norway in the early days of photography, and remarked incidentally that he was the first Englishman to photograph those views of Norway with which they were all so familiar. He actually published the first series of lantern slides of Norway, and he believed there were some of them still on the market —no doubt being shown in some obscure out of the way place. Proceeding, he remarked on the spoliation of natural beauty and stated that the time would come when a man who possessed a beautiful estate and trees and pretty surroundings would not be allowed to cut them down and erect in their place telegraph and electric wire poles, but would have to show some respect for natural configuration of the landscape.

The following is the result of the adjudicator's awards:—Landscape and seascape (open): Silver medal, G. Whitehouse, Birmingham; bronze medal, A. D. Elliott, Ripon. Portraiture: L. A. Edmonds, Menston-in-Wharfedale, silver medal; E. W. Strong, Shipley, bronze medal. Architecture: W. R. Lathbury, Bristol, silver medal; F. J. Phillips, Brighton, bronze medal. Enlargements: E. Seymour, Watford, bronze medal. Champion class: Greystone Bird, Bath, silver gilt medal; Charles E. Walmsley, Ambleside, silver medal. Members only: J. Brooks, Doncaster, silver medal; Dr. F. B. Cormick, Wheatley, bronze medal; J. B. Beck, Doncaster, certificate.

New Books.

"Elementary Photo-micrography." By Walter Bagshaw. London: Iliffe and Sons. Illustrated. Price 1s.

If the term "elementary" applied to an instruction book can be taken to mean that the book contains just the information required by any one taking up the pursuit with which it deals for the first time, and put in the clearest language, we are bound to say that the little work under notice is not entirely satisfactory. There is evidence in its pages that the author is practically acquainted with the subject upon which he treats, and, as far as it goes, his advice appears sound; but he is evidently wanting in a faculty essential in a teacher—that of placing himself in the position occupied by the learner, and stating the facts of the subject in the sequence it is necessary to follow in order that their significance may be grasped by a fallow mind. About one-third of the book is devoted to photographic information which does not specially bear upon photo-micrography, but covers a wide field, including development, fixing, hypo. eliminators, storing negatives, clearing solutions, pinholes, intensification, reduction, printing in P.O.P., toning, the combined bath, bromide printing, platinum printing, spotting prints, albums, lantern slide making, etc. This is a wide range of subjects to attempt to treat usefully in a few pages, and the author would have done better by devoting the space to matters strictly germane to the subject, and referring his readers to the ordinary text-books for matters purely photographic.

MR. J. T. SANDELL informs us that he has no longer any connection with Sandell Films and Plates, Ltd. His present address is 16, Whitworth Road, South Norwood, S.W. He is shortly placing a Sandell celluloid film on the market, in addition to Sandell plates.

THE following advertisement was published in the "Times," this week:—"To Artists or Photographers.—The late Colonel de Cetto, late of Byculla, Norwood, is believed some years ago to have sent a portrait of his late father, Baron de Cetto, of 6, Hill Street, Berkeley Square, to some artist or photographer in London for the purpose of being copied. Any one having in his possession, or any knowledge of, the portrait is requested to communicate with Messrs. Walker, Martineau, and Co., 36, Theobald's Road, Gray's Inn, W.C."

New Apparatus, &c.

The Westendorp and Wehner Orthochromatic Plates. Manufactured by Westendorp and Wehner Actiengesellschaft, Cologne.

We have received a sample of these plates for trial from the manufacturers, who are now placing them upon the British market. As they are advertised for use without a yellow screen, we tested them in this manner, using flowers and various other coloured objects. We found very perceptible colour-sensitiveness for yellow, and likewise some for red, but we were more particularly struck by the subdued rendering of various shades of blue, and in this respect the plates stand in marked contrast with the ordinary photographic plate used for landscape purposes. Their green and yellow sensitiveness should make them specially valuable for this class of work. The plates are well coated with a liberal supply of emulsion. The speed is rapid and the grain remarkably fine. We used rodinal for the development, and obtained good density and gradation, with excellent printing quality.

The M. Q. Developers. Manufactured and sold by John J. Griffin and Sons, Limited, 20—26, Sardinia Street, Lincoln's Inn Fields, W.C.

Messrs. Griffin write: "We wish to draw your attention to a new line we have introduced in connection with the 'M. Q.' developer. We are now putting up three 'M. Q.' cartols in a neat and convenient box, selling at the popular price of 1s. We believe this will meet with favour amongst many of your readers who already know this developer, and will



no doubt be glad to have it in a more convenient form. We would take this opportunity of saying that owing to the many imitations of 'M. Q.' developers, some of our competitors even using the letters 'M Q.' in a similar prominent manner to ourselves, we must warn our purchasers to look for our trade mark 'Gramme Standard,' on all boxes and packets, which alone designates the genuine article."

CITY and Guilds of London Institute.—The report of the department of technology in the City and Guilds of London Institute has been issued. In the different branches of technology the number of classes registered by the institute has increased from 2,222 to 2,320, and the number of students in attendance from 34,246 to 36,189. In the normal classes for manual training teachers the number of students has increased from 1,767 to 1,903. The total number of candidates for examination in Great Britain and Ireland was 16,580, showing an increase of 1,023 on the number presented in 1901. During the last ten years, particularly since the institute ceased to make payment on results, the volume of the work of the department has very much increased, and its scope has been enlarged. Besides the examination of candidates in different branches of technology, in manual training, and in domestic economy, the work includes the preparation of schemes of instruction, the registration of teachers, and the inspection of schools. The name of the department has accordingly been changed from the examinations department to the department of technology, as corresponding better with the character of the work undertaken by this branch of the institute. In their report of last year the committee referred to the appointment of a departmental committee by the then President of the Board of Education for co-ordinating the technological work to be undertaken by the Board with that conducted by the institute and other bodies. This year's report shows the relations that have been established between the Board of Education and the Institute for the Direction of Technological Instruction. As it was considered important that an effort should be made to strengthen the Board of Education as the central authority for all kinds of education, the institute desired to establish close relations with the Board, so that the work it had carried on for nearly 25 years might be brought under the ægis of the Board. From the report it can be seen that the Board of Education is now directly represented on the examination board, which is really the advisory committee of the department, and, failing the absolute transfer of the work of this department to the Board of Education, the arrangements agreed upon—which are set out fully in this report—are deemed satisfactory. From a letter from Sir Henry Craik, also given in the report, it appears that similar arrangements have been made with the Scotch Education Department, and from other papers that the institute is working in close relation with the Irish Department of Agriculture and Technical Instruction.

Commercial & Legal Intelligence

NOTICE of Removal.—Mr. J. L. Cox, wholesale photographic dealer, writes: Kindly note that on and after November 6th, my address will be Leda, Lawton Road, Heaton Chapel, near Stockport.

SYDNEY Photographers and Competition.—Competition is not always "the life of trade," as some would have us vainly believe; too frequently it is the death of all that is good and worth having. Fair and honest rivalry is helpful and acts as a stimulant, but what we know by competition nowadays means, not "the survival of the fittest," but rather "down with the other man at all costs." Competition has come to mean under-selling, and under-selling means loss and ruin. A good article and a fair charge suits all parties, whereas an indifferent article and a low price suits nobody. The public are prepared to pay a reasonable charge for good value, but they are not prepared to give more for a dozen pictures at the A studio if they gan get the same number of equally good pictures at the B studio 25 per cent. cheaper. The public have not asked for this reduction. Then, does it not seem folly for the studios to adopt a policy which eventually must bring disaster to the profession? For years past we have been sorry to notice an increasing tendency with some photographers to cut down prices so low that the margin of profit is invisible. We are led to wonder how the establishment can be maintained. The photographer has to bring ability and training and artistic taste into his profession—he has to be up-to-date in all matters photographic. He has closely to watch the popular tastes—his studio has at all times to be a place of attraction, and he himself must be a man of many parts to win favour with his customers. Any appearance of niggardliness in the studio surroundings is soon detected by his visitors and he suffers loss. He cannot afford to get behind the times—he must keep well in step or go down. All this means expenditure, and his profits, consequently, must be such as to enable him to keep well in the front at all hazards. Not many days ago a meeting was convened by circular, and presided over by Mr. J. J. Rouse, of the firm of Baker and Rouse Proprietary, Ltd., at which all the leading photographers of Sydney were present. This meeting was called to consider the present outlook, and to take such steps as the meeting might decide to improve the status of the profession. All present manifested a deep interest in the questions discussed, and, after several adjournments, a resolution was submitted to the effect that "a combine" or "trust" should be formed. This proposition was well and thoroughly discussed from every standpoint. It was eventually decided not to take any action for the present, but wait for further developments. The majority evidently were in favour of a combine of some kind that the profession might be brought into closer touch and a better understanding among the studios established. The unmistakeable good feeling that pervaded the deliberations gives promise for a better condition of things than has hitherto existed.—"The Australasian Photographic Review."

A CORRESPONDENT writes:—In your article last week "Gleanings from Old London Directories," you ask if the John Browning, spectroscope maker, of the Strand, was related to the Browning, of Spencer, Browning. He was son. The firm's last place of business was in the Minories. Goddard, the optician, was a workman of theirs at that time. He afterwards commenced business for himself at "Jesse Cottage," Isleworth, where I once visited him. Mr. Taylor had several lenses made by Goddard which he thought very much of. I have myself got two telescope lenses of his, and a pair of stereo-photographic lenses, six inches.

ROYAL Institution.—A general monthly meeting of the members of the Royal Institution was held on Monday afternoon (the 3rd inst.), Sir James Crichton-Browne, treasurer and vice-president, in the chair. The following were elected members: Mr. G. H. Baillie, Mr. W. D. Butcher, Mrs. A. R. Cox, Sir Archibald Campbell Lawrie, Mr. G. J. Morrison, and Mr. A. B. Tubini. The special thanks of the members were returned to Sir Andrew Noble, Bart., K.C.B., F.R.S., for his donation of £150, and to Dr. Ludwig Mond, F.R.S., for his donation of £200, to the fund for the promotion of experimental research at low temperatures.

ARTISTIC Copyright.—A meeting of artists and others interested in artistic copyright was held last week at 39b, Old Bond Street, for the purpose of considering a proposal to form a society for the protection of British artistic copyright at home, in the Colonies, and abroad. Mr. G. W. Agnew presided, and there was a good attendance. At the outset it was determined that the proceedings should be conducted in private. The circular convening the meeting bore the following names:—G. Agnew, L. Agnew, E. Bale, F. Bate, Sir Wyke Bayliss, G. Clausen, A. Clay, F. Dicksee, W. Dowdeswell, J. Farquharson, A.R.A., L. Fildes, R.A., A. Graves, J. F. Grundy, E. B. Haynes, J. MacWhirter, W. Q. Orchardson, J. B. Pratt, Sir W. B. Richmond, H. Scott-Bridgewater, Sir L. Alma-Tadema, D. Croal Thomson, and A. Tooth. The circular stated that it was being increasingly felt, in view of the constantly-expanding commercial value of artistic copyrights, that it was necessary to take active steps to form a society to afford protection to artists, collectors, publishers, and other owners of such copyrights. The success of the recent Act of Parliament controlling piracies of music emphasised what was possible to be done for artistic copyright by united and persistent action. Some months ago a society was formed for the protection of British fine art in the Colonies, but it was now recognised that the scope of this society was too limited to carry the general interest necessary to a successful movement. It was, therefore, to be proposed at the meeting to reconstruct this society and to enlarge it to one which might become of permanent utility.—"The Times."

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Nov.	Name of Society.	Subject.
7	Leicester Literary	*Some Beauty Spots in the Isle of Man.* Mr. Walter Keig.
7	Borough Polytechnic	*Enlarging on Bromide Paper.* Mr. F. W. Bannister.
10	Oxford Camera Club	*How Photography was Discovered.* Mr. G. E. Brown. Illustrated with Slides.
10	Southampton Camera Club	The Exhibition Lantern Slides.
11	Leeds Photographic Society	*A Tour Round an Old Garden.* Mr. Alex. Keighley, F.R.P.S.
11	Wolverhampton Photographic	Lantern Evening. *Irish Slides.* With Descriptive Lecture. Mr. A. Eaton Painter.
11	Royal Photographic	Ordinary meeting. A paper will be read by Mr. Thomas K. Grant.
12	Croydon Camera Club	*A Popular Explanation and Demonstration of the Photographic Half-tone Process.* Mr. J. J. Waddington.
12	Leeds Camera Club	*The Dales and Coast of Yorkshire.* Mr. Godfrey Bingley.
12	Borough Polytechnic	*English Chapter Houses.* Mr. E. W. Harvey Piper.
12	North Middlesex Photographic	*Errors.* Mr. Chapman Jones, F.I.C. F.C.S., F.R.P.S.
12	Nottingham Camera Club	*A Simple Demonstration in the Development of Gum Bichromate Prints.* Mr. J. Page Croft (Birmingham).
12	Southport Photo. Society	Members' Lantern Night.
12	Photographic Club	*How a Lens is Made.* Mr C. P. Goerz.
13	London and Provincial	*Collotype for Amateurs.* Mr. W. T. Wilkinson.
13	N.-W. London Photo. Society	Fireside Chat Upon Exposure, Development, and Retouching — with Demonstrations. The President.
13	Goldsmiths' Institute Photo.	Griffin's *To the After-Supper Photographer.*
13	Liverpool Amateur Photo.	*The Focal Plane Shutter.* Illustrated. Mr. Eustace F. Wallis.

ROYAL PHOTOGRAPHIC SOCIETY.

TECHNICAL Meeting, October 28th.—Mr. Furley Lewis in the chair.

Mr. Henry E. Davis exhibited and presented to the society a model of an ingenious little camera, constructed in the days when secret cameras, such as those in the scarf, the hat, and so forth, were in vogue. The designer was one Brin, but it appeared that he abandoned the patent. The plate used would be about the size of a florin. There was also an attachment which made a small telescope of the apparatus. The shutter was very cleverly contrived, and very simple. The curves of the trigger or handle corresponded with the curves on a fixed arm which, directly the lens was fully uncovered, carried the finger off the trigger, and so released the shutter without jar.

THE SINOP COLLOTYPE PROCESS.

Mr. William Gamble gave a demonstration of this variation of the collotype process proper, a variation which has claimed for it greater simplicity and reliability in working, with much saving of time. Mr. Gamble detailed for the sake of comparison the process known as collotype, which we will not enter into here, and then described the essential differences between it and Sinop. This name signifies nothing, and is a coined word to distinguish the process from any other. The tedious operations associated with collotype are largely overcome in Sinop. The prepared plates can be obtained commercially, and the apparatus or plant is of the simplest and cheapest description. The principle of the collotype process—that of the attraction and repulsion of printing ink by the gelatine image according to the varying degrees of its solubility when printed under a negative—is retained in the new process, but a new method of preparing the gelatine plate gives to it a much longer life in the sensitised state, and a much more durable printing surface. Briefly described, the operations are these: The special plate is exposed for some two to ten minutes under a negative, washed in water for ten minutes, drained, and soaked in glycerine for a quarter of an hour; the surplus moisture blotted off; the plate is attached to a printing bed, inked up with a printer's roller, and printed by means of an ordinary office letter-copying press. The process lends itself very well indeed to the production of illustrated postcards, Christmas and other cards, memo. and letter headings, and prints can be taken on paper, cardboard, silk, satin, leather, celluloid, etc. The three-colour process may also be applied to this printing method. The Sinop plate, with its image, may be stored for any length of time, and quickly prepared again for the printing of further copies.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

OCTOBER 30TH.—Mr. J. E. Hodd in the chair.

In drawing attention to the number of makes of P.O.P. now on the market, Mr. S. H. Fry passed round strips of seven different kinds, obtained commercially, which had all been printed from the same negative: they had all received identically the same treatment throughout, and there was extraordinarily little difference between them, and Mr. Fry had found practically no difference in the speed or in the working. Mr. W. Thomas gave a paper on "Suggestions." Touching on the subject of the Exhibitions and their use, it was pointed out that some of the

exhibits show us what to avoid, whilst others what to come up to. Mr. Thomas thought that what was really wanted was more study and retirement for work, with less rushing to the Exhibition walls. In regard to the selection of pictures to be hung, it was suggested that a quicker way, and a way that would do justice to everybody in this matter, would be for a select committee, previous to the final decision, to go through the various pictures, and classify each, according to its subject—all architecture in one pile, landscapes in another, portraits in another, and so on, then when the time came each pile could be taken and the similar subjects judged together. A picture of the interior of a cathedral cannot be judged alongside a portrait! whereas a portrait can be judged against a portrait, and in this way the cream of each set of subjects would find their way to the walls. Another matter of great importance is the effort of late years to decorate the walls by means of canvas, or coloured hangings, which do not harmonise with certain framing, and against these changes of decorations exhibitors have no chance whatever, and Mr. Thomas thought that exhibitors had a distinct right to receive previous notice of what colour the walls are intended to be. Passing on to individual work as a member of any society, it was suggested that one of the weakest points as applied to pictorial work is the untruthful rendering of colour value or tones, and to remedy this Mr. Thomas proposed that a monochrome or black and white drawing or painting should be made by a competent artist of some well-known local view, and then by photographic means and processes members could strive to obtain a like effect, as by this means a much fuller understanding of the meaning of colour values could be arrived at. Another useful suggestion to improve the work in societies was to have a standard negative, and from this have made by a first-class photographer an enlargement or print in bromide, and then loan out the negative for members to try and get as near a result as possible to the standard enlargement. Again, instead of wasting time on lantern lectures, or discussions as to the length of time one can use somebody's patent developers, why not set apart certain evenings for the reading of chapters from some standard work on pure photography, such as Abney's, which could then be discussed, and younger members of an association would in this way have a chance of learning something of practical advantage.

Mr. Thomas then showed several results of experiments in orthochromatic photography, showing very clearly how useful colour-sensitive plates really are, and concluded his remarks by showing on the screen reproductions from paintings of well-known artists, illustrating the arrangement of light and shade, and quoting the following rules by Clifton to the effect that: Shade defines form; every cloud is divided by light and shade; different shades express different distances or planes, and different planes express different shades and colours.

Mr. Teape proposed a very hearty vote of thanks to Mr. Thomas, which was seconded by Mr. A. Mackie and carried unanimously.

PHOTOGRAPHIC CLUB.

On October 29th, Mr. L. Medland in the chair, a lecture lent by the "Photogram" was read by Mr. G. E. Brown, in the absence, through illness, of Mr. H. Snowden Ward.

The lecture was illustrated by some of Mr. Walter Kilbey's photographs of divers, jumping, etc., taken with the focal plane shutter in 1-1000sec. Then some flash-light exposures in a Cornish tin-mine; some of the Embankment and Leicester Square taken on a wet night with an exposure of an hour or so, and others taken in the theatre instantaneously by Dr. Grun with his fluid lens. Some of Mr. Reinhold Thiele's combination pictures of London as Venice, etc., were shown. Telephotography and colour photography examples brought the lecture to a close. A few slides by Mr. Wallis of Suffolk cottages and scenes were afterwards put through the lantern. Votes of thanks to, and condolence with Mr. H. Snowden Ward and Mr. Brown were passed unanimously.

CAMERA CLUB.

Last week's lecture was by Mr. C. E. Keyser, a fellow of the Society of Antiquaries, who took for his subject "Norman Tympana." Possibly there may be many who have not dived sufficiently deeply into architectural terms to know the meaning of the word tympanum as applied to buildings, usually associated in their minds with a drum head, or with their own auditory apparatus. Be it known then, for their exclusive benefit, and not for the information of clever people who know everything that is to be known, that a tympan, or tympanum, is understood by architects to mean the semi-circular area, very often consisting of a single stone resting upon the lintel, which surmounts the doorway in many buildings. This tympanum is often richly ornamented with sculptures, and they may be found by those who care to search for them in many of the churches which are dotted about the hills and vales of England in rich profusion.

Mr. Keyser undertook, in the course of a couple of hours, to take his hearers tympanum hunting, and to show them, in the form of lantern slides, more than 200 examples which he had collected. He made a needless apology for the quality of some of the photographs, and explained that he was not himself a photographer, but had had to employ others to do the camera work for him. But he could appreciate the difficulties with which a photographer had to contend in dealing with these carvings, which were often situated in dark porches and other places difficult to get at. He did not hesitate to say that photographing tympana was one of the most difficult tasks that anyone could take up; but at the same time he must confess that the work was replete with interest.

These tympana belonged chiefly to the 12th century, and many of the examples represented a single stone covered with ornamental designs. He would begin with the most simple form of such ornament, and would show later on how elaborate carving gradually superseded mere incised patterns. In the simplest forms of tympana it would be found that patterns were produced by the placing of stones diamond-wise, by covering a surface with small holes, by stars, or by bosses of rose form. A zig-zag pattern was very common, and small square panels, with perhaps a knob in the centre of each, were often met with. A fish-scale design, consisting of overlapping scallops, was also not uncommon, and had probably a Scandinavian origin. Various examples of these different patterns were shown on the screen in quick succession, and if a fault could be found with them it could only be in their superabundance. It would have been, perhaps, better if fewer pictures had been exhibited and a little more time devoted to the consideration of each. Much of the ornamentation was of a symbolical character, and many of these tympana were at the same time dedication stones, as was evidenced by the inscriptions which they bore. The lecturer was of the opinion that many of these stones served at one time as samples, or patterns, cut by a master hand for the guidance of inferior workers, and that subsequently they were incorporated into the buildings

In most of the English Counties churches were to be found which afforded examples of these tympana, but there were exceptions to the rule. Thus in Norfolk he had not been able to discover a single specimen. In Gloucestershire, on the other hand, there were more examples than in any other county, while a great number occurred in Herefordshire.

Some of the sculptured figures of men and animals were of the rudest character, and one often had to guess at the genus of the creature represented. These quaint beings were generally shown doing homage to the cross, while the figure of Saggitarius, half man and half horse, St. George, or St. Michael and the Dragon, were very favourite subjects for the sculptor's art. A whole series of these tympana exhibited a tree as their chief feature, possibly emblematical of the tree of spiritual life and knowledge. Strange birds roosted in the branches, and griffins, dragons, and other fabulous monsters were shown devouring the fruit which grew there. At a later date, familiar bible stories were illustrated on these curious stones, and examples were shown of the episode of Elisha and the she bears, of the sacrifice of Isaac by Abraham, etc. In other cases the artist had been content to fill the space at his disposal with dragons, griffins, and other fearful wildfowl, which were perhaps intended to have a deterrent effect upon evil doers. Hunting scenes were not uncommon, and the frequent introduction into these compositions of the figure of a wild boar was probably due to the circumstance that at the time the animal was a familiar object in the adjacent woods. One curious example showed a boar and other animals taken by an abbot to do homage to the Agnus Dei, and in another a mermaid formed the principal figure. Another series of pictures were of New Testament subjects, the figure of Christ, or of the Virgin and Child, forming the centre piece.

Mr. Keyser had to leave rather hurriedly for another engagement, but before he went he expressed the hope that his paper would be productive of some discussion, and if any suggestions were made as to the meaning of some of these sculptures, which were rather obscure, he would be only too pleased to hear about it. He himself preferred a simple and straightforward interpretation rather than one which was strained and laboured.

Mr. Inwards said that it had struck him in looking at these pictures that a great many of the carved stones must have originally formed part of older buildings, and had later on been placed where they now were. They marked the time when superstition was being superseded by the teachings of Christianity. Some of the ruder sculptures recalled to his mind the roughly-wrought lions on the gate at Mycæne. He could not help remarking upon the vast amount of labour which the collection of these pictures must have entailed, and he quite envied the power of a memory which could retain so many names of churches and villages.

Mr. Lambert called special attention to one of the tympana shown, which he himself had photographed, and he gave an interesting description of the carvings thereon, and their interpretation.

Mr. Middleton, who occupied the chair, pointed out that these tympana were by no means peculiar to Britain, but were found in France of an even earlier date. They were probably introduced here by the Normans, although some were undoubtedly pre-Norman, and resembled in their execution the crude efforts of childhood. Those present would note that the earlier work is all incised; of the later work some is incised and some in relief. All work in relief is late, for the early workers did not know the use of the chisel. He was inclined to endorse the lecturer's opinion with regard to the use by the early workers of sample or patters stones, for it was remarkable how the use of any particular design quickly spread over a large area, just as if they came from a common source. There were two distinct classes of ornament shown in the later examples, the one of Scandinavian origin and the other Roman. The Roman work would have been introduced here by masons from France and from the Rhine, where it is common.

WEST LONDON PHOTOGRAPHIC SOCIETY.

The following is an abstract of the presidential address read before the Society on October 24th, 1902:—

What I would wish to impress most strongly on you is the importance of having some definite aim and keeping it steadily in view. If we spread our energies over too wide a range of subjects we shall not attain eminence in any of them, and the result will be a dead level of mediocrity. Most, if not all, of us have only a small amount of leisure that we can devote to photography, and it therefore behoves us to so utilise it as to obtain the greatest amount of satisfaction to ourselves. Now, this we shall never do if we take every interesting subject we come across, for there will be no time to do them justice, and the result will be a mass of prints, few, if any, of which reach the higher plane, and the contemplation of which leads to that feeling of dissatisfaction that so frequently ends in giving up photography altogether. One print of the

highest class is worth a thousand second-rate ones; and is a source of perennial pleasure and a stimulus to future work. Study and experiment are necessary to success in any class of subject, and I would suggest that you think out carefully in what class of photographic work your interest principally lies, and then concentrate all your energies upon it. To the great majority the pictorial side no doubt appeals most strongly; with some in portraiture or figure subjects, some in floral studies, and by far the larger number in landscape in its various forms. Now, in the latter the variety is far too great for anyone to successfully cover the whole, and that class of subject should be chosen which appeals most strongly to you. I may instance as distinct classes, mountain, woodland, river, moorland, fen and marsh, and marine, and one of these should be chosen and worked at until proficiency is attained. When you consider that a painter who devotes his whole time to his art and has been specially trained during the most susceptible years of youth, yet finds it necessary to limit himself to a certain class of subject, how is it possible to suppose that we who can only give a very limited amount of time can succeed in covering a wider range? Looking at the technical side alone, and considering that the development that will give the best results for any one of the kinds of subjects I have named differs for each of them, it is clear that the man who continually changes from one class of subject to another cannot expect to obtain such good results as he who confines himself to one. I know we are told that automatic development will give as good results as can be obtained by varying the developer with each subject, and no doubt it would if the exposure for all parts of the subject were the same, but in landscape work all exposure is a compromise, and therefore the development must also be a compromise, and must be adapted to suit the result we wish to obtain. Dwellers in London, and more especially in this part of it, enjoy almost unique advantages in the variety of subjects within easy reach, and I would strongly recommend to the novice, as the most satisfactory artistic training, that he should carefully select some subject that is easy of access to him, and set himself to carefully study it from all points of view and under all conditions of lighting, varying the exposure and development, printing from all the negatives, however bad they look, and taking prints on different kinds of paper and in different colours. Keep all the results, good or bad—particularly the latter. Make full and careful notes of every detail of exposure and development, then compare the results and think out why one is more pleasing than another. Test any ideas that may occur to you, and try if you can improve your results still further. Some will be better in one part than another, one perhaps in grouping, another in lighting, some more harmonious than others in relative subordination of the various parts to the whole. In some parts of the subject the details may be too pronounced, in others they may require accentuation, and attempts should be made to modify them. Familiarity with the subject will enable us to appreciate minute differences which otherwise would be almost certain to escape detection, and which are yet vital to the result. The difference between mediocrity and works of the greatest beauty is most often an aggregation, more or less extensive, of such minute differences. The way may be long and hard, and failures many, and success only attained after many struggles, but the pleasure resulting from such success will be in exact ratio to the difficulties of achievement. That you will succeed if you devote sufficient energy to it is certain, for in every man there is the germ of that artistic faculty which only needs proper cultivation to develop it. With some men it may be more easily developed than in others, owing to hereditary tendency; but that it is inherent in the human race is obvious to anyone who has studied the early history of man.

SOUTHAMPTON CAMERA CLUB.

The members of the above club held a meeting on the 27th October, when Mr. G. Vivian presided. The chairman introduced Mr. F. C. Wardall (representative of Messrs. G. Houghton and Son), who gave a very entertaining lecture and demonstration on "The Possibilities of a Modern Camera." He ably described the many virtues and capabilities of the Sanderson camera, and fully satisfied the members of its great value as a photographic apparatus of the highest degree. The subject of telephotography was profusely enlarged on, and most valuable blackboard sketches of a scientific nature, as to the construction of various lenses, were made; and the lecturer exemplified to the entire satisfaction of all, and with telling effect with numerous lantern slides, the great value of the use of the telephoto lens, and also the great advantage accruing from the use of the screen. Mr. Wardell was accorded a hearty vote of thanks for his most scientific and instructive discourse.

LEEDS CAMERA CLUB.

The advisability of a change of quarters was strikingly demonstrated on Wednesday evening, October the 29th, when an audience of upwards of 100 attended at the rooms of the above club, Athenæum Buildings, Park Lane, to hear a lecture on "The Motor Car as an aid to Photography on various Tours," by that racy humorist, Mr. George Thistlethwaite, being one of the series of lectures promoted by the Yorkshire Photographic Union.

The president of the club, Mr. Charles B. Howdill, was in the chair, and in opening the proceedings stated that he disagreed with those people who held views that only matters purely photographic should find room on the club syllabus. A lecture of this character gave members an opportunity of asking ladies to join them and they would learn in that night what photography could do for them in knocking about the great county of Yorkshire. Mr. Thistlethwaite commenced by remarking that his first motor car had only two speeds, and in hilly country he had very often to get out and push the machine, which proved of little use to him in the country round Wharfedale, which was his "happy hunting ground." He might say, en passant, that he spent a good deal of time reading up the subject, and fancied he knew a great deal of engineering, electricity, and gas engines, for a petrol motor car, which he favoured, was more or less worked simply on the gas engine principle; but he found with all these qualifications he had a lot to learn, and was learning still. He afterwards experimented a great deal on a 2¼ motor, driven with a belt on the back wheel, and had three or four engines roughly knocked together, but as he humorously remarked, bits of the machine were constantly dropping off; and when you began motoring, why "rates" were nothing to the expense of a motor car. Finally he adopted a solid tyre motor car, which pleased him very well and had carried him some 3,000 miles so far, and he had no hesitation in setting off anywhere on a motor of this character. A car was very convenient for carrying photographic apparatus, and would be also useful for a geologist in taking home his specimens. That reminded him of a story that was told him when staying at Hawes. A certain Cambridge professor tarrying there for a fortnight geologizing, had gathered a fairly large stock of specimens of stones in this limestone district, and secured the services of a native to take them to the station. Unlike the Americans, there is no "hustle" in the native round Hawes, and when he was safely round the corner he got rid of them, filling up his sack again at a convenient spot near the station. The trip he would now take them began at the Manningham Park gateway, Bradford, through the Dales into Wharfedale, via, Bierley, Guiseley, Burnsal, to Linton, and covered the most pleasant part of the country; thence to Kettlewell, Hawes Arcrigg, down to Wensley, and after a stay there, back to Bradford.

The lecture was illustrated by numerous slides, elucidating various remarkable and exciting incidents of the tour, and showing most things of a topographical interest on the way, whilst the lecturer amused his audience in a racy and satirical manner with anecdotes, of which he had a plentiful stock. One of them will suffice, viz., the relation of an incident said to have happened in Barden church. During the temporary absence of the vicar, a budding and ambitious young man was left in charge of the parishioners, and took for his text on the Sunday "I am the light of the world." On entering the pulpit his nervousness left him without any recollection of the well-planned sermon, so to save himself from ignominy he kept repeating his text in a slow and measured manner some six or seven times, when the congregation were horrified to hear an old dame scream out: "If thou is the light of the world, thou wants snuffing." On the motion of Mr. Simpson, seconded by Mr. Ratcliffe, a hearty vote of thanks was tendered to Mr. Thistlethwaite for his evening's entertainment.

CROYDON CAMERA CLUB.

The subject of last Wednesday's meeting was "The Universal Camera," as exemplified by the Sanderson hand camera.

The President, in introducing the lecturer, referred to the above camera, which, he stated, he himself and many other members of the club used, as a splendid example of British solidity. Mr. F. C. Wardall then gave his lecture upon the mechanics of camera construction, and in particular the optical principles involved in the Sanderson camera. He also explained other useful photographic apparatus, including the Ensign cameras, Dawson's Densitometer, and a cloud and lantern slide printing frame. A number of lantern slides were also shown in illustration of the demonstrator's remarks.

At the instance of the President, a hearty vote of thanks was accorded Mr. Wardall. He also announced that the sixth exhibition would be held in the spring, under the experienced secretaryship of Mr. W. H. Rogers. It should be added that Mr. F. W. Hicks will be associated with Mr. Rogers.

LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

The seventh ordinary meeting of the present session of the Association was held on Thursday last week. There was a large attendance of members, with Mr. E. R. Dibdin in the chair. Mr. C. B. Howdill, A.R.I.B.A., of Leeds, gave a lecture on "Natural Colour Photography." He began with a few notes on the history of colour photography, and proceeded to give a most lucid description of the Joly and Sanger-Shepherd processes. Dealing first with the decomposition of light by a prism, the lecturer showed the spectrum colours, and gave an interesting description of their action on the photographic plate. In connection with the Sanger-Shepherd process, Mr. Howdill gave a full description of the apparatus used as well as practical instruction. Among the slides made by Mr. Howdill were some exceedingly fine fruit and flower studies, as well as splendid examples of stained glass windows. At the conclusion a hearty vote of thanks was passed to the lecturer on the motion of Mr. Paul Lange, seconded by Mr. Marples.

EDINBURGH PHOTOGRAPHIC SOCIETY.

The following are abstracts from the presidential address, delivered at the first general meeting of the session:—

PURPOSELESS PHOTOGRAPHY.

In the early stages of our photographic career we are all keen and enthusiastic. The glamour of every phase of the production of a photograph absorbs all our energies, our leisure, and a great deal of our spare cash. This goes on for a long time, until, like the child and the toy, we look around for something fresh. Once we have got over being a nuisance to our own family circle and acquaintances, and perhaps still more so to the photographic dealer, whose life is not to be envied at times, judging by the inane questions he is asked about points which could be easily cleared up by buying and above all studying a shilling manual on photography, and also by the cool demands made on his time, as one of our members puts it, "for a pennyworth of hypo. and a shilling's worth of information," we then frequently feel photography beginning to pall.

Taking "the usual thing" does not interest us, snapping at everything is tiring. Particularly in developing and printing, which used to have such a delightful uncertainty about what kind of result would accrue as to fascinate us entirely, do we begin to find photography most monotonous; in short, we are losing interest. There are a few, no doubt, who never quite reach this stage, but remain nuisances for life, and try every one as well as every plate, every new developer, every new paper, and every other miscellaneous adjunct of photography devised for the special benefit of those who must have always something new. We can't help admiring the enthusiasm of this kind of photographer, and indeed we ought almost to feel grateful to him for bringing home to us the fact that even photography has its humorous aspect. However, it is with the more numerous contingent who are losing interest in photography that we have to do; and if they be caught at this stage, and their attention directed to the many phases of

SPECIALISATION IN PHOTOGRAPHY

open to them, much may be done to make them good and useful photographers if they be but persuaded to take up one phase or other and specialise. What a wide field is open for their energies. According to inclination and temperament, so will they select; but whatever it be, it may become much more than a mere hobby if they go into it with a heart and a will.

To begin to enumerate all the many aspects in which one could specialise is out of the question to-night, but a few may be briefly alluded to. On the purely scientific side of photography take photo-micrography; what an absorbing pursuit it may become if our interest in it be once awakened. Last session we were favoured with a most interesting paper on this phase of photography by Mr. Forgan. His knowledge of the subject was amazing, and he gave us a practical lesson of what "specialising" meant. His photo-micrographs of various natural objects, even of grains of sand, were a marvellous revelation of beauty, and a hint of what wondrous realms of knowledge lie hidden around us in the most trivial objects, yet ever there for the specialist to capture, not alone for himself, but to exhibit to others. All of us recollect the most excellent paper and demonstration given a year or two ago by Mr. Tudor Cundall on that most fascinating of photographic problems—colour photography. The results he showed us on that occasion were enough to force us to admit colour photography was something more than a mere dream. To treat or even attempt to deal with the subject in the fashion Mr. Cundall did would of course imply the necessity of a scientific training, but quite recently there has been put on the market more than one process of obtaining positives in natural colours that is within the reach and capacity of any level-headed photographer. Indeed, there has just been introduced one process which, at a very nominal cost for necessary materials, will enable any photographer who has already a camera to produce, with a little study, care, and patience, lantern slides in natural colours.

Many of us are familiar with the work done by the brothers Kearton, Lodge, and one or two of our own members in the field of portraying birds and their nests in their native haunts. Judging from the difficulties which the devotees of this side of photography face and encounter, and better still, overcome, in the quest after results portraying the haunts and habits of our wild birds, this phase of photography is one that may well occupy all the leisure anyone can give to photography. We may see almost everywhere examples of animal photography, the work of one of our own members, Mr. Charles Reid, of Wishaw, which could only have been obtained after long effort and untiring patience, but how splendid the results. What fields, then, are open ever in these two latter aspects of photography for the photographer to specialise.

Other fields of knowledge where the photographer might specialise and find absorbing work for a lifetime are astronomy and geology, but these must only be mentioned in passing, as they require considerable knowledge and training before hand to enable one to do satisfactory work.

The subject of architecture is one in which the photographer can easily specialise and acquire valuable knowledge as he goes along. It is a subject which furnishes material for portraying almost anywhere we like to go. Architecture has its difficulties, but it might well be more popular among photographers. We may not all be able to look with the eye of the architect on the many and varied forms of architecture, we may not all be able to appraise the value from an art point of view of every piece of architecture we see, but the subject is one of the grandest to which a photographer may devote his energies and skill. It is capable of being treated with the loftiest sentiment and poetical feeling, with the utmost breadth and in the most minute detail. Any old cathedral may furnish work for many years. In our city and neighbourhood architectural subjects, both ancient and modern, abound. Here is a wide field for any one to labour in photographically. Every day almost sees old landmarks hoary with age, historical associations, and romance, being swept away by the ruthless march of modern improvements. In many instances, such are being demolished without any record being in existence to hand down to future generations as to what they were like. Surely, then, even in

SURVEY WORK,

many photographers might find so much to do that would be of such incalculable value to posterity that the cry of "losing interest in photography" might well be dropped for many years to come. To those of you who affect no special phase of photography, as well as to those who do, let me appeal once more on behalf of our own Survey Section. During the past year it has made a little more progress than formerly, but **nothing like** what it should or might have made. It is astonishing the apathy members show regarding such a splendid scheme as this if it were only carried out in the **spirit** in which it was conceived. It is known generally in photographic circles that we have had such a scheme on hand for a year or two now. But what have we to show as results? So far, nothing very much. Visitors to our city see seemingly much better than ourselves the wondrous beauty of our grand old buildings and our grey old town. We have our reputation, I sometimes think, at stake in connection with this matter of the Survey. To me personally it would be a lasting disgrace if a Society such as ours, with an honoured and unique history in the annals of photography, were to allow this scheme to fall through. Let us then be up and doing, let us realise that it is a work in which we should feel it a proud privilege to be allowed to take a share in. With the members individually rests the responsibility of the success of the scheme. I cannot bring myself to face the thought of its failure. Whatever arrangements, therefore, as are made by the Survey Committee during the current session ought and will, it is to be hoped, receive the heartiest support of every member. If this support be given, there can then be no question but the close of the session will see satisfactory progress made in furtherance of the work of the scheme.

PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.—HULL BRANCH.

A MEETING was held at the Grosvenor Hotel, October 28th. Present, the Chairman (Mr. W. Barry), and Messrs. H. Abba, M. Boak, E. Cooper, C. Delf, W. H. Duncan, W. Fussey, C. Jones, A. J. Wellsted, and the hon Secretary.

The chairman welcomed the members after the interval of the summer months, in which meetings had not been called, and hoped that this second year of the Association's work in Hull would continue to be characterised by good fellowship and by many useful discussions on subjects of professional interest. He believed that these opportunities for friendly converse between photographers in business were of distinct benefit, and would tend to increase among them a feeling of pride in their profession as well as mutual respect.

The subjects on the agenda were "The permanency of collodio-chloride papers," and a matter referred to the branches from the London committee, viz., "The supply of electric current in the daytime at motor rates." Several prints in C.C. matte were then passed round, which illustrated the spots and markings commented upon by Mr. Lang Sims and others in letters to THE BRITISH JOURNAL OF PHOTOGRAPHY. It was generally agreed that collodio-chloride prints, toned with platinum, may as a rule be considered permanent, but that very occasionally the paper behaves badly, almost suggesting the presence of some impurity in the baryta basis.

Prints were shown which had been exposed to sunshine throughout the season, the mounts alone having changed colour, while other prints had spots and yellowish markings, which appeared in less than a month from the date of printing. One photographer stated that he had found this trouble occasionally, but that it had entirely disappeared with a change of the brand of paper in use.

Mr. Fussey said he could hardly believe the baryta base could be at fault, as the material was so cheap; but it was difficult to explain why the markings should appear on some samples of paper and not on others.

The chairman said that nearly all sensitive material was open to variation in quality, and all that we could hope for was the gradual rise to the perfection of manufacture which the majority of plate-makers had attained.

Messrs. Wellsted, Delf, Boak, and Cooper were of opinion that the silver image in collodion was more likely to be permanent when held in gelatine.

The hon. secretary thought the discussion pointed to the useful work which the branches might do in collecting information of this type, and comparing local experiences with those of London and the provincial members of the P.P.A. The water supply might not always be to blame for failures. The permanency of photographs was a matter of special interest to the profession, and this particular paper had undoubtedly come to stay. For small work some clients preferred it to platinotype, which itself was open to the risks of yellowing, if not actual fading, however careful the manipulation might be. He was of opinion that chemical decomposition of the paper itself might possibly be made accountable for fading troubles if the subject could be scientifically investigated.

The hon. secretary then read a paper on the supply of electric current as it affected Hull members of the P.P.A. He said:—

"It is safe to hazard the opinion that within a few years no professional studio will be considered complete in its working plant without an electric installation; indeed, at the present moment there are few businesses in the first rank which are deficient in this respect. It is therefore a good suggestion from theLondon committee that the matter of electrical supply should be brought before the branch meetings with the view of collecting information on the question of cost.

"Everyone is aware that the price for current varies with the purpose for which it is used, the distinction between motor and lighting consumers doubtless being made with the idea of increasing the demand for current in the daytime.

"But photographers for the most part use their studio installation between the hours of 10 a.m. and 6 p.m., and it is an anomoly to deny them the cheaper rate because they convert the current into light, instead of heat or mechanical energy. Hull photographers may heat their dark-rooms, or dressing-rooms, boil water for afternoon teas, ventilate the studio with fans, etc., at the cost of 2d. per unit, but directly the current is switched through lamps the price is raised to 4½d. per unit.

"Another matter for consideration is the serious waste of current which takes place in the large resistances which must be placed in circuit with any of the single arc lamps, and as the tendency is to raise the voltage on the mains for the sake of saving copper, this trouble will increase.

"Not long ago the Hull Municipal supply was raised from 110 to 220 volts, the effect in those studios using the single arc system being that

for the 45 volts actually utilised 175 is wasted in heating up the resistances. It is true this drawback does not apply to lighting by incandescent lamps as in the Adamson system, and it is obviated to a great extent by running arc lamps in series, as I believe Mr. Morgan, of Aberdeen, arranges; but the Pilsen single arc has been already established, and being worked with success in many studios, and these photographers are at considerable disadvantage in the matter of cost. At all events, their position provides an additional argument for urging the motor rate of charges as a more equitable thing.

"Probably any concession of this sort would not result in a loss to the supply companies, because photographers would be induced to burn their lamps more continuously, instead of switching them on for the brief periods of exposure. At present the temptation to save the current is necessarily strong, when a photographer using a 25 ampere lamp on a 220 volt circuit remembers it is costing about 2s. per hour, with the unit at 4½d. It can be worked economically by switching on and off for exposures, but it is not a comfortable practice, nor is it to the advantage of the supply company to have a somewhat heavy amperage drawing from the mains for brief periods only. It is not at all improbable that photographers may secure the motor rate if they can prove the demand for current in daylight hours is reasonably important. When we consider the wonderful success of municipal electric enterprise in our city, it is worth recalling the fact that the first customer of the Corporation in greater and modern Hull was a photographer, whose 50 ampere lamp was regarded as a nuisance by the switch board attendant. In those early days, whenever the lamps in the neighbouring shop windows or the club were inclined to be 'jumpy,' it was customary to find the excuse in "that photographer again!"

"Fortunately, with the immense and still growing central station at Sculcoates that absurd sensitiveness to varying pressure has ceased to trouble, and we can hope that with electricity in Hull relieving the rates this year to the extent of £25,000, the city can well afford to treat photographers as generously as printers, engineers, and other men of business who use the current in the daytime at 2d. per unit."

At the close of the paper it was ascertained that five photographers at present use arc lamps in Hull, and it was decided to write the city electrical engineer, and also to request the London committee to make a general representation on behalf of professional photographers. It was agreed (nem. con.) that the next six meetings should be held in the months of November, January, March, May, July, and October, and that the question of the reservation of copyright shall be fully discussed at the next meeting.

News and Notes.

The Princess of Wales has honoured Mr. Richard N. Speaight by accepting a copy of his last work, "Children's Portraits," the frontispiece of which consists of his portrait of Prince Edward by special permission of the Prince of Wales.

The Colours of Stars.—"The wide difference which there is between star and star as to brightness," says Mr. E. Walter Maunder, F.R.A.S., in "Knowledge," "is apparent on the very first glance towards the heavens; it requires a more careful scrutiny to realise that they differ also in their colour, and in the character of their shining. The ancients carried their discrimination of the difference of the brightnesses of stars so far as to recognise six magnitudes, but when it came to the question of colour they hardly noted any differences at all. The stars in general were described as yellow, six only being recorded as 'fiery.' Of these six we should class five as being distinctly orange or red—Antares, Betelgeuse, Aldebaran, Arcturus, and Pollux. The sixth, Sirius, is to us an intensely white star, and there have been many discussions as to whether it has changed its colour in the last 2,000 years, or whether the description given of it —'fiery red'—is due to some mistake in the record, or whether the excessive scintillation of the star may account for it. For, as we see it now when near the horizon, a momentary flash of vivid red flame shoots out from time to time, due to the irregular dispersion of its light in passing through the tremulous atmosphere. It is from this that Tennyson, most exact of all the poets in his scientific references, calls Sirius 'fiery' in the well-known passage from the 'Princess':—

'The fiery Sirius alters hue.
And bickers into red and emerald.'

Assuming that the light of any star is partly white and partly coloured, we may divide the stars into classes, depending entirely upon the depth of tint which it shows, and not upon its colour. A five-fold division suggests itself, something to the following effect:—(1) pure white, (2) tinted, (3) coloured, (4) fully coloured, (5) deeply coloured. After the question of the depth of tint which the stars show, comes the question of the colour of that tint. For naked-eye stars, the more refrangible colours do not come into consideration. The range is from orange-red up to yellowish green, or possibly in a single instance—that of Beta Librae—to green. Alpha Lyrae, and possibly one or two other stars, have a distinct bluish tinge, but in general the stars not passed as white may be very well scheduled under one of the five following heads:—(1) reddish orange, (2) orange, (3) orange-yellow, (4) yellow, (5) yellowish green. In working upon star colours with the naked eye it is impossible to use any artificial standard of colour, but the wide field of view, and the ease and rapidity with which the attention can be turned from one part of the heavens to the other, will much more than make up for this deficiency. The stars must be compared one with another, the estimations of colour must be purely relative, and the method will be found much the most accurate possible." In Mr. Maunder's forthcoming book on "Astronomy without a Telescope," the amateur observer of the manifold wonders and glories of the heavens will be led by a capable hand to a systematic study with the unaided sight of the ceaseless roll of the worlds around us.

The Royal Society's Catalogue of Scientific Papers.—The Royal Society has been engaged continuously during the past forty years in cataloguing the various scientific papers which have been issued in all parts of the world since the beginning of the last century. The original scheme of the Catalogue of Scientific Papers provided that the papers should be catalogued only under the names of their respective authors, arranged alphabetically. This "Authors' Catalogue" has now been carried down to the end of 1883, and comprises twelve quarto volumes. More recently it has been decided to prepare also a subject index of the same papers—that is to say, a catalogue in which the papers are indexed according to the subject-matter of which they treat. Considerable progress has been made with this subject index, though nothing has as yet been published. The expense of this work has been very large, since, although a great amount of gratuitous labour has been readily given by Fellows of the society, it has been necessary to employ a considerable permanent salaried staff upon the preparation of the copy for the press. At first the printing and publication were undertaken by H.M. Stationery Office, the Treasury having determined that the catalogue should be printed at the public expense. In coming to this conclusion the Lords of the Treasury stated that they had regard "to the importance of the work with reference to the promotion of scientific knowledge generally, to the high authority of the source from whence it came, and to the labour gratuitously given by members of the Royal Society for its production." This arrangement, however, came to an end after the publication of the first eight volumes. The Treasury in 1889 informed the society that the catalogue could no longer be printed and published by the Stationery Office. The unsold volumes, were, however, handed over to the society, and Parliament voted a sum of £1,000 to assist the society in continuing the printing and publication. The four subsequent volumes have been printed and published by the Cambridge University Press, which has received subsidies from the society for this purpose, and receives the sums arising from sales. The total sum expended by the society upon the catalogue down to the end of June last has been £14,790 5s. 5d. Towards this expenditure a donation of £2,000 was made by Dr. Ludwig Mond in 1892. Sums amounting to £524 11s. 9d. have been received as the proceeds of sales of the volumes handed over to the Royal Society by the Stationery Office. As already stated, £1,000 has been received from the Treasury. The council has also hitherto devoted the income of the Handley Fund (which they have power to apply as they may deem best for the advancement of science) towards defraying the cost of producing the catalogue. The total sum received from this source has been £2,394 11s. 10d. A sum of £341 11s., arising from money invested until actually required, has also been available for the same purpose. These pecuniary aids amount in all to £6,260 14s. 7d. As will be seen, they have not been nearly sufficient to meet the whole cost, and the society has been compelled to make up the balance of £8,529 10s. 10d. out of its own general income. As it became obvious that to permanently continue to prepare and publish catalogues of the ever-increasing stream of scientific literature was wholly beyond the means of the society, the council tooks steps to obtain international co-operation in this great work. Such co-operation has happily been secured, and the cataloguing of the scientific literature of the present century is now in the hands of an international council. The Royal Society has, however, incurred large special responsibilities in connection with the matter, having undertaken, inter alia, to act as the publishers of the catalogue, and also to advance the capital required to start the enterprise. The International Catalogue is concerned only with the scientific literature appearing after the commencement of the present century. The Royal Society's Catalogue, as already stated, is at present carried down to the end of the year 1883 only, and the subject index for that period is but partially dealt with. The foreign delegates, assembled to consider the establishment of the International Council, expressed their sense of the great importance of the Royal Society's Catalogue, and of the obligations which men of science in all countries were under to the society for having undertaken it. They also expressed the hope that the society would complete the catalogue up to the close of the last century, so as to bring it into line with the International Catalogue. Indeed, it may be said that the International Council is proceeding on the assumption that this will be done. In order to complete the catalogue, it will be necessary to prepare and publish a catalogue of authors for the seventeen years 1883-1900, and to complete and publish the subject index for the whole of the past century. The Council of the Royal Society are satisfied that this work must be done, and have not felt justified in refusing to undertake it. They have accordingly commenced operations, and it is hoped that the copy may be produced ready for the press in about five years. Owing to the enormous increase in the number of scientific publications at the close of the last century, it is estimated that to complete the catalogue, and to subsidise a publisher for undertaking the printing and publication, he retaining the proceeds of the sale, will cost at least £12,000. The question now arises whether the funds of the Royal Society ought to continue to be burdened with any part of this expense. The activity and responsibilities of the society have greatly increased in recent years, and it is much straitened by its inability to increase its expenditure, either on its own establishment, or in other directions, owing to the incessant demands of the catalogue. The council consider that the time has now come for them to appeal to those who are in a position to afford substantial financial assistance, to enable them to complete this great undertaking without devoting any part of their funds, so sorely needed for other purposes, to this object. They are thankful to be able to announce that Dr. Ludwig Mond, F.R.S., has been so impressed with the importance of the catalogue, with the necessity for producing the

subject index of the scientific literature of the past century so far as possible in the same complete form as that adopted by the International Council for the literature of the present century, and with the justice of the view that the Royal Society ought for the future to be relieved of the cost of producing the catalogue, that he has most generously added to his previous gift of £2,000 the munificent donation of £6,000, payable in four annual instalments of £1,500. The president and council have also much pleasure in stating that Mr. Andrew Carnegie, fully appreciating the value of the society's undertaking, and the claims that it has on the liberality of those who, though not Fellows of the society, are interested in the promotion of natural knowledge, has contributed the handsome sum of £1,000 towards its accomplishment. They venture to hope that others may be willing to contribute towards a fund to provide for the total cost of this national work.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

ENAMELLING SELF-TONING PAPERS.

To the Editors.

Gentlemen,—We have found a new method of enamelling our self-toning and other collodion paper. It is extremely simple, as you will see by the enclosed instructions. As the old method of laying down the print on collodionised glass was so troublesome, we feel sure that both professionals and amateurs will be interested to hear of this simple process.—Yours faithfully,

PAGET PRIZE PLATE COMPANY, LTD.

The Paget Prize Plate Company, Ltd., Watford.
October 29th, 1902.

GLAZING PRINTS.

If a highly glazed surface is desired, do not dry the prints after washing. Lay them, while wet, face downwards on a piece of well cleaned plate glass (which need not be French chalked or prepared in any way), roll the back firmly several times with a roller squeegee and leave to dry; or they may be dried by heat in a few minutes. When thoroughly dry, wet or well damp the back of the print in any way you please, and leave it for five minutes. Lift one corner of the print (if it is a large one, two adjacent corners are better), and pull steadily without stopping; the print will come off easily, and when dried again will have a highly glazed surface. This surface is not injured by wetting, which will be found to be a great advantage in mounting

KODAK, LIMITED, AND THE TRADE.

To the Editors.

Gentlemen,—The further statements made by the Photographic Trade Association in your last issue compel us to ask the equal favour of space in which to reply.

The Photographic Trade Association state that they are agitating this question because they have good reasons to believe that Kodak, Limited, are endeavouring to create a monopoly. "Reasons to believe." What a basis for a dispute, taking up so much valuable space in your columns! As a matter of fact, the Photographic Association was formed to excite and organise opposition to Kodak, the real aim being to create facilities for the marketing of imitations and piracies of our goods. The composition of its council proves this. The reports of its initial meetings prove it. The story can easily be read in print.

The association was formed at a time when the retailing dealers misunderstood our conditions. The case is very different now. Some of those on their own council even now refer to the Photographic Trade Association as "an association of Kodak haters." The association is led by wholesalers who are not now able to handle Kodak goods. We had to dispense with them because the intermediary of the middleman was found by us to be mischievous and useless. The manufacturer can get the goods to the dealers and to the public fresher and cheaper without him. Everyone knows that the aim of the middleman is to conceal the identity of the manufacturer and push out goods under his own name and brands.

All there is in this agitation is that certain of these wholesalers, not being able to handle Kodak goods, have induced German and English firms to produce imitations for them, and they seek to associate these imitations with the genuine articles as closely as possible, both in appearance and by crafty use of our special trade marks and names. The cry of monopoly is part of this scheme, and is adopted to confuse the real issue and excite animus against Kodak.

Our conditions are not aimed at, and cannot lead to any monopoly. Their object is to make sure that the thousands of purchasers who want Kodak goods shall be certain of having them in every town without fear of deception or confusion.

We, of course, mean to get all the business we can, and we offer those dealers who elect to concentrate on our goods better terms than to those who divide their interest between our goods and imitations of them. This is simply a business proposition.

If the imitators and wholesalers can make it worth the while of the dealers to handle their rollable film goods, it is open to them to do so, but for them to demand that we and all the trade should afford them every facility for marketing piracies in the channels that have been opened, and stand by and see our names and goods used as leaders and "call birds," without attempt to protect our customers from deception is beyond reason.

The cry of monopoly and coercion is a red herring across the trail. The Photographic Trade Association is merely seeking advertisement. Here is proof from their own lips that they have no other reason for this attempt at agitation. In their circular issued in September they state triumphantly that—

> "Other rollable film apparatus and rollable films are being largely and successfully handled by the wholesale houses, and through these channels are finding a ready sale in retail dealers' establishments."

If this be true, our conditions of sale are evidently inoperative to secure monopoly. We think this will plainly expose the hollowness of this attempt to excite sympathy for the imitation goods by a cry of monopoly or coercion. The Photographic Trade Association, in other words, the wholesalers and imitation manufacturers, do not really think that we are attempting to secure or shall secure a monopoly. Their aim is solely to get hold of some of our trade, and they are looking for assistance from some who are jealous of the success of Kodak and of its great expansion. To say that superiority in goods should alone be relied on by manufacturers is absurd. It is notorious that some of the largest firms in the world find it necessary to spend large sums of money in protecting purchasers from flagrant imitations. Take the case of Burroughes and Wellcome, Bass and Co., Martell, Lee and Perrin, and many others, and there are none of them more afflicted with impudent attempts to steal trade than Kodak, Limited.

The tricks of the middleman and shoddy imitator and their abettors are many and wily. One has been to get hold of the Kodak reels which are stamped with the trade mark of the company, and wind imitation films upon them. Judgments against infringers of this kind have had to be obtained, both in Germany and in England. Further, a customer sends his Kodak to be loaded with a genuine spool, and an alien article is put in, with the result that the user winds it off upon the receiving reel, which in 99 cases out of 100, is a Kodak reel. Consequently, on development, if bad results appear, he thinks Kodak is to blame. There have been many cases of this kind.—Yours faithfully,

KODAK, LIMITED.

43, Clerkenwell Road, London, E.C.
November 3rd, 1902.

To the Editors.

Gentlemen,—The letter of your correspondent, "Briton," in the BRITISH JOURNAL, of October 31st, seems to me to try to evade the real point at issue in this matter.

Assuming, for instance, that it is, as he says, "fair," to offer conditional discounts, the question seems to be—is it expedient, in the interests of the photographic public, that a powerful corporation, like the Kodak Company, should induce retailers by such means, not so much to give their productions "special attention"—which in itself is no doubt fair—as to induce them to refrain altogether from selling any similar productions, even though they may be improvements, by giving "sole attention" to their productions, and in so doing create a monopoly, whether intentional or not?

Surely this cannot be expedient in the general interests, and why should not Kodak, Limited, rely—to use their own words—on "good terms, good quality, and fair prices," to keep up the demand for their goods?—Yours faithfully,

ANOTHER BRITON.

To the Editors.

Gentlemen,—My husband tells me that several hundred of the most important of the photographic manufacturers and shopkeepers say that they cannot compete with the Kodak Company, and want us to stop buying Kodak spools. I am quite sure that you would never get several hundred English ladies to acknowledge they could not hold their own against one American girl, even if she be up to date.

Besides, if these men cannot make any film that is any good, what would they have to sell, except the Kodak film? But I suppose the Kodak Company will not let them make any but those oiled tissue paper-looking imitations. Some men are such silly creatures, they just have what they call association dinners and smoke and talk what they are going to do, and then go home and do nothing, except, perhaps, sell things "made in Germany," or somewhere else. The only thing that I can see to be done is for us English ladies to go into the photographic business. An old lady friend of ours is quite enthusiastic about it; she is quite sure that we would not get into such

a muddle as these men have done, and even if we did we would not be so stupid as to say so.

I hope you will kindly publish the opinions of a

LADY AMATEUR.

THE PRESIDENT'S ADDRESS AT THE R.P.S.

A CORRECTION.

To the Editors.

Gentlemen,—

I regret very much to find that, in my presidential address, I made a statement with regard to the photomicrographs of the Lippmann heliochromes of the spectrum, that does an injustice to Dr. R. Neuhauss, and other investigators. I am reminded by the "Amateur Photographer," May 20, 1898, page 394, that the credit of the production of the first of these photomicrographs is due to Dr. R. Neuhauss, and in the society's exhibition of 1900, there was an exhibit, "356." Section through the picture surface of the red zone of a spectrum, prepared after Lippmann's interference method of colour photography, enlarged 4,000 diameters, by Dr. R. Neuhauss." This oversight is the more to be regretted, as the exhibit was made at our own exhibition. With regard to the exhibit sent by Mr. Edgar Senior, it appears that (1) Mr. Senior made the Lippmann photograph, stripped it from its glass support, and gave to Mr. T. A. O'Donohoe the red and blue parts from which to cut sections and make photomicrographs; (2) that Mr. O'Donohoe was the first investigator in England who saw the laminæ under the microscope, and who produced photomicrographs showing most, though not all, of the strata; (3) that Mr. W. B. Randles, of the Royal College of Science, South Kensington, then made thinner sections on the microtome at the college; (4) that Mr. Randles took the photomicrograph of the blue part of the spectrum, which was sent to Professor Lippmann, and is now shown at the exhibition of R.P.S.; (5) that Mr. O'Donohoe produced the photomicrograph of the red part of the film with a magnification of 1,000 diameters, and this was the specimen Professor Lippmann pronounced to be strictly in accordance with theory, as the red actinic planes extend through the full thickness of the film; (6) that Mr. Senior's pictures, at present hanging in the photographic exhibition, are enlargements from the negatives taken by Mr. O'Donohoe and Mr. Randles.—Yours faithfully,

THOMAS R. DALLMEYER.

25, Newman Street, London, W.
October 30th, 1902.

A CORRECTION.

To the Editors.

Gentlemen,—We note in your issue of the 31st October, in your report on the double transfer carbon paper, that there is a slight error, which we would respectfully point out to you. You state that hitherto if a picture was desired on a matt paper by the carbon process it had to be made by the single transfer method, but we would point out to you that our gravure carbon tissue, which we introduced twelve months ago, was made for producing this very effect by double transfer, and it is now largely used by the leading photographers throughout the kingdom. We have supplied for twelve months matt papers, toned and white, with a special paste for rubbing the temporary support, and which gives a perfectly matt surface by the double transfer process. As we are the pioneers of this method, we trust in justice to us that you will kindly note this in your next issue, and, thanking you in anticipation and with compliments, we are, dear Sirs, yours faithfully,

THOMAS ILLINGWORTH AND CO., LTD.

Willesden Junction, London, N.W.
October 31st, 1902.

MR. ARTHUR MORTLOCK has sold for Mr. S. J. Porter (of Torquay, Paignton, and Exeter) the well-known high-class photographic business successfully carried on by him for the last fifteen years at "Maison Rouge," High Street, Ventnor. The purchaser is Mr. J. M. Allen, of Cirencester.

AN Appreciation of Sir J. Benjamin Stone.—In the last of his chatty series of articles "From Behind the Speaker's Chair," which appears in the November "Strand Magazine," Mr. Henry W. Lucy refers to Sir Benjamin Stone's photographic work in the following appreciative terms: A good deal is heard from time to time of Sir Benjamin Stone's collection of photographs relating to Parliamentary life. The photographs taken on the Terrace of the House of Commons, multitudinous as they are, form only a section of this unique collection. Like Ulysses, much has Sir Benjamin travelled, much of men and cities has he seen. Before he entered the House as member for East Birmingham he visited Japan, China, the Straits Settlements, Asia Minor, the West Indies, the Rocky Mountains, Vancouver, and the River Amazon, not to mention ordinary accomplishment in the way of historic places on the Continent of Europe. Wherever he went he carried with him his camera, bringing home photographs of whatever he saw. Nor are these of the ordinary snap-shot character common to Cook's tourists. They are works of art, skilful use of the platinum process giving them the appearance rather of engravings than of photographs. The fact is, if Sir Benjamin had not been dazzled by the dignity of being five times Mayor of Sutton-Coldfield, he would have been—perhaps he is—the most successful photographist of the age. In addition to being an artistic photographer he is a practised writer, having recorded in several volumes his travels in Japan, Brazil, Spain, and Norway. His practice, extended over many years, has been that when he takes a photograph of a memorable scene or a distinguished person he writes a descriptive note, which is affixed to the picture when it is stored away and catalogued. The consequence is that his collection, which now numbers 25,000 separate plates, is an unparalleled pictorial history of the world. It is well to know that this rare achievement will not be lost to the public and to posterity. Sir Benjamin tells me he has bequeathed the collection to the care of trustees, with direction to take whatever steps they in their judgment think best calculated to add to the instruction and entertainment of the public. Whether the pictures, with personal notes or descriptions of scenery, shall be published in book form, or whether they shall be deposited in some public institution, is a matter Sir Benjamin leaves to the unfettered discretion of the trustees. Amongst the series of pictures of immediate home interest are photographs of every part of the interior of the structure of the Palace of Westminster. The Tower of London has been dealt with in the same minute and masterly fashion. One of the most beautiful and impressive among the multitudinous pictures is one of which I possess a cherished copy. It shows the last halt of Mr. Gladstone on his way to burial in Westminster Abbey. It was taken early on the morning of the 5th June, 1898. Westminster Hall is empty, save for the coffin set in its midst, on which the early morning light falls softly through the lofty windows set in their place when Richard II. was King. During the summer Session Sir Benjamin Stone had a rich harvest of celebrities in the foreign, Indian, and Colonial celebrities coming over for the Coronation. His studio is a portion of the Terrace belonging to the deserted section pertaining to the House of Lords. With quick artistic eye he discovered the usefulness of the accessory of a wrought-iron gateway opening on to the Terrace. With this background his subjects are posed. It is a memorable procession, including all the more famous past and present members who have held seats during the last seven years. In addition is the fringe of foreign notabilities who flock to the Lobby of the House of Commons. The latest photograph of Mr. Chamberlain was taken by Sir Benjamin on the day peace was signed at Pretoria.

PHOTOGRAPHY, Philosophy, and Humour.—The three were well combined in an interesting lecture delivered last Saturday night in the Fine Art Gallery, in the Leeds Municipal Buildings, by Mr. E. Rimbault Dibdin, a Liverpool journalist, who is president of that city's amateur photographic association and a past president of the Liverpool Artists' Club. Mr. W. Edwin Tindall, R.B.A. (secretary of the Yorkshire Union of Artists) was in the chair, and had the satisfaction of presiding over a crowded audience, a fact which was all the more gratifying when it was considered that only just across the street some five or six thousand people had gathered together with the fell design of waiting a couple of hours for the public declaration of the results of the municipal elections The Saturday evenings at the Leeds Fine Art Gallery are usually devoted during the winter season to lectures on music and art of the brush-producing character, but last Saturday night the photographic people had an opportunity of showing to all and sundry that they too could claim to be endowed with the artistic feeling, and that they were moreover entitled to wear a nimbus which essentially is their own. Mr. Tindall in a sentence introduced the lecturer, remarking that Mr. Dibdin was not a stranger to most of them, and that he was known to be one of the best workers in the domain of photographic art in the kingdom. Mr. Dibdin said it was true that he was not an entire stranger to the city, as he could claim that an ancestor of his had the honour of entertaining the people by his songs as far back as the eighteenth century. The title of the lecture was the "Magic Carpet," but the old Arabian story was only utilised as an object lesson, and was in a sense treated allegorically. The lecturer sought to demonstrate his view of the proper treatment of a lantern lecture by making words and pictures interdependent on each other. Some people, he said, seemed to think that when they had made a lot of slides and obtained a lantern more or less effective their work was at an end, but as a matter of fact that was only the beginning, the best part being the lecturer's story which accompanied them. The lecture had been written for the purpose of showing his idea of how a miscellaneous collection of pictures might be made interesting alike to the spectator and the listener. There are few pictures that could not be turned to account as moral or other lessons, and adapted to the affairs of every-day life, as the fables of Æsop and La Fontaine might be. Having exhausted the story of the "Magic Carpet" Mr. Dibdin, in turns philosophic, sarcastic, and humorous, drew a parallel between the life of a child and of a river, and illustrated his story of development and progress by the aid of an excellent series of lantern slides. Several instances of the marvellous work of nature were depicted by slides of more than ordinary excellence, such as the effects of frost, heat, earthquakes, water, and air. A river, he claimed to be more than a symbol of human life, and strongly recommended the investigation of rivers, streams, mountains, and valleys to every student of life. Such an investigation could be made additionally interesting to the photographic student by reason of the fact that he could the better retain the impressions which had been made upon him, and could always revive them by looking at his pictures. The lecture seemed to be greatly enjoyed by the large audience, and Mr. Dibdin was frequently warmly applauded.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY, 24, *Wellington-street, Strand, London, W.C.*" *Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., *24, Wellington-street, Strand, London, W.C.*

PHOTOGRAPHS REGISTERED:—

F. Poppleton, 84, Urban Road, Hexthorpe, Doncaster. *Photograph of Doncaster Rovers Football Team.*

W. Sandbach, 97, Renshaw Street, Liverpool. *Photograph of Everton Football League team.*

R. Nichols, 30, St. Peter's Street, Stamford. *Photograph of the Horse Shoes, Oakham Castle.*

G. Lambourne, Abbey Studio, Malmesbury, Wilts. *Two photographs of the late J. Kensit.*

W. Jennings, 21, Larkhill, Blackburn. *Two photographs of the Very Rev. Monsignor Maglioné. Photograph of R. Crompton.*

G. F. Watson, 111, Brook Street, Macclesfield. *Photograph of Homing Pigeon.*

R. S. Webster, The Studio, Gilmore Place, Edinburgh. *Photograph of Rev. W. Williamson.*

A. Squibbs, 38, Fore Street, Bridgwater. *Photograph of crayon drawing, "Descent from the Cross."*

T. Bourke, 213, South Street, Perth, N.B. *Photograph of four Roman Catholic Priests.*

G. H. W. Adams, 58, St. George's Street, Canterbury. *Photograph of the Very Rev. the Dean of Canterbury.*

G. W. Gibson, High Street, Coldstream, N.B. *Photograph of Coldstream Bridge and Border Marriage House with Station Bus.*

WATER COLOURS.—S. W. asks: "Can you tell me where I can get colours from for photographic prints (water colours)."—In reply: The colours can be had of any of the artists' colourmen. It is the ordinary water colours that are used for colouring photographs.

COUNTY COURT CASE.—"I photographed a group on my own responsibility. I sent proof and the order was for ten copies. I sent same on and never received the money, which the people state was posted. Can I County Court them for same?"—In reply: You can sue in the County Court, but you will have to prove you never received the money. Then you will recover.

ENAMELLING PRINTS.—J. P. BAMBER asks: "Will you kindly give me formula for the mixing of emulsion for the enamelling of collodio-chloride prints?"—In reply: We do not understand what you mean by emulsion for enamelling C.C. prints. Collodion prints can be enamelled with gelatine and collodion, the same as any other prints. See reply to "Query."

REPAIR OF ENAMELLER.—C. SPENCE writes: "Do you know of any agent for the 'Globe enameller' in Britain, or other party that can put in order an 'enameller' that works with 'gasoline' not gas?"—In reply: Most of the large dealers supply "Globe enamellers," and no doubt the one who supplied yours, will get it repaired for you. Failing that, we imagine that any working engineer in your neighbourhood would do the needful.

COPYRIGHT QUERY.—A. W. SARGENT writes: "Kindly let me have your opinion of the following: A customer has asked me to make a negative of an old print out of a book published in 1725. Would there be any risk of infringing on any rights? Of course, the prints are not copyright at that date, but can I be prevented from making a photographic copy of them for reproduction?"—In reply: There being no copyright in the print there will be no risk in copying it for reproduction.

METALLINE PICTURES.—RETEP says: "I have recently been shown a photograph (presumably a carbon print) upon a square block (black), with silvered centre, and, I believe, lacquered over. Please inform me where the blocks may be obtained, and whether the idea is protected."—In reply: From the description we imagine that the picture is one that was produced by the "Metalline Company." If so, it is a carbon picture, but the Company make a secret of how they are produced. We cannot say where the blocks can be obtained, unless from the Company.

MARKING NEGATIVES.—MIDGET says: "Kindly inform me the best method of marking a negative so that it will print out the name and address the same time the picture is printed, in dark colour, for unmounted midgets printed on heavy bromide paper. Is there any appliance on the market for the purpose?"—In reply: The way to get the name and address to print black is to scratch it neatly out of the negative. There is no appliance on the market for the purpose, but there is for producing the lettering to print white. It may be had from Messrs. Richford, Snow Hill, E.C. Its name is "Namet."

A PROCESS QUERY.—W. C. EDMONDS asks: "Could you tell me what paper the enclosed print is. My employer says it is Velox special portrait but I cannot get the same rich effect with any slow gaslight paper. I believe it is C.C. matt, platinum toned. Should be very much obliged if you could say what paper, and if possible the brand, as we want to use it."—In reply: We see no reason to doubt what your employer says, as similar results can be produced on special "Velox" paper. We could not say for certain that the print is not on a collodion paper without submitting it to such test as would damage it. The picture has been returned as desired.

COPYRIGHT COPY asks: 1. "Will you be kind enough to inform me whether a copyright photo is bound to have 'copyright' on same, or other means of making known the fact that the picture is copyrighted? 2. Should I be doing right in copying a photograph without any 'copyright' or other words on? 3. If this print (half-plate) was from a copyright twelve by ten negative (that is part of the larger negative), would it be requisite for the word 'copyright' to appear on the smaller print?"—In reply: 1. A copyright photograph need not be marked as being copyright; 2, certainly not, if the photograph is a copyright one; 3. no, not at all necessary.

PHOTOGRAPHS ON JEWELLERY.—F. V. (Middlesbro') says: "I wish to transfer some photos on to a watch, and should be greatly obliged if you could give me the formula of the collodion mixture required for the process; also which kind of paste for pasting down the print; and thirdly, where to obtain the patent varnish, I think it is called "Zapona," or similar."—In reply: Full working details for putting photographs on jewellery were published in our issue for July 19th of last year, to which we must refer our correspondent, as there is not space in this column to repeat them. Zapon varnish is supplied by the Crane Chemical Company, Newhall Street, Birmingham.

DUAL BUSINESS.—E. W. BALDWIN says: "I should like to hear your opinion upon a profession I have honourably upheld for the past fifteen years. When we see the following notice in a baker's shop, 'Photos taken daily from 2 p.m. to sunset; artistic mounts if desired,' it makes one think 'whatever is photography coming to.' Is it bakery going to the wall, or photography?"—In reply: We cannot answer our correspondent's query; but there is nothing to prevent the baker carrying on photography if he chooses, any more than there is to prevent a photographer adding another business to his own, which many do.

ENAMELLING PRINTS.—QUERY writes: "Will you kindly inform me as to which is the best method of glazing collodio-chloride and P.O.P. prints, and best way of mounting same in large quantities? I understand that to obtain a highly glazed effect, the prints must be coated with collodion or gelatine, and squeegeed on glass."—In reply: Prints are enamelled in this way—Take a perfectly clean glass plate, rub it well with French chalk, and coat it with enamel collodion. Allow to set, and then put into water to wash away the ether and alcohol. Immerse the print in a warm, dilute solution of gelatine, together with washed plate; bring both in contact, avoiding air bubbles. Remove and squeegee together, then allow to dry and strip off. "Backing paper" is sold by the dealers, which, if used according to the directions, will prevent any of the gloss being destroyed when the prints are mounted.

STUDIO BUILDING.—SAXCULIE says: "I have a studio with a south-eastern light, and I am thinking of enlarging it and putting the side-light on the other side, and should like you to advise me if it would be best to make a ridge roof, with glass on both sides of roof, or if it would be best to make a lean-to roof. The studio is 10ft. wide, 27ft. long, and glass on the side about three parts of the length. Would it cast too heavy a shadow on the boarded side. If I build the side 14ft. and the other 6ft. 6in., and adopt the lean-to roof, how would it be to put a 6ft. by 4ft. section of glass in the side at the sitter's end as per sketch. I have a Suter's No. 5 landscape lens (12 by 10), and should like to know what the stops are; I mean, what are the apertures, in working with a Wynne's exposure meter."—In reply: It is quite a matter of personal opinion: both forms are good, one prefers one and another the other. If the lean-to form be adopted, the shadows, if necessary, could be softened by a reflector. The glass in the side would be useful, but we should advise its being put five or six feet nearer the middle than shown in the sketch. We have not one of the lenses mentioned by us, so cannot say what are the ratios of the stops.

*** NOTICE TO THE TRADE, WHOLESALE AGENTS AND BOOKSELLERS.—*A Contents Bill is issued with each number of the* JOURNAL, *and copies may be had on application to the Publishers.*

*** NOTICE TO ADVERTISERS.—*Blocks and copy are received subject to the approval of the Publishers, and advertisements are inserted absolutely without condition, expressed or implied as to what appears in the text portion of the paper.*

The British Journal of Photography.

The Oldest Photographic Journal in the World.

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It may also be obtained from all Booksellers, Photographic Dealers, and Railway Bookstalls.

THE BRITISH JOURNAL OF PHOTOGRAPHY.

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*** *The Editor can only be seen by appointment.*

*** *We do not undertake to answer letters by post.*

THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC FOR 1903.

Edited by Thomas Bedding, F.R.P.S.

The forty-second annual issue of The British Journal Photographic Almanac will be published in December next. This year's Almanac reached a total of 1,560 pages, and the entire edition of 20,500 copies was sold out a fortnight before publication. Of no other photographic book ever issued can two such unique facts be recorded.

The growth in popularity of the Almanac is evidenced by the remarkable rapidity of its sales.

The 1900 Edition (20,500 copies) was sold within three months after publication.

The 1901 Edition (20,500 copies) was sold a fortnight after publication.

The 1902 Edition (20,500 copies) was sold a fortnight *before* publication.

The widespread interest in the Almanac grows steadily year by year, and in order to supply the increasing home, foreign, and colonial demand, we have decided to enlarge the 1903 issue to

25,000 COPIES.

The great addition to the circulation of this most popular annual (over 20 per cent.) undoubtedly enhances its value as an advertising medium, and the issue of the large number of extra copies will supply the wants of thousands of photographers, dealers and publishers who were unable to obtain the Almanac for the last three years.

The Almanac for 1903 will appeal to photographers all the world over as a daily reference guide in practical work. The standard matter and formulæ will be revised and added to where necessary, and the latest departures in theory and practice will be chronicled. The year's advances will be recorded, and wherever practicable new features of an informative nature will be added.

EX CATHEDRA.

Aluminium. This metal promises to hold the public mind for some time to come, for the majority of scientific periodicals lately have contained references to and articles upon it, the exciting cause for this recrudescence of interest being probably the reading of a valuable and interesting paper on the subject by Professor Wilson, read before the British Association Meeting, the same topic having also been treated by him in a paper published in the *Journal of Electrical Engineers*. This metal, of prime importance in electrical work, has always had great attraction for what we might term photographic mechanics. It is not very far from half a century ago when its extreme lightness caused it to be used in the building up of a photographic objective, and almost as long ago it was employed as a substitute for wood in the construction of portable cameras, while at the present time in addition to these uses we find it subserve a variety of purposes, from the making of developing dishes onwards. In comparison with the familiar brass-work it has for some reason or other never had a great vogue for lens cases, the higher price of the aluminium mountings scarcely accounting for this in our opinion. The great drawback to its employment has been the greater difficulty of working it in the lathe; but the recent work of Professor Wilson will seem to show that some amelioration of these difficulties may be brought about by the adoption of certain alloys.

* * *

Aluminium Alloys. The occasional, or indeed, frequent, brittleness of the metal for a long time stood in the way of its utilisation for many purposes; but the product of the electric furnace is a vast improvement upon the substance obtained by the earlier modes, 99.5 per cent. being the rates of purity attained by this later method of production. By alloying it with a small proportion of other metals great gain in strength is obtained; thus, from a breaking strain of 64,000lbs. per square inch shown by pure copper we have 28,200lbs. only for the strength of aluminium, while with a little over 1 per cent. each of

copper and nickel this is increased to 49,500lbs. Again, the pure metal rapidly tarnishes in the air, though, really that is no great detriment to a lens fitting, as it is usually protected by a coating of lacquer, and if it does tarnish where the lacquer has been abraded the result is far less unsightly than the dirty colouration seen on brasswork under similar conditions. However, the increased purity of the latter-day samples of the metal tends to diminish the liability to alteration by atmospheric influences, and this liability is still further minimised by the addition of the small proportion of alloying metal referred to. A number of alloys of varying materials and proportions were, for over a year, placed on the roof of King's College and afterwards tested. It was found that the addition of copper and nickel gave a considerably increased corrosion-stability, but that an alloy with about one per cent. each of copper and nickel gave a considerably increased corrosive-resisting power.

* * *

Aluminium Two Thousand Years Ago. Though our practical acquaintance with the metal covers a period of about half a century only (the French chemist, Deville, in 1855 demonstrated the possibility of its commercial production, and in 1860 its manufacture on a large scale was started in Newcastle by Sir I. Lowthian Bell), yet it is claimed that a metal which, from the description of its properties, can scarcely have been anything else, was discovered in the reign of the Emperor Tiberius 41B.C. to 37A.D. According to a writer in the *Globe* of August 19th, 1898, Pliny tells us that in that reign "A worker in metals presented a beautiful metal cup resembling silver, but lighter, to the Emperor, who questioned him, and learned that he had extracted the new metal from clay. The secret, he said, was known but to himself and the gods. The sage Tiberius reflecting that if this metal could be made from earth, it would lower the price of silver and gold, decapitated the artificer in order that his secret might remain with the gods, and so deprived the world of a most useful benefactor." A recent writer in the *Chemical News* wishes to be provided with name and page of the edition of Pliny's work referred to, and he goes on to say that for four reasons the white metal could have been none other than aluminium, for "(1) it was obtained from clay, (2) it resembled silver, (3) it was lighter than silver, and (4) it was capable of being wrought into a vessel." So far we have not seen any reply to this pertinent query, and it will be one of the most remarkable facts in chemical history if it should prove that the extract from Pliny is no figment but an actual fact.

* * *

Soldering Aluminium. This necessary concomitant to the use of the metal has always formed the greatest difficulty in its practical economics, and innumerable have been the processes invented. The latest comes from the United States, on the authority of Mr. J. C. Webster, of Philadelphia, who has patented his invention. His solder consists of a mixture of tin, led, aluminium, and zinc, the proportions being altered according to whether the work is of a heavy or light character, the tin being increased for the latter, thus giving a lower melting point. The inventor states that no flux or scraping of the aluminium is needed for removing the oxide, and that the oxide which forms during the soldering can be disregarded, as it does not affect the joining when the proper heat is applied.

* * *

Thiocarbamide Toning Bath. We have already noted the suggestion of the late M. Helain as to the use of an acid thiocarbamide toning bath for printing out emulsion papers, and in the current number of the *Photographisch Correspondenz* Professor Valeuta reports most favourably upon it and strongly recommends it in preference to the ordinary sulphocyanide bath, and its advantages are that it is not poisonous, does not give rise to double toning does not attack the delicate details, and so far as his observations go it will keep well. Thiocarbamide is rather expensive, but as very small quantities are used, this need hardly be considered. The chemical formula for thiocarbamide is $CS(NH_2)_2$, and it forms with gold chlorides a colourless aurous salt $(CSN_2H_4)_2$ Au Cl, the gold in which is replaced by silver in the process of toning. The method of making the bath is as follows: Dissolve 1 gramme of thiocarbamide in 50cc. of water, and add sufficient of this solution to 25cc. of a 1 per cent solution of chloride of gold to dissolve the precipitate first formed (about 14 to 15cc. will be required), then add 0.5g. of citric acid and add sufficient water to make a litre, and then add 10g. of salt. The prints should be washed in water first, and also after toning, and then fixed in a 10 per cent. solution of hypo. We have been able to test this bath with two makes of P.O.P. and a collodio-chloride paper with excellent results, and found that toning takes place somewhat more quickly than with the sulphocyanide bath of normal constitution. The only point in its use to which we think attention need be called is the necessity for washing, after toning, as the toning bath being acid, there is, if this is not properly performed, danger of decomposition of the hypo, with possible sulphur toning.

* * *

No More Alkalies Required. Of late years we have had several salts suggested as suitable substitutes for the alkalies in developers. Of these, possibly, lithium hydrate, sodium tribasic phosphate, and acetone are the only ones which have been practically used. Lumière and Seyewitz suggested trimethylamine, which was certainly the most promising, had it not been for its awful stench, which made even the most luxuriously appointed dark-room a room of horrors. Now the well-known colour manufacturers, formerly Meister, Lucius and Brüning, of Höchst a. Main, have patented the use of amidoacetate of soda. At a recent meeting of the Verein zur Pflege der Photographie at Frankfort, Dr. König described the use of this salt, and we gather that it is cheap, keeps well, and is without smell, and does not attack the skin nor the gelatine of the film, and further with pyro gives a developer of extraordinary rapidity and density, giving power with a good black image and absolute freedom from fog. Dr. König says: "It was not our endeavour to increase the number of commercial developers. We consider it far more important that we have succeeded in discovering a substance which can not only replace the alkalies with all organic developers, but which can so increase the reducing power of most of the developing agents to such a degree that developers of quite new qualities are the result." Probably this new preparation will shortly be placed on the English market, and we shall be able to practically try it, and we note that the above-mentioned firm have introduced a pyro developer, under the name of "Pinakol P," which contains pyro, amidoacetate of soda, and sulphate in suitable proportions.

* * *

The Permanency of C.C. Prints. We are glad to see that the Hull branch of the P.P.A. discussed this important topic at their meeting, as reported in our last issue, and we would direct attention to one or two points which do not at present seem to have been noted. In the first place, it is essential to decide whether the

peculiar spots and markings that have been met with are due to the baryta paper or the image-bearing vehicle, and whether they are due to defective, though possibly unconsciously defective, working. It would be of interest if someone who has met with this particular trouble would dissolve the collodion film and see whether the baryta support itself were stained; further, it might be possible to strip the collodion film and compare the two. It would be interesting, too, if the same emulsion was coated on baryta paper and glass, the latter with and without a gelatine substratum, and submitted to various methods of treatment. Mercier, in his classic work "Virages et Fixage, 1893," points out that chloroplatinite of potash combines with free silver nitrate to form an insoluble salt which yellows under the action of light, and further it also forms an insoluble salt with hypo, which is also sensitive to light. Then again, all platinum toning baths are acid, and traces carried into the fixing bath may set up decomposition of the hypo and the incipient germs of fading. Chloroplatinite of potash coagulates gelatine, and may thus directly attack the baryta-bearing gelatine. The rational method of treating C.C. prints for platinum toning is obviously then to first immerse them in salt and water, so that no free silver salts, such as nitrate and citrate, are left in the paper, and then after toning to wash thoroughly, or else treat them to an alkaline salt bath and then fix in an alkaline hypo bath containing a little sulphite. If useful information is to be gathered from the members of the P.P.A. and others who use C.C. paper, as suggested by the hon. sec., specimen prints must be submitted with full working details, and we would suggest that when the spots are met with some of the same paper should be treated as we have suggested and compared under identical conditions with the defective prints.

* * *

Who was the Inventor? When photographs in the colours of nature are firmly established among us, the question will some day arise as to who originated the method. Most persons would assert that the discovery or invention cannot be credited to one particular brain, but that, like many other inventions, it is the result of assiduous work upon the part of several individuals, Mr. F. E. Ives taking first place among them. But there is one name at least which should not be forgotten, although many have never heard of him. He was not a photographer, but an artist, and one of some distinction presumably, for he was painting master to the late Queen Victoria. His name was Henry Collen, and a full description of the process of colour photography which he suggested will be found in our volume for the year 1865. It is true that the method proposed would not have succeeded, for he based it upon the old theory that the spectrum was made up of the three so-called primary colours—red, blue, and yellow, but in it lies the germ of modern methods of working. He writes that if substances were discovered sensitive only to the three primaries, that is to say, one substance to each colour, it would be possible to obtain photographs in the tints of nature by some such means as the following:—Obtain a negative sensitive to the blue rays only, a second one sensitive to the red rays, and a third sensitive to the yellow rays only. Then he goes on to suggest that positives could be printed on the same kind of material as that used for the negatives so as to obtain three-coloured pictures, and that if these were superposed and laid on a white surface the colours of the original would be reproduced. To use his own words: "It will not be difficult to suppose that the effect would be not only the representation of the form of the object, but that of its colour also in all its compounds." These words, written nearly forty years ago, seem to be strangely prophetic. It is true that the ideal substance which shall be sensitive in turn to each of the colour sensations has not yet been found, but we have now a very good substitute in the orthochromatic plate in conjunction with light filters. Henry Collen's suggestion was a most significant one, and if he had been a photographer he would at least have found a pedestal equal in height to that of Dr. Hauron, who published his method two or three years later. Indeed, the two methods are very much the same in principle, and both were based on a false theory of colour, but Collen's had the merit of priority.

* * *

The Colour Problem. As will be seen by reference to our report of Mr. Sanger Shepherd's lecture to the Camera Club last week, that indefatigable worker promises us a process for producing coloured photographs on paper which, unless he is over sanguine, will mark a very forward step in the history of composite heliochromy. One might reasonably imagine, looking to Mr. Shepherd's successful work in the production of lantern slides in colour, that the new process would follow the same lines, with the superposition of three coloured films on a rigid support, the support in question being paper in lieu of glass. But he expressly repudiates such a method of procedure, and explains that the new method may be likened to a water-colour drawing in that pigments and pigments alone form the image. This would appear to be quite a new departure so far as the hand production of photographs is concerned, although such pigmental pictures have been produced from three different blocks in various methods of tri-colour printing—the Orloff, for example. But most attempts to produce a coloured image on paper have hitherto rung changes on the superposed film method. Such a process was produced a few years back, which gave excellent results, the films consisting of layers of collodion, but the cost, trouble, and uncertainty involved in producing a single picture made the commercial working of it impossible. Mr. Shepherd's process is simple, we are told, and cheap, the printing of a dozen quarter-plate pictures costing less than three halfpence apiece. One thing which he told his hearers, which does not appear in our necessarily abridged report, was that the new process would admit of all kinds of liberties being taken with the prints produced, from which we gather that the proportions of red, yellow, and blue in a picture can be varied at the sweet will of the operator. This opens up terrible possibilities for the future. We have lately seen how the comparative novice can distort nature when he has only black and white to do it with. What will be the result of placing in his remorseless hands a box of colours?

THE Thornton-Pickard 1902 Competition.—The following is a list of the prize winners in this competition:—Mr. J. N. Taylor, Christchurch, N.Z.; Mr. G. R. Ballance, St. Moritz Dorf; Mr. W. Wilkinson, Derby; Mr. W. E. Topping, Belfast; Miss Ella Tomlinson, Chichester (two prizes); Miss Agnes Tomlinson, Chichester; Mrs. Barton, Birmingham (three prizes); Mr. Paul Massia, Algiers; Mr. H. Beadnell, Redhill; Mlle. Celine Laguarde, Aix-provence; Mr. Graystone Bird, Bath; Lieut. A. W. McCombie, Woolwich; Mr. A. W. Sargent, Cardiff; Miss Sybil Aird, Eastbourne (two prizes); Mr. J. Cooke Smith, Champery, Valois; Mr W. J. Watson, Toronto; Mr. Andre Callier, Ghent; Mr. J. O. Samuels, Parkgate; Mr. R. W. Martin, Altrincham; Mrs. Mahony, Dalkey; Mr. A. Durn, Wotton-under-Edge; Mr. J. Wield, Woodhall Spa; Mr. A. Macpherson, Stoke Newington, N.; Mr. T. Johnstone, Motherwell; Mr. J. Walker, Birkenhead; Mr. R. W. Dugdale, Gloucester; Mr. A. Compton, Sydenham; Mr. G. E. Low, Kingstown; Mr. A. W. M. Dickins, Bromley; Mr. Alphonse Cazal, Montpellier; Mr. W. Bratherton, Barrow-in-Furness; Mr. G. A. M. Baker, Harrow;. The number of entries and prints sent in was considerably larger than last year, there being an increase of 138 of the former and 345 of the latter. The company are already organising another competition for the coming year, and are dividing the prizes into classes, including one for stereoscopic workers.

THE ELECTRIC CURRENT IN THE STUDIO.

Since the successful introduction many years ago, by Vanderweyde, of electric-arc illumination for studio portraiture the use of electricity has been gradually but slowly gaining ground in the practice of the best portraitists. We say slowly, for, since the initial cost of an installation—where the current is already laid on, and the main lead is of sufficient capacity—does not necessarily exceed a score of pounds, the non-adoption of this means of lighting cannot well be due to financial causes, and it scarcely need be said that electrically lighted studios are the exception rather than the rule. A question, then, pertinent to the subject naturally arises, "Why this holding back?" We think we have discovered the cause. Recently we were in the company of a large number of what we might term representative professional photographers, when one of the number, apropos of the subject we are discussing, gave an opinion upon it which, to our surprise, was upheld by nearly all present. "Well," he said, "I have scrutinised a lot of portraits taken by electric light. I have never yet seen one equal to a good daylight picture." This opinion, as we say, was echoed by most of those present; yet, to our mind, it emphatically was not justified by the facts of the case. It is true that there are abroad a large number of badly lighted portraits taken with electric illumination; but to condemn the many because of the few is as bad in principle as it is in this case unjustified in practice. We have seen many portraits reflecting the highest credit upon their producers, who, having nothing but electricity to depend on for lighting the sitter, yet obtained results which no one could differentiate, by their appearance, from daylight photographs. When, as is evident to anyone who studies our "Answers to Correspondents" columns, we see so much ignorance upon the simple lighting of a studio by daylight, we ought not to be surprised at the inability of some men to so arrange their lighting with the electric current that the pictures taken by its aid should neither be inefficient as portraits nor unsuccessful as pictures.

It is obvious then that the schoolmaster needs to be abroad in matters of artistic lighting before its true principles are generally understood. There cannot possibly be anything in electric light *per se* that would prevent good portraits being taken; it is merely a question of its application. The chief difference between daylight and the best known forms of electric light illumination is that in the former the direction of the light and the area of what we might term the illuminating pencil is governed by the use of blinds, and is capable of being easily varied so as to obtain a pencil of light of any width, and directed upon the sitter from any angle. In the latter the illuminating area in the majority of forms of the lighting arrangement has a fixed width of illuminating pencil with a small maximum, and is equally capable of being directed from any angle.

The general tendency of inventors has been in the direction of modifications of the "umbrella" form of apparatus—that is, an arrangement shaped like an umbrella with a white reflecting under surface, the light itself being either a series of incandescent lamps directly lighting the sitter, or a central arc light or lights screened from the sitter and indirectly lighting him by reflection from the white inner surface of the umbrella. The incandescent type is almost always placed on a movable stand, while the arc form is used both in fixture and stand form. One great defect of many of the former kinds, and especially noticeable in foggy weather, is the transparent nature of the hemispherical reflector; this can, however, easily be remedied, and should be, as it nullifies one important advantage of the electric form of lighting in that it illuminates the atmosphere between lens and sitter, and so does not utilise the great power possible of avoiding foggy negatives as would be the case if no illumination proceeded from the back of the arrangement. All this is avoided in the usual arc forms, as the umbrella has to be substantially built, so as to present a solid reflecting surface for its pure white lining of pigment or paper. It is obvious that by not making use of the direct light of the arc itself, the reflected light only being utilised, a great amount of light is actually thrown away, and we have long held the opinion that the true principle of construction should embrace the utilisation of both the direct and the reflected light from the arc. There are comparatively isolated instances of the adoption of such a principle, one adaptation of which was quite recently reviewed in these columns.

To carry out such a system in its most perfect form the light itself would be best placed entirely outside the studio windows. Internally half-silvered globes might be used, so as to be as independent of the rain as the usual public outdoor arc lamp. The next point then to consider would be the breaking up of the too dazzling effect upon the eyes that the close proximity of the arc would entail. This might be carried out either by translucent screens or other light diffusing media. A series of prismatic refracting or reflecting glasses could be put up; the "Luxfer prisms" described some little time ago by us could be utilised, or a series of small silvered reflectors at various angles according to the distance from the arc could be adopted. A hundred ways might be devised for obtaining the maximum of light and the minimum of glare, and we feel assured that in the construction of lighting arrangements of this type is to be found the extirpation of the belief of the inferiority of electric to solar lighting. Properly devised and carried out, the acting efficiency of the arc might also be increased to tenfold that of the arc lighted umbrella form.

THE RIGHT TO EXHIBIT SITTERS' PORTRAITS WITHOUT THEIR CONSENT.

It may be remembered that, about this time last year, we made some comments on two decisions—the one in Scotland and the other in England—with reference to the right of a photographer to exhibit portraits taken in the ordinary course of business, that were diametrically opposed to each other. So far back as 1888 it was ruled in the English Court of Chancery, in the case of Pollard versus the Photographic Company, that a photographer had no right whatever to exhibit, or use for his own purpose, portraits taken of his sitters. The case in the Scotch Court was this: Enlarged portraits of two daughters of the plaintiff—in Scotland termed the pursuer—were being shown as specimens at a photographer's, and he sought to restrain their exhibition. The case came before the Sheriff's substitute, who decided that the photographer had the right to exhibit them if he thought fit to do so, and he therefore refused to grant an injunction—or interdict. Just after this decision was given, another and similar case was brought in our Court of Chancery, before Mr. Justice Swinfen Eady, and here the decision was identical with that previously given here—namely, that the photographer has no right to exhibit, as was claimed by the defendant, against whom an injunction, with costs, was granted. We pointed out at the time that, although the forms of law in Scotland are different from what they are here, it was seldom that, in the main, the decisions were distinctly opposed to each other, but in these cases they were, for, while it was illegal to exhibit portraits in

England, it, according to the Sheriff Substitute's ruling, was legal to do so in Scotland.

This decision, however, was appealed against, and the Sheriff Principal recalled it, and sent the case back for proof. After hearing proof, the Sheriff Substitute granted interdict, saying in a note that he did so "out of deference to the opinion expressed by the Sheriff." But the matter did not rest at this, for this decision in turn was appealed against, but, according to the *Glasgow Herald*, the Sheriff Principal adhered to it, with costs against the photographers. It will now be seen that after about a year's litigation it has been decided that photographers in Scotland have no more right to exhibit portraits of their sitters without their permission than have photographers in England. We surmise that these decisions, alike in Scotland and England, will meet the approval of most persons. In delivering judgment in the case of Pollard v. the Photographic Company tried in 1888, Mr. Justice North clearly deals with the relations between the photographer and the sitter, when he said: "The customer who sits for the negative thus puts the power of reproducing the object in the hands of the photographer, and in my opinion the photographer who uses the negative to produce other copies for his own use without authority is abusing the power placed in his hands."

In the Scotch case there is a point worthy of note; the negatives were not actually taken by the defendants. They were taken by Miss Adamson, whose business, with the negatives, etc., eventually passed into the hands of Messrs. Crow and Co., who were the defendants in the action. Here it will be seen that the sitter has control over the negatives after they have left the hands of the one who took them. This recalls to mind a point we referred to a few years ago. It was this: In strolling through the Friday Market, in the Caledonian Road, we saw a number of finished carbon enlargements, 36in. by 30in., and under, for sale; also a large number of cabinet size negatives in envelopes, named and numbered. Curiosity induced us to look at some of them, and many, we noticed, bore the names of the elite of society. Evidently the negatives were part of the stock of a West End house that had, sometime before, "come to grief." Now it will seem from the recent decisions that sitters can prohibit their portraits from being exhibited anywhere, or by anyone, even though they may have changed hands. Hence, those who may have purchased the negatives in question could be prevented from making any use of them. This is as it should be, for it would be exceedingly annoying to sitters taken in a high-class studio, say at the West End, to find their portraits exhibited, for example, in Whitechapel, Westminster Bridge Road, and such-like localities.

"The Platinotype Process" formed the subject of demonstration and discussion at the Chiswick Camera Club's meeting on Thursday week. Messrs. T. A. Coysh and A. Michaelsen demonstrated, and many of the members discussed.

There are more graves dug for colour-photography than for any other process, said Mr. T. K. Grant last Monday evening to the South London Photographic Society; and then after touching briefly on the history of colour-photography demonstrated the simplicity of the Lumiere N.A. process and the beauty of its results. Three screens, blue, yellow, and red, are required, and are fixed one at a time in front of the lens during exposure, which is made on three separate plates. Prints are then made on a mica sheet coated with gelatine emulsion sensitised with bichromate of potash giving a partially visible image. These three prints are developed by suspension in hot water at 150 F., and fixed in hypo-solution. The prints are then dried and dyed in aniline dyes, and afterwards carefully registered, giving a transparency in colour which is mounted between two sheets of glass like a lantern slide. Mr. T. K. Grant successfully developed and dyed several prints, and showed some excellent results on the screen. Emphasis was laid on the importance of keeping to one process of colour-photography right through, not using one make of plates with a different make of dye, etc.

THE HALF-TONE NEGATIVE UNDER THE MICROSCOPE

While making photo-micrographs of pathological specimens some time ago, it occurred to the writer that an interesting series of studies might be made of the photographic negative in its various stages of production, and the results of a few investigations are given here.

The half-tone screen negative was selected, for various reasons, as the most suitable for examination. In the first place, half-tone negatives are usually wet collodion films, and a wet collodion photograph was a sine quâ non for the high power objectives, on account of the silver in wet-plate negatives being deposited on the surface of the film, and the collodion, being free from granularity, does not impede the transmission of light. With gelatine dry plates the silver forming part of the emulsion renders it impossible to use a high power objective with any success, as the thickness of the gelatine film prevents the whole depth of the silver in the field of view being in focus at the same time.

There was another very important reason for using a screen negative, viz., the structure and size of the "dots," being practically the same all over the plate, providing a material of even texture is photographed (in this case a piece of white paper was used as the subject), the subsequent operations of intensifying can then be carried out with separate pieces of film, and the dots of each portion of film will have the same relative value. The half-tone dot makes a very convenient object for investigation, as its density varies from opacity in the centre to a few sparsely scattered grains at the edges. With the immersion lenses, the whole of the "dot" does not appear in the field of vision when under observation with the eyepiece, but when the inner tube and eyepiece of the microscope are removed, for photographic purposes, the increase of angle enlarges the field, and the whole of the dot comes easily into sight on the focussing glass.

Only one negative was used for the photo-micrographs of this article, to ensure identity of size and appearance in the screen points, and the camera remained in the same position for all objectives.

It will, perhaps, be best to give first the general effect of a screen negative under a low power. The following photograph (Fig. 1), taken with a $\frac{2}{3}$in., will answer that purpose. The

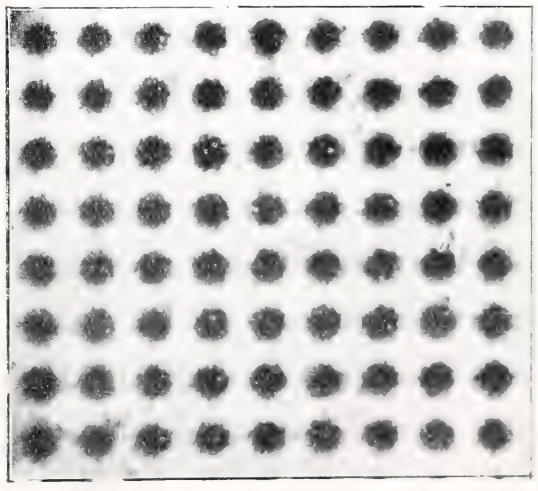


Fig. I.—Object, plus 30 diameters. Photo.-micro. of screen negative.

film had been intensified with nitrate of lead. In this reproduction the dots appear as black patches, with ragged edges; the varying density of the silver deposit is not apparent till a higher power is used.

The next illustration (Fig. 2) shows the dot under a $\frac{1}{6}$in. objective. The granules of silver, it will be observed, are here plainly visible; in the middle of each dot they are deposited in

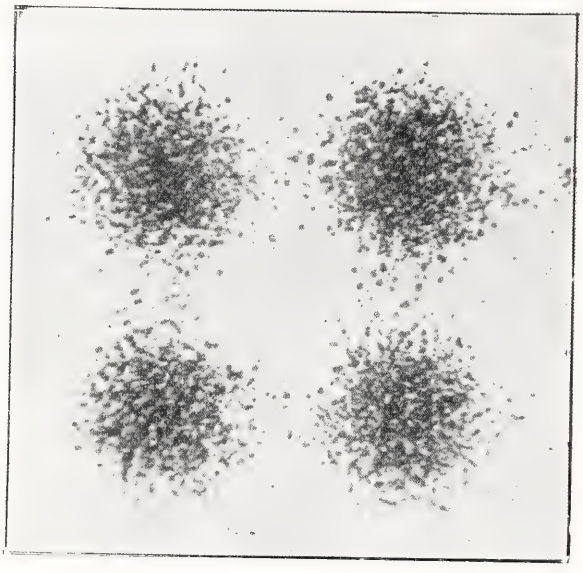


Fig. II.—Object, 1/6 plus 170 diameters.
Photo.-micro. of half-tone dots (unintensified).

dense patches, with the light showing between the clusters. The deposit decreases towards the edges, till only a few isolated granules of silver are visible.

In another illustration (Fig. 4), in which the dot is photographed with an oil immersion objective, the silver deposit is shown still more clearly; but the lower power was required to show the characteristic way in which the particles of one dot merge into the adjoining screen points.

Our next photograph (Fig. 3) gives the appearance of the image after it has been intensified. For process work lead

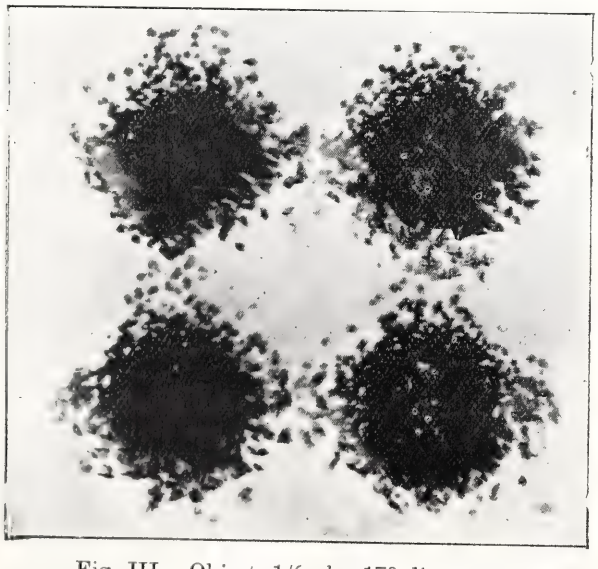


Fig. III.—Object, 1/6 plus 170 diameters.
Photo.-micro. of dots, intensified with lead.

intensification is in general favour, on account of the dense black image resulting from its use. The film of Fig. 3 was intensified in this manner. It will be noticed that the lead has considerably increased the size of the dense portion of the image, which has spread nearly to the edges of the dot, and the light can no longer penetrate between the patches of black as in Fig. 2.

The foregoing photographs have been made with low power objectives, in order that several dots may appear on the same plate. The following illustration (Fig. 4) gives the appearance

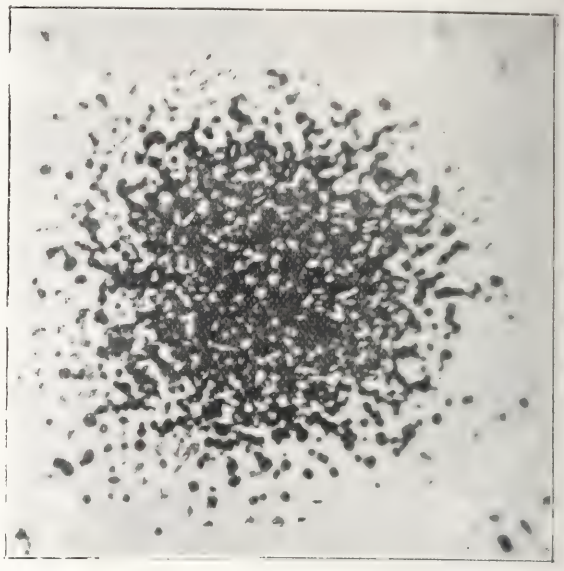


Fig. IV.—Object, 1/12 plus 400 diameters.
Half-tone dot before intensification.

a half-tone dot presents under a high power. It was taken with an oil immersion, and shows the shape and distribution of the silver granules very clearly. The particles of silver do not assume any specific form, though many are of a circular shape. In the illustration the negative is shown as it appears after development and before the intensifier has been applied. Fig. 5 is the result of mercuric intensification.

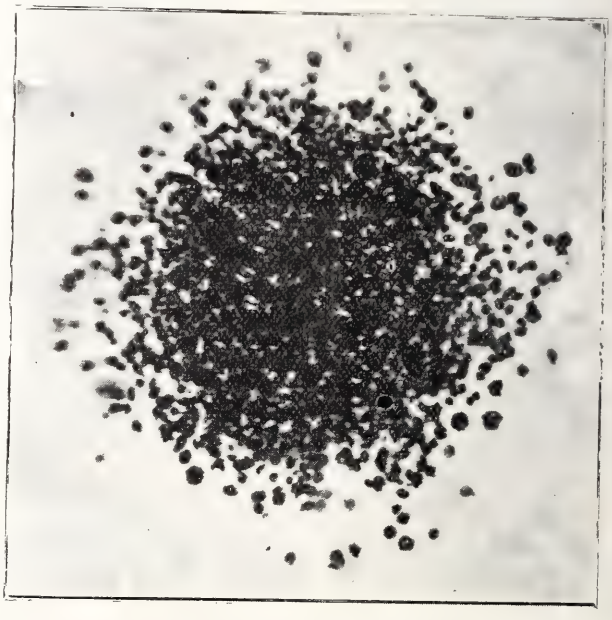


Fig. V.—Object, 1/12 plus 400 diameters.
Showing appearance of dot after mercuric intensification.

The action of mercury, it will be seen, is not nearly so drastic as that of lead, and on this account it is rarely used in half-tone work, where density is the great desideratum; but as it is the chemical generally used by dry-plate workers to obtain contrast in flat negatives, the effect produced on the silver deposit by its use will be of interest.

It will be noticed that the silver granules have been considerably enlarged, and the light cannot penetrate through the centre of the dot in as many places. After being intensified with mercury, the image was not blackened by the application of am-

monia, as under the microscope the silver particles, after the use of mercury, remain opaque. In this respect mercury differs from lead, which gives an opalescent image under the objective, and requires the application of ammonia-hydrosulphuret to give the necessary opacity.

We now come to Fig. 6, in which the portion of film under observation has been intensified with lead, and blackened with am. hydrosulph. The appearance of the dot has been altered far more than when mercury was used to strengthen the image. The dot is practically opaque, except just round the edges, and even there the dark blotches are very much in evidence. It will be readily understood from this illustration what valuable assistance lead intensification gives to the half-tone operator, who requires excessive density in the lights and clear glass in the shadows for a perfect negative.

The operator who had only seen a screen negative through an ordinary magnifying glass would be surprised to find how little the dot has increased in actual size by the application of lead;

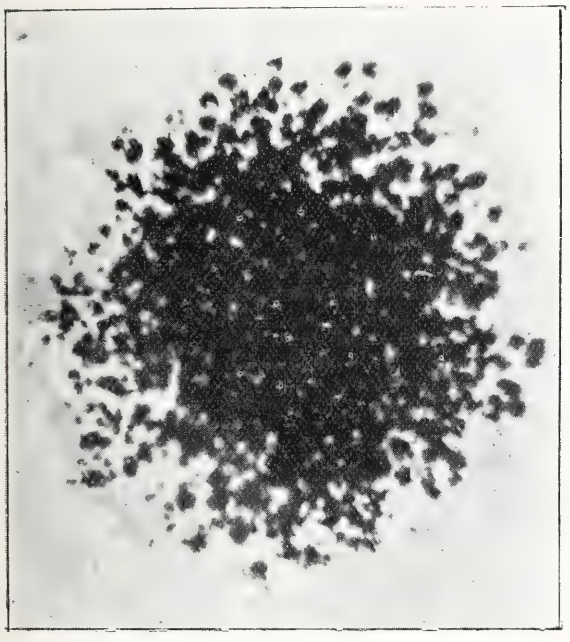


Fig. VI.—Object, 1/12 plus 400 diameters.
Half-tone dot, intensified with lead.

with a strong magnifying glass the dots appear to increase considerably in size during intensification, and in the densest part of the negative to gradually overlap each other. There is really only an infinitesimal increase in the actual circumference of the dot, but the isolated grains of silver that were invisible to the magnifying glass (though easily detected by the microscope) become much larger by the action of the lead, and thus form part of the picture when viewed through the pocket lens.

Our next illustration (Fig. 7) is a reproduction of the dot as it appears after being intensified with lead, but before the crystals have been rendered opaque by am. hydrosulphuret.

The structure of the crystals can be plainly seen in many of the granules round the edges of the picture. Of course, the centre is out of focus, as the silver particles are piled up in the middle, and are consequently too near the objective; in order to focus the edges of the image sharply, the detail of the densest deposit is lost.

The progress of lead intensification can be plainly seen under a high power. The writer found at first some little difficulty in accurately following the action of the intensifier, but after several failures in trying to find the best way of fixing the film to the glass, and applying the lead solution success was attained, and the gradual increase in the size of the granules was easily observed. The change in the size and appearance of the silver grains makes a very interesting study, and is well worth the trouble involved in carrying out the necessary preparations.

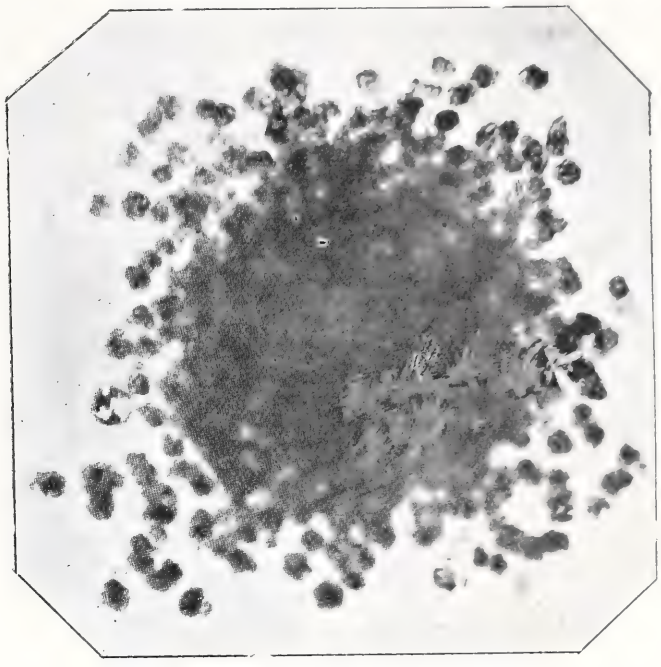


Fig. VII.—Object, 1/12 plus 450 diameters.
Half-tone dot, intensified with lead, not rendered opaque by am. hydro. sulp.

The objective we found to give the best results was a $\frac{1}{8}$in. Zeiss (dry); the higher power wet lenses for this purpose were not satisfactory.

A piece of wet film is placed on the slide and dried over the lamp; it will then remain flat on the glass. The cover slip being placed over the film, a dot is moved into the field of view, and carefully focussed. The lead is applied to the edge

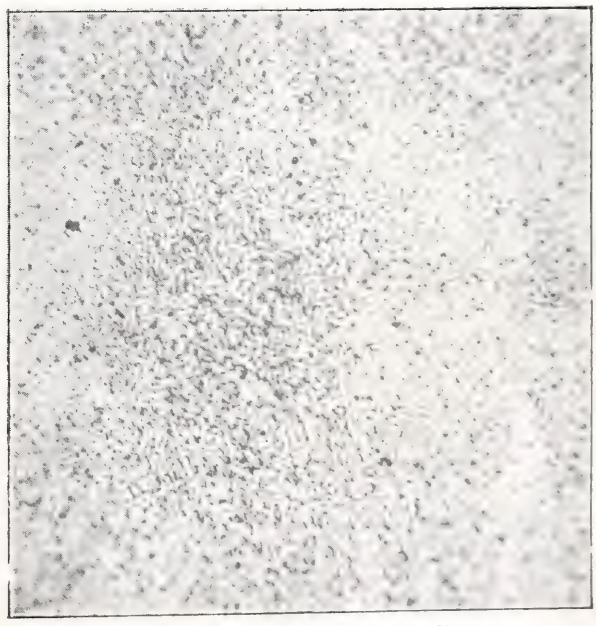


Fig. VIII.—Object, 1/12 plus 300 diameters.
Photo.-micro of ordinary wet-plate negative.

of the cover slip by a camel-hair brush, and the solution flows, by capillary attraction, between the glasses and over the film. The entrance of the fluid throws the dot out of focus, and the objective must be brought away from the

cover slip by a turn of the fine adjustment screw. The action of the lead is at once apparent, and the crystals of silver begin to expand. It is best to fix the attention on a few granules that are lying near, but do not touch, each other; these will gradually increase in size, till the intervening spaces are closed, and the several grains have consolidated. It will be found that several applications of the brush will be required before full density is attained. The original diameter of the particles is doubled when the action of the lead ceases.

Of course, the actual amalgamation of the lead and silver cannot be followed, but the writer hoped, by the use of a 1-12th immersion, to observe at least some local disturbance of the water round the granules while intensification was in progress. This, however, did not occur; the particles enlarged, but no motion of any kind was perceptible, though a comparatively large amount of lead was being drawn from the water.

The only evidence of movement was given by some minute specks of insoluble matter that were by chance in the unfiltered lead solution. Several of these floated across the field of view, and whenever they came near a granule that was being intensified were thrown into a state of agitation, which did not cease till they were drawn by attraction to the crystals, or had passed beyond their influence. When first observed, it appears as if the silver grains remain quiescent, and the lead is precipitated upon them, and the appearance of granules, with dark spots in the centre, certainly justifies the impression; but on closer inspection it is evident that the silver is amalgamated with the lead. The unintensified silver of the dot is practically opaque under the microscope, while the nitrate of lead is opalescent. After intensification many of the crystals are semi-transparent in all parts, which proves that the silver has been distributed and rendered permeable to light by the action of the lead. To make certain of this, the grains were examined with a polariscope, in conjunction with the 1-12th immersion; but even that test failed to resolve the crystals. It is not clear what causes the silver to combine with lead to such a degree; whether the action is caused by the magnetic influence brought about by the conjunction of two metals, or is merely the result of chemical affinity.

If a zinc plate is immersed in an alkaline solution of sulphate of copper, a coating of copper is deposited on the zinc. This experiment seems to favour the magnetic theory, but in that case the lead should be deposited in its metallic form, whereas it is precipitated in crystals.

With mercuric intensification there is considerable difficulty in following the progress of amalgamation, as the grains remain practically opaque, and the increase in size of the deposit is so slight that there is not much chance of successfully observing it.

Bromide of copper is very much in vogue with wet-plate workers for intensification purposes, and would probably afford an interesting field for study. It comes between mercury and lead for density of deposit.

It may be mentioned in passing that the photograph of Fig. 7, which gives a very fair idea of the appearance of the silver deposit under a high power, was not obtained without some difficulty, owing to the opalescent nature of the subject; but by the use of a yellow screen and an exposure of half-an-hour a very fair result was obtained.

Our last photograph was taken from an ordinary wet-plate negative (landscape), and shows the irregular deposit of silver on the photographic plate; it was taken from a rather thin part of the negative. The high lights of the picture appear under the microscope as an almost solid mass of granules.

We may remark, in closing, that the screen used in taking the negative for our experiments was ruled 150 lines to the inch consequently Fig. 7 shows the half-tone dot enlarged to over 200,000 times its original size.

J. I. Prog.

"PICTORIAL SELECTION" COMMITTEES.

Few can have felt greater dissatisfaction with the work of the Royal Photographic Society's Pictorial Selection and Hanging Committee than I have; although, in response to the invitation of the Council, I accepted membership of that tribunal, and tried to be of service thereon.

I may as well acknowledge that the Editor of the *Photographic News* has correctly divined my reasons for lending my name to the "Pictorial Wing of the Royal Photographic Society" (see "Editorial Chat," No. 357, October 31st). It is probable that others were actuated by similar zeal, and have been as disappointed as I am.

Yet I knew enough of the leaders in that movement to have been aware—had I given the matter due thought—of the probable leaning of their sympathies. But I am one of the credulous and confiding British Public, which, prone to accept men at their own valuation, would no more think of questioning whether those who undertake to look after the interests of pictorial photography are qualified to do so than it would of inquiring whether "the butcher, the baker, and the candlestick maker," so anxious just at present to be entrusted with the safeguarding of the interests of National Education, are capable of even the crudest conception of what that term implies.

I see no reason why the motives of the "Wing" should be called in question. Our actions are another matter: their results are obvious, and are a legitimate subject of comment.

But please give us credit for purity of intention. Try to believe, for instance, that our leader, in sending in—let us say—"The Park Palings" for exhibition, was only philanthropically anxious that other photographers and the public generally should have the opportunity of seeing what he considers to be purely pictorial photography.

Try also to believe that those members of the "Wing" who formed the largest united party on the Selection Committee, and who voted so loyally for each other's work, were not moved by the petty vanity that burns to exhibit itself, but were consumed with similar devouring zeal for the æsthetic education of that photographer, amateur or professional, who merely "takes" beautiful things, people, and scenery, and whose work has only the commonplace characteristics of perfect technique and good taste, and no "personality" or other eccentricity whatever.

It is not wonderful that such benighted folk should fail of the lesson intended for them, and should even draw—from an exhibition notably rich in works that were quite beyond ordinary comprehension—conclusions prejudicial to that confidence which a committee so anxious for their improvement, and for the reputation of the Society, should beget.

It is time, however, to be serious. The inferences Mr. Bennett drew from matters of common knowledge and from personal observation are simply the conclusions at which any intelligent thinker would arrive. If not absolutely exact in every minute particular, he is very near the mark. His criticisms are perfectly justifiable.

No good purpose can be served by deprecating public comment on what is so largely of public interest. I think Mr. Bennett did well to write to the magazines. It is usually an effectual preliminary to further action, and I fancy we shall find that Mr. Page Croft's challenge to bring the matter before a meeting of the R.P.S. was unnecessary.

I have only one more reference to make to the correspondence hat has arisen. Mr. Warburg's memory is at fault in one espect. There was not the unanimity he has implied in the oting on certain pictures. Several were passed on a majority f one vote, and in spite of strongly expressed dissent. This an be easily confirmed. Let us have daylight.

I am pressed for my "opinions" upon the whole matter. I vill try to express them briefly.

1.—A large hanging committee is a mistake. The work is better done by four or five earnest and qualified men. But f it has been decreed that hanging committees of the R.P.S. shall consist of fifteen members, then let each committee organise itself, appoint a chairman, adopt rules of procedure, and do its work in decency and order. I was astonished to find, on my unavoidably late arrival, that no attempt had been made to establish routine or to secure decorum. One member kept up a constant shouting that made it a most difficult matter to address any connected remark to the others. A chairman was sorely needed.

2.—Some consistent standard of appraisement should be, if possible, agreed upon for general guidance.

The best committee would be, I think, composed of five members—namely, two artists, two expert photographers, and a chairman, acquainted with both art and photography. (The others might also be qualified in both directions, but I am suggesting that two work as artists, etc.) The two artists should review the works, and pass all having a claim to be considered pictures. (Not merely pictorial, but pictures: there is no reason why anything imperfect should be accepted in photography.) Then the photographic experts should pass only those pictures which could claim to be excellent in technique.

But, if there must be fifteen, then let a section be delegated to pronounce on pictorial merits; a second on technique; and a third to ensure that no frames outrageous in themselves, or calculated to be an outrage to others in their proximity, be passed.

And if these three searching tests should leave but two hundred works for the exhibition walls, all the better for the quality of the exhibition, and for the benefit of those who go to see it.

3.—One way of raising the standard of the work would be to limit the number of entries. Nobody should be permitted to send in more than three works, or be entitled to have more than two hung.

A greater number of exhibitors would thus be represented, and new talent would have a chance of showing itself. And notable artists in photography would be precluded from "spoiling the sample." There were several cases, in the exhibition just closed, wherein if the artist had been represented by his one best work, he would have stood infinitely higher in popular estimation.

No hardship would be imposed by the limitation. Every man knows, within a little, his best dozen works during the year: in selecting the best three of these he may find a little difficulty, but will probably be right in his selection. And why should a selecting committee be charged to differentiate in such cases?

We had to deal with more than one instance of a whole series of studies from the same subject. It is ridiculous to suppose that a committee will hang a dozen studies of the same pretty girl in the same pretty hat; let the artist send the best trio, and spare the committee for more useful and less tedious work.

4.—But, above all, if the Royal Photographic Society would improve the pictorial quality of its exhibitions, let it do something to encourage the study of pictorial composition, particularly with the view of teaching wherein photography differs from the graphic arts—wherein it is inferior, and wherein it is superior—and how certain old conventions do not, while others do, apply to the genius of photography.

5.—And, finally, if we would improve our own work pictorially, let us have a little more masculinity in our methods, and in our talk about them. We are dealing with Photography, and a very fine and beautiful thing it is.

But there are certain rules just as applicable to our craft as ever they were to the graphic arts, because they are based upon æsthetic demands not very difficult to understand if thoughtfully studied, and calculated to be of the greatest assistance to the pictorial photographer.

But, alas, these rules and their foundations are far easier to talk and to write about than to understand, as every day proves in the amount of what a witty writer has lately called "flap-doodle" concerning art that magazines pour forth upon the amateur and the unwary.

Distrust the guide who, when you ask him for an opinion upon your first snap-shot at Scarborough Harbour, begins to talk to you of Velasquez, John Ruskin, and Poynter, and particularly of "individuality."

J. T. Ashby, F.R.P.S.

PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.
FORMATION OF A BIRMINGHAM BRANCH.

A meeting of professional photographers of Birmingham and district was held at the rooms of the Birmingham Photographic Society, on Monday, November 6th, to consider the formation of a branch of the Professional Photographers' Association. Mr. H. J. Whitlock presided.

Mr. Harold Baker, who had undertaken the duties of hon. secretary *pro tem.*, read letters from photographers of Kidderminster, Leamington, Bilston, Cannock, Leicester, Bridgnorth, Ludlow, Hednesford, etc., regretting inability to attend, and expressing sympathy with the object of the meeting. A telegram was read from Mr. William Grove, President P.P.A., wishing the meeting success.

Mr. Alfred Ellis, hon. sec. P.P.A., gave a short account of the formation of the Professional Photographers' Association in March, 1901, and of its progress to the present time. He said that approximately 550 photographers had joined, and that they had now a balance in hand of about £140, so that they were in a satisfactory position financially. The objects of the Association were: To promote the interests of its members in their professional work, by watching Parliamentary or public action affecting the interests of photographers, by dealing with matters affecting professional custom and practice, by co-operating with similar associations for the purpose of securing united action and mutual support in dealing with matters affecting the profession. As the Association was a newly-formed one, a considerable part of its first year's existence had naturally been spent in getting the machinery into working order, but still they had been able to do some good practical work. They had taken up the question of dealers' discounts to professional photographers, and had obtained some concessions, and undoubtedly would have been able to command still more had they been representing 5,000 instead of 500 photographers. The question of the premiums exacted by Fire Insurance Companies from professional photographers had been most successfully dealt with, and they were now in a position to get their members insured at a rate 20 per cent. less than they were paying heretofore. Mr. Ellis strongly urged each one present to join, and to bring in his friends in the profession. He pointed out that with a membership of four or five thousand they would have, at their present subscription of 5s., an income of at least £1,000 per annum. With such an income they would be able to have a permanent office and staff, and would be in a better position to assist their members in any difficulties they might encounter. As an example of what the Association was already doing, he might mention that he replied to about seventy letters a month, and that the advice of he committee was asked on questions so widely different as copyright insurance, lighting and building studios, electric lighting, discounts, becoming dealers, price cutting, objectionable advertisements, exhibiting specimens of private sitters, etc. In conclusion, he reminded his hearers that they should not expect to find that their subscription of 5s. brought an immediate and definite return. It should be looked upon as an investment for the benefit of the whole profession of which they were members. It was not only in this country that photographers had found the need of an association devoted to their interest. France had

a similar organisation, with which we were in friendly communication, with the object of mutual help.

Mr. Harold Baker, in urging the necessity of an Association for mutual protection, referred to a circumstance which had occurred in his own business, which clearly involved a question of importance to the whole profession.

Mr. T. C. Turner, hon. sec. of the local branches committee, who had journeyed from Hull in order to attend the meeting, moved a resolution that a local branch for the City of Birmingham and district be formed. Mr. Turner, in recommending the resolution to those present, explained the methods of working local branches, and gave an account of their work in Hull, where every photographer in the town, with two exceptions, had joined the branch. The result had been to put an end to the cutting of prices, as those photographers whose prices were low had asked the local branch to draw up a scale of minimum charges for certain work, and the members had agreed among themselves that work of a certain size, which had been done for 3s. 6d., should not be executed for less than 15s. Mr. Fletcher seconded the resolution, and in the discussion which followed Mr. J. W. Beaufort announced his intention of joining the Association, but expressed the fear that as there were photographers of such varied standing in the district it would be impossible to get them to work together for mutual protection. He also said that he was convinced that it was mistaken policy to charge low prices, as since he had raised his own he had done more business. Mr. Harold Baker thought the fact of there being so many different grades of photographers was the best argument in favour of combination, and pointed out that the best men in London, who had little or nothing to gain, had been most active in promoting the interests of an association whose object was to improve the position of all photographers, whatever their standing might be. Mr. Alfred Ellis then pointed out that the Association had no intention of interfering with any man's way of business, but sought to bring about a better state of things by mutual discussion and arrangement. The resolution was carried *nem. con.*

On the motion of Mr. H. J. Whitlock, seconded by Mr. McLucas, Mr. Harold Baker was elected branch hon. sec. Mr. Whitlock was elected chairman, on the motion of Mr. Baker, seconded by Mr. J. W. Beaufort. Votes of thanks were passed to the Birmingham Photographic Society for the use of their rooms for the meeting, and to Mr. Whitlock for presiding. After an excellent suggestion by Mr. Harry Whitlock, that each member should personally canvass all his neighbours, the meeting was brought to a close by every photographer present giving in his name as a member.

The following is a list of those who have been recommended by the President and Council of the Royal Society for election into the council for the year 1903, at the anniversary meeting on December 1st:—President, Sir William Huggins; treasurer, Mr. Alfred Bray Kempe; secretaries, Sir Michael Foster, M.P., and Dr. Joseph Larmor; foreign secretary, Dr. Thomas Edward Thorpe, C.B.; other members of the council, Mr. William Bateson, Mr. William Thomas Blandford, Professor Hugh Longbourne Callendar, Mr. Francis Darwin, Professor Harold Baily Dixon, Professor George Carey Foster, Sir John Gorst, M.P., Professor John Wesley Judd, C.B., Lord Lister, Professor George Downing Liveing, Professor Augustus Edward Hough Love, Professor Henry Alexander Miers, Professor Edward Albert Schafer, Captain Thomas Henry Tizard, R.N., C.B., Professor Herbert Hall Turner, and Sir John Wolfe-Barry.

Chemists and the Kodak Policy.—An "M.P.S." writes to our contemporary, "The Pharmaceutical Journal" as to the "clear (?) statement" issued by the Photographic Trade Association, which body is endeavouring to enlist the sympathy and support of the public. What a failing cause theirs must be when they have to shout for the sympathy and support of the public. The chemist dealer of to-day knows on which side his bread is buttered, and wants none of that "open competition" which prevents him from obtaining a living profit on what he sells. The experience he has had of Blank's pills, etc., which have, time after time, been placed on the market at 1s. 1½d. and then cut through want of protection, until he got a beggarly profit of less than a farthing, has "cleared his eyesight," and he is not to be bamboozled or cajoled by the wriggling contortions of the middleman photographic dealer, who appears to think if he cannot obtain the sympathy and support of the retailer, he will cater for them from the public, whose interests, as many chemists know to their cost, do not always lie in the same channel as their own, especially if it comes to the question as to where it can most cheaply buy. How have co-operative stores obtained their supplies, except through the middleman? and some of them give checks which are worth as much as 1½d. in the 1s. to outsiders, although manufacturers may be doing their utmost to protect prices in order to secure to the dealer a remunerative profit, which, at the best, is not anything very abnormal. Such matters as this almost justify the passing of even the largest and most powerful of the middlemen, who appear to be unable to protect either titles or prices of goods on which they place their names, but do not manufacture. Now that they find that the dealer is not sufficiently affected by their sophistries, they must, forsooth, call for the help of the public. Let the dealer consider this: Whose interests are being considered in this desperate cry for help, those of the dealer, the public, or the middleman?

New Apparatus, &c.

Messrs. W. Howard and Co., of 116, Bishopsgate Street Without London, E.C., are issuing a new mountant for which the following properties and advantages are claimed: It is chemically pure, permanently sweet, will allow slipping on mount for adjustment, and will not cockle thick or thin mounts. It dries quickly, thus saving time. It will be found to hold down the thickest of papers with ease. A speciality is the fact of the mountant being supplied in tubes with a patent vegetable lining. The lining preserves contents from any corrosive action.

Hinto-Kinone Cartridges. Manufactured and sold by Hinton and Co., 38, Bedford Street, Strand, London, W.C.

These cartridges are issued in boxes of six. Each cartridge makes eight to ten ounces of developer ready for immediate use, or the contents of one cartridge may be dissolved in the bottle provided, forming a concentrated developer which will keep many months, and any quantity of which may be diluted as required for use. A bottle and a celluloid measuring glass are provided. In our time we have used pints of Hinto-Kinone, the convenience of which in cartridge form will, no doubt, be widely appreciated.

The "Junior" Todd-Forret Magnesium Lamp. Sold by A. H. Baird, Lothian Street, Edinburgh.

All the years we have heard of the Todd-Forret flash lamp this is the first time that one of the forms of the lamp have come under our



direct notice. The "Junior" here described is extremely simple of manipulation. The bellows being connected with the brass tube of the lamp, the cap and burner are removed and the chamber charged with magnesium. The burner having been replaced, the wick is saturated with methylated spirit. Then the little spring clip shown at the edge of the illustration is made to grip the india rubber, and the netted bladder fully inflated with air. All being ready for exposure the wick is lit and the magnesium discharged through the flame by pressure with the clip. Nothing could be simpler or more efficient in use. As this is the season of the year when flashlight work attracts the notice of photographers, we append some useful hints given by Mr. Baird for the successful use of the "Junior" Todd-Forret:—

The magnesium chamber and discharging tube must be dry.

Test the action of the valve; it should rattle freely when the lamp is smartly shaken.

When not in use for any length of time, the bellows is liable to become hard (as is the case with all pure rubber goods), and must be carefully warmed till soft and elastic before the rubber ball is again inflated.

When the existing light is insufficient, the placing of the camera and the focussing of the picture are conveniently accomplished by the aid of one or more candles or tapers. While an assistant moves the light round the picture, the field included on the ground glass is determined by the operator; and the final adjustment is made by focussing some printed matter placed at that part of the picture requiring sharpest focus, and illuminating the type by a candle held a little in front of it.

In portraiture, the sudden brilliant illumination frequently causes the

sitter to start; and when the exposure is short, and commences with the firing of the lamp, the pupils of the eyes, being in process of contraction, lack that crispness in the negative so essential in sucessful portraiture. To combat these difficulties, it is advisable to burn a few inches of magnesium ribbon before exposing the plate.

When one lamp is used, the best position for it in most instances is on the top of the camera, or about three feet on either side. The height of the lamp can only be determined by the nature of the subject. If portraiture about eight feet high is recommended, while for interiors it will depend greatly upon the objects to be illuminated and the distance they are from the camera.

New Books.

"Jahrbuch fur Photographie und Reproductionstechnik, 1902." Edited by Dr. J. M. Eder. Published by Wilhelm Knapp, Halle a/S.

We have the pleasure once again to draw the attention of our readers to this valuable record of the progress of photography. The volume for the present year has just reached us, and we find it fully equal, if not superior in interest to any of the preceding fifteen volumes, which mark the life of the Jahrbuch. Its characteristic is a systematic collection of every item worth of note published in the photographic literature of the year. This, combined with an excellent index, makes the volume indispensable as a reference book to every serious student of photography. Amongst the numerous original contributions, one by Dr. J. Hartmann, of Potsdam, concerning the testing of lenses for focus, is of special interest. We are likewise glad to see the recent researches of Dr. Luppo-Cramer included in the record. The volume commends itself especially to students of photo-mechanical processes, who will find it most useful. At the end of the book we find the usual collection of specimens of various photo-mechanical processes. They comprise some work of great merit, and amongst them we are glad to see Professor Miethe's highly successful three-colour portrait of the lady with the red sunshade.

"Merck's Index."

Mr. E. Merck, the well-known chemist of Darmstadt, has sent us through his London manager, a copy of the second edition of the Index to the preparations, drugs, minerals, etc., forming the scope of his business. It is a volume of 374 closely printed quarto pages, and might almost be called a chemical dictionary. The chief attention has been given to the needs of physicians and pharmacists, but the photographer has found due recognition under the headings of various chemicals used in his work. The information throughout has been collated in such a way that the reader is presented in one volume with facts which otherwise would have to be sought out at the expense of much time and trouble in a library of standard works. The Index is divided into six parts. The first comprises chemical bodies and definite principles, certain galenical preparations and organic extracts. The second, special solutions, and forms of substances used in analytical and microscopical work. The third, crude drugs. The fourth, minerals. The fifth, collections suitable to schools and museums. The sixth, sundries. We learn that the first edition of 10,000 copies, published five years ago, is exhausted. Judged by the useful information the volume contains, we think that the second will be as highly appreciated as the previous issue.

"Photograms of the Year, 1902." 192 pp.; illustrated; cloth, 3s. net. London: Published by Dawbarn and Ward, Ltd., 6, Farringdon Road, E.C.

Tempus fugit! This is the "eighth annual volume illustrating and criticising the pictorial photographic work of the year"—quoting from the publisher's note. The number of pictures reproduced is slightly larger than in former years, and by excluding the miniature views of the exhibition walls it has been possible to make the average size considerably greater. The twenty-eight pages of "Hints to Would-be Picture-makers" from the pen of the editor (H. Snowden Ward) have been based upon the queries and difficulties of numbers of amateurs who send their prints for criticism. In addition to the chief criticism by Mr. A. C. R. Carter, there is a French section by Robert Demachy; American, by Alfred Stieglitz; New Zealand, by Josiah Martin; German, by Ernst Juhl; Australian, by A. J. Hill-Griffiths. Here and there the reproductions are qualitatively disappointing, but on the whole the book is a capital one. A very fine and representative selection of modern photographic work, and some ably written essays and critiques make up a gift book, which for beauty and utility quite deservedly ranks high amongst the world's photographic publications. We would not be without "Photograms of the Year" for many times its price.

"Practical Landscape Photography." By G. T. Harris, F.R.P.S.; 119 pp., illustrated; 1s. net. London: Iliffe and Sons, Ltd.

Mr. Harris, in his prefatory note, observes:—"The information conveyed in these chapters is the result of some twenty years' varied experience in landscape photography, and an effort has been made to treat the subject upon broad and practical lines rather than to embarrass the reader with a mass of formulæ and descriptions of apparatus that serve only to obscure essential points. The best office of a handbook like the present one is that of safely convoying the tyro until he has gained sufficient experience to formulate his own methods of work; and to enable him to pass through his novitiate with as few serious mistakes as possible." As we are personally aware that the author of this book is a most accomplished practical photographer. The teaching of the manual before us strikes us as perfectly sound, and the illustrations, amongst which are many stereos, could hardly be excelled in technique, although the half-tone process occasionally does the man injustice. It is one of the best beginner's books that has passed through our hands. In future editions let us have Kinnear spelt with a capital "K." We wonder how many modern amateurs know who Kinnear was.

"Photography by Night with the Grun Lens." Dr. Edward F. Grun. Elmutt Clifton, Ltd, 157-9, Church Road, Hove, Sussex.

This pamphlet, with a collection of specimens of work done with the Grun lens, will doubtless be welcomed by all who have followed the interesting experiments upon which Dr. Grun has been engaged for a considerable time, in his endeavours to produce a more rapid lens. It is a remarkable fact that within the past few years there have been two distinct reversions in photographic optics, and that these two fresh departures are apparently contradictory. Dr. Grun returns to fluid media for use between crown and flint, to obtain larger apertures, and claims the special advantage of increased brilliancy, through the diminution of the reflecting surfaces. On the other hand, Dr. Rudolph, Dr. Steinheil, Herr von Hoegh, and others are using air spaces for obtaining improved correction and greater rapidity. But whilst the latter deem it essential to retain those qualities of fine definition which photographers usually demand in a lens, Dr. Grun is content to make some sacrifice to obtain an aperture, which may still give an image of sufficient sharpness for what we may term an impressionistic sketch, instead of a realistic picture. Some of the specimens of Dr. Grun's work are sufficiently well defined for portraiture of large size, but unfortunately we are unable to form an estimate of their value, in relation to the lens, as Dr. Grun does not specify the aperture at which any of these photographs were taken, although in many instances the duration of the exposure is given. The lens, which this pamphlet introduces to the market, has an aperture of f.-2.5. If this be taken as the standard, it is not the most rapid lens at present obtainable. For instance, Dallmeyer's "Extra" quick-acting portrait lens (C) may be had with an aperture of f.-2.2, nor is this the highest rapidity yet attained without the use of fluid media. We mention the fact because Dr. Grun, in laying stress upon the rapidity of the instrument he has constructed, seems to ignore what has already been done in this direction. Dr. Grun also appears to lay claim to greater depth of field for his lens, as compared with other lenses of large aperture. Perhaps he means greater depth, through roundness of field, which is a different thing. A disk may be of the same thickness as a bowl, but the surfaces lie in different planes. We think it would have been better had Dr. Grun refrained from discussing questions of practical optics, as it detracts much from the value of his booklet. For instance, the statement that "the varying composition of the best glasses of the same class renders it difficult, if not impossible, to construct a lens on purely mathematical bases" cannot fail to raise a smile on the lips of those who are familiar with the achievements in optics during the last decade, at least. With all its shortcomings, however, the pamphlet will do good in attracting attention to Dr. Grun's work, the tendency of which must be to spur opticians to give us lenses of the highest intensity, so that the camera may be used under almost any conditions of light. Where light is, photography should be possible also.

We regret to learn of the death, on the 5th inst., of Mr. A. Rivot, of Willesden Green.

With the praiseworthy object of augmenting the funds of the committee of the Hadlow Ladies' Guild, and also the newly-formed reading-room and club, two musical monologues were given in the schools on Saturday afternoon and Monday evening last week by Mr. F. A. Bridge, assisted by Miss Muriel Gaze. Mr. Bridge was for many years a member of the Westminster Abbey choir, and has performed at the Crystal Palace and at the principal halls in all parts of the country. Saturday's matinee took the form of a musical monologue, entitled "Home, Sweet, Home," or songs and stories of the fireside. Unfortunately the room on this occasion was somewhat thin, considering the splendid object for which the entertainment was given. Certainly one of the most useful village institutions at Hadlow is the Ladies' Guild, which, among other kind and charitable works, provides a village nurse. In many cases, and especially in the homes of the poor in times of sickness, the kindly and timely services of a trained and experienced nurse are simply invaluable, and have proved on many occasions in the village a perfect Godsend, bearing out the truth of Lord Methuen's happy phrase, at Bristol, on Monday last—equally applicable in times of peace in country villages or great towns—as to the soldier in time of war. His lordship then paid a tribute to what he described as "The most beautiful of God's gifts to the soldier on active service—the sisters and nurses who were with them." On Monday evening the subject of the entertainment was "Songs and ballads, quaint and humorous," for the benefit of the newly-formed reading-room and club, an institution which has long been wanted in the village. Both prices and programme were popular, and the room was much better filled. Mr. Bridge's rich deep baritone voice was perfectly fitted for what was evidently his own favourite ballads, and was well supported by Miss Gaze's full mezzo-soprano, a voice of much power and sweetness, of very long range, and in wonderful control for so young an artiste. The string of remarks, historical, quizzical, and occasionally satirical, by which Mr. Bridge introduced the many musical illustrations, was often broken by ripples of laughter and applause, and although it had been announced that no encores would be given, the audience absolutely demanded them after Miss Gaze's song, "Somebody," and at the close of the evening Miss Gaze responded with "Coming through the Rye"; after which the negro melody, "The old banjo," was spiritedly given as a duet. Mr. Bridge's selections covered the range of ballads from "London Lackpenny," of 1460, to some of Mr. Chevalier's latest coster triumphs. Miss Gaze, in addition to accompanying Mr. Bridge, sang "Near Woodstock Town," a minstrel ballad of the 17th century, and also "Good morrow, Gossip Jean," an early 18th century balad.—"Tonbridge Free Press."

Commercial & Legal Intelligence

We have received a list of photographs of Sandringham and royalty by Mr. F. Ralph, photographer, Dersingham, Norfolk.

At the low price of 1s. 6d. Mr. William Tylar, of 41, High Street, Aston, Birmingham, is issuing a box of folding Christmas and New Year's cards, with mottoes and envelopes. The designs are refined, and the package is both cheap and good.

Mr. Wilfred Emery, of High Road, Cricklewood, N.W., sends us samples of his original Christmas mounts for the coming season. He supplies them in 2s. packets, either assorted sizes or all one size, from midget to half-plate. Mr. Emery informs us that he is the actual manufacturer of these cards.

George A. Weall and Co., Limited.—The above-named company has been registered with a capital of £1,000 in £1 shares. The objects of the company are to carry on the business of chemists, druggists, manufacturers of photographic and scientific apparatus and materials, etc. No initial public issue. Registered without articles of association. Registered office: 20, Neal Street, Bradford.

Messrs. Marion and Co., Ltd., of Soho Square, London, send us samples of some of their fancy mounts with Christmas and other mottos. They are made to take various size prints, some to paste on and others to slip in. By an accompanying list we perceive that Messrs. Marion stock a large variety of patterns and sizes. The specimens submitted to us are beautiful and varied, and we recommend them to the attention of our readers, who should procure the special twelve page list, in which descriptions, sizes, and prices of them are given.

Lord Kelvin is the richest of British inventors. He is now receiving royalties on fourteen of his patent appliances which have been fitted on board the latest Japanese warship. He was the son of a small farmer and was apparently destined to till the soil, as his forbears had done for several generations. Chancing to wander one day through the village churchyard he came to an old and forgotten sundial, the strange marks of which were so interesting to him that he was unable to rest until finding out their meaning. This investigation, which took the country boy some little time, aroused his interest in matters scientific, with the result, as all the world knows, of producing the greatest all-round scientist of his age.—"Invention."

The Instalment System.—At the Thetford County Court, before his honour Judge Eardley Willis, on Thursday last week, H. W. Boughton, of Thetford (Norfolk), sued E. L. Elias, to recover the price of a photographic camera. It appeared that plaintiff advertised cameras for sale on the instalment system, and the defendant had purchased one. No one appeared on behalf of the defendant, but a letter was received from his mother at Llandudno, stating that the boy was only 15 years of age, and in receipt of 15s. per week, which barely kept him in shoe leather. He was trying to learn watchmaking. His honour said he did not consider a camera a necessary of life, but as he had signed an agreement to pay by instalments, he gave judgment for 15s. and costs, to be paid at the rate of 2s. per month.

Mr. J. Fallowfield, of 146, Charing Cross Road, London, W.C., is issuing a special illustrated price list of Motto mounts for Christmas and the New Year. He makes the following special offer to dealers and professional photographers:—To enable dealers and professional photographers to show to their customers a good variety of designs to select from, without keeping a very large stock, I will on receipt of trade card and a postal order for 5s., send post free to any address in the united Kingdom, a specially selected parcel of sample Christmas mounts, of ull value (at list prices) for 7s. 6d. The samples will be of the newest and best designs. In ordering, the most suitable sizes should be stated, so that each parcel made be made up to suit customers' requirements. If desired the exact patterns may be specified, but only one of each pattern can be included.

Interesting Decision to Photographers.—Sheriff-Principal Berry has issued an interlocutor, in which he adheres to the judgment of Sheriff Strachan, interdicting a firm from publishing, offering for sale, or exhibiting in their studio photographs of pursuer's children or enlargements thereof, in an action at the instance of Mr. Thomas M'Cosk, residing at Flores Villa, Burnside, Rutherglen, against Messrs. George Crow and Co., photographers, 136, Buchanan Street, Glasgow. It was averred by the pursuer that in the year 1893 he took his two children to be photographed by Messrs. Adamson Brothers, and ordered and received 18 cabinet photographs of each. Without any instructions from him, Messrs. Adamson made and exhibited in their studio an enlargement of said photos. The defenders, as successors to Messrs. Adamson, came into possession of the enlargements, and exhibited them in their studio to their customers and the public for the purposes of their trade, and refused to remove them, although requested to do so. Sheriff Strachan first refused interdict, but the decision was appealed to the Sheriff-Principal, who recalled the decision, and sent the case back for proof. Sheriff Strachan, after hearing proof, granted interdict as craved, remarking, in a "note," that he did so "out of deference to the opinion expressed by the Sheriff." This decision also was appealed against, but the Sheriff-Principal adhered to it, with expenses against the appellants. Sheriff Berry, in the course of a "note," remarks that the photographs had passed through several hands since Mr. Adamson, who made the enlargements, sold them as part of his stock-in-trade. In 1894 the pursuer, when they were brought under his notice, desired to purchase them, but the parties differed as to price. If parties, however, could not agree as to the price, his Lordship could see nothing to prevent the pursuer from requiring that the pictures shall not be exhibited on the walls of the defenders' studio.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Nov.	Name of Society.	Subject.
14.....	Borough Polytechnic.....	*Defects in Negatives—Prevention and Remedy.* Mr. F. W. Bannister.
14.....	Photo. Society of Ireland.....	*Camp Life in Connemara.* Thos. Mason, Jun.
14.....	Croydon Natural History.....	Visit to Messrs. Waddington's Process Block Making Works.
18	Birmingham Photo. Society ...	A Demonstration of the use of the new Printing Paper "Chromatype." Mr. J. R. Gotz.
19.....	North Middlesex Photographic	*The Making of Lantern Slides.* A. Herbert Lisett.
19.....	Leeds Camera Club.....	*Flower Photography.* Mr. W. Handley.
19.....	Borough Polytechnic.....	Lantern Night. (Monthly Slide Competition.
19.....	Photographic Club.....	*Photographing from High Altitudes.* Rev. J. M. Bacon.
19.....	Wolverhampton Photographic	*The Possibilities of a Modern Hand-Camera, including Tele-photography* Mr. F. C. Wardell.
19.....	Society of Arts	Opening Meeting. Address by Sir William Henry Preece.
20.....	London and Provincial	Convention Slides. Mr. H. C. Rapson
20.....	N.-W. London Photo. Society	Monthly Slide Competition.
20.....	Liverpool Amateur Photo.	Open meeting. Exhibition of Photographic Dodges, especially in relation to Apparatus.

ROYAL PHOTOGRAPHIC SOCIETY.

PROCEEDINGS OF COUNCIL.

An Address to the King.—It was resolved at the first meeting since June that a message of sympathy with the King in his recent severe illness, and of congratulation upon his Coronation be addressed to his Majesty, the society's patron

The New Gallery.—The council received a report from the Finance Committee respecting future exhibitions, and recommending the renewal of the agreement with the proprietors of the New Gallery. Details in connection with the tenancy were considered, and it was resolved to take the New Gallery for a further period of three years.

The Permanent Collection.—The council received a report from the judges in the pictorial section of the exhibition recommending the acquisition of certain photographs for the society's collection. It was resolved that the society purchase the following works:—No. 69, "Where once the garden smiled," by J. M. Whitehead; No. 114, "Woodland Mists," by W. T. Greatbatch; No. 245, "The rose is sweetness," by William A. Stewart.

Metro-Photography. —The attention of the council having been drawn to the fact that metro-photography is languishing in England for want of efficient encouragement and support, it has been decided to appoint a committee with power to consult such authorities upon the subject as it may consider advisable, to give attention to the matter and report to council in due course.

The Metric System of Weights and Measures.—The council considered a communication received from the Decimal Association in which the request was made that the Royal Photographic Society should extend its approval and support to the association in its efforts to secure the adoption of the metric system throughout the British Empire. It was resolved that the president lay the matter before the next ordinary meeting, with an intimation that the council were in favour of the reform, and to ask the society to give its support to the objects of the Decimal Association.

A Photographic Studio.—The council have received a suggestion that it would be of great advantage to many members if the society could add to the existing facilities for the practice of photography at 66, Russell Square, by the provision of a properly fitted studio, which might be made self-supporting by a small charge to the members using it. The council have replied that a lack of funds prevented anything from being promised in the direction indicated, and that the question of making structural alterations to the house to permit of it constituted a very serious obstacle.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

November 6th.—Mr. R. Beckett in the chair.

Mr. Alfred Bedding gave a very interesting lecture on the Tower of London, illustrated by a comprehensive and well-selected set of lantern views from his own photographs. Mr. Bedding's pictures included, of course, many general views, but the chief interest attached to the photographs of the small details, the old relics and the historical corners which abound in a place like the subject of the lecture. As an old State prison and a building associated with many a political conspiracy, with the imprisonment, torture, and subsequent execution of people who have played a great part in the country's history, and as the subject of more than one historical novel, the Tower of London enjoys a very remarkable reputation amongst sight-seers, however unenviable the method of the gaining. Mr. Bedding showed that the keen eye of the photographer, trained to detect at once the slightest point of interest from the picture-making point of view, was capable of making a visit to the Tower one of far more attraction than the usual guide book, which dilates upon the prominent features of its career at the expense of many a less important but equally absorbing incident. One could not help feeling that Mr.

Bedding had mastered his Tower of London as no guide book teaching would permit, and of his pictures the general feeling was that they threw a very interesting light upon a subject that must always exercise a fascination upon the visitor within its precincts.

PHOTOGRAPHIC CLUB.

The annual general meeting was held at Anderton's Hotel, Fleet Street, E.C., on Wednesday, November 5th, Mr. F. A. Bridge in the chair. The balance sheet was adopted, and the following officers were elected for the ensuing year:—Trustees, F. A. Bridge, H. Snowden Ward; committee, A. L. Bell, G. E. Brown, L. E. Cooke, E. W. Foxlee, A. Mackie, C. Wallis, G. Wynne, J. W. Zaehnsdorf; hon. curator and librarian, Hans Muller; hon. secretary and treasurer, T. W. Derrington, 85, Trinity Road, Wimbledon. Votes of thanks were passed to the retiring officers and auditors, and the meeting adjourned.

CAMERA CLUB.

Mr. Sanger Shepherd's lecture on recent advances in colour-photography naturally drew a good audience last week, for most photographers are interested in the question of casting off the sober livery of their pictures in favour of something more like nature. Mr. Cadett, who occupied the chair, introduced the lecturer as the greatest authority upon the subject, after which the members present settled down in a good listening mood.

After a few brief remarks as to what had been done in the past, Mr. Shepherd, who spoke without notes, said that he had nothing more to tell them with regard to orthochromatic plates. It now remained for the plate maker to make the next advance in that direction. We can never hope to produce an exact representation of the luminosity of nature, because our range of tones between black and white, that is to say distinct tones, number only thirty, while the tones in an open landscape ranging from the brightness of the sky to the deepest shadow are about ten times as many. We must observe the old rule of exposing for the shadows and letting the lights take care of themselves. In open landscape the light coming from the sky is so very much greater than that reflected from the dark portions of the subject that some means must be adopted of meeting the difficulty. This has been done to some extent by the use of shutters which cut off a large portion of the sky light. He might name Furnell's shutter as one of these. Another was invented by Colonel Durnford, which did excellent work, but it was somewhat complicated in use, and never came into general use. The lecturer himself had long been experimenting with a view to making a light filter which would act in the same way as one of these shutters, and he had produced a graduated screen which could be put either in front of the lens or in front of the plate. At first he used a graduated carbon tissue screen, but he had since obtained better results by the employment of a glass stained yellow and graduated. In this filter the sky portion was almost as deep in colour as the wellknown "Gilvus" filter, and the screen was oblong in form so as to compensate, to some extent, for a high or a low foreground.

The advantages of using a light filter and orthochromatic plates were many, and no words would convince anyone so well as this, as a demonstration of what this combination was capable. He therefore handed round three pictures recently taken in Burnham Beeches by Mr. Seyton Scott, of the same subject. One taken with an ordinary plate, one with a "Gilvus" filter, and one with an "Absolutus" filter. It would be noted that the ordinary plate showed the foliage all of one tone, and that there was much halation where the trees cut the sky. These faults were quite absent in the other two pictures, and he thought everyone would agree that the picture taken with the "Absolutus" filter was the most perfect.

With regard to the reproduction of colour in photographs, attempts to solve the problem have been varied. No one could be named as the discoverer, for so many had worked at it, but there was no question that we had now a satisfactory method of making transparencies, and a method which was well within the powers of the ordinary worker. Obtaining a colour record was one thing, and reproducing from that record presentable pictures was another thing, but we have now the means at hand of deceiving the eye sufficiently well by the blending of the three colours, red, yellow, and blue.

(Mr. Sanger Shepherd here described his process of transparency production, which is already familiar to our readers.)

He considered that a practically perfect representation of coloured objects was obtained by Ives in his Kromskop, which had often been shown at the Camera Club, but the instrument had not commanded the public attention which had been expected of it, and was now seldom seen. He thought, on the other hand, that the triple lantern slide, the production of which he had just described, had come to stay. The accuracy of the results mainly depended upon two factors:—1, The suitability of the light filters, and, 2, the efficiency of the three colours selected. If filters, screens, and plates were in harmonious combination a very close representation of the colours of the objects photographed should be the result of the operation.

An easy way to get the blue transparency was to employ an ordinary lantern plate, such as is used for black pictures. Develop it as usual, and change the black image into a blue one by treatment with ferricyanide and a salt of iron. Upon this, as a basis for the transparency, the pink and yellow images on celluloid could be superposed.

And now he would like to say something with regard to the production of coloured prints on paper. Practically he had solved this problem a year ago, but it was one thing to perfect a process in the laboratory and quite another to launch it upon the world in a form that everyone could use. During the last few months all difficulties had vanished, and he hoped in the course of two or three weeks to make the process public.

The old plan was to take white paper as a basis, and to superpose upon it transparent coloured films of gelatine or other material. He did not care for a process of that kind, but maintained that a satisfactory method should, like a water colour drawing consist of layers of pigment only. Such is the process which he hopes to have ready for demonstration in about a fortnight's time. The prints on paper will contain colouring matter only, there will be no films, and the process is simple and permanent. Moreover, it can be worked at night, no daylight being necessary even for the printing, and the cost of making a dozen quarter plate prints will work out at something less than eighteenpence. Mr. Sanger Shepherd then brought his lecture to a close by an interesting exhibition of his lantern slides in colour, many of which were of great beauty.

The discussion was opened by Dr. Lyon, who said that to his eyes some of the pictures appeared too blue and others too red. It also occurred to him that the fundamental tints were truer to nature than the mixed tints. The lecturer at once answered these objections by stating that the artificial light used in the production of some of these slides was so different to daylight that discrepancies were likely to arise. The electric light used in the club lantern introduced another source of error. The accuracy of the colours must depend largely upon the negatives, if they are right the reproduction will then bear the strictest comparison with the original.

After a few desultory remarks from others, the chairman said that all of them would be interested in the new paper process which Mr. Shepherd had promised them. We cannot all carry lanterns about with us, and want to fill our albums with coloured prints. He then went into the question of possible improvements in plates, and said that if plates were sufficiently perfect no filters would be required. It would be easy to make a plate sensitive to all the rays of the specrum, if the necessity did not arise of having some light to work by. If automatic machinery could be devised for coating, examining, and packing plates in complete darkness the thing could be done. He was of opinion that if people would give a good trial to orthochromatic plates they would never use any other.

In replying to the vote of thanks, Mr. Sanger Shepherd referred to the speed at which photographs in colour could now be produced. He had seen snapshots in colour which had had only half a second exposure, and one of a breaking wave taken in one-eighth of that time.

CROYDON CAMERA CLUB.

An unusually bright and instructive evening upon "The Holy Land" was spent on Wednesday, the 5th inst., the personally and pleasantly-conducted tour being under the guidance of Mr. Salmon, the editor of the "Photographic News."

In the course of his remarks, Mr. Salmon disclaimed any intention of giving a lecture. What he had to say was to be regarded in the light of a friendly chat. This turned out to be a distinction without a difference, for in the opinion of all present Mr. Salmon proved a most interesting and entertaining lecturer, with a genuine sense of humour which readily communicated itself to his audience. The subjects shown on the screen included nearly every important Biblical scene. Jerusalem, the Dead Sea, Tyre and Sidon, the Jordan, and the Cedars of Lebanon were, amongst many others, illustrated, and in imagination visited. To give an idea of the thoroughness with which Mr. Salmon carried through his work, it may be mentioned that in order to photograph the Cedars of Lebanon, a journey extending over eight days was necessary, during which the photographer had to pass uncomfortable nights amidst the snow on the mountains.

Considerably more than 5,000 stereoscopic negatives were taken altogether, and judging from the quality of the slides shown, very excellent and softly gradated negatives must have been obtained.

CROYDON SCIENTIFIC SOCIETY.

On Friday evening a very successful demonstration of the Lumiere N. A process of colour photography was given by a representative of the Company. The history of the various attempts at colour photography was reviewed, beginning with Robert Hunt in 1843, but the scientific principles upon which the remarkable results now obtained owe their origin to Clerk Maxwell in 1861; by Mr. Ives in 1890, whose pictures were shown in 1894; and by numerous other experimenters. The Lumiere Company claim to have produced a simple and inexpensive process, all the necessary materials being obtainable for 25s. Three negatives have to be taken, through three colour screens, which are provided, i.e., the red, green, and blue. These negatives are all developed together, so as to give each an equal time. The blue may be examined by a red light, and if the exposure and development have been correct for that, then all are correct, there being a ratio between the different screens among themselves, and as regards to white light. Mica is employed instead of celluloid, and sensitised sheets of this material, 3¼in. square, are supplied for the purpose.

From these negatives, the positives are made by being printed in, or stained, the complementary tints, thus:—

The red negative is printed in, or stained, blue.
The green negative is printed in, or stained, red,
The blue negative is printed in, or stained, yellow,

and this must be done from the back, like carbon work. The image is brought out by using hot water, the unaltered silver bromide dissolved by means of Farmer's solution, and then stained. This has to be judiciously done, care being taken not to over-stain. Should this happen, water will reduce the red, and also fairly well the yellow, but for the blue a weak solution of glue, say 2 per cent. has to be employed. The positives are then dried, carefully superposed to obtain a correct register, and bound up between two pieces of glass, just like an ordinary lantern slide. It is very necessary, in carrying out this process, to be very careful which print is stained; the negatives should therefore be marked in some

way, such as cutting off one or two corners, so that the prints from the red, green, and blue negatives may unfailingly be stained blue, red, and green respectively. The demonstration, which was very successful, was much appreciated by the members present.

SOUTHAMPTON CAMERA CLUB.

The members of the above club held a meeting on the 3rd inst., under the presidency of Mr. G. Vivian. After the election of new members, a lantern slide competition was conducted, the subject being "Landscape." After a close contest, Mr. W. H. Trigg was declared the winner, with a pair of very fine slides portraying scenes from Mansbridge. He was awarded the club's certificate of merit. The winner was very closely followed by Mr. Evans. A number of slides representing work executed by the Beck-Stenheil Orthostigmal and Telephoto lenses were then projected on the screen, showing remarkable capabilities.

News and Notes.

THE Professional Photographers' Association.—There will be a meeting of the General Committee at 51, Baker Street, W., on Friday, November 14th, at six.

MR. G. H. STANFORD, photographer, Boscombe, informs us that H.R.H. Princess Henry of Battenberg has been pleased to purchase three of his photographs of Her Royal Highness's recent visit to St. John's Church, Boscombe.

PHOTOGRAPHIC Club, Anderton's Hotel, Fleet Street, E.C.—Wednesday evening, November 19th, 1902, at eight o'clock, "Photographing from High Altitudes," by the Rev. J. M. Bacon. Visitors, including ladies, are specially welcomed on this evening.

ROTHERHAM Photographic Society.—On Tuesday, November 4th, Mr. C. P. Goerz's lecture on "What can be done with a hand camera" was read before a good meeting of the Rotherham Photographic Society. Six new members were elected.

GLASGOW North-Western Camera Club.—At the meeting held on November 6th, Mr. J. B. Haggart demonstrated the advantages of tentative development, developing under, correct, and over-exposed plates. There was a large turn out of members.

THE Traill Taylor Memorial Lecture.—The subject of the Traill Taylor memorial lecture to be delivered by Professor H. H. Turner, F.R.S., on Thursday, December 11th, at the rooms of the Royal Photographic Society, No. 66, Russell Square, London, W.C., is: "The Great Photographic Star Map."

LIVERPOOL Amateur Photographic Association.—The usual weekly meeting of the above association was held on Thursday last week at the rooms in Eberle Street, when Mr. P. Lange presided. The lecturer of the evening was Mr. F. Anyon, who demonstrated the working of the oxy-hydrogen lantern. He afterwards gave instruction in the best method of working the lantern, so as to obtain the greatest amount of light. A hearty vote of thanks was accorded to the lecturer.

ROYAL Institution.—The annual course of Christmas lectures, specially adapted to young people, at the Royal Institution, will be delivered by Professor H. S. Hele-Shaw, LL.D., F.R.S., Professor of Engineering in University College, Liverpool, whose subject is "Locomotion—On the Earth; through the Water; in the Air." The first lecture will take place on Saturday, December 27th, at three o'clock, and the remaining lectures will be delivered on December 30th, 1902, and on January 1st, 3rd, 6th, and 8th, 1903.

MEMBERS of the Longton and District Photographic Society owe a debt of gratitude to Mr. C. F. Inston, of Liverpool, for his enjoyable chatty lecture on "The possibilities of a Hand Camera," also for the privilege of inspecting some seventy of his charming prints, the majority of which were most fascinating, and showed the master hand in their general excellence, and it is to be hoped that all may profit by his advice and be encouraged by the sight of his beautiful examples to try more earnestly to reach the high standard set.

DEVONPORT Camera Club on November 4th heard at the Technical Schools a lecture on "Lantern-slide Making," by Mr. A. J. Catford (secretary). Mr. J. Trouern Trend was to have given a demonstration of enlarging, but through indisposition was unable to attend. Mr. Catford described the simple method of reducing slides by Baskett's reducer, and also the use of the compensating cover glass, and the method of cloud printing. The lecture was illustrated by numerous lantern slides. The president (Mr. R. J. Lamb) was chairman, and at the close a hearty vote of thanks was accorded the lecturer.

A SUGGESTION as to an Application of "Rotokon" Bromide Paper.—The convenience of "Rotokon" printing has impressed a reader of the "Bromide Monthly," who makes a suggestion to us which is certainly worth all the publicity we can give it in these pages. Our correspondent's idea concerns the use of Rotokon paper for the multiplication of the sketches and designs of students in art schools. The drawing is done in the first instance on a glass plate coated with a soft opaque varnish, the lines being made by scraping away the varnish with a fine stylus. A negative thus results from which any number of prints can be taken on Rotokon in a very little time. We are not aware how far such multiplication of the work of students is desired in art schools, but we should say to a very limited extent. For private purposes, as for the preparation of Christmas cards and other forms of greeting, there may be a demand for such prepared plates; but the most likely sphere for this application of gaslight papers is in kindergarten schools. The copying of simple drawings by this means would fix the subject of the sketch in the child's mind as nothing else would, and it would not be difficult to instruct children of quite tender years to develop and fix the Rotokon prints. The New York kindergarten schools are in the habit of making use of ferroprussiate paper for the very similar purpose of copying ferns and various patterns. Why should not the kindergarten teacher do the same independently of the weather by means of gaslight paper?—The "Bromide Monthly."

THE late Dr. Schroeder.—We regret to learn that Dr. Hugo Schroeder died at his residence at Balham on 31st October, in his sixty-eighth year. About a year ago he had a stroke of paralysis, which affected his left side and arm, and a recent second attack of the same kind proved fatal. During the sixties and seventies Dr. Schroeder acquired a European reputation as a constructor of telescopes and other high-class scientific instruments. In 1897 he came to London as mathematician and scientific adviser to Messrs. Ross and Co., with whom he remained in that capacity for the long period of fourteen years. During this time he carried out many important improvements in optical instruments, particularly in photographic lenses, being the first to produce a lens possessing anastigmatic properties, in 1838, the Ross Concentric being the forerunner of all other anastigmatic lenses. Dr. Schroeder was one of the first opticians in England to recognise the value for photographic purposes of the Jena glass on its introduction by Dr. Schott in 1886 and 1837, and he conducted extensive experiments with the new glasses which were then available. In 1894 Dr. Schroeder went to America to organise an optical establishment in that country, but returned to London about a year later, since which time he has been engaged in experimental work and calculations for Ross, Ltd., and other opticians. Dr. Schroeder was well known throughout Germany, where his reputation was first made, and where a number of his pupils have successful business establishments. In that country his death will be noticed and his work appreciated perhaps even more than in England.

NATIONAL Photographic Records.—A meeting of the National Photographic Record Association was held on Tuesday last week at the Midland Grand Hotel, St. Pancras. Sir J. Benjamin Stone, M.P., the president, occupied the chair, and among those present were Sir C. Purdon Clarke, Mr. John Spiller, Mr. T. Sebastian Davies, Mr. John Sterry, and Mr. C. Welch. Mr. George Scamell, the hon. secretary, read the annual report, in which the council congratulated the members on the steady progress of the work. Since the last report 593 prints had been received, and Sir J. Benjamin Stone had contributed a series of pictures of St. James's Palace, Sandringham Hall, Frogmore, and some of the old mansions of England. Sir J. Benjamin Stone, in moving the adoption of the report, said the work he had done he regarded as an example of what could be done throughout the country. His pictures of the Coronation, a large number of which, together with other subjects, were on view, would probably be the best historical record of that celebration for future times. He also produced a series of photos taken of the "Kern Baby," as a record of an ancient custom still in vogue at Walton, Northumberland; and of the ceremonies at the Welsh Eisteddfod. With regard to the official work of that association, it was very inexpensive, and they relied on the good will of photographers throughout the country to take records in connection with their own localities. Mr. C. Welch, librarian of the Guildhall library, seconded the adoption of the report, and recommended that librarians throughout the country should be asked to collect and preserve records. He announced that the Guildhall library authorities had agreed to accept a loan of the Coronation photographs for public exhibition. On the motion of Sir Caspar Purdon Clarke, seconded by Mr. Fincham, Sir J. Benjamin Stone was re-elected president, and the meeting then proceeded to elect the council and officers, after which an inspection of the numerous interesting photographs on exhibition took place.

Is a New System of Mounting a Large Telescope to be Adopted at Amherst?—The announcement in the August and September number of "Popular Astronomy" that Amherst is to have a new observatory and that Professor Todd has secured a first-class 18-inch objective for a new telescope was very gratifying to all interested in astronomy. From the account given it appears that the telescope is to be mounted in a dome 33 feet in diameter, and we are told that "Professor Todd, a year or two ago, spent several weeks in studying appliances and mechanism of Continental observatories, and will embody the results of his investigations, together with numerous inventions of his own." The last clause of this quotation is, to me, writes Mr. S. B. Elliott, in "Popular Astronomy," the most interesting part, for there was published in the "New York Tribune," some six or more months ago, an illustrated article descriptive of an unique mounting for a large telescope, and Professor Todd was credited with being its inventor, and only a few weeks ago Miss Mary Proctor gave, in the "Scientific American," a similar description, with illustrations, of Professor Todd's device. According to these accounts, this consists of a huge hollow metal sphere, out of which the object-glass end of the telescope protrudes one-half its length. The eye-piece end extends inwardly to near the opposite side of the shell where the observer will sit in a fixed comfortable seat. Of course a door, for his use, would lead to the interior. If desired, about one-half of the shell could be left open or covered with glass or sliding shutters. This big ball is to float in some fluid, water, oil, or mercury, and, of course, is to be properly balanced so that the telescope can be readily pointed to any part of the heavens—a sort of "ball joint." The tube, in addition to being firmly

fastened to the shell, is rigidly braced to prevent springing. This for the scheme looks fairly well on paper; but how is this big globe to be moved, how held in place after it is moved, and how made to accurately adjust itself to the rotation of the earth? True, there is shown in the illustrations a shaft with gears at one end and a crank at the other, but no device appears to connect these with the ball, and I confess my utter inability to conceive how this can be done in a way that will permit it to be moved in any direction required, nor how or where the hour and declination circles can be placed and the whole under the proper guidance of clock work. But suppose the difficulties I name can be overcome, there are still others which I think will have to be dealt with. To bring about accuracy of movement nearly one-half of the globe must be, that much of it, a perfect sphere, and how can such be constructed, or, if constructed, how kept so? The varying temperature that the exposed part will experience, and which cannot be promptly shared by the submerged portion, will most certainly so distort its form as to render the accurate adjustment of any instrument connected with it very unstable, for as the tube is rigidly fixed to the hollow sphere, it must partake of the same movements. Then, too, what will prevent the wind from causing such a tremor of the telescope as will be fatal to any observation? No shield for the outer end of the telescope can be provided, as there is the revolving dome, nor can the sphere itself—I think 50 feet was the diameter named—escape from the effects of even a very moderate breeze. All readings must be taken by the assistant who must necessarily, be posted on the outside of the shell, and where he will be placed is a wonder to me. However, this may not be one of the "numerous inventions" spoken of which Professor Todd proposes to adopt at Amherst. Yet the statement that the dome is to be 33 feet in diameter and the length of the tube 14 feet—this may be a typographical error—gives colouring to the supposition that a radical departure from usual methods is, somehow, to be made. I shall watch, with great interest any attempt—if it shall be made—to make a floating ball a satisfactory mounting for a large telescope—or a small one, for that matter.

Photography as Applied to Illustration and Printing.—Mr. Duncan C. Dallas writes to the "Journal of the Society of Arts": In one of the Cantor Lectures given by Mr. J. D. Geddes he describes the present methods of producing blocks by the use of the screen for trichromatic printing. Mr. Geddes mentions two methods of producing the screen negatives—the indirect and the direct. In the indirect the negatives are taken in the ordinary way, and with, of course, the necessary colour filters. From each of the negatives a transparency is made, and from this again a reversed negative, having the screen texture. There are thus three operations. The advantage is that the exposure for the original negatives is not lengthened as it would be by the interposition of the screen in front of the plate in the camera. There is, however, the important disadvantage of two extra operations, and a risk, not mentioned by Mr. Geddes, of deterioration of result in the screen negatives as compared with its original ones. There has been a copy of a copy of a copy for example in reproducing a painting, and although we know that skill can do a great deal in removing or modifying defects some deterioration will remain, especially in tone if not in detail. In the direct method the required reversed negatives are made with the screen in front of the plate in the camera. This, of course, saves the two extra operations of the indirect method, but has the disadvantage of lengthening the exposure. There is also a disadvantage not mentioned, by the lecturer, of having to take three reversed negatives through colour filters in combination with either a reversing prism or mirror. The necessity of reversing is of itself a disadvantage. In both the direct and indirect methods there is the necessity, as stated by Mr. Geddes, that the angle at which the screen is placed must be varied for each of the three negatives so that there shall be a progressive difference of 30deg. Thus, one is to be 15deg., the next 45deg., and the third 75deg. Mr. Geddes states two disadvantages which arise from not varying the angle of the screen. First, imperfect register, and second, the moire antique effect. But there is a third, the necessity for very careful adjustment; and this not only in regard to the negatives but in two other respects not generally, if at all, considered, and in which the relationship of the angular conditions are probably never preserved. The first is the placing of the negatives to print by contact on the coated sensitised zinc or copper plates, and second, the perfectly accurate mounting and planing up after the etching and finishing. When all these points are considered, there is no question but that trichromatic work by screen-made photo-blocks is both complicated, expensive, and more or less imperfect—often indeed, very imperfect and unpleasing, not merely from the predominance of the red, but from muddiness of colour, due no doubt to the dots of each colour not properly registering, and therefore overlapping irregularly. The wonder is that any good work is done. The output of really presentable work is, up to the present, extremely scanty. Good results are decidedly the exception, not the rule, and are due greatly, there is little doubt, to highly-skilled engraver's work on the blocks. Compared with the complication of the screen trichromatic block method, and its uncertainties of result, the Dallastint natural grain trichromatic block method is simplicity itself and reliability. The natural grain, resembling, as it does, aquatint, not only lends itself to rendering gradations of colour without mechanical texture, but prevents slight imperfections in register from showing offensively. Indeed, a slight shifting of the register can be used in an effective manner if desired. As regards simplicity in the Dallastint method, it starts from the very foundation—the production of the negatives. With the exception of using the necessary colour filters the negatives are taken in the usual manner either on dry plates, collodion emulsion, or wet collodion. No reversed negatives are required for Dallastint blocks,except in the very rare case where the print has to appear reversed. No expensive screen, prism, or reversing mirror is required, though the well-equipped taker of negatives for other purposes may find them useful. The advantage of being able to use the original unsophisticated negative—rectified blemishes excepted—is obviously preferable to having a negative to which instead of its natural gradation and correct rendering of the texture and detail of the original has been added a mechanical texture which skilful, wonderful, and worthy of all praise as has been the development of the production and use of the screen, can never have the same pleasing artistic effect in print, as a well selected natural grain. From the foundation simplicity obtained by using unsophisticated negatives the production of the Dallastint blocks is more simple also in the subsequent operations than by the methods more chiefly in use, whether for colour or monochrome. There is the same possibility of being able to work on the blocks as in the screen method and even with greater effect.

"Spirit Photography."—It may be said at once that Mr. Podmore, in his two substantial volumes on "Modern Spiritualism," published last week by Messrs. Methuen, has not only given us the completest survey of the growth and nature of spiritualistic manifestations and beliefs which has so far been offered to the world, but that he has brought to his task a very rare faculty of intellectual detachment. The work has demanded great industry and scrupulous fairness, and the writer deserves to be congratulated in respect to both these qualities. It is not, indeed, easy to see how the book could have been better done, and it is not in any respect the author's fault that a thorough perusal of his pages, interesting as they are, leaves a certain weariness in the reader's mind. For Mr. Podmore is dealing with a theme which is probably more encrusted with humbug and credulity than any other in the world, and a prolonged survey of humbug and credulity is apt to sate the robustest inquirer. The writer has not set himself to pronounce judgment. He has made it his business to collect evidence on which a judgment may be formed. He says in effect, that if you believe the plaintiff you will find for the plaintiff, and if you believe the defendant you will find for the defendant. He is neither advocate nor jury. He is simply a scrupulously fair-minded and indefatigably industrious witness, and there is this rather striking peculiarity about his work—that it would be easy to build up from it, and from it alone, a very strong and plausible argument for either side. There is one encouragement which can hardly fail to present itself to the student's mind. The most striking thing in the earlier records of so-called spiritualistic manifestations is the absence of any real understanding of the nature of evidence. People of credit and repute were content to rely upon their eyes and ears. To see and hear is, of course, indubitable proof, of the thing seen and heard, but it is no proof whatever of the means by which the appearance and the sound were produced. There is a recorded case of a little child whose finger bore a witch-mark of a deep red colour and "about the bigness of a flea-bite." It is a hundred to one that the mark was there, but what an argument for the exercise of a malevolent supernatural power! We have left that sort of puerility behind us, and have learned that the observation of a simple fact is in itself of no importance whatever. The modern investigator asks for causes, and it is the safest of all rules in respect to this particular inquiry not to accept as supernormal anything whatever for which an explanation can be found in known natural means. Mr. Podmore, who cites almost every case of interest, deals, of course, with the exposure of Buguet, a Frenchman who was at one time famous for the production of spirit photographs. This man was watched by Mr. W. H. Harrison, and the identity of the plates he used was naturally the point at issue. Now M. Buguet, by way of establishing his bona fides, submitted a plate to Mr. Harrison which, on examination, was found not to have been tampered with in any way. He then broke off a fragment of glass, most obviously from a doctored plate which had not been inspected, and when the spirit negative was produced, "Mr. Harrison failed to detect any trickery in the operation." The test was a very good one if it had been properly applied. What ought to have been done was for the watcher to examine the plate and himself break off and retain the fragment. But this case of Buguet's constituted one of the most remarkable sensations of its time. The operator was put upon his trial for fraud, and made a clean breast of the whole business. He explained the methods he had practised, and produced the apparatus with which he had worked. Then it turned out that his dupes would not relinquish him. Many witnesses of high character, amongst them photographic experts and opticians, came to testify that they had watched the processes throughout, and were satisfied that the results were genuine. Stainton Moses averred that Buguet was obviously a genuine medium who had no doubt been bribed or terrorised to make a spurious confession and to fabricate a box of trick apparatus for exhibition at his own trial. William Howitt saw in the whole proceedings evidence of an organised conspiracy on the part of the Jesuits to overthrow spiritualism. The recorded facts cannot be held finally and definitely to prove that the whole pretence of spirit photography is fraudulent, and if Mr. Stainton Moses and Mr. William Howitt had been wise they would have contented themselves with that reflection. The proof of a fraud is the proof of a fraud, and there is an end of it. It is not a proof that a result apparently similar might not be produced by the most legitimate means. The truly intelligent modern spiritualist is far too discerning a man to put all his eggs in one basket in that fashion. He has permitted himself to be persuaded on what appears to him to be legitimate evidence that certain beliefs are true, that certain things not susceptible of explanation by commonly recognised causes do really happen. But he knows very well that many of these effects can be cunningly simulated, and, being a sensible man, he expects them to be simulated, whether by wholesale impostors who work for gain alone, or by genuine mediums who are tempted to pretend to powers which they do not possess.—"Merlin," in the "Referee."

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

WHERE ARE WE DRIFTING?

To the Editors.

Gentlemen,—Where are we drifting? Is it towards the light, upwards, or down to the darkness? This idea has often occurred to me when reading various lectures and statements reported in our journal. At one time a speaker states that a knowledge of drawing is not necessary to good retouching. At another we are told that the best way to copy engravings is to photograph them through ground glass. Then another clever fellow attempts to explain the nature of a vignette by comparing it to a piece of land surrounded by water. Further on, we learn that a "multiplicity of glass and blinds" in the studio is an "abomination," etc. Now, as all this is diametrically opposed to the truth of facts and must tend to increase the dense cloud of ignorance through which we appear to be drifting, it is necessary that such statements should not be allowed to remain unquestioned. I will therefore break a lance with these champions of error, giving to each and all a flat denial and proceed to show wherein they err.

Mistake No. 1.—Is it possible for a retoucher to make good the imperfections and improve the expression of a face if he does not know the drawing of the features and their natural planes? Any authority will affirm that this is not possible.

Mistake No. 2.—Engravings are composed of dots and lines. It follows, then, that the better defined each dot and line is, the better will be the resulting copy. The ground glass suggested would certainly obscure these dots and lines, and therefore must impair the quality of the reproduction.

Mistake No. 3.—This is a matter of vital importance to all portrait photographers. The lecturer here, after making some slighting remarks on the construction of the studios of the early photographers, remarks which in no way commend his knowledge, designates a "multiplicity of glass and blinds" in the studio as an "abomination," and attempts to prove the needlessness of so much glass, by some childish experiments with blotting-paper reflectors.

One of these I will give as an example of this new teacher's system of photographic lighting. He says, "On the shade side of sitter place a big reflector, covered with clean blotting-paper, and take a photograph; you will now get a horribly flat picture. Now close in your direct window light, take another photograph, and brilliance is again recovered." But if so, where did the light come from? Not from the direct window, for that has been closed, nor from the reflector, for if the direct light is shut off the reflected light must go too. He then advises the abandonment of all top light, and recommends that all studios be built having side light only. More, he tells us that he has actually designed several such studios. Lord, help them! Now, all this is so obviously wrong that only the most uninformed could be misled thereby, but being as it is a subject of such great importance (for is not "light and shade" the great study of artists and photography's "all in all"), I will endeavour in a few sentences to refute the erroneous teaching of this glib orator.

To begin with, without top light, all power of concentration is lost, and concentration is essential to all pictorial art, also the perfect rounding of the head cannot be obtained without top light. Then the illumination of groups would be most unequal if lighted only from the side. I have seen many, too many, examples from studios with the side light, horrible one-sided faces they were, with the ear on the light side, showing preposterously large and white, errors of tonality hopelessly exaggerated, and altogether lop-sided atrocities; in fact, although suitable to some compositions of fine art, all side-lighted work in portraiture is unnatural, and therefore inartistic. Nature provides us with light from above, giving all objects their proper value in the scale of gradation, and from nature we may learn that we cannot have too much light at our disposal. The ideal studio will then be the lecturers's abomination, i.e., one with as much glass as possible, with shutters and blinds to cover every square, than with the aid of suitable screens and reflectors the artist could arrange the light to suit any subject.

A great authority now passed away once said that "Every picture in black and white was an arrangement in tone," and as this axiom applies to photographic work quite as much as to any other work, it is manifestly absurd to limit the power of the artist in his chief function by depriving him of his best means of light. I feel assured that all artists in photography will concur in this. In a studio of the above description, using a diffusion of focus lens, with a little supplementary art work on the negative, it would be quite possible to produce photographic portraits of such high artistic merit as would vie with the matchless work of the old engravers but to attain this desirable end we want more art and less chemistry. It is, I think, due to this want of artistic knowledge, as so often shown by these irresponsible teachers, that we hear the parrot cry of the "limitations of photography." What are these limitations? Distortion, as seen in heads and extremities. This may be avoided by using lenses of greater focal length. Artists never think of drawing objects at a less distance than twenty feet; they know that if they did so, apparent distortion would result. False tonality. This can be corrected by art work on the negative, as want of colour has no reference to black and white it is not to be regarded as a limitation. Thus we find that there are practically no limitations in photography. Having written the above from a sense of common duty, which I think will not be misunderstood by artists, I will say, in conclusion, that I hope it may help to check the progress of error and assist in the discovery of light and truth.—Yours, etc.,

MICHAEL EDWARD BANGER.

Ivy House, E. Dereham, Norfolk.
November 4th, 1902.

TO OPERATORS.

To the Editors.

Gentlemen,—For many years there have been periodical complants made by "operators" about their specimens being, to use a gentle expression, "kept up." Stolen, I think would be the word used if such cases came into the police-courts. However, operators, your troubles in this respect should now be at an end—if you do as I did. My specimens were being very much kept back. I wrote repeatedly for their immediate return, but got no reply—gave up all hope of ever seeing them again—when fortunately I noticed our Editor's advice to a correspondent—viz., "Write to the Chief of Police." I took the hint; and, lightning result, got specimens returned next day. So, Messrs. Operators, Retouchers, etc., don't trouble our poor Editor again. Just write to the Chief of Police.—Thanking the BRITISH JOURNAL for the hint, I am, etc.,

SATISFIED.

THE CHISWICK CAMERA CLUB.

To the Editors.

Gentlemen,—I feel that there must be many photographers in this neighbourhood who are not aware of the fact that there flourishes in their midst a club devoted to their hobby. I shall therefore esteem it a very great favour if you will allow me to use your valuable columns in order to bring the Chiswick Camera Club under their notice. The club has been in existence since 1896, is in a sound financial position, and its membership increases year by year. Meetings are held weekly, on Thursday evenings, in the Devonshire Room, at the Town Hall, Chiswick, for the discussion of matters photographic. Gentlemen interested in photography will be cordially welcomed at any of the ordinary meetings, notices of which are posted up outside the Town Hall, and various other places in the locality. Beginners have been specially catered for by meetings which will be held in the club's dark room, 344, High Road, Chiswick, such subjects as "The manipulation of a camera," exposure and development, printing and toning, etc.; will be there dealt with in a practical manner, and in a way suited to the needs of such as require instruction. Such well-known gentlemen as John A. Hodges, Esq., F.R.P.S., Ernest Morgan, Esq., John Dollman, Esq., R.I., S. J. Beckett, Esq., F.R.P.S., etc., have kindly consented to attend in person and give the club the benefit of their services during the present session.

I shall be happy to furnish further particulars to anyone who cares to apply to me.

In conclusion, I will again call attention to the fact that gentlemen who are not members are invited to our ordinary meetings.—Thanking you in advance, I am, Gentlemen, yours faithfully,

J. MANN, Hon. Sec

344, High Road, Chiswick,
November 1st, 1902.

UTILITY OF THE PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

To the Editors.

Gentlemen,—It is very satisfactory to see that the P.P.A. is giving some attention to processes as well as to purely trade matters. At the last meeting of the Hull branch the question of the permanence of collodion-chloride pictures was discussed. Such subjects as the stability of his work is a matter of importance to every conscientious professional—he, for his credit sake, if not for that of photography itself, desires that his pictures should prove as permanent as the processes he works are capable of yielding. I hope that, as time goes on, the association will be able to devote some attention to the technical portion of the art its members follow. The general opinion of the meeting, as will be seen from the report given in your last issue, was that the silver image in collodion is more likely to be permanent than when it was held in gelatine. This is a point to which we have often made reference. This really beautiful process has been before the photographic world now nearly forty years, since 1864, and prints by it that were made about the time of its introduction are still intact. Although the process is so old, it seems strange that, until quite recently, it has been so little used by professional

photographers, and now complaints are being made as to the want of permanence of its results. At the Hull meeting the general opinion expressed was that the instability, when it arises, is due rather to the baryta coating than to the collodion emulsion. We have more than once pointed out that the insoluble sulphate of baryta, *per se*, may be considered an inert material, and that it is to the colloid body which cements it to the paper that the evil is really due. The free silver in the emulsion forms a compound with it, which is not dissolved out in the short time that is necessary to fix the collodion image. That such a compound is formed, and that it is sensitive to light, may be proved by removing the collodion film, when a faint image will be found in the baryta coating beneath. The emulsion employed in the early days of the process for the pictures that have withstood the test of time so well, was not materially different from that employed now, but the paper was entirely different. It had no so-called "baryta coating," it was the old "Saxe" or "Rims" paper, the camera was employed for albumenising, coated with arrowroot. A substratum of some kind of the paper is found, in practice, to be necessary, as the collodion does not adhere well to plain paper. Possibly some manufacturer will put upon the market a collodion paper prepared in this, the old, way. Or, as the emulsion is not difficult to prepare, some users of the paper may be induced to make some for themselves and compare it, for permanence, against the commercial article on the baryta coating. As the P.P.A, or the Hull branch of it, have given some attention to the question of permanence of C.C. prints, it may, perhaps, also go into that of the stability, or otherwise, of those made by other processes.—I am, yours, etc.,

PROFESSIONAL.

November 10th, 1902.

ON BEING APPRECIATED.

To the Editors.

Gentlemen,—That our work should be received with favour is a most vital point if we are to succeed, and therefore it becomes a very important matter of earnest study to find out the sort of work to turn out.

"That is the very best portrait ever taken of me, Mr. Focus. I cannot you tell how it has been admired; all my friends want one, and several of them say they shall get you to make good pictures of them." How it warms one to hear such a nice little speech, and makes us redouble our efforts to deserve such remarks. It is as good as a gold medal. Now, there are few callings in life which yield more opportunities of giving real pleasure than photography, as a true representation of a valued friend is a great treasure, and often the means of either commencing a friendship which may be lifelong, at least, or of cementing an engagement which is hanging on a thread.

Some there are who do not, or *say* they do not, care whether they exactly suit their clients' ideas or not—they have a notion that they must educate the public to like a certain sort of thing, which is, perhaps the only sort they care to make. This may be all very well if they are working simply for pleasure and not profit—and no doubt there have been cases where such a plan is a good one; but, as a general rule, we want the mill to grind us our bread, and so we must study the wind, and work accordingly.

Now, what do the public really want? "A correct likeness for sixpence" used to be the usual invitation when popular photography was young—and we who have had those "correct likenesses" to copy and enlarge in these modern days often open our eyes and wonder what our ancestors, and aunts and uncles, could have been really like if these were indeed "correct likenesses." But the invitation touched a chord that responded in those cases, or we should not have them before us now.

Then why is the invitation not repeated in some form at the present day by *high* class houses? Is a photographic likeness now so correct that it goes without saying?

Not exactly; retouching has proved itself a power for good or evil, as the case may be, and has much to answer for. In its early days it was often much overdone; and even now, in many cases, there is such an amount of scraping and patching that seeing cannot be believing by any means.

But let us return to our ideal of a "correct likeness," and see how our work may be generally "appreciated."

The first step is to *appreciate your sitter*. Get, if you can, an *excellent* idea of him into your own mind, and then set about expressing that idea so that all his friends shall not only *know* him by your picture, but also, as far as possible, they shall know his good qualities—his kind heart, or his firm decision, his thoughtful mind, or his studious habits. This must, as far as possible, be done by pose. If you know him to have a kind heart, don't take him with an expression as if he might bite your camera. If he has a firm disposition give him a firm pose. If you know he is a great thinker do not let the eyes turn exactly with the head—some look slightly away, or up or down, to give expression to a passing thought. If he is a great student give him a book. If a man of business, show him writing, etc., etc.

Another important point is to fall in with your sitters' ideas if possible. Many come to the studio with a very definite notion of the sort of picture they intend to make. Let this, therefore, be your first plate, as it will favour their feelings, and *possibly* be the best you will do as a likeness. It also gives you time and opportunity to get into their confidence and study what to do with your next plate. Then suggest a modification, and he will probably agree with the notion, and one position will grow out of another without a shock. On no account *complain* of your sitter. Don't say, "You are not easy to take a good picture of," as some do. Don't seem puzzled in posing, or find fault if an arm is looking stiff or awkward—see for yourself how it could be improved, and gently change it. Don't say, "Oh, full face won't suit you at all, your eyes are not alike," or "Your nose is crooked." If it is so it is your duty to get the best side, as one eye will be the happiest, and the nose will look better if taken the side it favours.

Most people enter a studio with a fairly good opinion of *themselves*. Take good care that when they leave they have a formed a good opinion of *you*. They also come with their nerves very much on edge, so to speak, and they compare you with a dentist; let your manner have the effect of soothing and setting their feelings at rest as much as possible, and let them depart in peace, with a strong desire to bring all their friends, babies, and dogs, for these are the things that pay.

Then, as to that "fine-art" bit of photography—the *retouching*. Suit your pencil to your subject. If a lady wishes her face to appear like a bladder of lard let her have it; you need not put your name on her mounts. If that musical genius wishes the lines of the stave to remain clearly drawn across his forehead, with a clef by each eye, and a mouth the shape of a slur, why should he not have it so? He will be more likely to be pleased with the "expression" than if he is smoothed away into a face like a young shopman. But for freckles, marks of small-pox, scars of wounds (except in soldiers), the less they appear the better; and if you have a face with very strong, hard lines, let it turn towards the light, and take it with a Rembrandt effect, and hardly any retouching will be wanted.

And speak gently—gentleness is infectious. If a sitter comes shouting into your studio don't shout back, but speak quietly and firmly, as if he had not shouted to you, and he will soon drop his voice nearer to your tone. It is often the effect of excitement, and it will pass off. Don't be frightened; expose a plate as soon as you can, and get away into the dark-room and collect yourself, while he listens to the echoes of his own noise and gets into a more even frame of mind.

A word to all assistants. If you wish to be appreciated by the "Head," as boys say, make yourself indispensable; *fill* your place, and be a *personality*, so that when you return from your short holiday you may be greeted with "Oh, I *am* glad to see you again; it has been *such a blank* while you have been away."—I am, yours faithfully,

ALFRED SEELEY.

November 6th, 1902.

MATT CARBON PRINTS.

To the Editors.

Gentlemen,—In the BRITISH JOURNAL OF PHOTOGRAPHY of November 7th Messrs. Illingworth and Co. write in reference to your statement that hitherto "if a picture was desired on a matt. paper by the carbon process, it had to be made by the single transfer method" that they introduced a special tissue, etc., for producing prints by double transfer on matt paper twelve months ago, and that they are, therefore, pioneers of this method of working.

Without wishing to claim that I am a pioneer of such a method, I wish to call your attention to the fact that I published more than two years ago in the "British Journal Almanac," and also in **your** contemporary "Photography," a method of easily **producing** carbon prints by double transfer on any **papers**, even rough-surfaced varieties, and this method has been in constant use ever since for almost all my carbon work.

I enclose a print made by this method on Whatman's drawing-paper; you will see that in the matter of retaining the texture of the paper it closely resembles a single transfer print, and it is also exactly similar in another equally important respect, and that is that while there is a slight gloss on the deep shadow-work, the lighter tones are as free from gloss as the paper itself. Prints produced by this method have great depth and richness.—I am, gentlemen, yours truly,

November 11th, 1902. HENRY W. BENNETT.

IRRITANT POISONING BY PHOTOGRAPHY.

To the Editors.

Gentlemen,—In your issue of August 28th there appears a letter on the above subject from a correspondent, who signs himself C., and to the letter is a footnote by yourself asking for the experience of others.

I have worked regularly as an amateur for the last nineteen years, and, except on one occasion, have never suffered from poisoning. On the occasion mentioned I was asked by a friend to come with him and assist to do some enlarging. The developer I used was metol, and the dish was one of wood with glass bottom, and unfortunately the carpenter who had made the dish had done his work very badly. Before

the development of each piece of bromide paper was complete, the dish was nearly empty of developer by leakage. The metol solution ran over my hands and between the fingers before it reached the sink. In a day or two afterwards I found my fingers red and itchy. I knew the cause, but not the remedy. However, walking in my garden I was struck instinctively to rub the affected parts with some dandelion flowers which I saw growing. I got relief at the time, and feeling the itchiness return next morning I again tried the same remedy, and, after that application had no more trouble. Although too late for your correspondent C., it might interest someone else, and if it prove efficacious to any person I should be glad to hear of it through your columns. The cure is at least easy and cheap.—I am, etc., W. L.

THE DELHI DURBAR.

To the Editors.

Gentlemen,—We think it may interest a number of your readers to know that the Viceroy has appointed us the official photographers to the Delhi Durbar Coronation, to be held in January next. We shall compile a book of all the eminent guests, native and foreign princes, who attend, with all interesting scenes. It will be on a costly and lavish scale. Their Excellencies the Viceroy and Lady Curzon have given us special sittings for this work.—Faithfully yours,

BOURNE AND SHEPHERD.

Calcutta.
October 16th, 1902.

To the Editors.

Gentlemen,—I shall be highly obliged if you will kindly recommend me to some illustrated paper or magazine publishers, some photo publishing firms, or lantern slide manufacturers, who would care to undertake to publish Delhi Durbar views. Of course, you must be knowing well that it is going to be a grand and unique affair of its kind in the history of India.

My charges are £9 9s. for one dozen negatives, with 10 per cent. discount. For orders exceeding two dozen, a discount of 25 per cent. will be allowed. All negatives guaranteed bona-fide and original. Each order should be accompanied by a certificate of appointment of me by them for the work.—Trusting to be favoured with an early reply, that should reach me not later than the mail that reaches this on the 12th of December next, I beg to remain, dear Sirs, yours faithfully,

MEHERWARYS, CAWASYS MODJ.

No. 37, Hornby Road, Fort, Bombay,
October 25th, 1902.

[We submit our correspondent's offer to our readers, in the hope that he may succeed in obtaining the commission he seeks.—EDS. B.J.P.]

KODAK, LIMITED, AND THE TRADE.

To the Editors.

Gentlemen,—I am reading with great interest, and I may say, with pleasure, the controversy between Kodak, Limited, and the Photographic Trade Association. Why the Photographic Trade Association goes with such energy for the Kodak, Limited, is a mystery. Has not Kodak, Limited, said repeatedly that they do not want a monopoly of photographic goods and instruments? Have we not had the testimony of a gentleman, about a year ago, showing the purity of Kodak, Limited's, designs on the photo. trade? Have they not now the assurances of "Briton" that monopoly was never thought of and will not be attempted? I do not exactly know or understand what "Lady Amateur" wants to prove in her letter; but I suppose she means to ask gents. to leave Kodak, Limited, alone. With all these assurances of no monopoly, what do you want more?

I understand that all Kodak, Limited, wants is to do all the business they can attend to, sell all their own instruments, instantaneous or otherwise, portable or not, their films and papers, plates and other outfits, etc., etc. To attain this end they offer good terms, and better ones to parties willing to exclude other goods (of course, much inferior ones always); but of monopoly there is no question whatever. If it were so they would reduce also their retail prices, but that is out of the question just now. They sell the best of all, and other goods are infringements. The only claim they make is superiority of quality, and if any film goes wrong it is that made by other manufacturers, and no mistake. *Prenez mon ours! Qui vivra verra!*—Yours very truly,

ANTI-MONOPOLIST

To the Editors.

Gentlemen,—It may interest "Kodak, Limited," who contend that they are not seeking a monopoly, to hear what an American professor has to say about the peculiar business methods which they are adopting. In a little work entitled "The Control of Trusts," published by Macmillan and Co., Professor John Bates Clark, of Columbia University, describes the "factors' agreement" as one in common use by trusts, and defines it as either an absolute refusal on the part of the trust to sell to a merchant who buys goods from a competing establishment, or a refusal to give him necessary discounts (p. 34) This form of agreement, he contends, should be made illegal, as contrary to public policy. He is by no means uncompromisingly hostile to trusts, and recognises that the crushing out of independent competitors by the mere process of centralisation is "in a way legitimate; for it is an instance of the survival of the fittest." But the "factors' agreement," and some other forms of business effected by the trusts, he characterises as an attempt to "foul competitors, and disable them by an underhand blow," and as "actions that have in them the essence of robbery, though they lie altogether outside the scope of statutes heretofore enacted."

The author of this interesting little *brochure* has much to say on the inherent weakness of trusts, as well as on their connection with a protective tariff, and he proposes certain methods of dealing with them which are well worth consideration. For these your readers must consult the book -Yours, etc., H. H. O'FARRELL.

Ealing, W.

To the Editors.

Gentlemen,—Having been away, I have only just received my copy of the JOURNAL, but I trust you will allow me to reply to X.Y.Z., as his letter consists of a series of inaccuracies.

He seems to be unaware of the exact signification of terms, and also of the conditions of the photographic trade in general. Asserting that there is nothing to choose between Kodak, Ltd., and the P.T.A. as both try to create a monopoly by keeping up prices; that it requires but a small capital to set up in the business; that the dealers have been having a merry time, the profits being very large; and that they have combined to "exploit the public."

A monopoly is a condition wherein a person (or persons) has an absolute control over the entire output, nature, quantity, quality, and price of an article. Now, how can the P.T.A. create a monopoly by fixing the prices of their articles? It is open for X.Y.Z. to flood the market with cheaper cameras as soon as he can get them ready, and no one could stop him.

There was never a time when more capital was required to set up than at the present moment. The large number of very high-priced cameras, the host of various makes and designs, the various brands of plates, papers, and films, and apparatus of all kinds, renders it increasingly difficult (except for those in a very large way of business) to keep up with the times.

The profits on a turnover of, say, £100 worth of cameras are no larger than those on the same quantity of beef, sugar, or any other article of trade; and if X.Y.Z. were a business man he would know that the cost of every undertaking must be borne by those who wish the undertaking carried on. He must be poor, indeed, at finance, who pockets the difference between buying and selling and calls it profit. Deterioration, consequent upon exposure to light and air; continual fingering, and opening and shutting of cameras to show enquirers; time occupied in making good defects in new cameras (nearly all are defective, even the high-priced ones); repairing machine after enquirer has damaged it; supercession of new patterns by still newer ones before one has had time to sell the former; a drop altogether in the sale of a certain class which went well a little while ago—all this comes out of that "huge" profit.

What does he mean by "exploiting the public?" I protest against both his remarks and those of many others who write, wherein they talk of two classes, retailers and the public. What are traders but part of the public? Who decreed that their sole aim should be for the benefit of the rest of the public? They, like, say, a bank clerk, lawyer, or government official, exist for their own benefit, and have just as much right to be properly paid for their work or occupation. Why should the optician sell a 1s. box of plates for 11d., which, when taking into account rent of storage room, time occupied in counting up, frequently, various makes, brands, rapidities, and sizes, to see he is not short (woe betide him if he be), time taken in ordering, heavy carriage, unpacking, storing away in order, stale stock of some brands after a time not asked for, salary of self or assistant while giving them out, etc.—is about what they cost, perhaps less.

The public benefit—or the greatest good to the greatest number—is not that one portion of it should live upon the other portion at cost price, but that each should have a wage or payment sufficient to enable him to carry on his calling and earn his living, to pay his accounts promptly, thereby allowing his creditors to settle their's, and so on; and, if a man in a town is, by reason of low prices, doing business at a loss, it is evident that those who are taking advantage of his services are not paying sufficiently to enable those services to be rendered.

If the optician's yearly income be no more than that of any other business man of the same standing—which it is not—he cannot be "exploiting the public," and it would be well to again remind X.Y.Z. and many others that those who trade do so for their own and the public

benefit in just the same measure as do those who sell by the hour, or the day, their writing, brains, or labour.—Yours faithfully,

A RETIRED DEALER.

To the Editors.

Gentlemen,—The Kodak letter in your issue of the 6th would imply that they were pioneers of daylight roll films and roll film cameras. Let me explain to your readers the history of daylight roll films and roll film cameras, so far as they concern this country.

The first daylight loading cameras and films were introduced by the European Blair Camera Co. in 1893; they were imported from America, but latterly they made first their film and then their cameras in this country. Two years later the Kodak Company put on this market a series of similar cameras and films, why then should Kodak take exception to others doing what they have done? If they had been the originators their case would be different. I can therefore only conclude that such terms so often used by them during this correspondence as "Shoddy Imitations," "Piracy," "Parasites," etc., are detrimental to their own products.

It will be seen that Kodak must have imitated, for, were the European Blair cameras not on the market two years before Kodak? Further, in 1895 I made folding pocket film cameras in two sizes, 3½ by 2½ and 4¼ by 3¼; they were similar to the present day loading ones, rather smaller if anything, and were taken off the market because of the difficulty at that time in getting good film. To the best of my knowledge, it was at least twelve months later before the folding daylight loading Kodaks appeared. Were they in design and size imitations or coincidence?

These statements can be substantiated by your readers referring to the "Amateur Photographer" or "Photography" for 1896, in which these folding pocket film cameras of my manufacture were advertised.

Kodak plate cameras were introduced this year, and attached to these is a folding focussing hood, which also serves to protect the ground glass. This arrangement was first applied to "Challenge" cameras when brought out seventeen years ago. Do Kodak Company then admit imitation on their part here?

Kodak Company have made a statement "that any dealer can retail their goods and is free to sell substitutes." I, as a dealer, have been refused to be supplied with their goods, and although I wrote them on the 11th June and on the 17th July for an explanation, it was only after my second letter that I got a verbal intimation from one of their officials that "acting on instructions from headquarters" I could not be supplied with their products, because I was pushing other makers' wares in preference to theirs.

In conclusion, I advocate free and fair trading, and that the public be the judge on the merits of the respective daylight roll film cameras and films.

J. LIZARS.

Glasgow, 9th November, 1902.

To the Editors.

Gentleman,—The question for the purchaser to consider is whether his (the customer's) interests are likely to be best served by the tied-house system. Evidently, many dealers have made up their minds that the exclusive policy serves their interest, and nobody can blame them for endeavouring to do the best they can for themselves. But it is not at all certain that the dealer will benefit in the long run by "concentrating" on Kodak goods. Anyway, if there were more competition in the manufacture of roll film, there would be a possibility of obtaining an efficient film at a cheaper price. At present it is too dear, particularly as affecting the larger sizes, in which the price is almost prohibitive, except to the wealthy dilettante. The Kodak Company's profits must be very considerable, or they would not be able to offer such handsome terms to the retail dealers. The purchaser does not benefit.

It is impossible for the makers of any successful invention to escape, more or less, imitation when the patent has expired. The Kodak Company make several things that they did not introduce. I wonder what would have happened if the Kodak Company had invented the dry plate.

Of course, the Kodak Company have every right to proceed against those who substitute other goods for theirs. Nobody would defend fraud. But I think it will be to the advantage of the customer if he claim to have an option of purchasing any of the roll film goods on the market. The question of quality and prices would then be deciding factors in the purchase. It is not expedient in the interests of the public that a powerful concern such as the Kodak Company should create anything like a continued monopoly, whether intentional or not.

Kodak, Limited, have themselves stated that, while dispensing with the services of the wholesale agents themselves—who I daresay have in the past done a good deal towards building up the Kodak business, but who are now charged with having committed all manner of offences—"the agency for leading makes of plates and papers may in time pass into their hands." The Kodak Company have not yet seen fit to explain away that statement. Do they propose to use their control in the roll film goods line as a sort of lever by which they can influence the dealer in other directions; or, does the statement mean anything at all? If the wholesale dealer is useless in the sale and distribution of goods—according to the Kodak Company—why should Kodak, Limited, themselves propose to become wholesale dealers for the supply of leading makes of plates and papers? Perhaps the statement was only made to throw dust in the eyes of the retailer. But if there is any truth in the statement, the customer necessarily has to consider how, if the agency referred to was effected, it would affect him.

Of course, in the matter of roll film goods, the Kodak Company are entitled to credit for their enterprise. But if they held controlling patents, they had a free field, and their business has in no way been harassed in this country by tariffs. The writer has used a considerable quantity of the Kodak Company's film with satisfaction. Although the numbers from the protective cartridge paper sometimes affect the film, I assume that the percentage of negatives spoilt in this way is small. Still, the liability exists. There is a roll film on the market for which the makers claim that the markings referred to are impossible. If that be so, then it must be admitted there is an advance. But what many really want is an effective film at a cheaper price, and they are more likely to get it under the stimulation of competition. For that reason, the Kodak Company's exclusive policy is not desirable in the interests of the user.

I suppose it is very wicked for anybody to attempt to compete with them. That all depends upon the point of view. It is just as impossible for the Kodak Company to expect to retain a monopoly in the manufacture of roll film goods as it would be for the Dunlop Tyre Company to expect to retain the control of the manufacture of pneumatic tyres In neither case, however, have the introducers and exploiters much occasion to grumble. In most cases inventions, when not of gradual evolution, are a matter of priority. If one person did not invent the thing, somebody else would. The Legislature gives the protection, and if it were a matter of public expediency it might be decided to curtail the period of protection after a reasonable time has elapsed, in regard to goods that are in almost universal demand.

I might add that I have no commercial interest in the matter whatever. I rather wish I had.—Yours truly,

J. A. REID.

Bedford, November 9, 1902.

To the Editors.

Gentlemen,—I was very much amused to see the appeal in a recent issue from the Photographic Trade Association.

Instead of sitting down and wringing their hands, if they are such "a thoroughly representative and influential" party as they make out, why do they not put their heads together, and see if they cannot invent an original "Photographic Trade Association Camera," with spools of special sizes and patterns that the Kodak spools will not fit?

The Kodak Company have alone worked out and made a practical success of film photography, with its special cameras, and all that these men seem able to do, or think of, is to make their cameras from the Kodak patterns (or, rather, to get some German firms to make them for them), and try to make imitation film on spools to fit the Kodak cameras.

If, instead of wanting to lay their eggs in another bird's nest in this way, how much better it would look had they followed the lessons that the success of the Kodak Company ought to have taught them by this time—viz. :—

1st. Have an original, go-ahead idea.

2nd. Lay down modern and scientific machinery.

3rd. Put the works in charge of practical analytical chemists and good business men.

There is no doubt that there would have been no 5s. or 10s. "Brownies" in the market had they been invented by a small English manufacturer. He would have been boycotted by the "Ring" for attempting to cut prices.—Yours faithfully,

HERBERT S. STARNES.

Myrtle Villa, Lion Road, Bexley Heath.

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Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY, 24, *Wellington-street, Strand, London, W.C." Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

PHOTOGRAPHS REGISTERED :—

W. J. Reed, Arcade Studio, Old Christchurch Road, Bournemouth. *Photograph of Bournemouth Officials.*

A, Holborn, 25, Stokes Croft, Bristol *Photograph of Esther McEwan as sailor boy.*

CLEANING DAGUERREOTYPES.—DAGO asks: "Will you oblige by giving me the address of an expert in restoring Daguerreotypes?"—In reply: Almost any old professional photographer would do the needful for you. We know of no one who makes a speciality of this work. The method of doing it has often been described in the JOURNAL.

COLLOTYPE PLATES.—E.J.M. asks: "Could you kindly inform me where the prepared collotype plates referred to by Mr. W. Gamble (in your last number) can be obtained commercially?"—In reply: Probably Messrs. Penrose and Co., Farringdon Rd., can supply them. If not we cannot say where they are to be obtained.

DEFINITION OF AMATEUR.—L. M. asks: "Is there any recognised definition of amateur and professional photographer? Can a so-called amateur recover for photographic work done under contract?"—There is really no recognition as to who is an amateur and who is a professional. Anyone, whether amateur or professional, can, of course, recover for work done under contract, whether it be photographic or otherwise.

ENLARGING.—BROMIDE writes: : "As I am taking up enlarging, I should feel obliged if you would advise me on the following. (1) Are daylight enlargements better than gaslight enlargements? (2) Is a condenser used when enlarging by daylight?"—In reply: (1) There is practically no diffierence, provided the artificial light be skilfully used. (2) No; a condenser would be of no use at all in daylight enlarging.

POST CARDS—PROCESS BLOCKS.—F.W.W. asks: 1. Would you oblige by letting me know address of cheapest house for sensitised post-cards; 2. also best place for getting blocks made and printing done on post-cards?"—In reply: 1. We do not know which is the cheapest house; better get the price lists of the different makers. 2. Any of the process block makers will supply what you require. It is quite against our rule, as we have said many times before, to recommend any particular maker's goods.

STUDIO LIGHT.—J. M. writes: "I would esteem it a favour if you could recommend me to a book dealing with side-light studios, as mentioned in Mr. Howard Farmer's article, 'Some aspects of professional photography,' if there is one that treats the subject fully?"—In reply: You will find Robinson's "The Studio, and what to do in it," a useful work; also "Artistic lighting," by Jas. Inglis. There is no book published devoted to the professional aspects of photography.

BOOK WANTED.—SEEKER says: "I should be very pleased if you could give me the name and publisher of a reliable text-book on wet-plate photography, also the best hand-book to orthochromatic work?"—For the wet collodion process 'Instruction in photography," by Abney; and "Wet Collodion photography," by Gamble. These books may be obtained through any of the dealers. Messrs. Cadett and Neal issue a pamphlet on orthochromatic photography, which you will find useful.

ARTIFICIAL LIGHT IN STUDIO.—W. H. asks: "Would you tell me anything about photos taken by night in studio, and the best means of doing it, and how to arrange the same for very short exposures? Do you know of the Electric Instanion?"—The best artificial light for the studio is the electric, either arc or incandescent. Flash light is very good for rapid exposures, but the former is preferable. Good results may be obtained with either; it is simply a matter of skill. We know nothing of the light mentioned.

HEAT OF ARC LIGHT.—LANTERNIST writes as under: "For projection purposes I use an electric arc lamp, but I find the heat from this very injurious to lantern slides, sometimes even cracking them. Do you know of any method whereby the heat could be reduced? I might say I have tried an alum bath, but I do not consider that at all satisfactory. I should be obliged for any hint."—In reply: We can suggest nothing better than the alum bath. Probably the one you have employed is not sufficiently thick to fulfil its purpose. Try a thicker one.

LACQUER.—NORMAN ASHTON says: "I should be glad if you could give formula for making tinted lacquer, for staining glass various colours for use with lime boxes. I believe that these tints are obtained by adding some kind of dye to lacquer, but do not know what kind. Should be glad if you could give me information?"—The manufacture of lacquers does not come within our province, as it in no way relates to photography. We may say, however, that they may be had in various tints from any of the polish and lacquer makers, and receipts for them are given in receipt books.

BUSINESS QUERIES.—REMBRANDT asks: "1. As operator in a certain studio can I supply magazines and compete in exhibitions with specimens of my own work in my own name? Can an employer copyright work taken by his assistant? 3. In the event of starting on my own could I trade under the name of "Rembrandt" or any such assumed name?"—In reply: I. Yes, but probably your employer would object to your doing so and possibly terminate your engagement; 2. Yes, if the copyright is registered in the assistant's name as the author, but if he takes part in the work himself that is not necessary; 3. Yes.

JAPANESE MOUNTS.—FAN asks: "Would you kindly tell me where I can buy (wholesale) the Japanese paper (for mounts) mentioned in the article in current number BRITISH JOURNAL OF PHOTOGRAPHY, page 884, entitled 'Mounting Photos on Thin Paper without Cockling'?"—In reply: Japanese paper, no doubt, may be had, both wholesale and, retail, from any of the large dealers, such as Marion's Houghton's, and the like. The importers of the paper only supply it in really wholesale quantities, and we surmise that you would not purchase several reams at a time, as the paper is somewhat expensive.

FOGGY NEGATIVES.—ZERO says: "I have been using extra rapid plates for snap-shots, and have been getting only weak and foggy-looking negatives from them. How can this be avoided? What is the best developer for under-exposed snap-shots?"—In reply: As the negatives are fogged, it is probable that the dark-room light is not safe for very rapid plates. If this should be the case, the remedy is obvious. Pyro is very good if the solution be well diluted, and contains a minimum of pyro and a good quantity of accelerator. The usual metol-hydrochinone developer, well diluted, is a good one for under-exposed plates.

REFLECTING STEREOSCOPE.—A.F.P. says: "I have a piece of apparatus which I have been told is a form of stereoscope, it consists of a grooved board in which slides an upright supporting two mirrors, there are also two other sliders fitting the same groove, apparently for supporting picture. I shall be very much obliged if you will kindly tell me if it really is a stereoscopic arrangement, and if so, how it is worked, for I confess I can make neither head nor tail of it?"—In reply: The description—and sketch—show that the apparatus is a Wheatstone's reflecting stereoscope. The pictures, about the whole plate size, were carried in the two slides. This form of stereoscope is quite obsolete, and has been for many years.

PANORAMIC PHOTOGRAPH.—CUPAR asks: "Would you kindly inform me how to correctly take panoramic views so that they join perfectly? I use 12 by 10 camera with wide-angle lens. I took a panorama on three plates by simply turning the camera on the tripod, the result being that my foreground was very distorted, the straight lines being very much curved, the centre part of picture joining correctly. I have also taken some by having the turntable screw in a line with the diaphragm of lens, but still have distortion, the camera in each case being levelled with spirit level."—In reply: With pictures taken with a wide-angle lens the perspective of the foreground is usually very violent, and the corners of the picture, as a rule, are not evenly illumined. We should advise our correspondent to use a lens including a moderate angle, and take the panorama in four or more sections instead of three.

VARIOUS QUERIES.—ANXIOUS asks: "(1) Can pou inform me where Baryta paper is to be had, and whether it can be bought in small quantities? In sensitising plain salted paper, should I still have to first size it with arrow-root, or is the Baryta paper prepared for that? (2) Can you give me the address of any firm that sells life-size plaster heads, for practising how light and shade should fall on the face when photographing a person, and can you kindly mention about how much such heads would cost? (3)Also recommend a book on the above lighting and posing. I should prefer a good book, as cost is no object for this."—In reply: (1) Baryta paper may be had from Messrs. Otto Konig and Co., Cross Street, Finsbury, but whether they supply it in any but wholesale quantities we cannot say. Baryta paper is not suited for "salted paper" pictures. (2) The busts may be had from any of the plaster image makers, such as Bruccianni's, 4, Russell Street, Covent Garden. (3) "Artistic Lighting," by Jas. Inglis.

The British Journal of Photography.

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*** *The Editor can only be seen by appointment.*

*** *We do not undertake to answer letters by post.*

THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC FOR 1903.

Edited by Thomas Bedding, F.R.P.S.

The forty-second annual issue of The British Journal Photographic Almanac will be published in December next. This year's Almanac reached a total of 1,560 pages, and the entire edition of 20,500 copies was sold out a fortnight before publication. Of no other photographic book ever issued can two such unique facts be recorded.

The growth in popularity of the Almanac is evidenced by the remarkable rapidity of its sales.

The 1900 Edition (20,500 copies) was sold within three months after publication.

The 1901 Edition (20,500 copies) was sold a fortnight after publication.

The 1902 Edition (20,500 copies) was sold a fortnight *before* publication.

The widespread interest in the Almanac grows steadily year by year, and in order to supply the increasing home, foreign, and colonial demand, we have decided to enlarge the 1903 issue to

25,000 COPIES.

The great addition to the circulation of this most popular annual (over 20 per cent.) undoubtedly enhances its value as an advertising medium, and the issue of the large number of extra copies will supply the wants of thousands of photographers, dealers and publishers who were unable to obtain the Almanac for the last three years.

The Almanac for 1903 will appeal to photographers all the world over as a daily reference guide in practical work. The standard matter and formulæ will be revised and added to where necessary, and the latest departures in theory and practice will be chronicled. The year's advances will be recorded, and wherever practicable new features of an informative nature will be added.

EX CATHEDRA.

Affiliation of Scottish Societies. The proposed affiliation of Scottish societies seems a step in the right direction. The representatives of the societies that met in Dundee on Saturday did right in making no definite arrangements until all the societies in Scotland were consulted: the affiliation can then go forth as a united national body, and do much good work in the advancement of photography. The R.P.S. Affiliation has, somehow, never "caught on" in Scotland, and as the Scots are proverbially clannish, a Scottish affiliation should have a better chance of conserving the various photographic energies into a composite and harmonious whole. If the proposed affiliation comes into being, as we earnestly hope it will, there is nothing to prevent it having a working arrangement with the R.P.S. Affiliation, as is the case with the governing bodies of various pastimes on opposite sides of the Border. We commend the scheme to the earnest consideration of our Scottish readers.

* * *

Electricity, Gas, or Oil? In the latter part of the Nineteenth Century, Ely Place, Holborn, offered an example of a most singular anachronism. While the whole district around was one blaze of gas-lighting, any inquisitive visitor into that *cul de sac*, beloved of diamond merchants, would be astonished by seeing over the gateway in front of one of the houses, a little twinkling light, which proved on enquiry to be an old-fashioned oil lamp, religiously lighted every night, as a sort of silent protest of the aged tenant against the extravagant illumination that surrounded him. It formed an instructive comment upon the progress of less than a century in the matter of illumination. When the streets were as bright as day with gas-lights, and the photographer in his studio was able to rely upon a sufficiently brilliant artificial light to enable him to take portraits during London's fogs, this pathetic little twinkle showed us what our grandfathers were content with, and anyone who should have supported the possibility of a return to a liquid fuel as a source of public light would have been jeered at. Yet, at the beginning of this Twentieth Cen-

tury, such a suggestion is being realised, and, during the coming winter, anyone finding himself in Whitehall will see, between the Horse Guards and Bridge Street, a public installation of the Kitson-light, which will be tested against gas and electricity. It is true that there will be as much resemblance between the Kitson-light and the Ely Place oil lamp, as between the sun and a comet, still, the fact remains that, with the aid of compressed air, it is true oil as an illuminant, is to have a trial.

* * *

Artificial Light in the Studio. The Whitehall experiment will possess considerable interest for the photographer, who, as we have said, is by no means wedded to electricity as a daylight substitute. Acetylene, for a time, seemed to promise an effectual supersession of all competitors; yet we do not hear of many studios where it is in regular use. The old pyrotechnic flare such as was used in, for example, the Moule's photogen of the middle of last century has given way to magnesium—as a flash-light or lamp—yet there is a steady band of workers who pin their trust to incandescent gas. All will be interested in the Whitehall experiments, as, though a successful street illuminant is by no means necessarily a success for the studio, it is still possible that a light may eventually be evolved suitable for either the photographer in his studio or the pedestrian in the street. The question of pounds, shillings, and pence is, naturally, one of prime importance in discussing this subject, and is, perhaps, operative in many cases where electricity has not yet been employed. Hence the progress of a new patent incandescent gas burner, recently described in the *Scientific American*, and for which great economy is claimed, will be closely watched. Two patterns are made, one for rooms of limited size, and the other for street use. The main characteristics of these new burners seems to be an efficient method of mixing the air and gas, so as to utilise to the utmost the whole of the gas consumed in rendering the mantle incandescent. To this end a complete control over the quantity of air admitted is provided for by a series of comparatively simple arrangements. The larger burner has openings in its chimney to admit air to the outer surface of the mantle to insure high incandescence, though it may be stated that the more recent Welsbach burners have also a series of apertures in their glass chimneys designed for the same end. Our readers who are incandescent gas burners may be reminded that, especially in the older patterns, the maximum illumination is by no means coincident with the maximum amount of gas consumed. It is, in cases where the pressure is high, quite possible to more than double the intensity of the light by turning the gas down to a certain extent. Indeed, with these older burners, if it be desired to attain the very highest excellence of light, the exact point to which the gas should be turned off is a matter of very nice adjustment. We more particularly draw attention to this, not so much on the score of economy as in view of high efficiency, the main factor in the use of these Welsbach lights for portrait taking.

* * *

Photography through the Telephone. It may be predicted, with a fair amount of safety, that if seeing by telephone should be rendered possible, it should be possible to photograph by the same agency, hence our readers will be interested to learn that a technical committee of the French Academy have under examination a new discovery relating to the possibility of seeing, at the receiving end of the telephone, the reflection of persons at the operating end of the service; but it is not possible, the Secretary of the Academy states, to pronounce upon the real value of the discovery at this early stage. The only information available to the public is to the effect that a fresh contribution to the solution of the problem of vision through obstacles has been submitted to the Academy by an inventor whose name would be withheld until after the Committee had reported on the practicability of his invention. The leading idea of the plan is the utilisation of the well-known light sensitiveness of selenium in the circuit of the electric current, a problem which, in one form or another, has for many years occupied the attention of a large number of experimenters.

* * *

Is Pyro Excelled? Even after the introduction of so many new developers, whose merits for cleanliness and rapidity of action have been so loudly sung, there still remain many photographers, mostly professional, who look upon pyrogallic acid as the developer par excellence for the gelatine dry plate. The rapid spread of amateur photography, and with it the desire for a developer free from that objectionable stain, which at one time might have served as a trade mark, has injured to some extent the reputation that pyro enjoyed so long. We have even heard the remark that its price has also been affected. Be his as it may, there seems some prospect that pyro may recover its old position. From a paper read at a Frankfort Photographic Society, we gather that the substitution of glyccoll (amido-acetic acid) for the alkalis usually combined with pyro for development, adds greatly to its power, and places pyro in the front rank. It is said that the effect of the amido-acetic salts, in conjunction with sulphite of soda, is even greater with pyro than any other developer. By using, instead of carbonate of potash, only half the equivalent quantity of amido-acetate of soda, a remarkable gain in rapidity, pluck, and clearness is perceptible. Even if the solution be used as many as ten times in succession, the negatives are still of the stainless, pure, black type. The stock solution remains clear when kept, and the developer neither attacks the skin nor the film. With para-amidophinol, if the corresponding amount of amido-acetate of soda be substituted for the carbonate of potash generally used, the developer is an excellent one for bromide paper, and transparencies, the characteristics being greater rapidity and vigour, with exceptional purity of the high lights. The firm of Meister, Lucius, and Bruning, of Hoechst a/m., is bringing out a patent developer of this type, containing pyrogallic acid, an amido-acetate salt and sulphite of soda in suitable proportions. It is known as "Pinakol P."

* * *

Enlargement by the Radiometer. The *Photographisches Wochenblatt* contains an article by Dr. H. Baurath describing an arrangement he has made for enlarging by day-light. As it is very simple, inexpensive, and practical, we give a description of the details. Dr. Baurath's dark-room has a sloping roof containing a window about 32 inches broad by 48 inches long, glazed with a stout, single sheet of glass. Beneath this, on a level with the lower edge of the window frame, is a shelf about 34 inches wide. The front and sides are closed with wood, and afford a convenient means of fastening the shelf to the window frame, or rafters. The shelf has an aperture of the size of the negative to be enlarged. Beneath it a camera may be fixed with the lens downwards, directed to the floor. Placed at some distance below the camera is a drawing-board supported on trestles, or a tripod. The

board carries the bromide paper, and it should be accurately levelled. The front of the structure enclosing the window is provided with a sliding door, through which the negative may be introduced and placed in the frame corresponding with the ground glass screen of the camera, which should be removed or turned back. In front of the edge of the negative, near the sliding door we have just described, is placed a Crookes' radiometer. Between the radiometer and the sliding door a tube, about 1¼in. in diameter, is introduced through the shelf. This tube is provided with elbows at both ends. The top one is turned towards the radiometer, and the bottom one towards the eye of the operator. Two small squares of looking-glass placed diagonally in the elbows, reflect the image of the radiometer through the tube to the eye of the operator, who is thus able to count the number of turns the radiometer makes, without permitting any light to pass into the dark-room. The rack and pinion of the camera are used for focussing the enlargement. As the radiometer is sensitive to heat as well as light, care should be taken to avoid exposure when making the enlargement. A trial will give the number of turns the radiometer should make for the exposure. Dr. Baurath has made experiments with the radiometer by exposing it to electric light, and has found it so reliable, that the speed at different distances varied almost with proportional exactitude. Only when the light was so weak that merely one or two revolutions per minute were made, did it give an incorrect reading. As an aid to counting the revolutions of the vane of the radiometer, one of the wings should be perforated with a round hole. This passes a flash of light at each revolution. Whether the light be dull or bright, the number of turns indicates the exposure that should be given, as they are more or less rapid according to the light intensity.

* * *

Acid Toning Baths. In our issue of the 23rd May we drew attention to a new toning bath by Monsieur A. Helain, of which the following is the formula:—Two per cent. solution of sulpho-carbamide, 40c.c.; tartaric acid, ½ gramme; one per cent. solution of chloride of gold, 50c.c.; common salt, 20 grammes; water, according to toning quality of the paper, 1 to 2 litres. Professor Valenta has been induced to make a series of experiments with this bath, and speaks highly of it for uniformity and absence of double tones in the prints for which it is used. We refer our readers to page 402 of the current volume of THE BRITISH JOURNAL OF PHOTOGRAPHY for instructions concerning the bath. Professor Valenta attributes its action to the formation of a characteristic gold salt, by chloride of gold in the presence of an excess of sulpho-carbamide. The process by which the silver is converted by the bath may be expressed as follows:—$(CSN_2H_4)_2$ Au Cl. + Ag = $(CSN_2H_4)_2$ Ag Cl + Au. The addition of organic acids assists toning considerably, and this is specially the case with tartaric and citric acids, the latter being of greater use with collodio chloride papers. Professor Valenta has found the bath of good keeping quality and likewise economical, the high price of thio-carbamide being compensated for by the small quantity used. As the bath does not attack the fine detail of the half-tones, and is not poisonous, Professor Valenta is of opinion that it should supersede the sulpho-cyanide bath.

THE Southsea Exhibition.—Mr. F. J. Mortimer, the hon. sec., writes: "Our show this year promises to be another record. I shall be glad if you will kindly find room to mention that our last day for entries is December 3rd."

INTENTION IN PHOTOGRAPHY.

WHEN we come to analyse the principal merits of any acceptedly excellent pictorial photograph, to sit in calm judgment, as it were, on all its superlative and minor beauties, what is it, after all, that finally contents and satisfies our artistic perception, and makes us admit that the picture's reputation is well deserved? In nine cases out of ten, probably, we shall come to the conclusion that it is the evident presence of what, for want of any better name, is called intention, the clear existence of a motive, and the more or less successful expression thereof. It is the possession or absence of this abstract good quality which makes all the difference between what may be a merely admirable technical result, and the work of art which demands and keeps our appreciative attention. Now of all things to be patiently aimed at in the pursuit of photographic excellence the successful expression of intention is, perhaps, the most difficult and most seldom achieved. Nor is it hard to understand why this should be so, considering the inevitably mechanical nature of the means and methods employed, which, except in the most skilful hands, are more apt to dominate their master than to move obediently at his dictation. The photographer, unlike his brother artists of the brush, pencil, chisel, or graving tool, does not always start his work with one clearly definite and settled object. Certainly, when he does, one would naturally expect that evidences of thought and intention would proceed to show themselves in his results as a coherent and necessary evolution. Sometimes, indeed, such is the case, more particularly in genre work and figure studies, some admirable examples of which may occur to us, that we know as a fact were the product of deliberate preparation and many trials before the pre-arranged imagination of the artist of the camera crystallised into the finished picture. More frequently, however, inspiration comes, so to speak, on the spur of the moment, on seeing what is felt to be a good subject for special and definite treatment. And it is wonderful how differently the same view or object may impress different workers, and how great may be the unlikeness of their individual renderings. For it would seem that there are four chief factors which go to the making of a pictorial photograph; the subject itself as it stands before the camera, the photographer's own impression and mental ideas of that subject, the way in which he tries to render it, and, lastly, the manner in which the mechanical powers and laws of his art will kindly allow him to render it. The successful worker is obviously the one who has not only his craft best under control, but he who knows best how to interpret and voice his own half intelligible thoughts and fancies in the concrete form of definite aim and intention; in a word, the man who not only feels, but understands his feelings, and the best method of compelling his material and tools to adequately translate them, so that his work may be understanded of all.

Photography is admittedly very disappointing in the extent to which it allows its devotees to attain the results they so carefully aim at. Thought and care may be lavished liberally from start to finish, and yet, somehow, the wished-for sentiment and expression of the worker altogether fails to show itself in the finished print, be he never so expert and artistically right-minded. "It is pretty," he will say; "very pretty, but it's not what I meant!" This is one of the haunting draw-backs of the camera craft, which often causes a sense as of a broken melody, and tends to induce a gentle melancholy in the keenly photographic soul, and a resigned acceptance of the fact that, even at his best, he is striving after the unattainable that mockingly elusive beauty of outline, light, and

shade, whatever it be, that he feels so plainly, sees so truly, yet cannot grasp.

Nevertheless, our art has its compensations. How often it happens that, if we do not get what we intended, we come across rare treasure which we did not intend. It is nothing to boast of, perhaps, but if we would only admit it, how many an admired result has been the product of happy accident and sheer perversity! The plate that we think is going to yield a perfect negative proves a melancholy disappointment; the one we paid little attention to, and have slight expectations of, great is its success and plentiful its meed of admiration! "The last shall be first, and the first last!"

But, after all, "the print's the thing." Fortunate is it for the artist of the camera that so great a power of modification lies ready to his hand between the initial negative and the grand finale of his exhibition picture. Here he has it nearly all his own way. He can lighten this part, darken that; in a thousand ways which show the master hand he can impress his native individuality on his cherished productions. It was said of Michael Angelo that he could stand before a rough block of marble and see in his mind's eye the triumphant work of art which, with ready, unhesitating chisel, he shortly proceeded to bring forth. In like manner, it may be, some of us may have stored in our mental visions the beautiful photograph of the future, waiting but the suitable conjunction of circumstances to turn the ideal into reality. And, strictly and literally speaking, a photograph truly deserves its title of an artistic creation, only when it fulfils to the uttermost the original design and motive of its producer.

When all is said and done, it must not be forgotten that however successful the photographer may be in carrying out his primary intention and motive, he has, except as regards his own pleasure, utterly failed in his object unless his picture will convey to the minds of others the same sensations and impressions which he himself felt at the commencement. As that great authority on all matters artistic, Sir Joshua Reynolds, so well says:—"If the imagination be affected, the conclusion is fairly drawn; if it be not affected, the reasoning is erroneous, because the end is not obtained; the effect itself being the test, and the only test of the truth and efficacy of the means."

Many of the pictures we see that are attractive, yet unconvincing, are so simply because the original intention of their creator has not been successfully carried out. He has failed in getting what he wanted, knew he had failed, and yet rested content with something that fell short of his desires, and tried to make the best of it. Such results, attained in such a manner, can never be genuinely and permanently pleasing; the only road to that real success, which touches the mind and reaches the sympathy of others, is in loyal adherence to first impressions and purposes, and unshaken determination to render them, and nothing else, though it may cost many a futile trial and disappointment before the gratifying end is gained.

Society of Arts.—The Society of Arts is nearly half through its second century, for it commenced its 149th Session on the 19th of this month with a meeting at which an address was delivered by Sir William H. Preece, the Chairman of the Council, when the medals awarded by the Society during the past session were presented. At the next meeting, on November 26th, Dr. Goegg will read a paper in French on the Simplon Tunnel, and its effects on railway traffic to the East. At the other meetings before Christmas there are to be papers on "Photographic Development," by Mr. Watkins, on "French Education," by Mr. Brereton, and on the "Russian Iron Industry," by Mr. Head. There will also be a meeting of the Indian Section, at which a paper on "Domestic Life in Persia" will be read by Miss Ella Sykes, who, with her brother, Major Molesworth Sykes, has had so much experience of Persian travel. The Monday evenings up to Christmas will be devoted to a course of Cantor lectures on "Gas and Allied Illuminants," by Professor Vivian Lewes.

SOME NOTES ON COPYRIGHT.

Photographers in provincial towns, seaside resorts, etc., who publish views of local scenery, often feel aggrieved, and not altogether without reason, when they have issued a fresh series of pictures, to find that the enterprising, cheap view publisher comes along, purchases the prints, and reproduces them by collotype, or process block, as "albums," containing a dozen pictures, to sell at about the price that the photographer charges for a single print. Sometimes a fellow-townsman, a stationer, buys the photographs and sends them away and has them reproduced in album form. In these circumstances the photographer, as we have just remarked, feels aggrieved, particularly when he finds that he has no redress against the pirates. But who is to blame for that? Only himself! The Copyright Act protects him if he would only avail himself of it by registering his pictures as soon as they are taken. But this he too often neglects to do, and then complains loudly if they are pirated. The cost of registration is but nominal—only one shilling for each picture—which cost would, in most cases, be covered by the sale of the first copy. As will have been noticed in the "Answers" column, we are frequently asked by correspondents if by registering the copyright after the piracies have been published they can restrain the publication and recover damages. There is an old saying that "it is no use locking the stable door after the steed is stolen." Subsequent copyright will not cover copyright in prints issued prior to registration, consequently that will give no redress, as most of the houses that publish these cheap albums of local views that do so much injury to the photographers who produce them, are substantial ones, heavy damages might often be recovered if the photographs had been registered in the first instance, and that they cannot be, is entirely the photographer's own fault. Subsequent registration is, however, sometimes of use in preventing future piracy. If there is a slight alteration made in the negative—say a few private marks put upon it, and a print from it is then registered, and any of those prints be pirated, the photographer can obtain redress as there will then be clear proof that the piracy was made *after* the picture had been registered. Some few years ago we were in Court where a case was being tried. It was this. A picture that was published on the Continent was pirated here, but as the copyright law of the country had not been complied with, there was no redress here. Subsequently, the artist who painted the picture made some slight alterations in it and fresh reproductions were made and published here. These were afterwards pirated by a well-known firm, as an advertisement in connection with their nostrums. An action for infringement was entered, and the owner of the copyright recovered substantial three figure damages, an injunction, and the forfeiture of all copies—many thousands—as well as the stones from which they were printed.

We are frequently asked by correspondents two questions. One is, if a photograph, the copyright of which has been registered, has to be marked "Copyright?" The other is, how is one to know whether such or such picture is copyright? The answer to the first query is in the negative. The photograph need not be so marked, and anyone who copies it has to take any risk he may incur in reproducing it. The reply to the second question is by searching the register at Stationers Hall. This may be done at any time between 10 and 4 o'clock, except on Saturday, when the hours are from 10 till 2. The fee for a search is one shilling for each subject. The names of the authors of the work are arranged alphabetically, so are the names of the assignees in the case of the copyright being

assigned by the author to a second party. So, it will be seen that it is easy for anyone to find out whether the copyright in any particular photograph has been registered or not; also who is the owner of the copyright for the time being. It is the custom with some photographers to mark pictures "Copyright" when the copyright in them has not been registered. This is certainly morally, if not legally, wrong, inasmuch as it implies a protection they are not legally entitled to. In the case of applying the term "patent" to anything that has not been patented, even if a provisional protection has been granted, incurs a heavy penalty which has more than once been enforced; though we do not know of a case where legal proceedings have been taken for falsely using the word "copyright" when the copyright has not been registered—still, such a case may arise.

DR. HEINRICH LUDWIG HUGO SCHROEDER.

In announcing the death of Dr. Schroeder in our issue of last week, we only had the opportunity of briefly referring to the work of this distinguished optician, whose name commanded world-wide respect for learning and constructive ability. Not much information has been published concerning his career, and it is therefore difficult to give a detailed, comprehensive account of it. We gather from Dr. Moritz von Rohr's work on the "Theory and History of the Photographic Objective," that he served his apprenticeship as a mechanic and optician with Moritz Meyerstein, Instrument Maker to the University of Göttingen. His study of optics was continued under J. B. Listing, of the same city, when he had completed his apprenticeship, and subsequently we find him in Hamburg as a maker of telescopes. In the latter part of the seventies he removed to Oberursel, near Frankfort-sur-Maine, but this change did not add to his business, and he relinquished it in 1882, to accept an invitation from the firm of Ross and Co., to take charge of the scientific work connected with their establishment. His knowledge of the optics of the telescope and microscope eminently qualified him for the position. It will be remembered that a few years after his arrival in this country, the discoveries of Dr. Schott, who was working in conjunction with Professor Abbé, revolutionised the manufacture of optical glass, and gave an enormous extension to the field for the optician's skill. Dr. Schroeder was one of the first to make use of the new possibilities, and led the van in photographic optics by inventing the concentric lens, the first photographic objective constructed with an abnormal pair of glasses. The lens is remarkable for its simplicity of construction, being symmetrical, with both halves, formed of a plano-convex cemented to a plano-concave element, possessing concentric surfaces. In adopting this construction, it was necessary to disregard the aberration of sphericity, and correct it by means of a diaphragm. The lens was consequently slow, and it was soon superseded by the more complex, but much more rapid objectives, invented by Continental opticians. It should, however, be remembered that the patent of this lens was applied for in 1888, and that its commercial introduction was delayed for some years by difficulty in obtaining the requisite glass. We may say, in recognition of the inventor's skill, that attempts were made by at least one other optician to construct a lens on similar lines, but without success. For the information of those unacquainted with the performance of the lens, it may be described as having a very flat anastigmatic field, and in this respect shows a great improvement, in comparison with the portable symmetrical type.

In the year 1891 a controversy arose between Mr. T. R. Dallmeyer and Dr. A. Miethe, as to priority in constructing a telephoto system of lenses. Like many other supposed inventions in photography, it was found to be ante-dated, and both disputants were denied the distinction. In a letter to The British Journal of Photography, published on the 29th January, 1892, Dr. Schroeder pointed out that in 1869 to 1870 he was engaged upon the construction of a telescope for Baron von Bülow, and converted it to a telephoto system by using either a negative or a positive enlarging lens, according to the instructions given in the works of Sir John Herschel, Peter Barlow, and others. Photographs were taken with the instrument by Herr Höge, a Hamburg photographer. The late Editor of this paper, Mr. J. Traill Taylor, appended a footnote congratulating Dr. Schroeder upon the completeness of his researches, and stated that in the race for priority Dr. Schroeder must be held as coming in an easy first. It has, however, since been shown by Dr. von Rohr that Porro ante-dated Dr. Schroeder, having constructed a telephoto lens, with which he photographed an eclipse of the sun on the 28th July, 1851. Dr. Schroeder made use of the principle subsequently in a patent for a terrestrial telescope. The enlarging lens formed one of the components of the erector, and by a mechanical contrivance the eye-piece and the magnifying lens were so connected that the two could be simultaneously adjusted. In 1894 we find Dr. Schroeder's name associated with a patent for another photographic lens. This was an unsymmetrical doublet, in which the spherical aberration was corrected by one component and the chromatic aberration by the other. In the former the relative dispersions of the two glasses were as nearly as possible equal, whilst the difference of refraction was as great as possible. The converse was the case in the other component. Another photographic lens was also outlined by Dr. Schroeder, whilst engaged by the firm of Ross and Co. Dr. von Rohr describes it as a lens for astro-photography, resembling Sutton's triplet. The outer lenses were collective menisci, and the spherical and chromatic aberrations of the axial and oblique pencils were to be corrected by a middle compound lens. The construction does not appear to have been completed.

In 1894 Dr. Schroeder migrated to the United States, and entered the service of the Manhattan Optical Companies. Whilst there he invented and patented a photographic lens of very simple construction. The front lens was a combination of flint and crown, whilst the back lens was of flint only. Modern glass was used in its construction. In this lens we see Mr. Aldis's idea embodied, of constructing a doublet formed of only three elements. Considering the simplicity of the lens, very good results were obtained.

Dr. Schroeder returned to England in 1895, and since then has lived in retirement. Frequent articles from his pen have, however, appeared in the German press. Even as late as February, 1901, we find a patent taken out in his name for an improvement in photographic lenses. Whilst the former patents were marked by simplicity of construction, this last effort is of an opposite character. Two constructions are described and illustrated in the specification. Both have four elements in each component, and both objectives are unsymmetrical. Details of the indices, curves, and thicknesses are not given.

Dr. Schroeder's work on photographic optics, entitled, "Die Elemente der Photographischen Optik," was published in 1891, and forms one of the volumes of Dr. Vogel's "Handbook of Photography." The strength and originality of Dr. Schroeder's mind is visible throughout its pages.

By the death of Dr. Hugo Schroeder we lose an optician in the fullest sense of the word, for he combined great technical skill with scientific knowledge and inventive genius.

THE ACTION OF HYDROGEN PEROXIDE UPON PHOTOGRAPHIC PLATES IN THE RUSSELL EXPERIMENTS.

TRANSLATED FROM THE "PHOTOGRAPHISCHE CORRESPONDENZ."

DR. W. J. RUSSELL, in his important paper on "Hydrogen Peroxide as the Active Agent in Producing Pictures on a Photographic Plate in the Dark," shows that hydrogen peroxide, even in minute quantities, when it evaporates, strongly affects photographic dry plates. Dr. Russell has also found that various metals, like organic substances, affect the plate in the moist state, even if films of gelatine, celluloid, etc., be interposed, and he has established in a highly probable degree the cause of the action of these substances, in the intermediate formation of hydrogen peroxide. Le Roy,* in 1894, showed that a strongly alkaline solution of hydrogen peroxide would develop the latent image. This fact, as well as the action of an acid solution of hydrogen peroxide as a reducer, was thoroughly investigated by Dr. Andresen, in 1899.†

As the alkaline solution of hydrogen peroxide prepared by Dr. Andresen (100 c.c. of a 3 per cent. solution of H_2O_2 + 7 grammes of Na OH) possesses exceptional energy as a developer, we might be led to suppose that the action of hydrogen peroxide upon plates in the dark is likewise reduction of the silver.

A few experiments have shown me, however, that the nature of the action of H_2O_2 in the experiments undertaken by Dr. Russell, is quite different. The veiling action of hydrogen peroxide upon a dry plate may be studied in a more simple way than that of Dr. Russell by dipping it in a solution of H_2O_2. If the plate be dipped for one minute in a solution of 100 c.c. of water and 5 c.c. of a 3 per cent. solution of commercial hydrogen peroxide‡, the film after washing will be completely blackened by any developer. But if a collodio-bromide plate be used instead of a gelatine plate, no action of the kind takes place. Even if the plate be left for some time in the 3 per cent. solution of H_2O_2, without dilution, it will remain perfectly clear after the developer has been used. This experiment shows that the action upon gelatine dry plates, observed by Dr. Russell, has nothing to do with the reducing action of hydrogen peroxide, notwithstanding the fact that in alkaline solution it is a powerful developer for collodion plates. It is more probable that hydrogen peroxide belongs to those substances, which destroy the union evidently existing between bromide of silver and gelatine, by affecting the latter and thus bringing the silver bromide again into the reducible form exhibited by it in the precipitated state. This was shown by me some time ago§ in connection with nitric acid, sulphuric acid, and persulphate, and recently in connection with hydrochloric acid, citric acid, and gaseous nitrous acid.

As gelatine is dissolved, or decomposed, by hydrogen peroxide, the property of rendering emulsified bromide of silver amenable to development, in the absence of light action, is apparently a consequence, as in the case of the other substances we have mentioned.

It is not bromide of silver in the chemical sense, but "gelatino-bromide of silver," that is affected by the extremely delicate reaction of H_2O_2, and this proves to us once more how easily "gelatino-bromide of silver" may be brought into the developable state without assuming previous reduction to have taken place. This may be important in the theory of the latent image. It is a remarkable peculiarity of hydrogen peroxide that the action exhibited in the Russell experiments is only exerted when the solution is in a more or less neutral state. There is no veiling of the image when the gelatine plate is developed with alkaline H_2O_2, according to Andresen's formula. But if the plate is first dipped in neutral H_2O_2, it will be completely veiled when developed with an alkaline H_2O_2 solution. The same behaviour is exhibited by gelatino-bromide of silver, when it is subsequently treated with the ordinary organic developers. If first subjected to neutral hydrogen peroxide, the plate fogs, but this is not the case if the preliminary bath of hydrogen peroxide be alkaline. These experiments clearly prove that there is no question, in the Russell experiments, of the action of H_2O_2 being a reduction of silver bromide, such as undoubtedly occurs in the formation of the latent image by the action of light. They prove that a true developer of great reductive power, such as alkaline hydrogen peroxide, does not produce fog, whilst neutral H_2O_2 does, although it has no capacity for development. Strongly acidified hydrogen peroxide also acts differently from neutral. If 1 c.c. of strongest sulphuric acid be added to 100 c.c. of a 3 per cent. solution of H_2O_2, an exposed plate dipped in it for one minute, then washed and developed with an organic developer, will be found almost as clear as an undipped plate, although much of the latent image has been lost. My previous experiments have shown that dilute sulphuric acid of itself fogs a dry plate. A plate was therefore dipped in a 1 per cent. solution of sulphuric acid at the same time. It showed considerable fog, and it therefore follows that no kind of veiling action should be ascribed to H_2O_2, even in the acid state.

PHENOMENA OF REVERSAL WITHOUT THE ACTION OF LIGHT.

Dr. Russell remarks in his treatise that reversal of the image occurs when the plate is subjected to the action of larger quantities of hydrogen peroxide. My experiments in this direction gave very remarkable results.

Strips of dry plate, 1c. broad by 9c. long, were placed in test tubes filled to a height of about 3c., with solutions of H_2O_2, in ascending degrees of strength. They were kept in absolute darkness for two hours at a temperature of 20 degrees C. The strips were then washed and developed for three minutes with metol-soda

percentage of H_2O_2 contained in each solution.	
0.001.	The dipped end of the plate showed a slight deposit, but the upper (dry) end was unaffected.
0.003.	Considerably greater action. The top unaffected.
0.01.	Very strong action below. The top unaffected.
0.03.	Very strong action below. Perceptible action at the top.
0.1.	Somewhat stronger action below than in the previous case, and marked action above.
0.3.	Less dense below than in the previous case, and a much greater deposit above than below.
1.0.	Only slight reduction below. Complete reduction above.
3.—	Perfectly clear below. Complete reduction above.

With strengths between 0.03 and 1.1 per cent. the appearance of the plates resembles that of the "neutral condition" of solarisation by light. With 3 per cent. a complete reversal of the image occurs, that is to say, solarisation by chemical means. This phenomenon, exactly resembling solarisation by action of light‖ acquires much interest from the fact mentioned at the beginning of this paper that the primary action of H_2O_2 upon the plate is not a direct reduction of the silver bromide, as in the case of exposure to light, since silver bromide emulsified in collodion is not affected by H_2O_2. We would also remark that difference in the swelling of the gelatine, caused by difference in the diffusion of the developer at both extremities of the plates, or in the strips used with different quantities of hydrogen peroxide, cannot be looked upon as an explanation, as the entire surface of the plate is fixed with the equal rapidity in every instance. The phenomenon we have described might be explained by the peculiarity of hydrogen peroxide being a reducer as well as an oxidiser. In its

* "Bulletin de la Société Française," 1894, p. 23. See "Eder's Jahrbuch," 1896, p. 413.

† "Photographische Correspondenz," 1899, p. 260.

‡ It is immaterial, whether the ordinary, acid, commercial, hydrogen peroxide be neutralized or not. For further particulars see later on.

§ "Photographische Correspondenz, 1901, p. 159.

‖ The statement recently put forward by Precht (Photo. Wochenblatt, 1902, p. 237) that solarisation is merely a phenomenon of development, is in my opinion, an entire misjudgement of the interesting phenomenon of the reversal of the latent image. My exhaustive examination of solarisation appears to have escaped Precht's notice, and I therefore take the liberty to refer him to my experiments concerning the action of Bromine and Nitric Acid upon solarised collodio-bromide plates (Photographische Correspondenz, 1901, p. 351, Luppo-Cramer: Wissenschaftliche Arbeiten; Knapp, Halle, 1902, p. 39). It has long been known that bisulphite acts as a retarder, merely by counter-action of the alkali, and that the point at which reversal takes place may be set back by suitable development. Precht's researches, consequently, do not throw any fresh light upon the question. The use of acetone sulphite instead of bisulphite of potash, or even sulphuric acid, etc., for neutralizing alkalies, is also an innovation of very little importance. Professor Precht can ascertain for himself in very few minutes, that the same quantity of sulphuric acid will produce far more retarding action upon Edinol than can be obtained with Acetone sulphite, which he praises so inordinately for some incomprehensible reason. The phenolate developers, like Rodinal, contain a relatively small quantity of alkali, which can be counteracted by small additions of acid. With the carbonate developers it is of course preferable to use a small quantity of alkali for over exposure, instead of the inconvenient method of first taking a large quantity of alkali and then neutralizing it by a suitable acid body, such as Acetone sulphite, or sulphuric acid, which is much cheaper.

action upon the gelatine a substance may be formed which reduces a trace of the silver bromide, but when stronger solutions are used the "latent chemical image" is destroyed (oxidised). We find, in fact, that the latent image due to the action of light is considerably enfeebled by bathing a collodion plate for fifteen minutes in a 3 per cent. solution of H_2O_2.

Ammonium persulphate, in different degrees of strength, acts upon a dry plate in precisely the same manner as hydrogen peroxide, excepting that it is slower and requires considerably more time to produce reversal. As persulphate does not evaporate, the part of the plate which is not immersed does not become affected, and the reversal is only to be judged by the diminished density of the immersed portion in proportion to the strength of the solution. We allowed the persulphate to act upon the plates for fifteen hours in 5, 3, 2, 1, and 0.5 per cent. solutions. Upon development, the 0.5 per cent. test showed the maximum of density, which diminished until 2 per cent. was reached. At this stage the density was still greater than the chemical fog originally present in the plate. With from 3 to 5 per cent., the dipped end was clearer than the other, and with 5 per cent. it was perfectly clear.

The action of persulphate might, with some effort, be similarly explained to that of H_2O_2, as Lumière and Seyewetz endeavoured to interpret the process of reduction with persulphate, by oxidation and reduction proceeding simultaneously.

It is noteworthy that sulphuric acid was found to act similarly to hydrogen peroxide and persulphate. With solutions of higher strength, however (4 to 5 per cent. of H_2SO_4, and fours hours' immersion), the undipped part of the plate was likewise affected, but it is improbable that sulphuric acid evaporates at ordinary temperatures, and it may therefore be assumed that an impurity was the cause of this action. This appears probable from the fact that acid obtained from different sources, containing the same amount of H_2SO_4, showed considerable difference in the time requisite to obtain reversal.

The action of sulphuric acid in other respects is the same as that of hydrogen peroxide, and it is open to doubt if traces of this substance may not be present in the acid, since the Russell experiments show by their extremely delicate photographic reaction how widely spread it is, and how easily it may be produced.

Unfortunately, it was impossible to obtain reversal with nitric acid, as the gelatine was dissolved by solutions exceeding 1 per cent. in strength, and the maximum of density was not reached. Citric acid also exerted a mechanical destructive action upon the medium before reversal could take place.

It is necessary to exercise great caution in formulating a hypothesis for these peculiar phenomena of reversal. The assumption of variable reduction, or secondary reoxidation by H_2O_2 and persulphate, according to strength of solution, seems very risky. In this case the action of sulphuric acid would have to be explained by the presence of H_2O_2 (or $H_2S_2O_8$?), an assumption which has not yet been proved. Above all, however, it seems impossible that the action of nitric acid upon gelatine should form a substance which could reduce bromide of silver in the presence of nitric acid. The action of nitric acid must consequently be considered in endeavouring to explain the cause of reversal by hydrogen peroxide, although reversal cannot be produced by its means.

DR. LUPPO-CRAMER.

Frankfort-on-Main. July, 1902.

P.S.—Dated September 16th, 1902.

Further close study of the nature of chemical fog, so-called, shows unquestionably that ordinary fog and the alteration in gelatino-bromide of silver caused by H_2O_2 and nitric acid, differ fundamentally from light action, and have nothing whatever to do with the very slight reduction of silver bromide produced by exposure. An account of this will shortly follow in the "Photographische Correspondenz."

THE AUTHOR.

IN connection with the camera section of the Norwich Field Club, it is proposed to hold a three days' exhibition in January, 1903. In the open section there will be classes for (A) landscape, river and broads scenery; (B) Portraiture, figure and animal studies; (C) Architecture (interior and exterior) and survey work; (D) Field studies (animal, bird, and insect life photographed amid natural surroundings; (E) Instantaneous work (set of six). Silver and bronze medals will be awarded in each class. Full particulars, etc., will shortly be obtainable of the hon. secretary, Mr. J. H. Goreham, Ingleside, Lakenham, Norwich.

MOUNTS AND MOUNTING.

[A Paper read before the Edinburgh Photographic Society.]

THE territory of photography is undoubtedly a wide and increasing one, and the pioneers in its domain have ever something new and interesting to lay before you. Alas! I am no pioneer, and the field of the past has been so thoroughly surveyed, its lodes so accurately located, and its veins so persistently and successfully mined, that little is left one now but the opportunity to potter around about the "tailings," so to speak, in the small chance of turning to account some overlooked trifle, the contemplation of which in the absence of greater finds may serve to encourage us in our pursuit. It is just such a trifle I offer you to-night. It may repay your attention, or it may not, according to your previous experience and success; and while I can never hope to claim the attention of the advance guard, I may still be able to whisper advice to recruits in the ever-increasing army of our art-science. We are all ready enough to expose plates (a hand camera that carries less than a dozen is considered a drug on the market)—we are, as a rule, fairly eager to develop them; we may even exhibit anxiety occasionally about our printing; but from this stage enthusiasm rapidly evaporates, and he is indeed an amateur to be envied who possesses even an unmounted copy from each of his printable negatives. "Oh! mounting! that can be done later, at any odd moment—it's a small matter, almost beneath notice." Alas! it is too often considered beneath our thought; the notion that it is beyond it I shall endeavour to dispel. Whatever advantages the title of this discourse may claim—and I here acknowledge it provides a very wide scope—it has the disadvantage of possessing a certain sphinx-like quality, a feeling of the great unknown. As I have already alluded to the level I wish to reach, viz., that on which stand those having something to learn of mounting, I may be permitted to indicate the section I wish to work. This may be most rapidly done in a negative manner. I shall say nothing of the ordinary commercial cabinet; of the mounts selected to convey mementoes to our friends (unless special friends); of that article beloved of the lazy amateur, the "slip-in," "slip-about" mount. Neither shall I by implication or reference further the interest of any particular manufacturer of mounting compound, but assume that you have the means and ability to evenly apply a good adhesive to a good print, and spend all my time in trying to help you to decide on what you will place it. Notice, I say a good print. By that I mean a print which is the result of care in the preceding operations of selection, development, and printing—a print that contains some thought or feeling you would wish to convey to others; a print, in short, that holds part of yourself, and that, whatever others may think, you are not ashamed to be judged by.

In a large photographic society there are almost sure to be those who take up photography as a pastime or relaxation, and who are able to command the time of, and willing to relegate the trouble to, experts. Again there be those who belong to the great army of "snap-shooters" (I detest the word, but it is current), and who are quite content if they get say ten hits out of twelve shots, even supposing these are only "outers" in every sense of the word; while, on the other hand, there may be many who have attained and long since passed the limited range of my remarks. All of these, to quote the Duke of Plaza Toro, "may allow their attention to wander." I shall not interest them. But the real "amateurs," the "lovers" of our science—art—craft—call it what you will, may find something interesting or new here or there in what I say, and it is to these, as a brother amateur, I submit this lecture. "Addressing, then, the attentive gentlemen," to quote once more, why should

we mount our photographs? Well, this is a question that would have admitted a much simpler answer ten or twelve years ago. Mounting was a necessity then, and although a necessity, strange to say, there was less attention paid to the subject than now, when the needs are less clamant. Prints being for the most part on albumenised paper, had a tendency to retire upon themselves in a bashful but persistently irritating manner, unless closely attached to something that would supply sufficient "back-bone," so to speak, to meet the public gaze. Any good white or cream board, and plenty of it, was considered good enough for this; and as thoughts on mounting seemed to run to area, and white boards were fairly cheap, a speck of print was usually sailing on a sea of mount. This "unrelieved expanse of ocean's gleam" ultimately began to pall on some man with ideas, and he got to confining his cruises to one side the line, or rather series of lines. But this still left him plenty of sea-room. Someone else, recognising the improvement, "went one better," and taking up the ends of these lines, he crossed and re-crossed, tacked, and came about in the most complicated manœuvres, till the onlooker was as much at sea as the print. Then came the advent of the use of colour boards. If the mount-maker was lavish in line, he was positively prodigal in colour. Purple, maroon, green, and gold (especially gold), singly and in combination, matt on matt, he piled them up, and having experienced the scope for variety in line, he pressed that also to his service. Dome and square, oval and rectangle, not to mention fearful and wonderful shapes beyond the limits of a geometric vocabulary, all striving in strident tones, and producing an effect of barbaric splendour, which in its own medium outstripped anything "Tchkowsky" ever dreamed in his. One would have thought that such examples of misdirected genius were long since decently buried; but there may be found for sale at the present day a new mount which, while being pitched in a lower key and appealing in smoother harmonies, succeeds nevertheless in completely smothering the print in the embroidery of its themes. As a specimen of marquetry it might reach excellence; as a mount it is simply excess. The grey dawn of the bromide and platinotype period came in a restful change, and ushered in the day of the "plate-sunk" and "India-tint" mount. In these latter times, hypercritical people have, with and without reason, condemned the "plate-sunk" mount, and it may be interesting to speculate on the cause of its adoption and its long run of popularity. The first batch of prints in black-and-white, when shown to that ubiquitous and all-round critic, "the man in the street," drew from him the exclamation, "How unlike photographs"; and his hasty and ill-formed conclusion has been stereotyped and set in nearly every photographic art critique to the present day. Certainly they were unlike the photographs he had been accustomed to, and more like the familiar engravings, lithographs, or etchings of the printsellers'. This was also recognised by their producer, and he saw that different treatment would be required in mounting. Now photography in its art infancy has too often been tempted to imitate its elders, and while imitation is the sincerest form of flattery, that flattery is not to the imitator. Hence when the maker of mounts boldly annexed the idea of India-tint and plate-mark from the province of plate-produced impressions, he made two very grievous blunders. First, he aided and abetted the uninitiated in forming a false notion as to the nature of the prints; and secondly, he made the more flagrant but less-censured mistake of putting his plate-mark outside his tint. The effect of plate-mark and tint on a white mount or broad-margined impression is decidedly good; but as I will show later, it might have been arrived at in a manner which would have saved us for many years from much adverse comment. But taking the much-maligned plate-sunk as it is, no one can deny it superiority for photographic purposes to its predecessors. Until recently, greys and grey-greens were the only shades to be had in this style of mount, but the infusion of art principles into photography, and the concomitant higher demands by the persistent amateur, have gradually changed all that, and at the present time no one can grumble at the paucity of tints in mounting boards, so that there can be no excuse for inharmonious mounting.

Having arrived at present-day conditions, at this stage the question may be repeated, why mount our photographs? Well, in many cases there is no reason why we should—and we do not. Photographs on heavy paper framed close up, and small prints on heavy paper with wide margin, such as may be got by printing in carbon, ozotype, gun, or platinotype, may with advantage be left unmounted. In two of the prints here shown the India-tint effect is obtained by legitimate photographic means. The prints (bromide or platinotype) are exposed in a frame with clear glass front and of sufficient size to take paper the full size of the finished picture. A mask is cut, showing size to be printed, and the part cut from this mask carefully laid aside. The mask is then laid on the clear glass front of printing frame, negative adjusted, and paper inserted to print. When printed, the mask is removed, and one with similar shape, but quarter to half inch larger, is inserted, the piece cut from original mask is carefully adjusted to cover the part already printed, the whole inserted once more in the frame, and a slight exposure given. This prints a band of selected width and varying depth all round the print, leaving the picture and white margin as before. A similar method was adopted with the bromide print, but the band was printed after the central part had been partially developed, to aid in accuracy of centring. The other unmounted examples are on platinotype C.C. paper, brush developed. But these means apart, prints are mounted, consciously or unconsciously, for three chief reasons:—(*a*) To isolate the print from its surroundings; (*b*) to enhance its good qualities; (*c*) to counteract its defects. I shall just say a word or two on the first reason, and deal with the second and third together. The amount of isolation a print requires depends a great deal on its surroundings. A print to be viewed in a room may not require such strong treatment as one for exhibition, where all the prints are adjacent, and each crying aloud for recognition. Hence heavy exhibition frames seldom appear to advantage unless in a large room, while portfolio prints admit of much daintier dressing. In this, as in many other points in mounting, a good deal depends on the point of view. The effect of a mount to enhance or mar a print may best be shown by experiment. Taking the two extremes, a white and a black mount, it will be noted that a grey print looks greyer on the white mount, but brightens up considerably on being placed on the black one. The selection will depend on the impression to be conveyed, always bearing in mind that there is a considerable range of mounting tints between white and black. There is nothing so easy to deceive as the human eye, and taking advantage of this, it will be seen that we have here, at one and the same time, a means of enhancing the qualities of our print, or of apparently removing some of its defects. But if we are to spend time on the isolating and enhancing properties of our mount, let us take care that we do not unduly burden it with the task. Has the print itself got good qualities, or negatively, not too many defects? Have we cut down all superfluities and disconcerting unnecessaries? Have we isolated the print as much as possible in itself? A good way to find this out is to employ two pieces of neutral-tinted cardboard cut in the form of the letter L, and by moving them about over the print,

find out how much can be done without. How many pleasing pictures lie lurking unseen in the weary expanse of large prints. The lens does not discriminate. One may of necessity be tied to a certain size of plate and a fixed focus of lens, but not to one size of paper when there are trimming knives in existence. Better far an inch of interest than a foot of futility. If a twelve by ten print contains but a ten by two picture, let that same knife have free exercise.

But you may urge, how about mounts? A dealer can hardly be expected to stock such odd sizes? Well, hardly. The poor man has his own share of life's little worries at our hands, without increasing the burden. He may carry a wide range of boards, and a full stock of cut mounts, but these necessarily will be of well-known sizes, usually corresponding to the proportions of our plates. So it comes to this, either you must trim your print to suit your mount, or cut your mount to suit your print. Having made up your mind whether mount or print is of most importance, the answer is obvious. This brings us face to face with the fact that the man who wishes to preserve the individuality of his prints must make his own mounts, and having once begun, I can hardly fancy him returning to the old order. For he thus frees himself from the bonds of the mount-maker and the dealer's suave—"Very sorry, sir! Just out of that particular size at present. Expect them in every day, etc., etc."—these all become echoes of the past. He will have no difficulty in having his ideas carried out, and be saved many barren explanations. And lastly, if he prints in any of the permanent processes, as he is most likely to do, he will be able to use odd pieces of pulp or straw board, which will reduce his mount bill considerably. It is advisable to have always on hand a sheet or two of large board, say 25in. by 30in., and a few sheets of facing paper, and the amateur is equipped to meet the demand of odd sizes and delicate colours better than the largest stocked house in town. Now, assuming that the advantage of home-mounting is acknowledged, the selection of a suitable mount for a particular print will depend mainly on three things, viz., texture, tone, and tint. Though circumstances demand that we should consider each of these prints seriatim, they are closely allied and have a mutual effect, working together to a common end. By the texture of the mount is meant the comparative coarseness or fineness of surface, and on this matter I wish to call attention to two points only. First, rough and smooth are comparative terms, and vary, or seem to vary, like tones, according to the quality or tone of the immediate surroundings. Hence a smooth-surfaced print will appear by comparison smoother on a rough mount than on one with a "laid" surface; conversely, a rough-surfaced print on an ivory surface mount will appear much coarser than it does when viewed on a rough-faced mount. This power is often very valuable, and should weigh in selecting a texture for any particular print. Secondly, rough papers break up and scatter rather than reflect light; hence of two equal shades of grey, that on a rough paper will appear softer and lighter than the same shade on a calendered paper.

Having noted these points, we pass to the next consideration, that of tone. The terms tone and tint are sometimes used indiscriminately, so, to prevent confusion, I may say that here the word tone is used in a similar sense to "pitch"—that is, a high tone is one approaching the light or white end of the scale of colour, while a low tone belongs to the dark. Tone refers to depth—tint to colour. For example, a shade of red and a shade of green might be of the same tone, but could not be of the same tint. In our experiment with the grey prints on the black-and-white mounts, we saw in extreme the effect of tone in mounting. Between black and white there is a very wide range of greys, and if we add colour or tint to our stock, an equally extensive range is available in each colour. On the white mount the greys appear dark and muddy, the high lights veiled, and the dark masses unduly dense. On the black, we improve the deep greys, banish the light ones, and cast a green-brown sheen on the shadows. Clearly we must find some medium tone if we would do the best we can for our print, and a trial or two on various shades of grey will probably give us what we require. The same method may be applied to colour prints, and I show you the effect of tone on a dark green and a dark blue carbon. The third consideration—that of tint—calls, perhaps, for somewhat fuller attention, as it is in this direction difficulties are most likely to arise. Let us first look at the general principle which underlies the whole question. Every photographic print has some dominant tint or colour, which varies according to the process employed in its production. Silver prints have usually the brown, brownish purple, or purple-black tints predominating; bromide and platinum papers range through the greys; while prints in carbon, ozotype, and gum bichromate allow the photographer some limited scope in the field of bright colour. In any single print, however, there is but one ruling tint, and the proper mount for that particular print—to be truly satisfactory—must either continue and harmonise wih it or, on the other hand, contrast with it under the laws of complementary colour. To mount harmoniously is much more easy than to mount in contrast, as the principles underlying the one are less complicated than those which govern the other. In harmonious mounting, the prevailing tint of the photograph should at once indicate the colour to be employed; considerations of tone and texture coming after. Yet how often do we find grey prints on green or brown mounts, showing either that this principle is not recognised, that considerations of tint have been sacrificed to tone, or (and this is much more likely) that the commercial range available in that size was limited. Now at the present time there is no excuse—save want of knowledge—for a continued perpetration of such mistakes. There is no dearth of material ready to hand. Several shades of so-called "crayon" paper, to be obtained from the artists' colourmen, are very suitable, while from the same source the stock may be enriched with sheets of "Whatman" in various grades; Michallet, vellum, and Japanese papers. Good shades are sometimes to be picked up at the printers' or paper-makers', in the line they call "cover papers," while many tints of homely wrapping-paper are not to be despised. In fact, there is nothing so far removed from the usual photographic sphere in papers that cannot now and again be pressed into service. You may doubtless remember the rage a year or so ago for brown-paper mounts. It was a swing of the pendulum, and like most movements started with a jerk, went too far. Brown-paper mounts were considered the salvation of every print mounted thereon, and hardly an exhibition lacked its patch of packing-paper. The demand got so persistent that makers made, and dealers took to stocking, brown-paper mounts, and the average amateur was for the moment happy. We have got over that now, and no man did more for the general upward tendency of mounts at this stage than Mr. Percy Lund, of Bradford. His "Nature Series" of mounting papers came—if I may safely annex the phrase in Edinburgh—as "boons and blessings" to the aspiring photographer. The range in this series is extensive and open to addition, and with, perhaps, one or two extra tones of grey, would meet all the demands we would be likely to make, till the advent of such time as colour photography enables us to emulate the example of the elder arts, and exhibit our productions in heavy gilt frames. Another firm catering for the wants of the artistic mounter is the publishers of the "Photographic

Art Journal," Leicester. They issue for 1s. 6d. a sample set of papers, from which one may make a large selection, there being over eighty different grades and shades in the sample packet. The sheets size about 20in. by 25in., and cost about 2d. per sheet. Some of these papers, and all of the "Nature Series," admit of scrap mounting for portfolio use, without any backing of cardboard. These same stores are available for mounting in contrast; but I approach this part of the subject with diffidence, as it is delicate ground, and presupposes a knowledge of the theory of complementary colour not usually possessed by every amateur. The appreciation of colour effects and values is largely a matter of temperament and training, but there are certain laws that influence results, whether or not we may be conscious of their working. Briefly, it may be said that colours in juxtaposition act upon each other. For example, a white patch on a green mount will assume a reddish tinge, while if mounted on a purple it will seem tinged with yellow. The same applies to prints on strongly-coloured mounts—it exists, but in a subtler form, in the tertiary colours also—and the amateur may best be advised to judge by experiment. If his attempt at colour contrast looks well—in the print, I mean, not the mount—then it may be successful; it will entirely depend, as does so much more in this branch of mounting, on the feeling or effect to be conveyed. But a word of warning may be given in this connection. Do not waste time hunting for colour contrasts to black-and-white prints, as no colour contrast to either exists. Black and white will contrast and harmonise with each other, and between the deep tone of the one and the high tone of the other lies the whole gamut of greys.

Having so far considered, in some of its phases, the theory of artistic mounting, let us now pass to the practice; and as example is better than precept, I may be allowed to submit to you some specimens, showing the methods of applying our knowledge to our work, asking you, however, to bear in mind that it is the method the specimens are meant to show, not the mount, and much less the print. We saw in casting about for the suitable tone of our grey print that a grey board fulfilled the conditions as to tone; but in some cases we may find that, while its general effect may be good, it may seem to lack something to connect the print and mount, and destroy the "stuck-on" appearance. This may be supplied in a variety of ways, such as the printing in of a matt, as explained; in saving a border of the original paper (if tinted), and so arriving at what is equivalent to the India-tint without being, as the mount-makers say, "laid on"; or by masking a border to print white, and trimming so as to leave a narrow margin of this between print and a darker mount. Care should be taken, however, that the print is amenable to this treatment, or the border may get lost in a white sky. Another method is to lay he print first on one tint or tone, trim to show a margin of that, and then place the whole on another tint or tone. This may even be repeated with care, showing two tones, or a combination of matted border and applied tint be used successfully. This method is much used by our American friends, and sometimes, in fact, we find this called the American method of mounting. It may be easily overdone, however. An example is given of this treatment on the lines of contrast. But this breaking or connecting effect may be got in another way, viz., by what is known as the French method. This style, when neatly done, is very effective for delicate prints, and consists of a series of lines drawn about the print, of varying widths, at irregular intervals, with perhaps one or more of these intervals filled in with a wash of a pale tone in correct tint. I have already spoken of the plate-mark, and acknowledged its use in breaking up the space between the impression and the edge of the margin. As we have no impression, and hence no plate-mark, to mark a mount with a blank plate or card, and then paste on a photograph, is undoubtedly trying to sail under false colours, and although few could be taken in with the deception, let us be true to our own flag. The same effect may be obtained by indents made with any stylate instrument or the edge of a paper-knife. This is very effective on a paper of good substance, such as Whatman "not."

In mounting on straw boards, all of the foregoing methods are available; but if cut openings, either plain or bevel, be desired, a white board must be used, as the edge shows. This white edge may take the place of the white matt if the board be thick and the bevel deep; in which case, if a tint also is employed, the tint should be laid down first and the opening cut afterwards. The cutting of bevel mounts is not a difficult matter, all that is required being a bevel rule with a bevel about 45 deg., a good flat knife or chisel, a cutting board or glass, and an obliging friend or a clamp. Of the latter perhaps the clamp is to be preferred, as you can put on the screw with less compunction. Having marked the desired opening, the bevel rule is placed sufficiently back from the line to allow the knife to get just on it when placed on the angle, the further end clamped to the bench, board, or table, and the cut or cuts made. It is desirable that if more than one cut is made in the one line, the second be a true continuation of the first, or ragged edges will result. The full effect of matts is obtained with a deep bevel on a double or triple board, but in this case the facing-paper is better laid over the bevel as well. A word about the size of the mount in relation to that of the print. Small prints require relatively larger mounts than large prints, therefore it follows that the larger the print the smaller relatively the mount, till in large sizes the mount may be dispensed with altogether. If the mount be too large, it dwarfs the print. If the margin of mount visible is equal to or more than the width of the print, the latter looks insignificant. In trimming a mount, which I usually do after rather than before the other operations, there are one or two little points to be observed. The diagonals of mount and print should never coincide. If the composition has a vertical tendency, dignity will be added by leaving the margin at top and bottom greater than that at the sides; while if the composition be horizontal, repose will be gained by the greater margin being at the ends. This refers, of course, to rectangular prints; circles and ovals require special treatment. The circle is a difficult figure to fill in a good decorative manner, and the oval more so, there being very few subjects that suit it; but if it is desired to trim to such shapes, a circular wheel trimmer and circle or oval metal forms are almost an absolute necessity, unless more elaborate and expensive apparatus be employed. Do not be led away by fad or fashion to adopt one style of mounting for everything Let individuality enter into this as in other portions of your work, but do not mistake eccentricity for genius. With the knowledge of the effects of texture, tone, tint, and size on your print, employ that which will best express your idea. Art ceases to be art and becomes science when hemmed in by rules or laws, and so in artistic mounting it does not become one to dogmatise or lay down rules which, if blindly followed, would rob the result of all artistic quality; but rather I have attempted to indicate some of the lines along which the intelligent worker may proceed, remembering always that the only true rule of art is study, experiment, liberty, and personal feeling.

J. W. Eadie.

Those who are interested in the prosperity of the Photographic Association of 16, Brook Street will be glad to hear that the newly elected board of directors are strengthening its financial position by a considerable issue of debentures at 6 per cent., most of which have already been allotted.

Exhibitions.

HACKNEY PHOTOGRAPHIC SOCIETY.

The annual exhibition of the Hackney Photographic Society was held at Morley Hall, Hackney, on the 12th, 13th, and 14th inst.

The fact that the Hackney exhibition immediately follows the great photographic exhibitions of the year places the unselected work of the members of a suburban society in direct comparison with the pick of nearly three thousand photographs from all over the world. That, in such a competition, the Hackney Society is beaten is inevitable. That it is possible even to suggest the comparison shows that the little photographic community which forgathers week by week in the east of our city consists of able instructors and apt pupils, that the technical and pictorial aspects of photographic practice are equally matters of serious study, and that in spite of the individual spirit of emulation which must necessarily exist where there are prizes to be competed for, the members as a body are united in their efforts for the honour of their society. The exhibition that has just closed was indeed worthy of unstinted praise. It did not consist entirely of masterpieces—no exhibition ever did, but there was so much that reached the level of the best photographic work of the present day, and so little that fell immeasurably below it that as a whole it constituted perhaps the best society's exhibition that has been held within the London district. We have been referring to the members' classes, but the Hackney Society has always attracted some of the best work of the year to its open classes, and this year there was no falling off, perhaps an improvement.

The society is not very fortunate in the accommodation which it has for holding its exhibitions. The Morley Hall, though suitable enough for a concert or lecture hall, is certainly not an ideal exhibition gallery. It is insufficiently lighted, and the wall space available does not allow the pictures to be displayed to their best advantage. These are difficulties the society cannot overcome unaided, and it is to be hoped that at no distant time the educational value of such an exhibition as this will be recognised, and that, instead of an exhibition open for three days, under municipal encouragement, it will be open free for a sufficiently long period to allow all who are interested to view it.

The judges were Messrs. Reginald W. Craigie, A. Horsley Hinton, and Rev. F. C. Lambert. It may be a mere coincidence, but while on the members' side only one award was made to a picture accepted at the Royal or the Salon, several were made to pictures rejected by one or the other. On the open side there were two of the medalled pictures from the New Gallery; one was passed over and the other received a bronze medal. There is something very wrong somewhere. The fact that three, or really four, sets of authorities can create such hopeless confusion as to the merits of the same pictures is not a hopeful sign of the times.

The Awards.

MEMBERS' CLASSES.

Best Picture in Members' Classes.—Gold medal, F. E. Roofe.

Class A.—Portraiture and Figure Studies.—Silver medal, W. A. I. Hensler; bronze medal, G. Parks; certificate, F. E. Roofe.

Class B.—Landscape, Seascape, and River Subjects.—Gold centre medal, E. J. Hunt; silver medal, W. Selfe; bronze medal, W. A. I. Hensler; certificates, W. F. Fenton-Jones and W. Selfe.

Class C.—Animal Studies.—Silver medal, W. Selfe; bronze medal, J. L. Smith.

Class D.—Architecture.—Silver medal, F. E. Roofe; certificates, Dr. Roland Smith.

Class E.—Lantern Slides.—Silver medal, F. E. Roofe; bronze medal, A. W. Cook; certificate, W. Selfe.

OPEN CLASSES.

Best Picture in Open Classes.—Gold medal, W. Scutt.

Class F.—Portraiture and Figure Studies.—Silver medal, Miss A. B. Warburg; bronze medal, J. D. Shields.

Class G.—Landscape, etc.—Silver medal, V. G. Barford; bronze medal, J. M. Whitehead; certificate, W. A. I. Hensler.

Class H.—Architecture.—Silver medal, Rev. H. R. Campion; bronze medal, W. R. Lathbury.

Class I.—Still Life, Animals, etc.—Silver medal, W. Selfe; bronze medal, O. G. Pike.

Class J.—Stereoscopic.—Silver medal, L. S. Wilks; bronze medal, W. Harvey.

Class K.—Lantern Slides.—Silver medal, J. W. Hodges; bronze medal, J. W. Hodges; certificate, W. J. Shelley.

TRADE SECTION.

Best Exhibit.—Silver medal, G. Houghton and Sons.

Most Useful Photographic Novelty.—Bronze medal, J. Ashford.

We have already indicated our opinion of the general progress the society has made since the last exhibition, but particularly is improvement to be found in the class for portraiture and figure studies. This class of subject at Hackney, as with most societies appears, until recently to have received only occasional and desultory attention, with the result that at the exhibitions the class contained hardly anything worth looking at. The impetus in the Hackney Society seems to have been given by Mr. Snowden Ward, who invited the members to spend a summer day at his place at Tonbridge, provided a few graceful models, and stimulated efforts by the offer of prizes for the best figure studies made on the occasion. The result has been that the class contains several extremely good pictures, obviously taken at the Tonbridge excursion, and further that some of the members have realised that success in this branch of photography is quite within their reach if the same serious study be given to the essential conditions that, applied to field work, has won them eminence. The president of the society, Mr. Wm. Rawlings, who marks all his work "Not for Competition," has produced a most successful version of his Tonbridge model, and has imbued his picture with the refinement which characterises all his work. W. A. I. Hensler's "Musician," for which he has evidently been his own model, was also an entirely satisfactory work, and it was perhaps an unavoidable feature of the surroundings that robbed F. E. Roofe's "Blind News Seller" of something more than ordinary distinction. G. Parks, W. Selfe, H. W. Lane, and F. W. Gosling deserve a good word, and several others showed work that was more than passable.

The landscape class, which has always been at Hackney an echo of the fashions of the day, showed signs of a breaking away from the ordinary conventional subjects, treated in the conventional way. When mud puddles were the rage, Hackney revelled in mud and mist, but it must be confessed it was good mud and mist, though there was too much of it. One would have thought the members lived in a poetical atmosphere of gloom and melancholy, though they are usually as sunny a set of fellows as one would wish to meet; then came a period of woodland glades and forest paths, and the pensive charms of sylvan solitude was the all pervading sentiment. Since then experience has taught them to be more catholic, and if they are now prone to choose less romantic materials and more homely aspects of life, such as the dust cart, a fire engine station in Cloth Fair, Ludgate Hill from St. Paul's, etc., it is due to them to say that they are not unsuccessful in treating their subjects with that feeling for what is picturesque in them that characterises the works of the old Dutch masters when dealing with similar themes. But we do not wish to convey the impression that this kind of subject was more than pleasantly in evidence. There was plenty of spring, summer, autumn, and winter, and, indeed, a wonderfully good variety, and hardly a photograph that did not deserve its place on the wall. There were too many good things to refer to individually, without unduly trespassing on our space.

The architecture class, and that for animals, etc., were not so well filled as usual, but some very fair work was to be found amongst that shown.

The open classes were quite as well supported as usual. At this exhibition the classes are always greatly helped by contributions from members of the society, for it is considered a great thing to win a medal in an open class. Last year a member succeeded in capturing the gold medal. This year the society has not been so fortunate, but two silver medals and a certificate have been its share. Among the best known exhibitors in the open classes are H. Quilter, A. and F. Read, W. Scutt, Graystone Bird, Miss A. B. Warburg, E. A. Morgan, Jas. Auld, W. A. Stewart, C. Sweet, A. Tauxe, W. Kilbey, Jas. Gale, J. G. Barford, W. A. I. Hensler, G. H. Capper, W. J. Shelley, W. R. Lathbury, J. M. Whitehead, O. G. Pike, G. T. Harris, J. T. French, S. C. Stean, Rev. H. R. Campion, H. W. Bennett, W. Selfe, C. E. Walmsley, L. S. Wilks, and J. W. Hodges.

The trade exhibitors were Messrs. J. Ashford, Birmingham; R. and J. Beck, Cornhill, E.C.; Burroughes, Wellcome, and Co., F. F. Dadd and Son, Hackney; G. Houghton and Sons, T. Illingworth and Co., Ltd., the Kodak Company, J. Lizars, Sanders and Crowhurst, Shaftesbury Avenue; the Warwick Dry Plate Company, and S. J. Beckett, Baker Street, W.

In addition to the ordinary attractions of the exhibition, each evening there were concerts, lantern entertainments, and demonstrations of stereoscopic radiography, and wireless telegraphy.

SOUTHAMPTON CAMERA CLUB.

[From a Correspondent.]

The Southampton Camera Club is to be congratulated on the initial effort in proving its capabilities in running a big open exhibition. This year's show places it at once in the front rank with other prominent Southern societies of the calibre of Southsea and Hove; and the most captious critic can find no fault with either the organisation of the show itself or the quality of the work sent in; indeed it is all of a very high standard. The Society has the good fortune to possess those desirable components—a hard-working, enthusiastic hon. secretary, and a competent committee. The Exhibition's success is due undoubtedly in a great measure, if not entirely, to the unrelaxing efforts of Mr. S. G. Kimber, the hon. secretary. The members of the committee have helped conscientiously throughout,

and it is a significant sign of the vitality of the Club that out of a membership of about eighty, nearly 50 have contributed specimens of their work to the Exhibition. Who can say after this fresh proof that Southern societies are moribund?

The idea of running the three Exhibitions of Southampton, Hove, and Southsea consecutively, and so save the cost of carriage between the shows, has undoubtedly had a big effect in bringing a great amount of good work to Southampton, and if the idea is as well carried out in future years, there is no reason to think otherwise than that these three societies will be the pick of the English exhibitions.

The Southampton catalogue, which is a well got up production, and should be a profitable source of income to the Exhibition, shows 582 entries. Of these 136 are contributed by members of the Club, and the remainder are in the open classes. The Rev. F. C. Lambert, M.A., and Mr. Walter D. Welford, F.R.P.S., were the judges, and they expressed themselves well pleased with the high standard of work shown throughout all the classes, indeed the judging was anything but an enviable task.

Dealing with the members' classes first, the awards are (Class K.) Landscapes, etc.):—Silver medal—F. Thomson, for a quiet toned little platinum print: a river scene, entitled "Summer Time." Much of its beauty, however, is lost by contrast with its shocking frame of brilliant silvered wood and wide blue-grey mount. With one or two notable exceptions, unsuitable mounting and framing seem the shoal on which many members of the Club have wrecked their ship of success. The true comprehension of a suitable environment for their prints will be more than quickened by a glance at the framing in the open classes, which should prove an education in itself to these members. Bronze medal—E. Harrington, for "Autumn Haze," strikes one as being a trifle spotty about the sky; and certificate—S. G. Kimber, for a crisp little toned platinum print, entitled "On Chilworth Common."

Notable in this class are:—15, a dyed bromide print, "Evening, Hamble River," by F. Thomson, which has a most striking effect, although the means of obtaining it are questionable; 11, "Early Morning, Quimper," by Rev. J. Cairns, which, with its smoky haze rising from the housetops below, gives a fine suggestion of breakfast; 8, "My Remedy is an Absolute Cure," by the same worker, is one of the most vigorous bits of pure hand camera snap-shot work in the show; 13, W. J. Goatcher's "In the Stubble," a pleasing sheep study, which might, however, be improved by more judicious trimming; 26, Arthur Gibbings's "On the Ockment, Dartmoor," a little gem, full of life, and showing high technical qualities; 10, E. Max-Mills's "A Light Breeze," a good yachting study; 25, a vigorous landscape by G. R. Johnson, "Through the Woods," the true value of which is rather marred by its light mount; 24, "At Bosham," showing good selective abilities on the part of the worker, Geo. Vialls, although sky a trifle overdone. C. C. Cook also shows several good things in this class, all remarkable for careful selection, clean work and suitable framing. S. G. Kimber's other contributions are also noteworthy, and some carbon prints by A. E. Henley show that at future exhibitions the worker will take high rank. In Class L. (Portraiture, Figure, and Animals), Ed. Max-Mills secures the first award with a clever animal study, "Red Deer," evidently a bromide enlargement rather unevenly toned. C. C. Cook takes second place with a charming figure study *en plein air*, entitled "Meadow Sweet," while the third award is withheld, although Nos. 27, "Mischief," by Arthur Gibbings; 61, "Her Daily Toil," by Rev. J. Cairns; 57, "A Snack," by R. E. Jurd; 70, "Harrowing," by R. E. Jurd; and 66, "Old Dave," by S. G. Kimber, seem worthy of attention.

In the Architectural Class, M., C. C. Cook again scores, and takes the silver medal for 97, "Old Houses, Dinan," a good representation of a street in this old world town, showing careful selection on the part of its producer; 108, "To the Nave, Winchester Cathedral," by S. G. Kimber, is worthily awarded the bronze medal; and the certificate goes to H. R. Northover, for his little print, "Old Steps, West Gate Tower, Southampton," which is nearly spoilt by being overframed. Other exhibits specially worthy of note in this class are 109, "Interior Tudor House," G. T. Vivian, and 84, "North Aisle Steps, Winchester," by the same worker; 96, "Norman Arches, Winchester," C. C. Cook; 103, "Behind the Choir, Winchester," G. R. Johnson; 111, by C. C. Cook. This is a very strong class and shows good thoughtful work throughout, and also contains the only contribution of a lady member—110, "A Studio Exhibition," Miss Lydia Powell.

In the open classes some remarkably good work is shown in Class I., "For amateurs who have never won an award in any exhibition," and which proves that there is "as good fish in the sea as ever came out of it," Gilbert Watson takes the premier award (bronze medal) for a stirring landscape 124, "Sand Dunes," which shows a good mastery of technique, although perhaps the clouds are a trifle overdone, and 130, "Auld Reekie, a Study of Factory Chimneys and Fog," by Dr. Fred B. Jefferies, is awarded the second place, although there are many better things in the class, notably 128, 137, and 148, three good compositions representing ice-bound stream scenes, with pleasing touches of sunlight and shade, by F. Parkinson; 123, "What of the Weather," by Lewis Longfield; 163, "Sunlight on a Cottage Floor," by E. S. Tardrew; 151, "Portrait of a Sailor," a quaintly lit but distinctly pleasing figure study, by J. H. Greville; 149, "In the Crypt D'Aquilon," a successful architectural bit by A. De Silva; 144, "An Organ Grinder," an effective portrait study, by E. Boyer Brown; 145, "An Echo of Caldecot's," is also a good attempt, rather spoilt by the wall paper background.

Coming now to Class A. (Landscape River Scenery and Marine), open to all—the strongest class in the show, containing no less than 145 exhibits—Charles E. Etches is awarded the silver medal for a representative example of the advanced fuzzy school, "A Derbyshire Dale," which, in justice to its latent pictorial possibilities, rather suffers by close contact with the bright gold slip of the frame. 213, "Homewards," a delicately rendered boat scene, teeming with light and atmosphere and conveying an idea of breadth and distance distinctly pleasing, secures the bronze medal, Gilbert Watson. And 224, "A Winter's Day," which well carries out the title, gets the certificate, G. H. Capper. This class contains many fine things, which must have run the winners very close indeed for an award. Dr. C. F. Grindrod's contributions are remarkable for strength and vigorous lighting, particularly 168, "A Worcestershire River," with a printed grain, evidently made with bolting cloth, and very atmospheric in effect; and 197, "Carting Trowse." 180 is a crisp little picture, entitled "Drying the Sails," by Miss Edith Thompson. 191, "Nature's Graces," W. A. Hubbard; 193, "The Cooling Stream," James Higson, are also both good. 196, "Sunshine," a well rendered effect of sun amongst tree trunks, by Augustus Fenn. 206, "Summer in the Woods," by D. Deely, is also a fine rendering of a similar subject. 210 gives a beautiful rendering of snow, and is entitled "Winter," Miss M. M. Eames. 219, "Sunrise," by Charles E. Etches, carries out the idea of the title perfectly. 202, "Reapers," is a work of important size, by Augustus Fenn, which fails somewhat in the matter of composition, the placing of the figures producing a spotty effect. 178 is a beautiful little reaping scene by E. Wood, who would have scored higher if more attention had been paid to the relative lighting of sky and figure. 187 is a pretty little cloud study by H. S. Sidebotham. 167, "The Harvest Moon," is a good example of the "What is it school?" and calls for attention only by the absurd length to which its author, F. M. Andrews, has carried fuzziness.

172, "After a Storm on the Thames," by Colonel W. F. Noverre, is just the opposite, and a rather pleasing subject is spoilt by the excessive lack of atmosphere and unnaturally heavy clouds. 211 and 212 are a couple of quaint pictures on silk by A. Tauxe. Graystone Bird contributes many examples of his excellent work, 216, "Summer Idleness," being very pleasing, although the figures are a trifle "posey." 243, "The Silent Watch," is a cleverly conceived and well carried out idea of moonlight amongst ruins; and 252, "Meadow Sweet," is a good figure study. 249, "The Glitter of the Sun," by A. R. F. Evershed, is a little gem, but suggestive more of the glitter of the moon. 228, "A Snowy Shore," by Miss A. Bird, is rather uneven, but very delicate and pretty. 226, "Thames Barges," by A. R. F. Evershed, is very striking, but the mounting is reminiscent of the American school at its worst. 246, "Harvest," by W. B. Summers, is a breezy little thing. 247, "Becalmed," shows thoughtful work, by G. H. Capper. 253, "Sunny Moon," a study of birches by Dan Dunlop, is good, straight-forward work, although the subject is rather hackneyed. 256, "A Dweller in the Wilderness," is a striking sheep study which gives an effect of solitary grandeur. 248 is a strong cattle study by R. Thomson. Mr. Hofler contributes many fine landscape subjects, which, however, arrived too late for judging. And other pictures in this class worthy of note are 233, "An Old World Fishing Town," Graystone Bird; 235, "Pastures," W. H. Max-Mills; 240, "A Forest Path," by the same worker; 242, "Misty December," by W. T. Marriott; and 309, "Industry," a fine rendering of smoke rolling from factory chimneys, by A. Nicholson.

A. L. Spiller, Syd. A. Pitcher, D. Fuller England, Captain F. Young, Fred Judge also sent noteworthy examples of their work.

In Class B. (Portraiture, Figure, Animals, etc.), which is also a very strong class, the silver medal goes to Miss Bessie Stanford for 392, "Shadows of departing Day," a carefully thought out and cleverly executed "genre" subject with a pathetic character all its own: an aged countryman bends over an old sundial, peering at the fleeting shadow cast by the evening sun. Andrew Paterson takes the bronze medal for "The Plotter," 318, a sinister-looking individual in Cromwellian costume and a pose very suggestive of Steichen's "Solitude." It is a pity, however, that the print, a bromide, is of such poor quality. Drummond Shiel's "Old Spinner, 370, takes third place and undoubtedly deserves it, as it is a beautiful little picture of high technical and pictorial quality. No. 310, "Lady with Hat," by A. Tauxe, commands attention by its powerful light and shade, and stands out as one of the strongest things in the show. 313, "In the Highlands," is a clever cattle study, by Colonel W. L. Noverre, and

oks almost like a copy of a painting. 316, "My Old Sun Bonnet," an effective portrait study, by Miss Maud Shelley. Dr. C. F. rindrod's "Village Scholar," 321, is immense, and quite in this ever worker's best vein. Ed. Norton Collins' fine figure studies, 322 d 341, are splendid examples of high technical knowledge well plied. John H. Coath contributes some excellent "straight" work, though 326, "A Copper, Please," suffers somewhat for want of imming. 337, "Portrait of a Clergyman," by R. M. Scott, is iginal in treatment. 342, "I Saw a Ship A-sailing," by F. A. cMichael, is a first-rate rendering of flesh. Miss Johnson's two ortraits, 348 and 349 are delicate in execution and show a complete astery of pose and lighting. 350, "Pleasance," is a striking portrait "Ozotype," by C. J. West; and C. Skelton Tyler is well repre- nted by his two charmingly unconventional figure studies, "Daddy's et," 352, and "The Skein of Wool," 363. Graystone Bird's delightful ttle figure study, "Good-morning," should be as successful as his opular "Good-night," which is saying a great deal. A. Tauxe's hibits are characterised throughout the exhibition by their origin- lity and forcefulness, and 357, "Study of An Old Man" on "Mattos," another good example, and also is 359, "Little Raphael." And 378 79, and 380, "Mineur" — strong semi-nude figure study — John haffin and Son's exhibits, in their curious frames, attract much at- ention and are withal good work. 388, "The Glove," by H. Wild, s cleverly lit, and 420, by the same worker, is also well done. 415e is striking portrait study by S. A. Pitcher, and 383, "The Forge," hows good technical work again, by W. B. Summers.

In Class C. (Architecture), W. A. Max-Mills, a member of the outhampton Club, takes the first award with 426, "The Montague hantry, Christchurch," a noble picture and a clever representation f a difficult subject, both as regard lighting and selection. W. R. athbury, who contributes several first-class examples of architectural ork, takes the bronze medal for 436, "As Day Steals on Night: elting the Darkness"; and W. Kilbey secures the certificate for 438, A Norman Crypt." The Rev. H. R. Campion's work in this class hows difficult subjects overcome in a masterly way, and Alfred edding, Syd. A. Pitcher, A. L. Spiller, and E. F. Harmer also how notable pictures. A. Nicholson's frames unfortunately arrived oo late for judging.

Class D. (Flowers, Fruit, Still Life, Natural History, etc.) has rought together a good collection of artistic work, and the silver edal is taken again by Mr. Max-Mills for a beautiful photograph f "Apple Blossom," 455, which is almost stereoscopic in effect. A auxe secures the bronze medal for his curiously coloured "Mattos" rint, "Still Life," and certificates are awarded to both Douglas nglish for his always interesting photographs of "Old English lack Rat," and Mrs. Alice Dumas for "White Clematis," which as the effect of being almost in relief. Mrs. R. M. King's "Short ife and Merry" is a good study of butterflies, and Miss Mary C. ames' "Chrysanthemums," are as delightfully done as most of this lever lady's work. Miss E. L. Turner's natural history photographs re distinctly clever, and J. C. H. Wallsgrove is another exhibitor whose work is always praiseworthy. Dan Dunlop's "Daffodils" are lso good.

The Champion Class—for pictures that have previously taken an xhibition award—concludes the pictorial part of the show, and con- ains many old friends, and it must have been a difficult task indeed o judge them. The gold medal, however, falls to Dr. C. F. Grindrod's "Woodcutters"; the silver medal to Ed. Strong's "At Midnight"; the bronze medal to Ed. Norton Collins' "The Old General"; and the certificate to James Burns' "The Wind Bloweth rom the Sea." It must be said, however, in justice to Thomas Wright's nagnificent landscape, "Winter," that it arrived too late to be udged.

The lantern slide entries are exceptionally heavy, and include much good work. The awards are:—

Class F. (Landscape, River Scenery, and Marine), bronze medal presented by H. Wilson), V. E. Morris; certificate, W. A. Clark.

Class G (Portraiture and Figure Studies), bronze medal (presented by P. O. B. Hartnoll), Harry Wade; certificates, A. Warden Harvey and Graystone Bird.

Class H. (Architecture and other subject not included in F. and G.), bronze medal (presented by A. H. Marsack), A. Bailey; certificate, W. A. Max-Mills.

Class J. (Any Subject for Amateurs who have never won an Exhibition Award), bronze medal (presented by H. Wilson), F. Parkinson; certificate, A. Black.

The "A.P." special silver medal (presented by A. Horsley Hinton, Esq., editor of the "Amateur Photographer," to the best set of slides n Classes F., G., and H.), V. E. Morris.

Class N. (Members' Class, any subject), silver medal (presented by G. R. Johnson), E. G. Rose; bronze medal (presented by P. O. B. Hartnoll), W. J. Goatcher; certificate, F. W. Winzar.

Two fine portraits, one of the president, Mr. Burroughs Hill, F.S.I., and the other of the hon. secretary, S. G. Kimber, attract much attention, and have generously been presented to the Club by their exhibitor, Mr. Max-Mills.

The entire Exhibition is arranged in tasteful fashion in the admirably lit main hall of the Southampton Art School, Marland Place, and the show is attracting great attention locally.

Mr. Martin, of Southampton, has on view in the centre of the room a stall of the latest photographic novelties, and the lantern slides were shown at the Club Rooms, Philharmonic Hall.

FRENCH AND ENGLISH PROFESSIONAL PHOTOGRAPHERS.

THE following is a condensed translation of a letter addressed to Mr. Alfred Ellis, hon. secretary of the Professional Photographers' Association, by Monsieur Paul Nadar, President of the Chambre Syndicale de Photographie et de ses applications, of Paris:—

Chambre Syndicale de la Photographie
et de ses applications,
Paris, 27th October, 1902.

My dear Mr. Ellis,—

I have to thank you for sending me your last two little books containing information on the Professional Photographers' Association. I have had them translated, and probably we shall insert an article about your association in one of our reports.

As you desire, I have much pleasure in sending you the Statutes of our "Chambre Syndicale." I also send you, in the name of the French photographers whom we represent, an account of the National Congress of Professional Photographers of 1900, the organisation of which will perhaps interest some of your members; at the same time they will find therein the different questions that were treated.

Our "Chambre Syndicale" represents, as you know, the corporation of French professional photographers, and its mission is to watch their interests and support their rights. It includes not only commercial photographers taking portraits, landscapes, monuments, reproductions, enlargements, etc., but also photomechanical industries in all processes.

These are all admitted to our association as active members. We also receive as honorary members inventors, manufacturers, dealers in apparatus, instruments, and photographic accessories, but the latter, though entitled to be present at the meetings and take part in the discussions, have no right to vote. This regulation is made to prevent the association from diverging from its original intention, that of protecting the interests of professional photographers.

We also admit as honorary members foreign photographers, whether of our own nationality or not. You will see also in Article 6 that one of our objects is to establish and keep up relations with all French and foreign societies having a similar aim to ours. In our thoughts and intentions we would wish that the development and progress that can be obtained in many cases of fraternal understanding on various questions for our mutual interests could be internationally spread.

We do not ignore the obstacles that prevent us realising this golden age of photography, but we depend at least on the cordiality and understanding between photographers of different countries to render mutual assistance.

At this moment I am occupied with the important preparations for our next congress, which takes place on the 25th, 26th, and 27th November. The congress is to have the support of Government, and has as honorary presidents the Minister of Commerce and Industry, and the Minister of Public Instruction and Fine Arts. It has been very important to us that in 1900 the Minister of Fine Arts patronised our congress, and it is equally a matter for congratulation to be accorded the same protection this year, as heretofore photography has never been officially classified with the fine arts. I point out these details to you, as probably you have found the same difficulties and undergone the same struggles that we have.

We have instituted a competition to instruct photographers in the best systems of lighting, whether by electricity, magnesium, or acetylene, for portraiture, enlargements, and photomechanical processes.

I beg of you to read either the whole or part of this letter to your colleagues, and to present the cordial salutations to your new society from the "Chambre Syndicale Française de la Photographie," to which I am proud to belong, and accept from myself a hearty shake of the hand.

P. NADAR.

THE Newcastle-upon-Tyne and Northern Counties Photographic Association held the first meeting of the session in the Connaught Hall Y.M.C.A., Newcastle-upon-Tyne, on the 11th inst. The meeting partook more of the nature of a social entertainment than of the ordinary society meeting. The president, Mr. W. E. Cowan, opened the proceedings with a genial little speech, in which he gave many good reasons why photographers should join the association. An exhibition of high-class lantern slides by some of the foremost workers in the north followed; Mr. J. P. Gibson's Tyne scenery, and Mr. W. E. Cowan's night photographs of Glasgow Exhibition being especially fine. After the lantern slides had been duly admired, and refreshments were partaken of, the members and their friends settled down to listen to an excellent concert. The enthusiasm displayed augurs well for the success of the remainder of the session.

Commercial & Legal Intelligence

MESSRS. FUERST BROS. have engaged Mr. Walter D. Welford to demonstrate their "Axe" brand specialities before the various photographic societies. The title of his lecture is "Photographic Flexibilities."

THE Austin-Edwards Monthly Film Negative Competition.—The prize camera for current month has been awarded to Mr. Harold Moore, Quinta, Sidcup, for his negative, "An Old Gateway, Glastonbury."

ALWYNE DYSON, Ltd.—The above-named company has been registered with a capital of £2,000 in £1 shares. The objects of the company are to carry on the business of photographers, manufacturers of and dealers in photographic materials and apparatus, pictures, prints, engravings, and works of art, printers, etc. Registered office: 67, Grainger Street, Newcastle-on-Tyne.

THE Bausch and Lomb Competitions.—Messrs. A. E. Staley and Co., of 35, Aldermanbury, E.C., write: "Messrs. Bausch and Lomb have advised us of an extension of the time for the receipt of the pictures for their 3,000 dollar prize competition, which was originally announced to close on January 1st, 1903, but owing to the desire of their friends in European countries, they have extended the time till October 1st, 1903. We shall be pleased to supply booklets of the competition to applicants, if they will favour us with their names and addresses."

AFFILIATION OF Scottish Societies.—At a meeting of the district societies held in Dundee on Saturday, it was decided to form an affiliaton of photographic societies for their mutual benefit, but before taking any active steps in the actual formation it was decided to ask all the societies in Scotland to join and so make the movement national in its scope. Mr. John B. Maclachlan, Blairgowrie, was appointed to write to the secretaries of all the societies appearing in the "BRITISH JOURNAL Almanac," but any omitted will oblige by communicating with him.

W. A. WHARRAM, Limited.—The above-named company has been registered by Jordan and Sons, Limited, 120, Chancery Lane, W.C., with a capital of £10,000 in £1 shares (5,000 preference). The objects of the company are to carry on the business of chemists, wine, beer, and spirit merchants, distillers, importers of aerated mineral and artificial waters, manufacturers of photographic and scientific apparatus and materials, etc., and to take over the business carried on at 49, St. Paul's Street, Leeds, as W. A. Wharram. No initial public issue. The first directors (to number not less than two nor more than five) are W. A. Wharram, T. B. Wharram, and W. Brown (all permanent). Qualification £100. Registered office, North Street, Leeds.

THE Photographer and his Apprentices.—At the last sitting of the Gloucester County Court, before his Honour Judge Ellicott, two actions against Edwin Debenham, photographer, of Newquay, and formerly of Gloucester, were heard. They were brought to recover £50 in each case for alleged breach of contract to teach Alfred Samuel Lyde and Elsie Webb the art of photography, and application was also made to cancel the indentures. It appeared from the evidence that defendant sold his business at Gloucester and went to Newquay without making any arrangement for his apprentices, though it appeared that subsequently he offered to transfer the apprentices to his successors, or to provide for them at Newquay. Judgment was given for plaintiffs for £25 in Lyde's case and for £15 in Webb's case, each with costs, the indentures to be cancelled.

AN Injunction Granted.—At the Wakefield County Court on Wednesday last, George Henry Pycock, photographer, Normanton, sued A. I. Hart, also a photographer, of Normanton, to recover £3 7s. 6d., moneys over-paid on commission, and £10 10s. damages through breach of agreement. Plaintiff also sought for an injunction restraining defendant from carrying on business at Normanton. On April 19th, defendant entered plaintiff's employment as canvasser on commission, and signed an agreement not to commence business on his own account or canvass for others within three miles of Normanton for two years. Afterwards defendant ceased to canvass for plaintiff, and it was alleged that he had since started business on his own account at Normanton, though professedly in his son's name. He had also, it was alleged, been paid commission on orders which were not bona fide. Defendant denied this latter allegation, and said he thought the agreement only related to canvassing. His Honour granted an injunction, and awarded plaintiff £2 2s. damages.

ILFORD, Limited.—The following is an extract from the Directors' report for the year ended October 31st, 1902:—The Directors have the pleasure to report that after payment of working expenses, directors' fees, income tax, etc., and making provision for doubtful debts, the net profit for the year's trading is £51,507 15s. 3d. This amount, with £4,407 3s. 8d. brought forward from last year, gives £55,914 18s. 11d. for appropriation. The directors have paid an interim dividend on the ordinary share capital for the half-year ended April 30th, 1902, at the rate of 8 per cent. per annum, absorbing £7,600, and for the same period they have paid the dividend on the six per cent, preference shares, amounting to £5,700. Since then the second dividend on the six per cent. preference shares has been paid. From the balance, the directors recommend that on the ordinary share capital, a dividend be paid for the half-year ended October 31st, 1902, at the rate of 12 per cent. per annum, and in addition a bonus of 2½ per cent., making with the above interim dividend, a distribution of 12½ per cent. for the year. This will absorb £16,150. On the profit sharing scheme £843 16s. 7d., more or less, will be paid as bonus to the employees. Of the balance, £19,921 2s. 4d., the directors recommend that £8,000 be written off goodwill, processes, etc., that £9,000 be placed to reserve, and the balance, £2,921 2s. 4d., carried forward. The business continues to show satisfactory progress, and notwithstanding the very unseasonable weather throughout the summer, the sales are only a small fraction less than last year. During the past year the Hon. Derek W. G. Keppel has resigned his seat at the board. One director, Mr. Charles J. Cox, retires this year from the board, and being eligible, offers himself for re-election. The auditors, Messrs. Turquand, Youngs, Bishop and Clarke, now retire and being eligible, offer themselves for re-election.

THE Watson Enlarger Prize Competition.—W. Watson and Sons, 313, High Holborn, W.C., announce an enlarger competition, in connection with which they offer 28 cash prizes of from £2 2s. to 10s. 6d. for the two best enlargements in each division of the various classes named below. The prizes will be awarded by judges selected by Messrs. Watson. Each class will be in two divisions, namely, landscape and portrait, and two prizes will be awarded in each division. Class I., enlargement made from No. 1 or 2 Brownie negative, in Watson's enlarger for Brownie cameras, 1st prize £1 1s.; 2nd prize 10s. 6d. Class II., enlargement made from Pocket Kodak negative, in Watson's enlarger for Pocket Kodak, 1st prize £1 1s.; 2nd prize 10s. 6d. Class III., enlargement made from Folding Pocket Kodak negative, No. 1 or No. 1a, in Watson's enlarger for these cameras, 1st prize £1 10s., 2nd prize 15s. Class IV., enlargement made from Kodak negative sizes Folding Pocket No. 2, Bull's-eye No. 2, Special Bull's-eye No. 2, or Plico, in Watson's enlarger for these cameras, 1st prize £1 10s.; 2nd prize 15s. Class V., enlargement made from F.O.P. Freena or No. 2 Scout negative, in Watson's enlarger for these cameras, 1st prize £1 1s., 2nd prize 10s. 6d. Class VI., enlargement made from ¼-plate negative in Watson's ¼-plate enlarger, 1st prize £2 2s.; 2nd prize £1 1s. Class VII., enlargement made from 5 by 4 negative, in Watson's 5 by 4 enlarger, 1st prize £2 2s.; 2nd prize £1 1s. The following are the rules of the competition:—1. The competition is for amateur photographers only. 2. All enlargements must be sent in, postage paid, by January 20th, 1903. 3. The enlargements must be made with Watson's patent enlarger, and each competitor will be required to furnish the name and address of the dealer from whom the enlarger was purchased. 4. The enlargements selected for prizes, and the negatives from which they are made, become the absolute property of W. Watson and Sons, who will acquire the sole right of reproduction for advertisement, or other purposes. 5. Any competitor may enter for one or more of the classes, but not more than one enlargement in each division. 6. No name or address of competitor shall appear on any enlargement. 7. It shall be at the option of any prize winner to take the value of the prize, plus 25 per cent., in any article manufactured by W. Watson and Sons. 8. The enlargements, with the exception of spotting, shall have no hand work upon them, and must be mounted on a plain cardboard. 9. Enlargements other than those awarded prizes will be returned to competitors on payment of postage. 10. Competitors must fill in the form of entry which will be provided, and can be obtained from their local photo dealer, or direct from Messrs. W. Watson and Sons, 313, High Holborn, London, and 16, Forrest Road, Edinburgh.

DISPUTE about a Dark Room.—At the Clerkenwell County Court on Thursday last, Harvey Ernest Walker, 89, York Road, Islington, sued A. Butcher to recover £10 16s. in respect of work done and materials supplied. Defendant had paid £5 into Court. Mr. Beckmore, counsel for plaintiff, said defendant wished to have a dark room for photographic purposes erected in his garden, and towards the end of July he employed plaintiff to construct it. He wanted something nice looking, and had certain ideas of his own about erecting the house, so that it could be taken to pieces, and also that it should not be an eyesore to his garden. Plaintiff, who was a painter, employed a carpenter and plumber to carry on the work, he himself doing the painting. In addition to being made portable, it had also to be made light-tight. No estimate was asked for, and nothing was said about the price. When the account was sent in defendant declared the price to be excessive, and offered £5, at the same time asking for a detailed account to be sent in. Plaintiff said the size of the building was 4ft. 6in. by 4ft. 4in., and 7ft. high. Defendant supplied the wood, but on examining it the carpenter said that inch matchboard would be preferable, and would come out much cheaper than the wood supplied by defendant, as this would involve much labour in properly working up. Defendant, however, insisted that his own wood should be used. He (plaintiff) painted the structure inside and out, and used three coats of paint. Defendant questioned plaintiff as to a number of items in the account, and elicited the fact that a charge had been made over and above what was customary in respect of the men's time. Peter Peterson, the carpenter, said the wood supplied by defendant was in a very bad state, and required a lot of labour in ploughing and tonguing. Mr. Atkinson, a builder of eighteen years' experience, said he had examined the building and measured it. He concluded that the charges were fair and reasonable. Defendant said his contention was that everything had been done in the most expensive way. The Judge: You find every tradesman does that when there is no estimate, making what he calls a "good job" of it. Defendant: But that is not fair to a client. The Judge: Then you should take care to have an estimate. Mr. Smith, a builder, said he had measured and valued the building, and thought that at the very utmost it would not be worth more than £5 to £6. All the wood had been grooved and tongued by hand, and this cost three times more than wood that had been already grooved and tongued by machinery. Evidence was given by another builder, who estimated the value at about £6. The Judge said it was perfectly clear that at the time defendant gave the order he had purchased some timber, and thought it would be cheaper to use that than follow the advice of the carpenter and obtain wood already grooved and tongued. Very often when a man did that sort of thing he was launched in much heavy and extra expense, and that seemed to be the state of affairs in this case. As far as the other items were concerned, he thought the charges were higher than they ought to be, and as to the extra charge respecting the men, that ought not to be down at all. His verdict would be for plaintiff for £11, including costs.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Nov.	Name of Society.	Subject.
1	Croydon Natural History	*The Ozotype Process.* Illustrated by Lantern Slides. By Mr. T. Manley.
1	West London Photo. Society	*Intensification and Reduction.* Mr. J. Brown.
1	Borough Polytechnic	*Developers—Their Use and Abuse.* Mr. Ernest Human.
4	Southampton Camera Club	Affiliation Lecture.
4	Society of Arts	*The Future of Coal Gas and Allied Illuminants.* Professor Vivian B. Lewes.
5	Leeds Photographic Society	*Photo-Micrography.* Mr. Walter Bagshaw, J.P.
5	Croydon Natural History	Society's Soirée at Pembroke Hall, Croydon.
5	Birmingham Photo. Society	*The Principles embodied in the Aldis Lens.* Mr. Hugh L. Aldis, B.A., F.R.A.S.
5	Isle of Thanet Photo. Society	Lantern Evening: *Flanders, Architectural and Otherwise.* Rev. C. E. Eastgate, M.A.
6	Borough Polytechnic	"*How I Visited Pekin with a Camera.*" Captain Frank Young, R.A.
6	Society of Arts	*Le Tunnel du Simplon, et la nouvelle ligne de Chemin de Fer directe, Anglo-Italienne pour l'Orient.* Dr. Gustave Goegg.
6	Leeds Camera Club	*Some Recent Experiences in Picture Making.* Mr. A. Horsley Hinton.
6	Edinburgh Photo Society	*Printing Processes.* Robert Forbes.
6	Nottingham Camera Club	*A Visit to Holland.* Mr. C. T. Smith.
6	Photographic Club	*The Nile* Mr. F. N. Ellis.
6	Ashton-under-Lyne Photo.	*Photography by Night with the Grün Lens.* Dr. Grün.
6	London and Provincial	*Night Photography.* Photogram Lecture by Mr. Ellis Kelsey.
7	N.-W. London Photo. Society	*The Photography of Architecture.* Mr. J. W. Hodges
7	Goldsmiths' Institute Photo.	*One Square Mile of Holland.* Messrs. Percy G.R.Wright & E. H. Carpenter.
7	Liverpool Amateur Photo.	*Collotype for Amateurs.* W. T. Wilkinson.
7	Woolwich Photo. Society	Lantern Lecture. *A Journey through Spain.* Mr. Jas. A. Sinclair.
		Lumière Process of Colour Photography. Mr. T. K. Grant.

ROYAL PHOTOGRAPHIC SOCIETY.

ORDINARY MEETING, November 11th.—Mr. J. C. S. Mummery in the chair.

NEW MEMBERS.

Nominations in favour of eight candidates for membership were read, and forty candidates were elected by ballot members of the Society.

PRESENTS.

A portrait of Scott Archer, one of the pioneers of photography, was announced as received from Mr. Henry Cade, of Ipswich. It was a glass positive taken in 1875, and in excellent condition. A vote of thanks was passed to the donor of this present, as well as to Mr. Henry E. Davis, for his present of Brin's patent snap-shot camera, shown and described at a previous meeting.

AFFILIATION.

The Nottingham Mechanics' Institute Photographic Society and the Marple and District Photographic Society were announced as newly admitted to affiliation.

Mr. Thomas K. Grant read a paper on "The Fading of Positive Photographic Prints printed on Chloro-citrate of Silver Paper, toned and fixed in one operation," by Messrs. Lumiere and Seyewetz. The paper shows that the principal cause of the fading of chloro-citrate of silver prints is the presence of hyposulphite of soda incompletely eliminated, but that the fading of the image only takes place in the presence of moisture. The authors continue to point out that fading takes place in gold-toned images containing hyposulphite of soda, even if the toning occur in a neutral medium, as in the case where toning and fixing are separate operations. The absence of all traces of hyposulphite of soda in the print is a guarantee of its keeping in humid air, even if the image does not contain gold, and if it be constituted of either sulphide of silver, silver only, or silver and lead. It appears that the yellowish appearance of faded prints is not therefore due to the presence of sulphide of silver or lead, but perhaps to that of very finely divided sulphur, resulting from the decomposition of the soda hyposulphite. The authors do not consider the supposed drawbacks of combined toning and fixing methods to be well founded. On the other hand, prints toned and fixed separately fade as readily as those toned and fixed at a single operation, if they have been incompletely washed and exposed to damp air. The complete elimination of the hyposulphite of soda is therefore the only preventive of the fading of toned prints.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

NOVEMBER 13TH.—Mr. W. Thomas in the chair.

Mr. J. W. Collings gave a demonstration of

THE SINOP COLLOTYPE PROCESS.

The process was briefly introduced by Mr. W. T. Wilkinson, who shared with Mr. Collings the burden of the demonstration. The Sinop process is a simplified form of the well-known but, to the amateur, little used process of collotype, a process of reproduction which yields very beautiful results. In the ordinary way, the collotype plates can only be prepared as wanted, and certain expensive apparatus is required by the process. The operator also requires considerable skill and experience. On the other hand, Sinop calls for practically no special knowledge. Plates may be obtained commercially, which only need sensitising in the bichromate solution, thus doing away with a great initial trouble attaching to the old process. The plates are of good keeping quality, both in the insensitive and sensitive state. The prepared plate is sensitised and dried, and exposed in a printing frame under the negative for from two to ten minutes at most; it is then washed with water for a further ten minutes, and soaked in glycerine for a quarter of an hour. The plate is then attached to a printing bed and inked with a printer's roller. When the inking has been thoroughly effected, prints may be taken with the aid of an ordinary office letter-copying press. Sinop thus depends upon exactly the same principles as does the collotype process. The plates are quicker than the collotype plates—a fact that was emphasised by the inking of a plate that had been exposed by Mr. Wilkinson that day, which showed marked over-exposure. Mr. Collings succeeded in pulling a number of excellent prints from plates previously exposed, and a portfolio containing a large number of examples was passed round. The Sinop plates may, after an addition has been pulled, be stored away for any length of time, and no difficulty presents itself when at some future time it is desired to take off further copies. The process is useful for the printing of postcards from negatives, Christmas cards, etc. It should be borne in mind that the image is a reversed one. This, of course, does not matter in many cases, but occasionally it will be necessary to have a reversed negative. Thin film negatives may be used without reversal, however, there being no noticeable loss of definition when they are printed from the reverse side.

PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

A MEETING of the General Committee was held at 51, Baker Street, W., on Monday, 14th inst., Mr. William Grove, president, in the chair.

The hon. secretary announced the death of Mr. H. J. Dalby, of Woolwich, a member of the committee. A letter of condolence, in the name of the committee, had been written to Mrs. Dalby, and her reply was read. The fact that Mr. H. Walter Barnett, a vice-president of the association, had been confined to his house for some time through illness, having been referred to, the hon. secretary was instructed to express to Mr. Barnett the regret of the committee at the cause of his absence.

The following gentlemen were accepted as members:—Percy Claude Byron (Byron New York), 63, West Thirty-second Street, New York, U.S.A.; Howard Cooper, 19, Bearwood Road, Smethwick; William Edwin Foster, 17, Bennett's Hill, Birmingham; William G. Hutt, 374, Dudley Road, Birmingham; Mark Edward Mitchell, Princes Colonnade, Princes Street, Harrogate; Sydney Charles Mote, 28, Breakspear Road, St. John's, S.E.; Frederick Charles Strate, Castlbury Studio, Stafford; W. Alanson Varley, The Polygon, Bowdon, Cheshire.

The hon. secretary reported that since the last meeting of the committee, meetings had been held by branches of the Association at Edinburgh, Liverpool and Hull, and reports had been published in the BRITISH JOURNAL OF PHOTOGRAPHY. He also reported that Mr. T. C. Turner, hon. secretary of the Branch Organising Sub-Committee, and he had attended a meeting of photographers at Birmingham, held for the purpose of establishing a branch for the locality (the proceedings of the meeting were published in last week's B.J.). The meeting resulted in all present who were not already members of the P.P.A. agreeing to join, and the prospect of the branch becoming large and influential appeared most promising. Votes of thanks were passed to Messrs. Ellis and Turner for attending the meeting, and to Mr. Harold Baker for his services in connection therewith.

Letters from members relating to insurance copyright, etc., were read, and the hon. secretary instructed thereon.

A letter was read from Mons. Paul, Nadar, President of the Chambre Syndicate de la Photographie of Paris, explaining that the organisation had a basis similar to that of the P.P.A., and asking support for the forthcoming "Congres Nationale de la Photographie Professionelle" to be held in Paris on the 25th, 26th, and 27th inst. The hon. secretary was directed to reply regretting that the date being so near the Association could do little with regard to the Congress, but assuring him of its fraternal sympathy and hoping that means could be found of bringing the two organisations into closer relationship.

The hon. secretary announced that four members of the committee had attended a meeting of artists and others interested in artistic copyright, held at Messrs. Agnew's gallery, Bond Street, W., which resulted in the formation of a new society having for its object the protection of the interests of owners of copyrig' in works of art, etc. Arrangements were made that the P.P.A. shou be represented.

A letter was read from the Photographic T de Association, asking the sympathy and support of the P.P.A. in eir protest against the trade regulations of the Kodak Co. It was re ved that the Association should adopt a position of strict neutrality.

Letters and other communications respecting instances of price cutting, objectionable advertisements, and similar matters were read. These were dealt with.

The question of holding an exhibition of members' work was discussed, and the hon. secretary was instructed to make certain enquiries and report at the next meeting. It was decided that on the date of the next dinner a reception room at the place of holding the dinner should be open all the afternoon for the purpose of affording members, especially those from the provinces, the opportunity of discussing matters of mutual interest in a friendly and informal way.

LEEDS CAMERA CLUB.

THE presence of Mr. Godfrey Bingley at the rooms of the above Club, Athenæum Buildings, Park Lane, on Wednesday, Nov. 12th, drew together one of the largest audiences of the session, when close upon 150 members and friends attended to hear a lecture on "The Dales and Coast of Yorkshire."

The lecture was illustrated by a series of close upon 250 lantern slides of as fine a class as it has ever been our lot to witness, and during the course of the lecture, round after round of applause greeted the appearance of the fine specimens of the lecturer's work upon the screen.

The president, Mr. Howdill, by the way of introducing Mr. Bingley referred to the large attendance and to the evident attraction the lecture had to the fair sex. They all know Mr. Bingley's position and the work he had done as a lantern slide maker, in which he was such a past master, and if they could not make something as good, at any rate they had something to aim for.

Mr. Bingley, rising to address the meeting, thought the president had raised their expectations too high—some of the slides were not so very good, either technically or pictorially, but they had to be included to carry out the story. He remarked that by the aid of photography he hoped to be able to show them some of the natural beauty and places of interest in the County of Yorkshire, and a brief history would not be altogether out of place. At the date of the Roman Invasion the Celts occupied the County, their capital being at Boroughbridge, whilst York was at the time the chief City of Northern Britain. In the year 410 the Roman Legions withdrew in consequence of trouble of their own, and York subsequently became the capital of the Danish Kingdom. Through succeeding years Yorkshire was the scene of many historical events too numerous to go into that evening, and further, it was with the scenery and not with the history they would be occupied that evening. The scenery of Yorkshire was more varied than that of any other County in England. The coast line was full of beauties with its indented bays, fishing fleets, and numerous watering places, and perhaps no place could be found showing so many different features as along the seaboard of Yorkshire. The Tees formed the northern boundary, and was the only river of any size which did not empty its waters into the Humber. In the western part of the county the mountains formed the backbone, and divided the watershed east and west. At the time of the dissolution of the monasteries of York there were no less than twenty-eight abbeys and 128 convent buildings in the county. Going from Leeds to the Craven district was the River Aire, known to all of them by its perfumes rather than its beauty, but at its source intensely interesting, taking its rise about Malham. About three miles from the village on the moors was Malham Tarn, the greatest of our Yorkshire lakes, and where what was known as the water sinks appeared. Standing on the top of Malham Tarn a fine view of the dry valley of the Aire was obtained. From the water at the Tarn sinks, known as Aire Head, Malham Cove, and the stream called Gordale Beck, the River Aire was formed.

Mr. Bingley next proceeded to describe the experiments made to trace the source of the River Aire; then went on to Malham Church, where is shown the signature of Oliver Cromwell on the marriage certificate of a certain John Lambert. Then on to Settle and Giggleswick, and going back to the river valley we get to Catterick Force, the scenery round which was exceedingly pretty, and afforded many pictures for photographers, the views shown having been taken on one of the Yorkshire Union excursions to the neighbourhood.

Ripley Valley was next dealt with and the "hot holes" described, which are approached by Horton in Ribblesdale. Across the Penine Chain next, to Ingleboro', famous for its seventeen falls. Over Ingleboro' to Gaping Hill hole, the first exploration of which was due to a Frenchman, M. Martell. Proceeding, the lecturer touched lightly upon Skipton, Towtonfield, then on to Boston Spa in the Washburn Valley, Bolton Hall, Bolton Abbey, Grassington, and Grass Woods to Coniston. The coast was touched at Saltburn, Brunswick, Sandsend, Whitby, Filey, Scarboro', Bridlington, Hull, and returning to York, where the tour ended—one of the most interesting and instructive lectures delivered before the society.

On the motion of Mr. Howdill, seconded by Mr. Emmott, a most hearty vote of thanks was accorded to Mr. Bingley for his valuable lecture.

PHYSICAL SOCIETY.

AT a meeting of the Physical Society on October 31st, Dr. Silvanus P. Thompson, F.R.S., president, in the chair, a paper on "The Size of Atoms" was read by Mr. H. V. Ridout. This investigation deals with the size of dissociated atoms, or ions, and the results obtained refer to a dissociated atom as the smallest quantity of matter which can take part in an electrolytic action. The element chosen is hydrogen, and the author concludes that, in round numbers, 114½ million atoms are necessary to form a line 1cm. long. The method employed consists in finding a pair of spheres which would be charged by the quantity of electricity known to be necessary to electrolyse a given quantity of the body under examination—in this case water—to the known difference of potential of its ions. From this the size of the atoms is deduced, subject to certain assumptions enumerated and discussed in the paper. The atoms are regarded as spherical and closely packed. To facilitate the calculations, the packing is assumed to be such that the centre of any sphere is immediately above the centre of the sphere upon which it rests. Under these circumstances the total volume of spheres necessary to fill a given cube is equal to that of the single sphere about which the cube is described. The electrical capacities of isolated spheres being proportional to their diameters, it follows that the total capacity of any number of such spheres is equal to the capacity of a single sphere, t diameter of which is equal to the sum of the diameters of the sm spheres. Using these two propositions, the size of the atoms is easi deduced from the pair of spheres already determined. The auth points out that the method fixes both the superior and the inferior si of the atoms, and gives, therefore, the true value.

Lord Kelvin remarked that he had often concerned himself wit the si of atoms, and pointed out that the value obtained by the author f the diameter of a hydrogen ion was almost exactly one-half of that whic he had obtained for the diameter of a molecule of hydrogen. The fac however, might be a coincidence. He had dealt with a sphere whic would have the same effect as a double atom of hydrogen. While avoi ing the assumption that atoms are hard and spherical, it was usual t treat them as such for purposes of calculation. The paper was an in portant one, but there were many assumptions which required lookin into. Lord Kelvin said that in dealing with the subject of atoms i was necessary to consider the atoms of electricity. The atomic theor of electricity, now almost universally accepted, had been thought o by Faraday and Clerk-Maxwell and definitely proposed by Helmholtz The atoms of electricity were very much smaller than the atoms o matter, and permeated freely through the spaces occupied by thes greater atoms and also freely through space not occupied by them. A atom of electricity in the interior of an atom of matter experience electric force towards the centre of the atom. We were forced to conclud that every kind of matter had electricity in it, and Lorenz had named electricity as the moving thing in atomic vibrations. If the electrons, or atoms of electricity, succeeded in getting out of the atoms of matter, they proceeded with the velocity of light, and the body was radio-active. It was, therefore, not surprising that some bodies showed radio-active properties, but rather surprising that such properties were not shown by all forms of matter. Our knowledge of this subject, which originated with the discovery of the Becquerel rays, had been greatly advanced by the experiments carried out at the Cavendish Laboratory, and he had no doubt that in the next two or three years much light would be thrown upon this important matter.

Professor Everett asked why the author had taken the specific inductive capacity of water equal to 2.

The author said that the latest determinations of the constant approximated to that number.

HILLSBRO' AND DISTRICT PHOTOGRAPHIC SOCIETY.

LANTERN-SLIDE making was the subject of a practical demonstration given by Mr. T. G. Hibbert to the members of the Hillsbro' and District Photographic Society, Sheffield, on the 12th inst. By the use of an exposure meter, and the developing of negatives strictly to time, good results are sure to follow, said the lecturer, which he proved to the satisfaction of his audience. Thus, if the high lights in a negative begin to show in half a minute, it will take three minutes to properly develop the same, or six times the factor.

CROYDON CAMERA CLUB.

NEARLY forty members of this club on Wednesday, the 12th inst., in response to a kind invitation, paid a visit to Mr. T. T. Waddington's works at London Road, Croydon, a popular and thoroughly practical demonstration of the "half-tone process" being afforded them.

Mr. Waddington first lucidly explained the process, and afterwards conducted the members over the workshops of the company, every step from the preparation of the collodion wet plate, to the ultimate etched block, being shown in actual operation.

Broadly speaking, the process, as explained by Mr. Waddington, may be outlined as follows:—A glass screen with minute opaque crossed rulings is placed in front of the plate in the camera, and a negative taken in the usual way. On development, this negative, if closely inspected under a powerful glass, will be found to possess, in a sense, no half-tone at all, the tints being represented by a series of dots and cross hatchings of varying degrees of frequency. A copper plate is next taken, coated with an exceedingly thin film of gum arabic, white of egg, fish glue, and ammonium bichromate in suitable proportions, and placed behind the negative, great pressure being used to secure absolute contact. An exposure for a few minutes to an arc lamp is sufficient to render those parts of the film, immediately behind the clear spaces in the negative, insoluble. The film is then developed in manner familiar to carbon workers, dyed so that exposure may be judged, and dried at a high temperature. At this stage we have a visible positive image composed of what is termed "resist." A solution of perchloride of iron is then flowed over the plate, which attacks the copper where not protected by the resist, and the necessary relief is obtained. The plate is then proofed, and if satisfactory, trimmed and mounted type high ready for printing.

THE Dangers of Celluloid. An evening contemporary is responsible for the following:—A remarkable and painful experience befel M. Leon Godefroy in the Boulevard St. Michel, in Paris. M. Godefroy once had the misfortune to be involved in a street row, the result being that his nose was smashed, and he had to secure an artificial nasal appendix. He was walking on the boulevard, and stopped to light a cigarette. Suddenly his nose burst into flames, which spread to his beard. M. Godefroy danced with pain until some policemen took him to a chemist's shop, where his burns were treated. An examination of the nose showed that it was made of celluloid, the unscrupulous dealer who sold it having foisted it on to his client instead of the horn nose which had been prescribed.

News and Notes.

THE Earl of Crawford, F.R.S., who is about to take a winter tour round the world in his famous steam yacht Valhalla, has invited Mr. H. J. Nicoll, a member of the British Ornithologists' Union, to accompany him as naturalist. After passing through the Straits of Magellan, the Valhalla will visit the principal island groups of the South Pacific, where its naturalist will have ample opportunities for collecting and observing birds and other animals. The return will be made by the Indian Ocean and Suez Canal.

CORRECTLY exposed platinotypes can be over-developed, in spite of the usual belief to the contrary, said Mr. W. H. Smith to the South London Photographic Society on Monday evening, by using the glycerine method of development, owing to none of the salts being dissolved by the developer, and therefore prints should not be left unfixed. Mr. Frank Goddard, hon. secretary to the South London Photographic Society, has resigned that position, and Mr. W. Calder Marshall, 41, Glenton Road, S.E., has been appointed to succeed him.

MR. E. MERCK, 16, Jewry Street, E.C., writes: "In handing you herewith a sample of Merck's Pyro Developer in cartridge form, I would like to draw your attention to an innovation which I have made in the get-up of my photographic cartridges. Hitherto the alkalies and developer have been separated in the cartridges by a thin layer of specially prepared paper, but I found that this was not sufficient protection, and I am now supplying cartridges where the chemicals are separated by a glass partition. As both ends are hermetically sealed, there is no risk of oxidation, and on the other hand, owing to the glass, there is now no danger of interaction between the chemicals. I think it would interest your readers to know of this improvement."

STONEHENGE.—A meeting of the Stonehenge Committee, consisting of Lord Dillon, the Bishop of Bristol, Mr. Thackeray Turner, Mr. John Carruthers, the Rev. E. H. Goddard, Mr. N. Story Maskelyne, Mr. W. Gowland, and Mr. C. H. Read, representing the Society of Antiquaries of London, the Wilts Archæological Society, and the Society for the Protection of Ancient Buildings, was held at Burlington House last week. The committee received a report of the operations that had taken place under its advice, with the sanction and at the cost of Sir Edmund Antrobus, expressed approval of the steps already taken towards ensuring the safety of Stonehenge, and repeated its resolve that further steps must be guided by the determination to do as little as possible in order to save the monument for posterity. The committee is anxiously conscious of the fact that in the present state of Stonehenge there is grave danger of further accident. To meet the dangers of the present winter it has now recommended the immediate application of wooden props to the stones about which the chief anxiety is felt.

"A NEW and Lucrative Profession."—Mr. Hector Maclean, F.G.S., takes upon himself the serious responsibility of the following paragraph in last Saturday's "Morning Post":—It falls to my lot during the year to address a good many assemblages of amateurs, and once in each year I am called on for what is called a presidential address, the which is meant to arouse enthusiasm amongst the members of the society. I mention this because during the last of these addresses, recently given, among topics which I touched on was one which certainly arrested attention beyond all others. It was a relation of the comparative affluence to which a very large number of humble, or not well-to-do, individuals have attained through joining local photographic societies. I could mention one instance of a gentleman now receiving a "four-figure" income entirely through taking up amateur photography and attending photographic society meetings. The number of those who through similar means have risen from positions of a few shillings a week to distinguished appointments of from £500 to £1,000 per annum are too numerous to mention.

THE Royal Society.—The following is a list of those to whom the Royal Society has this year awarded medals. The awards of the Royal medals have received the King's gracious approval:——The Copley Medal to Lord Lister in recognition of the value of his physiological and pathological researches in regard to their influence on the modern practice of surgery. The Rumford Medal to the Hon. Charles Algernon Parsons for his success in the application of the steam turbine to industrial purposes and for its recent extension to navigation. A Royal medal to Professor Horace Lamb for his investigations in mathematical physics. A Royal medal to Professor Edward Albert Schafer for his researches into the functions and minute structure of the central nervous system, especially with regard to the motor and sensory functions of the cortex of the brain. The Davy Medal to Professor Svante August Arrhenius for the application of the theory of dissociation to the explanation of chemical change. The Darwin Medal to Mr. Francis Galton for his numerous contributions to the exact study of heredity and variation contained in "Hereditary Genius," "Natural Inheritance," and other writings. The Buchanan Medal to Dr. Sydney A. Monckton Copeman for his experimental investigations into the bacteriology and comparative pathology of vaccination. The Hughes Medal to Professor Joseph John Thomson for his numerous contributions to electric science, especially in reference to the phenomena of electric discharge in gases.

INFLAMMABLE Spirits.—The danger of handling spirits that give off inflammable vapours at low temperatures by those who do not understand their properties, was exemplified at Woolwich dockyard a few weeks ago, when two persons lost their lives and another was seriously injured while experimenting with gasoline, the vapour from which became ignited. We cull the following from the "Standard" of Saturday last, as illustrating still further this danger:—"A case was heard before the Oxford magistrates yesterday in which the chemist of the Christ Church laboratory was charged with having handed to the Great Western Railway, for conveyance, a consignment falsely declared as ordinary petroleum, but which really consisted of petroleum spirit, giving off a vapour inflammable in a temperature below zero (Fahr.), also with not having observed the Government regulations in regard to packing traffic of such a highly dangerous character. During transit, when a member of the company's staff was carrying a lighted lamp through a yard, the vapour given off by the petroleum spirit became ignited, and if the efforts which were made to extinguish the fire had not been successful the result would have been disastrous. The magistrates commented upon the serious nature of the offence, but, as the defendant pleaded ignorance of the regulations, only a small fine of 20s. and costs was inflicted."

ART Lecture in Leeds.—The Lecture Hall of the Leeds Institute was well filled on Wednesday evening last, on the occasion of a lecture delivered by Mr. Whitworth Wallis, F.S.A., on the "Art of Lord Leighton." Commencing, the lecturer paid the late President of the Academy a gracious tribute in saying that no artist during the Victorian era had accomplished better and purer work than he did. Lord Leighton was a veritable "Crichton" among artists, combining with his knowledge and talent for art the gift of sculpture, the powers of a linguist, and also the accomplishment of a musician. Such training as Leighton received in his youth had perhaps been the privilege of no other artist. He studied successively and successfully at Rome, Berlin, Munich, and Frankfort. His entrance to the school at Berlin was obtained by means of a "wicked misrepresentation." The age limit was fifteen, and the future peer had to state that he was a year older than he actually was at the time, before he could be taken in as a pupil. Whilst staying at Rome, and at ten years of age, Leighton decided to become an artist, much against the wishes of his father, who was a doctor, but who did not press his objections to this profession. About this time, the novelist Thackeray encountered the youthful painter. Returning to England, the author of "Vanity Fair" came across John Millais, who was then about twenty years old. He told him that he had met at Rome a young artist who "will some day run you very close for the Presidency of the Royal Academy." This prophecy was so true that so close did these two artists run each other for the honour, that Leighton actually achieved it first. Leighton became an Associate of the Academy in 1864, and was admitted as a member five years later. The lecturer then exhibited several views of Lord Leighton's past work, which without them would have rendered the lecture unenlivening. One cannot conceive of few more difficult tasks than that of keeping a mixed audience interested in descriptions of paintings; but Mr. Wallis's analysis of the qualities that enabled the great artist to make an enduring mark on the art of the age were not without value and interest, and in the occasional employment of human touches did Mr. Wallis find salvation.

GREENWICH Observatory.—The report of the Astronomer Royal to the Board of Visitors, Greenwich Observatory, read at the annual visitation in June last, has just been issued as a Parliamentary Paper. It relates to the year ended on May 10th last, and says that the sun, moon, planets, and fundamental stars had been regularly observed on the meridian as in previous years. The number of observations made was as follows:—Transits, the separate limbs being counted as one observation, 11,133; determinations of collimation error, 303; determinations of level error, 663; circle observations, 9,666; determinations of nadir point (included in the number of circle observations), 681; reflexion observations of stars (similarly included), 505. The number of stars observed in 1901 was 4,327. The progress made in the observations of the reference stars for the astrographic plates, for which 10,000 stars are to be observed three times above and twice below pole—with the exception of about 1,000 stars fainter than the ninth magnitude, which cannot be observed below pole—is shown in a table. These stars include all the stars down to the ninth magnitude of the "Bonn Durchmusterung," and fainter stars which have been added to the list recently, so that there will in no case be fewer than twelve reference stars on a plate, the average number being 22.4. The observations of these stars were commenced at the beginning of 1897, and as more than half of the observations required have already been secured, it may be confidently anticipated that the full number of observations will be obtained for the new Ten Year Catalogue, 1897 to 1906. During the year photographs of the sun were taken on 178 days. The Dallmeyer photoheliograph was in use till September 19th, when the Thompson photoheliograph, which had been taken to Sumatra for the eclipse, was mounted in its place. Of the Greenwich photographs, 344, taken on 171 days, have been selected for preservation, besides 18 with double images of the sun for the determination of zero of position angles. Supplementary photographs have been received from India and Mauritius to January 18th last. For the year 1901 Greenwich photographs were selected for measurement on 149 days and photographs from India and Mauritius (filling up gaps in the series) on 210 days, making a total of 359 days out of 365 on which photographs are at present available. The proportion of days upon which the sun was entirely free from spots was 80 per cent. for the year 1901, and about the same proportion for 1902 to May 31st. But the appearance of two considerable groups this year, and the high latitudes of the spots generally, are, Mr. Christie thinks, indications that the actual minimum is passed. The report states that in the year ending May 10th, 1902, the average daily number of chronometers and deck-watches being rated was 557; the total number received was 1,258, the total number issued was 1,183, and the number sent for repair 570. These include 35 box chronometers and two pocket chronometers for the Indian Government. During the year there have been on trial for purchase by the Indian Government eight box chronometers, of which three have been selected for purchase. Two pocket chronometers have also been purchased for the Indian Government. The Greenwich time-ball was not raised on two days during the year, owing to the violence of the wind. On June 18th the ball did not drop at 13h., owing to an interruption in the electric connections. The automatic signals from the Westminster clock were received throughout the year except on five days, when the

signal failed. The apparent error of the clock was not greater than 0s.5 on 28 per cent. of the days of observation; not greater than 1s.0 on 56 per cent., not greater than 2s.0 on 88 per cent., not greater than 3s.0 on 97 per cent., and exceeded 4s.0 on twelve occasions. The first stage of the re-determination of the Greenwich-Paris longitude, referred to in the last report, was, after consultation with M. Lœwy, deferred to the spring of this year, in order to allow more time for preparation and testing of the instruments, after Mr. Dyson's return from the Eclipse Expedition to Sumatra. Mr. Christie adds:—"The observations were made in three groups of three, six, and three full nights (or their equivalents in half-nights), the observers with their instruments being interchanged between the first and second, and again between the second and third groups. The English observers were Mr. Dyson and Mr. Hollis throughout, and the French M. Bigourdan and M. Renan during the first group. Unfortunately, at the end of this group, M. Renan was taken seriously ill, and it was necessary to replace him by another observer, M. Lancelin, and to recommence the work of the French observers, which is still in progress. It is proposed to carry out the second stage of the observations in the autumn. For these operations the Post-office authorities have courteously given the use of the telegraph line and the services of a telegraphist."—"Standard"

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

KODAK, LIMITED, AND THE TRADE.

To the Editors.

Gentlemen,—May I trouble you again in regard to the above, though you must be rather tired of the subject? I think there must be many, including myself, who were somewhat in the dark as to what the Kodak Company had a right to claim in regard to the manufacture of roll film goods. From the letter of Mr. J. Lizars, published in your Journal last week, it seems that both the European Blair Camera Company and Mr. Lizars made folding pocket daylight loading cameras similar to those on the market to-day several years ago. And presumably, any other manufacturer could have done the same, from which it must be gathered that the Kodak Company had no controlling patent for the manufacture of roll film goods, though I see from an old advertisement that the Kodak Company, then the Eastman Company, were selling roll film cameras (not daylight loading, I assume) in this country in 1890, and possibly a short time previous. The Kodak Company then claimed to have the only practical system of roll holder photography. There can be no doubt that from the first they had great faith in the roll film principle. Mr. Lizars, however, states that the first daylight roll films and roll film cameras were introduced into this country by the European Blair Camera Company. A detailed history of the subject would be interesting. Most people would be willing to give credit to whom credit is due. Whoever made the first efficient roll film, no doubt they were indebted to the investigations of those who did not succeed, though it is those who make a commercial success of a new thing who get the most credit. But the point I wish to emphasise is that, in view of the statements made by Mr. Lizars, it is evident that the Kodak Company did not possess a controlling patent. I was under the impression, and I have no doubt many others were, too, that they did. I do not profess to understand why other British manufacturers did not give attention to the matter long ago, which would probably have prevented the present difficulties.

I do not see how it can be made illegal for any of the retail dealers to "concentrate" on any particular firm's goods, as suggested by one of your correspondents. It is an interesting question, but I suppose the retailer has a right to please himself, though he may be obliged, by public demand, to stock other goods in the same line. Many of them would probably not at all object if the Kodak Company did secure the complete control of the photographic trade, as they may consider that it would simplify matters for them. Whether it would be beneficial to the customer is another matter. If the dealer decides to concentrate on any one firm's goods, the customer may concentrate elsewhere.
—Yours truly, J. A. Reid.

Kincraig, Cutcliffe Grove, Bedford.
November 15th, 1902.

To the Editors.

Gentlemen,—I hope "A Retired Dealer" finds himself in comfortable circumstances, if not affluence, through success in business, otherwise his fossilised notions of trade leave small hope for his future. It is a common expedient, in defending a bad case, to set up an arbitrary definition, and to dance and whoop around the imaginary corpse, after having scalped it in the most satisfactory manner. "A Retired Dealer" formulates his own definition of monopoly. You may infer the rest. I prefer to take the common, accepted meaning, as shown by the following definition, taken from a standard dictionary:—"The exclusive possession of anything, as a commodity or a market; the sole right of selling."

Let us now turn to the facts. Kodak, Limited, are exclusive owners of certain articles and refuse to supply the trade, but upon certain conditions of sale. The P.T.A., collectively, are exclusive owners of certain articles, and refuse to supply the trade but upon certain conditions of sale. You may fill in the names of the articles and the terms for each particular case, but it is evident the principle is the same for all. What I ask for is, that the retailer should be free to fix his prices as he pleases, and not as "the Ring" dictates. This is the only policy by which you will succeed in defeating a business undertaking, organised on the lines of Kodak, Limited. Large profits have enabled it to obtain the control of the market for certain articles. Until you cut down those profits by competition, or scatter them by forcing the company to open a large number of shops, your efforts will be futile, and you may continue to snivel and drivel to an unsympathetic public.

I am not so ignorant of the photographic trade as "A Retired Dealer" imagines, and can inform him it is a fact that in one large photographic business, where prices had to be raised at the dictation of "the Ring," the net profits for the year reached 60 per cent. upon the capital invested. The profits upon a large number of photographic articles are much too heavy where business is transacted upon cash terms. I could name one that a small dealer would decline to stock and only supply to order. Yet for the small service of taking the order and handing the article to the purchaser, he receives the handsome remuneration of 35 per cent. of the price, or 50 per cent. on his outlay. In many cases the profit amounts to pounds. The P.T.A. refuses to supply men who would be content to serve the public upon reasonable terms. Whilst it does so, it cannot expect to receive the support of the public in fighting an organisation, managed on similar lines. "The Ring" is an organisation of manufacturers and retailers formed for the exploitation of the public. The outcome of the large retail profits must be a needless extension of the number of shops opened by men who will fritter away the profits until they touch the ordinary level of a shopkeeper's standard of living. When they have reached that stage their defence can be very ably undertaken by men of the stamp of "A Retired Dealer."—Yours truly, X. Y. Z.

To the Editors.

Gentlemen,—In his letter in your issue of November 14th, Mr. H. H. O'Farrell suggests that Kodak, Limited, imposes factors' agreements upon dealers and refuses dealers' "necessary" discounts. This is a mistake. They do not refuse dealers' discounts, and do not ask them to enter into any factors' agreements. The Kodak Company gives a trade discount, varying from about 15 per cent. to 23 per cent., to all dealers alike.

If some of them like to earn more by under certain conditions that is for them to decide, and they claim further discounts for electing to handle only Kodak's rollable film goods, and they are not bound in any way for a moment longer than they elect. Mr. H. H. O'Farrell does not state what the "factors' agreements" are which Professor J. B. Clarke, of Columbia University, discusses. He assumes that they are the same as the conditions of sale of the Kodak Company. In this I believe he is in error. Who is to decide what are "necessary discounts?" A Suburban Dealer.

November 18th, 1902.

To the Editors.

Gentlemen,—The letter, signed "J. Lizars," appearing in your issue of the 14th inst., is a delightful instance of suppression of facts and suggestion of fictions. It is an attempt to justify imitations, among which Mr. Lizars' own products figure, and seeks to mislead your readers into the belief that the Kodak Companies have not been the pioneers of the roll film industry.

The Kodak Companies have been almost exclusively responsible from the outset for creating the vast trade that now exists in rollable film goods.

Films and roll holders were made by experimenters in very early days, but the Eastman Company introduced and acquired inventions and improvements (and this without any competition to speak of), and made these goods commercially successful in every stage.

The history of the progress of rollable film appliances is the history of the Eastman Companies, and this is common knowledge. First, paper films, then stripping films, then transparent films: none other than the Eastman Company has had any appreciable share in the making of the trade.

As regards daylight loading appliances, Mr. Lizars finds it convenient to suppress the fact that the apparatus stated by him to have been introduced here in 1893 was obtained from a company, which was afterwards merged in the Eastman Company, and all of whose patent rights were purchased at considerable cost. It may be added that the patents

covering essential features in the existing daylight loading camera system were bought up by the Eastman Company, and are still their property, wherever any such rights exist.

Mr. Lizars makes the mistake of saying we complain of imitations. It is not we who complain. It is the imitators themselves, who are crying out for assistance and sympathy, because all possible facilities for substitution practices are not afforded by the trade.

We do not complain of imitations, but when appliances are pushed forward by competitors which are similar to ours in outward appearance, and in which our gauges are minutely and exactly measured and copied, it is time to protect the public against "piracies" and "parasites," and to take precautionary measures against would-be purchasers of Kodak goods being deceived. We do not waste our breath in taking exception; we take proper business measures to encourage honest and pushful service from the dealers. That is all there is in it.

The competing manufacturers appear to be so poverty stricken in invention. If they want to make honest and original trade for themselves in rollable film goods, why do they not produce cameras and spools of their own design, and in the standard popular English sizes, ¼ plate, 5 by 4, and ½ plate, instead of imitating our models and measuring up and copying all the new gauges we have introduced, which are in no case the standard sizes, but are special and peculiar to our introductions? Your readers ought to know why this little device of adopting our gauges is resorted to. It is that these special designs and sizes are associated with our world renowned trade names, "Kodak," "Brownie," "Bull's-Eye," etc., and the imitators desire such conditions as will help them to steal some benefit from our trade and make substitution as easy as possible. Not only have our Kodak reels—which are stamped with the trade mark of the company—been wound up with alien films upon them by imitation manufacturers, but purchasers who ask for spools under our trade mark names have passed off upon them, or put into their cameras without explanation, some one or other of the imitations made up like Kodak spools for use in Kodak cameras. As long as patents are not infringed we do not complain, but such tricks have to be met by giving better terms to those dealers who give us the best and most honest service.

We should have thought that Mr. Lizars would have kept discreetly silent concerning the fact that he is not now being supplied with Kodak goods for his shops. We on our part cannot, however, at the present time say more than that the real reason will be known sufficiently soon, when the legal proceedings, which we have had to take against Mr. Lizars, come to a hearing.

The suggestion made by Mr. Lizars that the Kodak Company has imitated sizes previously made by himself is as amusing as it is untrue, and, like the rest of the letter, is evidently put forward in the hope that the mis-statement will get a useful start of the contradiction.—We are, yours faithfully,

KODAK, LIMITED.

THE CHEMISTRY OF THE LEAD INTENSIFIER.

To the Editors.

Gentlemen,—In the interesting article, entitled "The Half-Tone Negative Under the Microscope," by Mr. J. I. Pigg, in your last issue, he seems to be under some misapprehension as to lead intensification.

It is quite unnecessary to call into explanation any "magnetic influence brought about by the conjunction of two metals," when we can explain the process, very simply, from a chemical point of view, thus: On mixing nitrate of lead and potassium ferridcyanide, we get lead ferridcyanide and nitrate of potash, as shown in the following equation:—

$$3\,Pb(NO_3)_2 + K_6\,Fe_2\,CN_{12} = Pb_3\,Fe_2\,CN_{12} + 6\,KNO_3$$

in contact with metallic silver, the lead ferridcyanide is reduced to ferrocyanide, silver ferrocyanide being at the same time formed, both of which are much less opaque than metallic silver; the equation representing this reaction is—

$$2\,Pb_3\,Fe_2\,CN_{12} + Ag_4 = Ag_4\,Fe\,CN_6 + 3\,Pb_2\,Fe\,CN_6$$

and both these ferrocyanides are reduced by the ammonium sulphide to the corresponding lead and silver salts, thus—

$$Ag_4\,Fe\,CN_6 + Pb_2\,Fe\,CN_6 + 4\,(NH_4)_2\,S = 2\,Ag_2\,S + 2\,PbS + 2\,(NH_4)_4\,Fe\,CN_6$$

—Yours faithfully,

CHEMICUS.

THE ELECTRIC LIGHT IN THE STUDIO.

To the Editors.

Gentlemen,—I was pleased to read your article on "Electric Light in the Studio," in last week's issue. It seems a rather hard matter to estimate the value in candle power of the light needed, but I believe that nothing short of 3,000 candle power will give the necessary brightness required for short exposures in the studio.

Arc lamps give about 900 candle power, when used without shades, but if worked with reflected light only, it is questionable if much more than 600 candle power is available. On that basis five lamps are required instead of three, as sometimes, and one as often used by photographers; the greater diffusion of the light will not be found so trying by the sitter, and will enable better negatives to be produced.

Incandescent lights are more easily managed, a group of 15 200 candle power lights being quite portable, even when placed inside a reflector, and, to my mind, the light is more comfortable to a sitter, which is a great point in making that style of lighting popular.

In regard to the working cost, it depends whether the light is only switched on during exposure, or burnt all the while the sitter is in the studio. The short lighting makes the cost about even, but five arc lamps only consume about three units per hour, against over ten for the incandescent.

The electric companies might reduce the cost if photographers did not switch on and off, but it is now well known that they do not appreciate the heavy load for such a short while.—Yours, sincerely,

ALF. H. CADE.

Cade's Popular Studio, Cornhill, Ipswich.
November 17th, 1902.

SPIRIT PHOTOGRAPHY.

To the Editors.

Gentlemen,—Referring to spirit photography, as per paragraph in your last number, there is in West London an old gentleman, now aged seventy, who is taking photos of spirits and of pictures made by spirits since 1895. He is naturally clairvoyant, or double sighted, and can see spirits. His daughter, who died some ten years ago, had the same gift, and acted as a medium for years. He is a photographer since 30 years back, in the same shop and studio. He is convinced that if his neighbours knew that he photographs ghosts he would lose his business and living, consequently he ties a veil of timid secrecy over the spiritual department of his establishment by never referring to it, and in other ways, and refusing to entertain applications from the Press lest his name as spirit photographer, with his address, should appear in print; his excellent but giftless wife is a strongly prejudiced anti-spiritualist, though converted.

I myself, who am an amateur medium, qualified "to call up spirits from the vasty deep," was the innocent cause of his becoming a spirit photographer in 1895. I went to him to have cabinet photos of myself to send to my son in India. He operated at the camera, and, being double sighted, saw a young woman, a spirit, by my side, when all was ready to take me. That was his first spirit photograph. I went to him frequently in the next ensuing two years, and had over forty photos of spirits taken—male and female, old and young-looking. I bought all the negatives (cabinet size photos) of him. They were described in "Borderland" (14 pages), October, 1895, and other publications. I expected to recoup my disbursements by selling copies of the photographs, but the public can only think they are spurious, because they refuse to believe, despite our bristling spires all over the country, that the dead revive in a new garment of flesh; and if they don't, why have we any religion in the land?—a dead letter, without that immortality that it promises! Any of your readers can have a spirit photo from me for a shilling, post paid. Money returned, if desired, on receipt of returned photo.—Yours truly,

J. STARLING.

62, Abercrombie Street, S.W.

WHERE ARE WE DRIFTING?

To the Editors.

Gentlemen,—"Where are we drifting?" Forsooth! Towards the light, surely, but not all top light. I think, like Mr. Farmer, that the studio of the future will be minus top light. I myself am taking portraits in an ordinary room (with two ordinary house windows on one side, about six feet apart), which I opened about three years ago, as a photographic studio, and find no difficulty in obtaining results, far from lop-sided atrocities; in fact, I often hear remarks, such as: "How very natural," "Quite artistic," "Looks as though he were about to speak," etc., etc. After reading Mr. Banger's letter I must consider my sitters an awfully ignorant lot, and not feel at all surprised if some were to develop large ears. To say that "Nature gives us light from above" is quite true, and if concentrated through the sky-light gives a most angelic beam; then all that is necessary to make a complete picture by the said light is a sitter with an expression to correspond. But it matters not whether the light is concentrated through the top, side, or through a keyhole, so long as the desired result is obtained. I am also afraid that midget or carte de visite full length portraits, taken with Mr. B.'s ideal lens, would require a vast amount of supplementary something on them, before one got paid for same.—I remain, yours, etc.,

SIDE LIGHT.

THE CARE OF APPARATUS WHEN OUT OF USE.

To the Editors.

Gentlemen,—The season has now arrived when outdoor photography with many, particularly with the users of hand cameras, will be a thing of the past, until next year. Too often the apparatus is relegated to the lumber room without any consideration as to the state it will be found in when next required for use, with the result that when it is, it is frequently found unusable until certain repairs have been done. This state of things might easily have been avoided if a little

care had been bestowed upon the apparatus before it was stowed away, and if it had been kept under other conditions, "lumber rooms," if at the top of the house, where the majority of them are situated, are, as a rule, none too dry, and as a consequence apparatus stored therein is often found in quite a different state from what it was when put away. The leather portions may have become mouldy, and the metal parts rusted or oxydised, things that, by a little care, might easily have been avoided. Here are a few hints that may be useful to many. Suppose it be a hand camera. All parts should be thoroughly freed from dust, and if it is supplied with metal sheaths it is a good plan to give them a coating of black varnish as a protection against rust. The leather cover may also be very slightly oiled with good olive oil; this will often prevent mildew. When this is all done the camera should be securely wrapped in brown paper, if it has not a leather case, to prevent access to dust, etc. In the case of cameras with leather bellows it is a good plan, after thoroughly dusting all parts, to rub the bellows over with French chalk, to prevent the gussets from sticking together, and pulling off the surface when they are again taken into use. With bellows body cameras it is a good precaution to open them two or three times during the storage, and expand the bellows, and, if any tendency to sticking is found, the French chalk treatment should be repeated. With regard to the place in which the apparatus is stored, it should be dry, but not abnormally so, as the wood with which the cheaper forms of modern apparatus are constructed is not too well seasoned, and an abnormally dry and warm place may do almost as much harm as a moderately damp one. However, if a little consideration be given in storing the apparatus it will always be found in as good working condition when next required for use as when it was put away. There is an old aphorism, "Safe bind safe find," and that well applies to photographic apparatus when not in constant use. Hence these seasonable hints.—I am, yours, etc.

DARK SLIDE.

November 16th, 1902.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY, 24, *Wellington-street, Strand, London, W.C." Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C*

PHOTOGRAPHS REGISTERED:—

E. J. W. Beech, The Studio, The Cotteridge, King's Norton. *Photograph of St. Nicholas Parish Church and Old Grammar School.*

R. P. Gregson, 37, Church Road, Lytham. *Two photographs of W. Farnworth, Esq.*

H. Barney, 26, Bourne Street, Dudley. *Photograph of Dudley Town Prize Band.*

"SINOP."—J. D. STOKOE writes: "I shall feel indebted if you will inform me where I can get to know particulars of the process "-Sinop" as mentioned in your Journal of November 7th inst."—In reply: See reply to "Sinop" below.

ADDRESSES WANTED.—FRANK THOMAS asks: "Could you oblige me by giving names and addresses of photographic view publishers?"—In reply: Messrs. Valentine and Son, Dundee; Frith and Co., Reigate; G. W. Wilson and Co., Aberdeen, are all publishers of photographic views.

CHRISTMAS CARDS.—A. FRASER asks: "Where can I get mounts for Christmas cards with mottoes, such as some professional photographers are now making such a feature of?"—In reply: Surely our correspondent cannot look at our advertisement pages or he would not need to ask this question.

BREMER ARC LAMP.—PHOTOPHIL says: "I should be obliged by information about the Bremer arc lamp, and where to procure it in Paris or in London. Is it of dimensions suitable for a magic lantern?"—In reply: We, unfortunately, do not know the lamp mentioned. Perhaps some reader may be able to give our correspondent the desired information.

J. P. BAMBER.—Your queries are so "mixed" between emulsions and enamel that we really do not understand what you require. If it is information on making collodio-chloride paper, you cannot do better than get Abney's book on "Photography with Emulsions." That gives formulæ for collodio-chloride emulsions. You ask for your queries to be answered in the "text portion" of the JOURNAL. Correspondents are only replied to in this column.

DETERIORATION OF PLATES.—W. J. HORNER says: "If I keep plates in my magazine camera more than two or three days I find when I develop that they are often fogged or covered with patches, or go black all over. I feel satisfied that the camera is light tight and the dark room all right. Can you suggest a reason, and do plates generally spoil quicker if they are kept in the camera? Imperial, special rapid I use."—In reply: If the camera is light tight and the dark room light safe, the deterioration must be due to the camera—probably from some exhalations from the wood or the blacking of the inside. Dry plates deteriorate rapidly if kept long in some dark slides from the same cause.

LOAN OF SLIDES.—MR. PERCY J. ASHFIELD writes as under: "Can you give me any information as to the best means of obtaining the addresses of lantern and photographic societies. The Rhyl Town and Improvement Association have a set of over sixty lantern slides of Rhyl and district, with a descriptive lecture they are willing to loan free of charge, hence my desire for above information?"—In reply: A list of different photographic societies and clubs in the United Kingdom is given on Pages 623-664 of the "Almanac" for the current year. Should any society desire the loan of the slides mentioned they had better communicate with Mr. Ashfield. His address is 66, High Street, Rhyl.

DRYING MACHINE FOR PLATES.—H. C. F. says: "I should be much obliged if you would let me know your opinion on the following—(1) Is there any demand for negative drying machines? (2) Are there many at present on market? (3) Would it be worth while taking up one of following detail—Will dry negative in six minutes (about) without treatment in further baths or application of spirits; adaptable to dry several at once; cost not to exceed five shillings?"—In reply: (1) We do not imagine that there is any great demand for the machines. (2) There are not many on the market. (3) We think, perhaps, it would, as the price is moderate, if the apparatus were well-exploited, but without seeing the machine we could give no decided opinion.

OBSTRUCTED LIGHT.—"TROUBLED" writes: "Five years ago I bought a piece of freehold land on which I have built a house and a studio on the garden at the back. Now the owner of the next house, built since mine, is putting up large workshops on his garden that will block out all my north side light, which is all the light I get. Will you kindly advise me as to what steps I must take to stop the building, which is at present only eight or ten feet high?"—In reply: Unfortunately you cannot stop the erection of the building, as your neighbour has as much right to put up what he likes on his ground, the same as you had on yours. As your studio has only been in existence for five years you cannot claim "ancient lights," consequently, you can do nothing in the matter——unfortunately for you.

COLLOTYPE.—"SINOP" writes: "(1) In the BRITISH JOURNAL OF PHOTOGRAPHY, November 7th, there appears a report of a demonstration given by Mr. William Gamble at the Royal Photographic Society on a process for printing known as Sinop. I should be obliged if you could help me in finding an address where I could obtain the prepared plates which he (Mr. Gamble) says can be obtained commercially? (2) Would the same be exposed under a negative or a positive so as to make a negative in relief? (3) Where can I obtain the rollers and ink for this process?"—In reply: (1) The plates, we believe, are supplied by Messrs. Penrose and Co., Farringdon Road. (2) A negative, but it must be a reversed one in order to have the image the "right way about." (3) Messrs. Penrose and Co. supply all the necessary materials for collotype work.

CHOICE OF APPARATUS.—"CASSIO" says: "I am going to take up photography for experimental purposes, such as the testing of the speed and quality of plates under all conditions. I am anxious to have the best apparatus, but I am somewhat in doubt as to the best form of lens and camera suitable for the purpose, whether the double anastigmat type of lens and a folding camera, or a good rapid symmetrical and a double extension camera. I favour the former type, but I am not quite certain whether it would be really adaptable for all purposes. Also I should be greatly obliged if you would tell me where to obtain a 'Sanger Shepherd' plate tester and the price?"—In reply: If the apparatus is only required for the purpose named almost any camera or lens will answer, supposing the apparatus is perfectly light tight. Both the systems menioned are good and reliable. The plate tester named may be had from Messrs. Sanger-Shepherd and Co., Grays Inn Passage, Red Lion Street, Holborn, W.C.

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*** *The Editor can only be seen by appointment.*

*** *We do not undertake to answer letters by post.*

THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC FOR 1903.

Edited by Thomas Bedding, F.R.P.S.

The forty-second annual issue of The British Journal Photographic Almanac will be published in December next. This year's Almanac reached a total of 1,560 pages, and the entire edition of 20,500 copies was sold out a fortnight before publication. Of no other photographic book ever issued can two such unique facts be recorded.

The growth in popularity of the Almanac is evidenced by the remarkable rapidity of its sales.

The 1900 Edition (20,500 copies) was sold within three months after publication.

The 1901 Edition (20,500 copies) was sold a fortnight after publication.

The 1902 Edition (20,500 copies) was sold a fortnight *before* publication.

The widespread interest in the Almanac grows steadily year by year, and in order to supply the increasing home, foreign, and colonial demand, we have decided to enlarge the 1903 issue to

25,000 COPIES.

The great addition to the circulation of this most popular annual (over 20 per cent.) undoubtedly enhances its value as an advertising medium, and the issue of the large number of extra copies will supply the wants of thousands of photographers, dealers and publishers who were unable to obtain the Almanac for the last three years.

The Almanac for 1903 will appeal to photographers all the world over as a daily reference guide in practical work. The standard matter and formulæ will be revised and added to where necessary, and the latest departures in theory and practice will be chronicled. The year's advances will be recorded, and wherever practicable new features of an informative nature will be added.

EX CATHEDRA.

Travellers' Tales.

As by an unfortunate *contretemps* the Camera Club was last week deprived of its customary lecture, the members made the best of the mishap and organised an informal discussion upon travelling experiences. The talk turned out to be of a rather desultory, as well as discursive character, but it was far from being uninteresting, for a number of points were considered by men who had visited most parts of the habitable globe. But there was common agreement among them upon one matter, and that was with regard to Custom House practice. It was maintained that although we enjoy the blessings of free trade to such an extent that duty is now levied on very few articles, there is far more trouble to the traveller in getting clear of the Customs officials at our own ports than in any other country under the sun. One member plaintively recounted his experiences in landing from France, his luggage being mercilessly overhauled in spite of his reiterated protest that he "had nothing to declare." But what he seemed to feel more acutely than anything else was the presumption that he might have concealed among his things any Gallic cigars. "As if anyone in his senses would burden himself with that awful form of tobacco represented by a French cigar." It is perfectly true that during the past twelve months the English tourist from abroad has been put to unusual inconveniences in passing the Customs, and we ourselves can testify to this. We believe the reason to be that instructions have been issued to the officials to keep a sharp look-out for smuggled saccharin. Since the war duty was placed on sugar, there has been a temptation to smuggle this sweet compound into the country. It is mostly made in Germany, and owing to the fact that it is some hundred times sweeter than sugar, and that a comparatively small quantity of it would be equal in sweetening power to a ton of the best Demerara, a duty of one sovereign per lb. has been put upon it. Those inclined to smuggle have not had such a good chance for many years of making a dishonest penny, and our readers will call to mind many recent instances in which individuals have

been heavily fined for the illegal possession of saccharin upon which no duty had been paid. It would certainly be hard on photographic tourists if packets of undeveloped plates were exposed to light in the search for saccharin, but such an accident is quite likely to occur unless the traveller is on the alert, and insists that the examination be conducted under red light. At most Custom-houses a dark-room is available for the purpose of examining packages said to contain photographic materials which for any cause come under suspicion of containing goods liable to duty.

* * *

German Industrial Methods. We have, on more than one occasion, referred to the organisation of labour which is being carried out by the State in Germany, and we give the following extract from the *Allgemeine Photographen Zeitung*, which shows that the interference of the government with labour may not be an unmixed blessing. The balance sheet of the labour organisation for the district of Düsseldorf for the year 1902 deals with a total of 88,990 marks (about £4,300). Of this sum it is affirmed that only a few hundred marks were directly applied to the improvement of the workmen. The income appears to have been devoted principally to the payment of salaried officials, travelling expenses, delegates' charges, diet, and allowances. The seven master workmen, who occupy positions as presidents of the various departments, received together a sum of 17,600 marks for their attendances, etc., at congresses, although their positions are considered honorary. In addition to this, there are a number of officials receiving salaries varying between 3,000 to 4,800 marks per annum. Their personal expenses figure for an additional few thousand marks. Thus there were only a few hundred marks remaining for the apparently minor purpose of instructing master workmen and apprentices. Things are done so much better abroad!

* * *

Colour Protection. A few weeks ago we commented upon the circumstance that the Admiralty authorities had determined to give our battleships a coat of grey paint, with the idea that this tint would so match the sea and sky that the vessels would be less visible to the eye of an enemy than if they retained the deeper colour which they have hitherto assumed. And we pointed out that photographers would be the first to note that the efficacy of the new dress would depend upon the conditions of lighting. "With a bright sky at their back," we wrote, "they will look under certain conditions quite black; while, should the sky be murky and the light full upon them, they will stand out almost white in tone." We now learn that our surmise was correct. H.M.S. Devastation is the first ship that has been submitted experimentally to the new treatment, and a picture of her, contrasted with another picture of the ship as she appeared before the pigmentary transformation, is published in last week's *Illustrated London News*. A note in forms us that the new paint is composed of white 11ozs., and black 6ozs., but the particular kind of pigments, a very important point, is not given. The statement in which we are more interested is to the effect that there is a clear gain in invisibility by day, but that under the search-light the grey has been found more conspicuous than black. If our warships could be endowed with the power of the chameleon, to change their colour according to surroundings, it would be a gain indeed, but we can never hope for such protective value in one fixed tint. The steam banner from a tall chimney shaft will look as black as Erebus against a sunset sky, but it will appear as white as snow if the morning sunlight falls upon it.

* * *

Line Drawing. There are comparatively few artists of note who can be said to be thorough masters of line. The introduction of the zinco block, which was the first step towards the suppression of wood engraving, naturally attracted many to that mode of artistic expression; but the fact still remains that for every one who can make a good line drawing, i.e., a pen and ink sketch, there are hundreds who can work with pencil and brush. Some of the most skilled of our line draughtsmen have been on the staff of *Punch*, and the names of Leech, Charles Keene, and Du Maurier naturally occur to one in connection with the past history of that popular periodical, just as to-day it is associated with the names of Linley Sambourne, Bernard Partridge, Phil May, and others. The wonderful command of line which these artists possess has given them their reputation. We have observed of late that a new method of illustration has found its way into the Conservative pages of the "London Charivari." Last week, for example, Mr. Lucy's amusing article on the doings of Parliament was illustrated by four half-tone blocks reproduced from pencil sketches. We were glad to see this because it is a sign that the pages of *Punch* will be thrown open to those who, while possessing the power of humorous expression, are not at their best when handling a pen and ink to give utterance to it. There was a rumour recently to the effect that *Punch* was to be confronted with a formidable rival, to contend with it in its own peculiar field of literature and art. Many attempts at such rivalry will be remembered by those who are approaching middle age, for success always leads to imitation, and the position of *Punch* has again and again been assailed. Students of comic literature could, without much difficulty, compile a list of at least fifty publications which have aimed at assuming the cap and bells worn so long by the genial hunchback, and a few of these have been conducted with so much ability that it is a matter for wonder that their existence was so ephemeral.

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The Encyclopædia Britannica. The supplementary volumes of this stupendous literary production differ from those which have preceded them in the circumstance that they are partly illustrated by half-tone process blocks. This is a most welcome innovation, and we consider that it adds considerably to the value of the work as a whole. Taking one of the first articles as an example, that on agriculture, we find it well illustrated by pictures of prize animals of different breeds—cattle, horses, pigs, and sheep. Such pictures may not be necessary for the information of the bucolic mind, but there are thousands of persons bred in towns whose knowledge of sheep and cattle is confined to the mutton and beef which they eat at their meals. By reference to the new volumes of the "Encyclopædia" they will now be able to distinguish between the many varieties of these animals which are so important to the welfare of man, and will be able to take an intelligent interest in them. The photographs are good, and have been excellently reproduced. To turn to another subject, and to show the up-to-date character of the work, we may mention that two half-tone pictures are given of M. Santos Dumont's dirigible balloon: one taken in Paris showing the gigantic aërostat resting in its shed, and the other taken instantaneously at Nice showing the balloon high in the air. A page is devoted to the life

and work of Sir L. Alma-Tadema, and another is given to a reproduction of one of his chief pictures "The Roses of Heliogabalus." Two paintings by Rosa Bonheur occupy another page, while, curiously enough, Lord Beaconsfield is dismissed with a small woodcut portrait. The article on "Caricature" is illustrated by three pages of specimens, but full page cartoons from *Punch* are not improved by being contracted to three inches in height. We are of opinion that half-tone blocks might have been introduced far more lavishly than they have been. For instance, the article on "Bacteriology" has nothing but wood blocks, and, of course, photographs of these organisms would have been much more convincing. Their omission is still more felt in the article on "Astronomy," which has merely a few geometrical diagrams. When we call to mind the immense revolution in astronomical methods which has been brought about by the wedding of the telescope with the camera, it seems surprising that no photographic examples are furnished to illustrate this article. The fact that a photographic chart of the heavens is now in progress would alone have furnished a plea for inserting some of these interesting pictures. It may be in contemplation to use such photographs in connection with other articles o come, and we hope that this may be the case. An encyclopœdia is a work which, by its nature can never be finished, for by the time the last volume is completed, the first one requires amendment. We may feel certain that, eventually, the photographic illustrations to the work will supersede all others.

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An Improved Carbon Process. The *Deutsche Photographen Zeitung* informs its readers that Herr Carl Zink will shortly introduce an improved carbon process. Specimens have been submitted to the editor, who expresses a very favourable opinion upon the process for portraits of large size. The following are the advantages claimed by Herr Zink for his process:— I Disuse of the photometer. 2. A visible image. 3. No transposition from right to left. 4. No transfer. 5. Abolition of the safe edge. 6. No necessity for a second, or reversed negative. 7. No blisters in development, even if boiling water be used. 8. A film that cannot be damaged in development. 9. In using an enlarged negative, the absence of the characteristics of an enlargement combined with perfect similarity to the original negative. It is also said that the process lends itself to the effects obtained with gum-bichromate. In referring to these various points the *Deutsche Photographen Zeitung* remarks that No. 1 and 2 are practically identical, since the image must be visible if the photometer is to be dispensed with. Moreover, if a large number of identical points are required, the retention of the photometer might be desirable. It is pointed out that No. 4 is discounted by the fact that the paper has to pass through a similar process before exposure, and that the carbon process may be worked without transfer by spreading the pigment with a brush. A large number of prints upon opal glass were produced in this way. Point No. 6 does not apply when double transfer is used in carbon printing. Nos. 7 and 8 may be looked upon as one and the same. No. 9 may depend to some extent upon the process of enlargement. There is, however, an unquestionable advantage in No. 3, and it may be of sufficient importance to make the process valuable. As the Editor of the *Deutsche Photographen Zeitung* does not know the details of the process, only its general outline, he abstains from expressing a definite opinion upon it. In our opinion the wiser course for photographers would also be to suspend their judgment until more is known. The process is not to be placed upon the market in a concrete form, but as a formula for which subscribers have to pay 35 marks. Experience has often been unfavourable where processes have been introduced in such a way, but we say this without prejudice in the present instance. The firm of Haacke and Albers, Frankfort 0 M., has taken up the matter and will send the formula to subscribers in the course of the month of January.

* * *

Silvering Mirrors. The following method of silvering, given by M. Izarn in the "Comptes rendus de l'Académie des Sciences," should be of great value to users of mirrors, as the author appears to have been uniformly successful with it. The process is a modification of that of M. Lumière, but as their account of it was very brief, M. Izarn had to ascertain the best conditions by experiment. The surface to be silvered should be scrupulously clean. Prepare it by rubbing it well with a wad of cotton wool, first using acid and then ammonia. Polish with a little finest rouge, and finally rinse well under the tap. The dish in which the mirror is silvered should also be perfectly clean. A 1 per cent. solution of silver nitrate should be prepared and converted with pure ammonia in the usual way. Take the quantity of solution required for the mirror and place it in a measure. In another measure take a certain quantity of formol, counting the number of drops from a dropping-flask. The determination of the quantity will be afterwards described. Pour the silver solution into the measure containing the formol, then back again into the original measure, and finally into the silvering dish. This should be done very quickly, so that the change which takes place in the colour of the solution may not begin until the dish is filled. Rock the dish well until the silvering is finished. The process takes scarcely more than a minute. The quantity of commercial formol (40 per cent.) to be used, should be ascertained in the following manner. Take a white porcelain dish, clean it well, pour a little ammonia into it, and finally rinse it thoroughly under the tap. Pour into the dish 15 c.c. of the ammonio-nitrate of silver solution and add successively seven drops of formol, rocking the dish well meanwhile. The solution rapidly assumes a rose-violet tint, which deepens in colour. This is quickly followed by an irregular deposit upon the surface of the dish. The deposit passes through various shades of colour from rose to violet, blue and iron-grey, and finally forms a film of bright silver, of yellowish tinge. The solution, meanwhile, clears and becomes coated with patches of fine metallic lustre, giving it an oily appearance. The dropping-flask determines, to some extent, the number of drops of formol. That used by M. Izarn gave a reading of 5 grammes for 100 drops. The silvering is complete when the solution clears and becomes charged with a flocculent precipitate. Insufficiency of formol is indicated by muddiness of the solution, whilst an excess will work too quickly and fail to give a deposit, or one too tender to be of use. When the solution is correctly adjusted the film, after well rinsing under the tap, will withstand hard rubbing. M. Izarn prepared glass plates in this way for daguerreotype. After the mirror has been well washed under the tap and finally rinsed with distilled water, it may be polished with soft washleather and finest rouge, as soon as it is dry. As the film becomes very hard, if it is intended to be used as a resist for engraving with hydrofluoric acid, the work should be done as soon as the film is dry.

LIGHT IN DEVELOPING.

Lately there has been brought under our notice a rather singular phase of photographer versus plate-maker. A certain dealer was rather surprised to have a letter from an old and expert customer complaining of a batch of plates he had just received being difficult to develop up to the right density. Seing that a large number of plates out of the same batch had been sent out and no other complaint made, it was felt that some mistake must have occurred somewhere, for even yet makers often have at times to wade through a sea of correspondence describing the defects their plates are exhibiting, though they know full well that inexperience will almost certainly prove to be the explanation of all the so-called defects and deficiencies. Upon investigation into the particulars of the case in question a perfect explanation was found. The photographer admitted that he had written on the spur of the moment in a fit of anger as soon as he had finished development and placed his plates in the hypo, and without waiting to examine them after fixing; for when he had a little further experience with the objectionable plates he found himself getting all his negatives too dense. It appeared that the incandescent electric light, which he always used for development, had after a temporary disarrangement, been replaced much nearer the coloured glass of the lamp, which was covered with yellow fabric, so that the lamp itself was not visible. The result was, of course, that a much larger amount of actinic light passed through than when the light was placed further away; we need scarcely remind our readers that the intensity of the illumination on the fabric, etc., would increase in inverse proportion to the square of that distance, so that if, for example, the ordinary position of the light was four inches from the screening glass and the new position left only an inch of space, there would be a sixteen times more powerful light energy at work trying to penetrate the coloured lamp screen, and, of course, this increased intensity of illumination not having been discovered, the unfixed negatives would naturally look less dense than under the former conditions of lighting. Equally naturally, of course, the fixed negatives examined by daylight would be too dense.

This incident leads to a consideration of many nice points in dark-room work. For some time past there has been a growing tendency to abandon the use of daylight as a dark-room illuminant on account of its variability, and to adopt gas or electric light, either of which provides illumination that, for all practical purposes, may be looked upon as constant and uniform. It is beyond discussion that the greater the uniformity that can be made to attach to all dark-room operations and conditions the greater will be the attendant success.

We have lately had the opportunity of examining the dark-room arrangements of many studios, and it has been very instructive to note the great variety of illumination adopted, from the dim glow of a double thickness of ruby glass, through "cathedral green" to yellow, any of which may be safe or unsafe according to the conditions. It is now well understood that there is no such thing as a "safe" light, it is simply a question of time as to whether a plate will be fogged or not when exposed to any light, and if this fact were sufficiently appreciated much greater comfort might obtain in many dark-rooms. A careful operator when arranging his illumination will, perhaps, experiment on a partially-screened plate exposed at a certain distance to his light for a while and developed. It is evident that this exposure, if sufficiently prolonged, is bound, sooner or later, to show the effect of light action upon development. Hence the logical deduction is to decide first as to the length of time which it is considered a plate under average developing conditions will be exposed to the light; secondly, as to which of available light screens will give a maximum amount of illumination with maximum approach to safety in that time. That such a simple principle of selection is not generally adopted seems in the examples we have had the opportunity of observing to be beyond doubt, for we have seen in some places developing carried on under conditions that are absolutely painful in comparison with those prevailing in other studios. We do not think the cause is far to seek. In the earlier days of dry-plate work it was soon discovered that a light safe for wet-plate conditions was not so for gelatino bromide, and the immediate effect was a reduction in amount of illumination, rather than an improvement in its light-obstructing power. Ruby glass was mentioned; it was adopted by most of the pioneers; and when it was found that gelatine had come to stay, almost every dark-room lamp put on the market was provided with ruby glass. After a time a little variation was introduced; but to this day if it is required to hunt out in a dealer's catalogue a dark-room lamp it may be safely looked for under the heading "Ruby Lamps." So much hold has this idea obtained that the word ruby seems almost in danger of losing (in photographic language) its true meaning and becoming accepted as a synonym for what is termed "non-actinic," an objectionable term, which has come to be adopted in opposition to etymological considerations like so many others that have obtained a footing in our language on false pretences. Some thirty or more years ago it was proposed, we believe, by the late R. W. Thomas, that the word adiactinic should be adopted (the word is to be found in the "New English Dictionary," but with no reference earlier than 1880), but it has not found favour, and "non-actinic" still holds the field.

It may be queried, Where is the objection to ruby glass? using the word in its true sense. The reply is that it offers a minimum of light with a maximum of danger, for unless it be of such light obstructive power as to give most feeble illumination, ruby glass permits a large proportion of the light from the most refrangible region of the spectrum to pass, and so causes fog after a comparatively short exposure. We cannot beyond this cautionary dealing with this particular glass give more space for the subject, though on a later occasion we may be able to give it further consideration.

WINTER TROUBLES IN PHOTOGRAPHY.

The inclement weather we have already experienced has been sufficient to bring trouble and discomfort to many photographers. Although the temperature here has been exceedingly low for November, it has been some 15 to 20 degrees colder at some places on the Continent—Paris, Berlin, Munich, for example. It is rarely such extreme cold is experienced so early in the winter, and it is for this reason, perhaps, that some "weather-wise" prophets are predicting a long and very severe one. A Continental one even goes so far as to say that the forthcoming will be the most severe winter for the last fifty years. Most, nowaday, know how much or how little dependence is to be placed upon the predictions of weather prophets, who profess to foretell the weather some months in advance. Still the recent spells of cold have been sufficient to unpleasantly remind us that winter, with its photographic inconveniences, is at hand, and it may be asked, How many at the time it set in were fully prepared for it?

The troubles brought about by a very low temperature are often not at first fully realised by many photographers, even professionals, while with novices more often than not they remain for a time quite unsuspected. What is often

really due to a depressed temperature in the dark-room is frequently put down to under-exposure. As the image is slow in making its appearance, and takes a long time in the development, and in the end is thin and feeble, it is not altogether surprising that novices do suspect insufficient exposure as being the cause, rather than the low temperature. Sometimes, however, the trouble is ascribed to the plates; it is so easy to put blame on plates when things go wrong. In cold weather it is frequently recommended to heat the developer and the developing-dish to 65 or 70deg. That will certainly mend matters to some extent, but a little consideration will show that much of the advantage thus gained is considerably discounted if the manipulations are carried on in a dark-room the temperature of which is some twenty degrees lower. The temperature of many dark-rooms last week, unless they were artificially heated, did not exceed 45deg., and it is clear that if the development was commenced at the higher temperature the developing solution as well as the dish would cool down before the development was complete, and as a consequence the resulting negatives may be lacking in printing vigour, so that they frequently have to be afterwards intensified. Here, not infrequently, a further trouble is met with.

At a low temperature all chemical actions are slow, and the fixing of the image, unless the hypo solution is warmed, takes a long time and, too often, the plate is not allowed to remain in it long enough to (after the bromide of silver has disappeared) bring the hypo salts of silver into the freely soluble in water condition, with the result that when the image is attempted to be intensified stains are in evidence, and the negative is often spoilt. Again, supposing that the plate is left in the hypo long enough to perfectly fix it, the fact should be kept in mind that the water as it comes from the tap at, perhaps, but a few degrees above freezing point, has not the same solvent action as when it is, say, 20 degrees warmer, hence a much longer washing becomes necessary to ensure complete removal of the hypo. Unless that is done, stains may be expected if the negatives be intensified; or it may become stained with silver in the paper if that be at all damp when it is printed.

In the case of negatives the result of a depressed temperature is more directly manifest than it is in the case of paper prints. In the former the disappearance of the bromide of silver from the film while in the fixing bath is some guide as to its fixation. In the case of a paper print there is no such guide, and, too frequently, prints made in cold weather are not only imperfectly fixed, but also insufficiently washed, and as a consequence, they quickly change, developing yellow stains, spots, etc. We have long noticed that we hear far more complaints of these and similar defects during the winter months than at any other period of the year, and in the majority of instances the cause of the trouble is not far to seek.

In all well-appointed photographic establishments there are heating appliances to keep the dark-rooms, printing, and work-rooms, at an equable temperature. But even that does not effect the water supply, that still remains cold. With albumen or collodion papers warm water may be used for freeing the prints from the hypo. But the majority of gelatine papers will not permit of such treatment; hence a more prolonged washing becomes imperative to rid the prints from the last traces of hypo in very cold weather than when it is milder. The dark-rooms of many amateurs are little more than cupboards—often in the basement, or at the top of the house, with no direct means of heating them. Yet they may be brought to a comfortable working temperature by a cheap paraffin stove—one of these with a four, or four and a half, inch wick, will keep a small room at a comfortable working temperature, even when that outside may be almost at the freezing point. A common paraffin lamp with an inch wick, left burning all night, with the door shut, will keep the room, the solution, dishes, etc., at a temperature suitable for working with in the morning. Objection may be raised to this mode of heating on account of the smell, but as a matter of fact there need not be any, provided the lamp, or stove, be kept scrupulously clean, and the wicks properly trimmed and adjusted. Even if from neglect of these conditions unpleasant fumes are given off they will have no injurious action whatever on photographic work of any kind.

A STRAY CONVERSATION.

"But, my dear fellow, I cannot conceive how you can doubt it. Do you really want me to believe that you refute the existence of personality? I have always thought of you as an egoist, and from your contributions to the press I had no hesitation in classing you as a disciple of metaphysical doctrines. And now you would scatter this belief to the fair winds; in a fit of what I can only imagine to be ironical humour you declare yourself to be a positivist; you place yourself on the side of Mill and Lewes, avowing the principles of psychology as your fundamental basis. Are you unable to realise the truth of *Τὰ μετὰ τα δισικά*? or do you sink lower still, and declare yourself at once to be a materialist?"

"Yes and no; I hardly sufficiently explained myself. We commenced our conversation on the eternal topic of art photography, you at once branching off into the domain of portraiture; and here we are, less than half-an-hour from the time we started, involved in far deeper philosophy than I usually contemplate. I do not think I quite recognise the bearing it has on the subject."

"Why not? You think pretty deeply as a rule, and you admitted to me once that your success as a portraitist was chiefly due to intuition; now you try to convince me that anyone with your knowledge of technique would do just as well if they had a little studio experience. I will not believe you are serious. I regard it as an unthinkable absurdity that anyone in his senses can deny the existence of personality in an artist."

"That is of course true, and I do not wish to dispute the hypothesis; but I have often thought that after all is said and done our art is purely imitative. Quatremère de Quincy says the object of imitation is 'To produce the resemblance of a thing, but in some other thing which becomes the image of it.' Well, my dear fellow, that seems to fit our case. As portraitists, we try to turn out pictures which produce in the minds of the observers the resemblance of the original subject."

"That is exactly what I complain of—you are content with allowing your art to be imitative. If you would but exert yourself more, it would be possible to advance much further, and make it substitutive and suggestive. This, perhaps, wants a little explanation: the greatest of all arts, poetry, is substitutive and suggestive, employing, as it does, words not images; and I do not at all agree with those who say that words raise images in our minds. Thus Hegel tells us that the name has the same value as the representation, and supplies its place in memory. Pronounce the name of a lion, and there is no need of the image of a lion, the name being the intellectual existence of the thing. Thus, I think, if we can do it, it is our duty to invest our work with some of the attributes of poetry, so that. suppose for instance someone was looking at my portrait, he would not only say 'Oh! that's very good of him,' but would somehow find himself gazing at it, conscious of being struck with some abstract thought, and forgetting about the mere image of the subject. If you can do that, I say that your work is sug-

gestive and substitutive—suggestive because it has aroused an abstract idea, substitutive because it is through the medium of a virtual image that this emotion has been awakened."

"Ah! if we could only be sure of being able to do that, we could at once class ourselves as artists; but I think there are very few of us who can do so. It must be admitted that the methods of our work are all against succeeding on such ambitious grounds—don't you think so?"

"Indeed I do; but then, I do not see why someone should not be more honest than the general mass, and if he claims to be an artist prove himself one, not only by the superiority of his work, but also by the originality of his methods."

"But, my dear fellow, he would soon be a beggar——"

"No, no; I don't think so at all. A little capital would, of course, be necessary, but his vastly superior work would be bound to win its own reward. People would quickly recognise the artist, and be bound to patronise him. You must recollect his expenses would be very low indeed. The work would be done altogether by himself, and the personal tastes of such a man as I mean are always most economical. It would be necessary for him to adopt exactly the same methods as his brothers of the brush, and if possible live among them. His would be a life devoted to art, devoid of all those ugly barriers that make portraiture as practised by our present-day professional photographers such a mechanical method of reproduction. There would be time for the infusion of his personal genius into his work. Undoubtedly he would be considered more or less insane by other photographers, but the insanity would be altogether on their side and not on his——"

"You mean to say that by his mode of living and his methods of work he would be warmly fostering all the possibilities of art in his craft?"

"That's it exactly; he would. How the majority of our present-day professionals have the courage to call themselves artists I cannot understand. I can only conclude that they must be exceedingly thick-skinned and very ignorant of all art matters. What a very interesting thing it would be if they had to attend an examination, and answer ten questions on the philosophy of art. I think the answers would be a fitting memorial to their ignorance. And yet I do not see how any progress of a real value can be made until the fundamental principles are thoroughly understood. The fault of photography from the artist's standpoint is that it does too much for the operator. Don't you think so?"

"Yes, I do indeed. If the camera only did one quarter the work it does at present, we should have two things happen. Firstly, there would be one quarter, at least, of the number of photographers we have now. Secondly, they would be far better men. As practised nowadays, it is a sort of "dernier ressort" of the man who has failed in everything else; and, in this respect, shares the field with the wine business. It is probably on account of this that our profession does not occupy the position in society we would like it to. It is not, I think, because of the work itself, but because of the poverty of intellect and education which is so very apparent among the rank and file. They know so little that they are cruelly jealous of each other, and can hardly be got together in a friendly meeting. And yet as each year goes on fresh discoveries and further improvements bring greater opportunities for personal feelings being displayed in our work; but if these are to be taken full advantage of they must be employed by the intellectually endowed individual, and not by the merely mechanically accurate man."

"Of course. It is the difference between the artist and the artisan. I fear the majority of us belong to the latter class; our work is done on a commercial basis, and the longer we stick at it the more does this spirit of trade become the main factor in our efforts. There are some who, I believe, think that if the print is made in carbon or platinotype, or some crude method which they call 'Rembrandt'—but which would make that master have a fit could he but see it—be adopted for the lighting, their work is at once a work of art. There are others who claim the same distinction, because they arrange the folds of a skirt or a piece of drapery gracefully, or place the hands in some fantastical position, which invariably looks most unnatural."

"Yes, old chap; the amateurs are the best on the whole, I think. They work on truer art lines, and their failings are those which can generally be soon put right with more experience. If they stick at it till they reach the top of the tree, they will probably be far better qualified to speak on the subject than a professional man, because the chances are they have made a far more careful and exhaustive study of it, especially theoretically, than the other can do under the existing trade customs. They have greater freedom of action, more chances of suiting their own fancies, and realising their own ideas——"

"In other words, my friend, of displaying their personality. Aha! I knew you would be bound to come down to it sooner or later. How delightful!—you admit that nowadays the master amateur does work more entitled to be called art work than does his brother professional; further, you agree that the reason of this is that he is working on truer artistic lines, and, therefore, giving greater scope to his personality. The 'a priori' truth is consequently personality. 'Cogito ergo sum'—it is necessary that I who think should be somewhat. Thought is inconceivable without a thinker, but the philosophy of the subject by no means stops there. But I am delighted that you can distinguish the difference between sensation and neural process. Tyndall said:—'We have not an organ, nor apparently the rudiments of an organ, by which to apprehend how a motion in the brain becomes a sensation in consciousness.' And yet the eye is the all powerful source of the artist. The great difference in the way the same thing affects different people is due to its subtle agency; and if this real spirit is strongly within anyone, it is bound to manifest itself in his work. The artist and the poet are men who can extract inner truths from what they see, where ordinary folk merely observe an external reality. Just hand me down that little book of verses by Henley, will you, please? Thanks; now listen to this:—

'Tis the spring.
Earth has conceived, and her bosom,
Teeming with summer, is glad.

There you have the expressed thoughts of a poet. No ordinary man ever drew such a comparison or offered such a fitting explanation of the buoyant energy and new life which seems to be in the air in springtime."

"Ah! my dear friend, I think, though, you go too far. Your enthusiasm runs away with you, and your ideals are, I fear, too beautiful to be realised. I only wish such a man, endowed with the gifts you have mentioned, would do as you want him to. What do you think would be the result?"

"I think he would succeed."

"Do you think he would be understood?"

"Undoubtedly; but only by those who were themselves animated by the spirit of pure art."

"He would want to be a man of very superior education and refinement, and such men devote their lives to more intellectual spheres, as a rule, and would hardly be content with photography."

"Why? There are immense possibilities before such a man. I will not admit his failure for a moment, though I believe he

would be laughed at by those he was brought up with, as being fanatic in his ideas. He would live his life like other artists, and while being subject to the limitations of his methods, would nevertheless have ample scope for the display of his personality. My pretty dream may never be realised; it may always remain the offspring of a diseased mind, as many would say; but I would give much to see the experiment tried. Meanwhile, we must wait until Dame Fortune sees fit to grant our wishes. In the words of our old school song:—

Concinamus ad Pinates!
Vox et audiatur:
Phosphore! quid jubar.
Segnius emicans,
Gaudia nostra moratur?"

A. V. K.

INTERFERENCE IN THIN FILMS — A GRAPHICAL TREATMENT.

[Reprinted from the "Physical Review."]

When light falls upon a thin film of a transparent substance, interference fringes are observed in the portions of light reflected from the two surfaces. These fringes, under given conditions, appear to be localised at a particular place, so that they are not seen distinctly with a telescope unless it is focussed upon a point at a particular distance from the film. This feature of the phenomenon of interference due to thin films has seemed rather difficult of explanation.

Michelson* has given a mathematical solution of the problem for the cases which arise in the form of interferometer devised by him, in which the light is always incident normally or nearly so; and Feussner† has given an elaborate treatment of the general case of light incident at any angle upon a film whose plane surfaces make a small angle with each other. More recently H. A. Pocklington‡ has proposed a method of analysis which is much simpler and clearer than that of Feussner.

It has seemed to the writer that it might be an aid to clearness of thought with regard to the whole phenomenon if it could be treated in a graphical way, by which the wave surfaces could be constructed and the interference effects obtained by the intersections of these surfaces.

The method is often used in making clear some simple cases of interference, as, for instance, the effects which are seen when a distant arc light is viewed through two pinholes close together in a card which is held just in front of the eye. In this case each pinhole becomes effectively a source of light, sending out disturbances in the form of spherical waves into the region behind the card. The waves in the two sets are similar in every respect, having come from the same actual source, and so are able to produce definite interference effects.

In Fig. 1, A and B represent these two effective sources, and the circular arcs represent a series of corresponding wave-fronts of the two systems of waves. Any point in which a wave-front of system A intersects one of system B is evidently a point of maximum disturbance; and as the wave-fronts move outward, all points on the loci of these intersections will be points of maximum disturbance continuously. These loci are obviously portions of a system of hyperbolas, having A and B as foci; but within the region considered their curvature is so small that they may be well enough represented by straight lines. If a screen be placed within this region, so that the light passing through the two pinholes falls upon it, there will be a maximum of intensity at each point where it is cut by one of these lines. In this case the fringes have no definite focus.

* Winkelmann, "Handbuch der Physik," II., 1, p. 546.
† Phil. Mag. (5), 13, p. 235, 1882.
‡ Proc. Camb. Phil. Soc., XI., 2, p. 105, April, 1901.

Consider next a thin film of air enclosed between two glass plates, with the light from a sodium burner falling upon the film at any angle, and being reflected from its two surfaces. The figures are plane sections perpendicular to the surfaces of the film, and passing through the source of light and the eye of the observer. The desired simplicity of treatment can only be attained by considering a somewhat ideal case, in which the effect due to refraction in the upper glass plate is neglected. But the two portions of light which come by reflection from the two surfaces of the film are refracted by this plate in almost identical fashion, so that any relations which exist between them will not be appreciably changed thereby.

In Fig. 2, the two surfaces of the film are taken parallel. A is a particular point in the sodium flame which serves as the source of light, A′ its image formed by reflection at the upper surface of the film, A″ that formed at the lower surface. The two reflected portions of light will then diverge from these two points as virtual sources. Finding the loci of the points of maximum disturbance as in Fig. 1, a_4 may represent the locus of points whose difference in distance from A′ and A″ is four wave-lengths, a_3 the similar locus for a difference in path of three wave-lengths. In this and the following figures, the loci are constructed by locating two points on a chosen hyperbola, and drawing a straight line through them.

This construction is next carried out for two other points, B and C, on the luminous source, giving the loci b_4, c_4, and b_3, c_3. The three lines in each set are evidently parallel. There is actually a continuous series of luminous points across the source where it is intersected by the plane of the figure, and the loci for all of these points will similarly be parallel in each set. But for some point on the source, a locus of maximum disturbance will lie midway between a_4 and a_3, which will be the locus of minimum disturbance for the point A on the source. This overlapping of maxima and minima on a screen placed in the path of reflected light will evidently prevent the formation of any definite interference effect. But if a portion of this reflected light enter the eye, the observer will see a maximum illumination coming apparently along the path a_4 and all paths parallel to it, and therefore coming apparently from the point where these parts intersect, at infinity. Looking along a direction midway between a_4 and a_3, he will similarly see a minimum effect coming along a set of parallel paths. The interference fringes will then be clearly seen by the eye, or in a telescope, only when it is focussed for parallel light.

It is, of course, to be noted that definite interference cannot occur between portions of light coming from two different points, A and B, on the source, but only between different portions of the light which originally came from a single point on the source.

There are other portions of the light from A which will emerge from the film after multiple reflection within it, and interference may occur among any two of these portions. The locus for one such case is shown by the dotted line in the figure; and it is evident that they will all be parallel to those already found.

In Fig. 3 the same construction is applied to a wedge-shaped film. The two lines a_4 here represent two portions of the same hyperbola, in one case the light being reflected towards the angle of the wedge, in the other away from it. The two loci a and b now intersect at various points near the film. This means physically that at such a point of intersection there is a maximum of intensity in the illumination due to the point A on the source, and also in that due to B. It means, also, that the eye will see a maximum illumination coming along the two directions a and b, which will consequently seem to be localised at their intersection, and so a sharply-defined bright fringe will be seen in a telescope focussed upon this point.

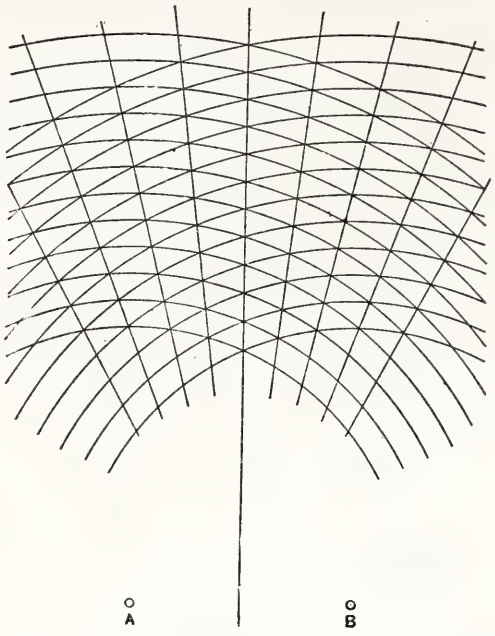


Fig. 1.

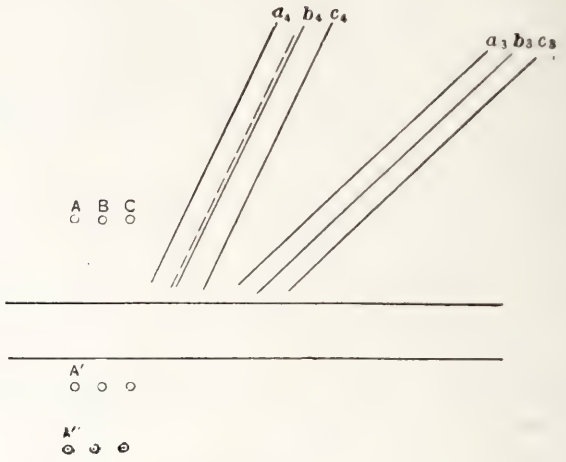


Fig. 2.

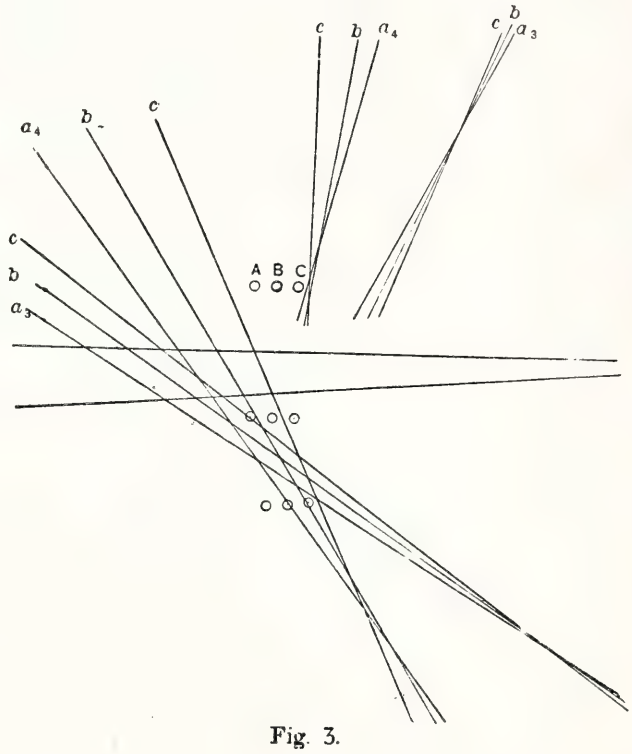


Fig. 3.

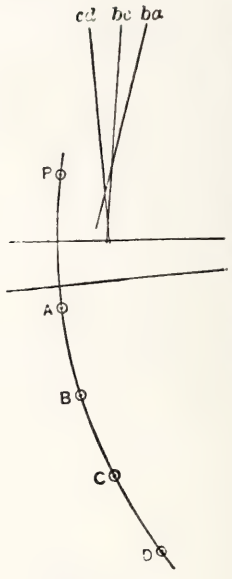


Fig. 4.

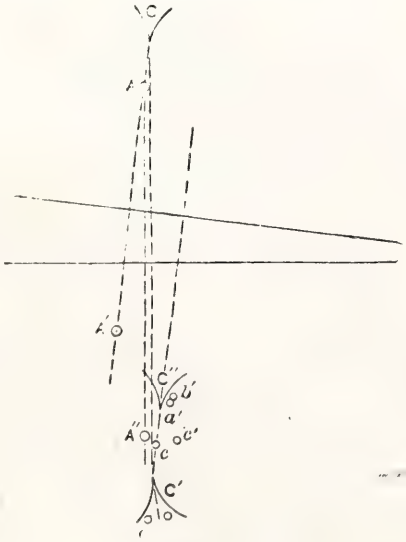


Fig. 5.

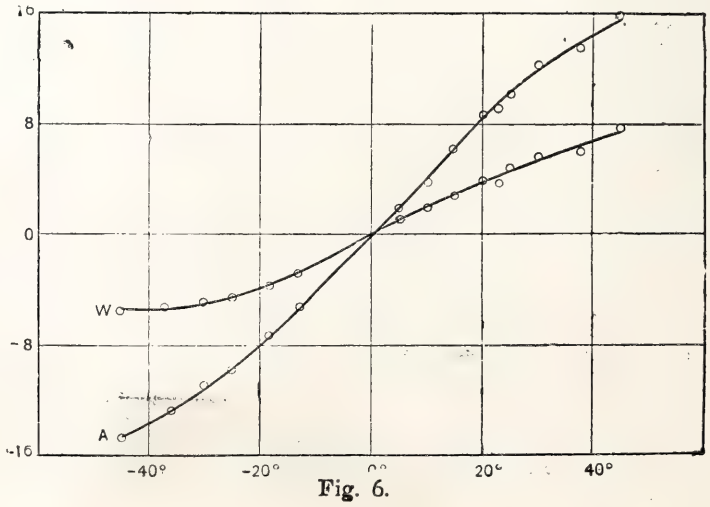


Fig. 6.

The construction shows that any three loci do not in general intersect in a point. It is quite suggestive of the similar construction for the wave-normals of light obliquely refracted at a plane surface.

The distance of the fringes from the film varies with the angle of incidence, becoming zero, and changing sign, with it. The distance also varies with the thickness of the film; for if the film, imagined extended beyond the vertex, be moved toward the left, keeping the angle of incidence fixed, the fringes will pass through the film as the vertex, where the thickness is zero, passes the point of incidence. It is also evident that the distance will vary inversely with the angle of the film, for the distance becomes infinite when the angle becomes zero.

Fig. 4 shows the effect of multiple reflection within the film. A, B, C, D are four successive images of the single point P on the source. The three loci obtained by taking these images successively in pairs intersect in a way very similar to those in the corresponding position in Fig. 3.

If the film be composed of a refracting medium, as water, instead of air, the light reflected from the lower surface of the film will appear to come, not from a point, but from a caustic surface; or, for a small pencil in any particular direction, from the circle of least confusion midway between two focal lines. Fig. 5 is an attempt to realise this condition graphically. The caustic C represents the image of the point A on the source, formed by refraction at the upper surface of the film, and C′ is its reflected image at the lower surface. For small angles of incidence, the effective image is quite near the cusp of the caustic, and the light which finally emerges from the film will then appear to come from points quite near the cusp of the caustic C″.

The substitution of water for air has thus moved the second image of A from A″ to the cusp of the caustic C″, which could also have been done by making the air film thinner, and of greater angle. Both of these changes would bring the fringes nearer to the film, for the same angle of incidence. The ratio of tangents of angles of film, multiplied by the ratio of thickness, deduced from the figure, is approximately one-half. For small angles of incidence then the fringes should be about half as far from a water-film as from an air-film under similar conditions.

For a large angle of incidence, a and b may represent the effective images of A after reflection at the lower surface, for equal positive and negative values of the angle. For these two cases the cusp of the caustic C″ would be placed at c and c' respectively, and the final effective images of A, for light emerging from the upper surface, would be a' and b'. By the same reasoning that was used in the last paragraph, this shows that with the increasing angle of incidence the distance of the water-fringes from the film does not increase so fast as that of the air-fringes. Also that the distance does not increase quite so fast for negative as for positive angles of incidence, negative angles being those for which the light is reflected away from the angle of the film. The drawing is hardly exact enough to show this last point with certainty, although the others are quite clear.

All these conditions were verified by a series of observations on a film enclosed between glass plates about 4 cm. long, in contact at one end, and separated by two layers of tin-foil at the other. Small drops of water distributed irregularly in the film made it possible to observe the fringes in air and water, on either side of a boundary line, by merely changing the focus of the observing microscope without moving it laterally. The observations are plotted in Fig. 6, the curve A representing the results for the air-fringes and W for the water-fringes. Ordinates are distances in millimeters measured along the line of sight from film to fringes, and abscissæ are corresponding angles of incidence. It will be noted that for angles of incidence less than 20 deg. the ratio of ordinates to the two curves is very nearly one-half.

For angles of incidence greater than 45 deg. the aberration becomes so great that measurements cannot be made with any accuracy.

It may be well to add that, for the sake of avoiding confusion, the phase difference of a half period introduced by the reflection within the glass, at the upper surface of the film, has been disregarded throughout.

E. R. Drew.

A VOICE FROM INDIA.

The season is fast approaching when the ubiquitous globe-trotters and Murrayers are expected to come in large numbers to India from all parts of Europe and America with hand-cameras in hand of all shapes and description. A voice from India, from an Indian, may not be out of place if it can give them any help in their cameric expedition.

From November to February 8 a.m. to 4 p.m. may be advantageously occupied in photography, but beginning half an hour later and closing half an hour earlier is necessary for snap-shotting and instantaneous work generally.

In full sunlight $f.12$ with 1-10th of a second exposure on Ilford "Special Rapid" and Wratten's "Instantaneous" plates may fairly be employed without any appreciable risk of under exposure, provided the landscape is sufficiently free from large and bushy trees. In India the trees "that are leafless" are an exception rather than a rule, even in the winter season; and the heat of the greater part of the year has made Nature to provide the country with an abundance of these trees, which are rich in foliage, and spacious in their umbrage giving dimensions.

I have mentioned Ilford and Wratten plates. I do not mean to disparage the other brands, but those are the two brands of dry plates that are always available in the Indian market. The others are rare, and if available, are in many cases of doubtful freshness. For tripod cameras and for time exposures the "ordinary" rapidity of both the above two brands are by far the best, but Ilford "Empress" and Wratten's "Instantaneous" are good for all-round general work. A hand-camerist does not require faster plates than Ilford "Special Rapid" or Wratten's "Instantaneous." Plates faster than these (other things being equal) are not only not necessary, but not suitable for their requirements.

In India architecture is the special feature for photography. The photographer should not, therefore, forget his wide-angle lens, with the aperture capable of working at $f.12$ if not larger. But one should not forget that the architects in Old India were seldom cramped for space and foreground; compound and gardens were inseparable companions of architecture. The necessity for the wide-angle lens was not conceived of by those royal builders, though they "designed like Titans and finished like jewellers." It is the modern greed for land that has killed space and frontage in some cases, and has brought into existence an unwholesome and unsightly neighbourhood—much to the detriment of long and ordinary focus lenses.

Pyro-soda and pyro-ammonia are the ruling developers in India. But locomotion in the country being generally not very smooth the various sorts of liver-squeezing conveyances that are brought into requisition transgress the wildest dreams of Europeans. The tourist should keep down his luggage as much as possible, and make them as little fragile as practicable under the circumstances. Tabloids, therefore, are much in requisition, though the cost is a bit high. Twelve annas to

the shilling, or 1s. 4d. to the rupee—the statutory rate of exchange in India—is seldom respected by the tradesmen here, not to speak of the photographic dealers.

Speaking for myself personally, I prefer Rodinal as the best result-producing, handy developer in India. Being a one-solution developer in a very concentrated form, it is particularly suited for touring. Its detail-giving, density-making, and quick-developing properties are the special features. But it has always been a matter of surprise to me that the recipe given by the maker for its use has always been fraught with disastrous results in my hands. The following has been the proportion which would give very satisfactory results, producing brilliant negatives of excellent printing qualities:—

Rodinal	1 dram.
Potassium bromide	36 grains.
Water up to	4 oz.

I first of all pour out one dram of Rodinal, then add to it 3 drams of a 20 per cent. bromide solution (there being 12 grains in each dram), or 6 drams of a 10 per cent. bromide solution (there being 6 grains in 1 dram, or 60 minims), and add water to the above up to 4 ounces.

In developing half-plates, I use the whole of the 4-ounce solution at once. The solution remains strong enough to develop the first and second plate. For each subsequent plate I go on adding 10 minims of Rodinal for each plate. This is for Ilford plates. Wratten's plates want a bit more Rodinal; and after the development of the first cabinet-size plate I would go on adding 10 to 15 minims of Rodinal for each of the subsequent plates.

No more bromide of potassium is necessary to be added even if two dozen or more are developed with the same developer. In fact, by the process of development the bromide, freed from the silver-bromide of the plate, and forming hydro-bromic acid, goes on strengthening the action of the bromide as the development proceeds.

One is likely to think that 36 grains of bromide of potassium is rather high. I should say that with Rodinal, Amidol, and other quick developers heroic doses of bromide of potassium are necessary to control the action of the developer, watch its progress by prolonging the development, and to obtain requisite density with a freedom from fog.

With Rodinal no frilling need be feared. Therefore, no alum solution is necessary. But if not otherwise inconvenient, alum solution may be used with advantage for Ilford plates. For Wratten's plates alum is altogether unnecessary.

Fixing is done as usual. A simple solution of Hypo is quite enough.

SARAT C. BASU.

THE STEREOSCOPE IN THE SCHOOLROOM.

[Reprinted from "The Stereoscopic Photograph."]

THE autocratic Doctor Johnson pronounces:—

> Let observation with extensive view
> Survey mankind from China to Peru,

the impressiveness of which dictum is a little diminished by someone's witty paraphrase, "Let observation with extensive observation observe mankind extensively." Tautological the doctor's lines may be, but the art of a good writer often lies in his skill in concealing tautology; and even in the paraphrast's grinning version, in which he swears he uses "no art at all," the admonition is still emphatic, "observe mankind," which is doubtless the point the good doctor desired to enforce.

"Observe mankind extensively" is certainly good advice, but the learned versifier omitted to indicate the ways and means. If a fellow has never been to China or Peru, how can he carry on the prescribed observations? How would Dr. Johnson himself have done so? for his farthest journey was into that Scotland where, according to his well-remembered sneer, they feed men on oats, which in England is fodder for horses. Is it not likely that Dr. Johnson's own observations on China or Peru must have been rather insubstantial, wide of the truth—in fact, grotesque? For in his day, at least, there were but poor substitutes for travel. There were no photographs, no process illustrations. To be sure, there were books of travel; but seeing through other men's eyes is a poor sort of observation at best. It is seeing through a glass darkly; and where are the books of the travellers who have seen clearly, sympathetically, understandingly, without prejudices to twist and ignorances to blind their vision? The great and peculiar value of travelling is that we see for ourselves, we see with emotional sight, we see what appeals to our interest and can be clutched by our apprehension (no one can really see anything else), and so we store up for all our future years a great fund of concrete images to be called on at occasion.

It cannot be too often urged upon those who carry on the work of education that the mind of the child is nourished and enriched mainly through its receiving abundance of concrete impressions. Minds must be brought into contact with realities. A dozen pedagogical maxims enforce this truth. The mind cannot grow upon itself. It must be fed. We cannot think unless we have things to think about, and the more we have seen and experienced, the more valuable and probably correct will be our conclusions. "Nihil in intellectu quod non prius in sensu." Hence the modern condemnation of "book-learning," "rote-teaching," "words before ideas," "signs without the things signified," and so on. Hence the modern demand for visualisation in teaching—storing the growing mind with realities—through the laboratory method in teaching science, business usages, and so on; through the use of concrete illustrations in arithmetic; through field-work in geography and history; through the reading of literature itself, instead of books about literature. The mind rests when it deals first hand with reality. The concrete is the basis of mental life.

In a way, this truth has always been more or less recognised. Men's esteem of literary works, for instance, has in a great degree depended upon the amount of concreteness, sense of reality, contained in the pages read. In early times poetry was the literature of the people, because it was vivid with the actual, it was "simple, sensuous, passionate." And from the time of Robinson Crusoe on to our own day fiction has been in the ascendant, because it is concrete, it deals with definite men and women in definite situations. The only other form of prose literature equally concrete is biography, and to this day a good piece of biography grips us as firmly as any novel; more firmly, in a way, for we know it to deal not only with the definite, but with the actual. Hence, when a man sick of speculations, abstruse studies, or routine labours, has sought in vain for relief in the froth of fiction, let him have recourse to a good autobiography — such as old Villehardouin's account of the crusade he assisted in, or Benvenuto Cellini's story of his remarkable life, or Pepys' naive diary, or, to take more recent examples, Ruskin's "Preterita," or Stillman's "Autobiography of a Journalist." These are real books, and it may be said of each of them, as Walt Whitman said of his unique "Leaves of Grass," that "he who touches this book touches a man." It is recorded by Trelawney, in his "Recollections of the Last Days of Byron and Shelley," that almost the only kind of reading Byron really cared for was autobiography. Indeed, it is in this sort of book that we get as near as we ever may, outside of ourselves, to the mystery of the inner life of a man.

But when all is said we come at reality in books only through

interpreting word symbols by the power of our imagination and through the illumination afforded by our personal experiences. Books cannot furnish us with new perceptions of realities. They can remind us, recall to us, suggest to us what we have seen or experienced, and with their aid the imagination may construct, using the materials it has, more or less correct notions of what we have never beheld. We are brought a great step nearer the actual by pictures. It is a mistake to suppose that mere amusement or entertainment explains our love of pictures. They go far to satisfy our desire for actuality, with the information the mind craves. Hence the importance of abundant illustrations in school work can hardly be exaggerated. Children learn more from the pictures in their geographies than from the text. So the modern school-book in almost all subjects abounds in illustrations, and is thereby not so much embellished merely, as enriched in power to convey instruction.

But in late years has been perfected something that, in my judgment, goes ahead of pictures, and quenches the mind's thirst for the concrete almost as completely as the very object before the bodily sight. I refer to the stereograph. The art of illustration, as we all know, has been marvellously improved in recent years. Our commonest school-books to-day have process illustrations that for accuracy, delicacy, and beauty, are greatly superior to the best of sixty years since. Our ten-cent magazines are familiar miracles of picture-books. Certainly the human mind has been vastly enriched by this cheapening and perfecting of processes of illustration. But even the best pictures we still feel to be but pictures; they do not create the illusions of reality, solidity, depth. "The best in this kind are but shadows." But with the stereoscope the wonder of photography is brought to its culmination. Man is a two-eyed animal, and the stereoscope, with its two lenses that blend two pictures into one, is like a pair of omnipresent human eyes, at the command of everyone.

Omnipresent eyes! The magic carpet we read of in the "Arabian Nights" was not so swift a transporter, nor to such remote and various regions. Goldsmith's "Traveller," who amid foreign scenes could sigh,

My heart, untravell'd, fondly turns to thee!

would (one is tempted to say) have been spared the pangs of homesickness had he travelled by the favour of the stereoscope. He could have an excellent substitute for going "to the uttermost parts of the earth," and still retained the satisfactions of the man in the popular song who "never cared to wander from his own fireside." One may imagine that the late Henry George, who taught that the earth is rightly the heritage and property of all, might have seen in the stereoscope at least a secondary means of bestowing upon disinherited men their God-given earth. For to see a thing with understanding and appreciation is about as much as to own it. I think it was Ruskin who said that if he looked upon a nobleman's parks or jewels with a more appreciative eye than the nobleman's, he really possessed them the more truly. "Finders is havers," shouts the small boy when looking for something that has been lost. This may or may not be a great truth; but it comes near being one, that seeing is having; and therein lies the value of travel. But the stereoscope gives us many of the most prized effects of travel, without the inconveniences and worries. Of course, some travellers relish the little annoyances and mishaps of a journey, as giving flavour to the experience; but it is still for most persons no small advantage to be able at will to reach China or Peru (or to have in good degree the feeling of being there) without seasickness, delays, ticket-buying, and weariness. Besides, the most of even us grown-ups cannot afford to travel widely anyway. Yet armed with the stereoscope, as Ancient Pistol was with his sword, we like him can exult, "The world is mine oyster!"

Yet the most remarkable thing about the stereoscopic view is not that it transports us to so many quarters of the great round earth, but that it does it so completely. We look upon strange peoples and unknown lands with our own eyes, not with another's. We have a feeling that we are gazing upon reality. The tree-trunks are not lines upon a canvas or a printed page; they are solid, separate, growing. The objects we see take their positions in space, the scene has depth, vista, atmosphere, it is the real thing, and it stays for us as long as we desire to look. These Esquimaux, for example, are so real that one is almost embarrassed in scrutinising them so closely. It seems impolite to observe the dull earnestness of the man, the unlighted curiosity of the woman in her dirty sheepskins, and the more intelligent look of the one in the background. Like Whitman, observing a mother and child, "we study them long and long." They are human documents. One moment, and we likewise are gazing unabashed upon the dignitaries of President McKinley's Cabinet, and at very short range. Another moment, and we are seeing how pineapples and girls grow in Porto Rico; the next, and far in the frozen north, we discern a great hill of crumbly snow rising from the waveless ice-gorged sea. Thus, turn by turn, the burning tropics, the snow-draped peaks of the Alps, the wonders of the Yellowstone, the strange scenes of far India, and the cosy cottages of rural England, come before us—not as mere pictures, but rather as realities.

The problem of enriching the minds of children with a manifold contact with the actual is solved by the stereoscope. Illustrations in books, as I have said, are good, and have contributed much to the great work of giving real knowledge, a store of visualised impressions for the mind to work with. But with the stereoscope in the schoolchild's hands, he may range the inexhaustible world almost as if on actual travel, because with a much keener feeling of self-transference than is possible with any other means short of the impossible travel itself. Is he to study history? He may be present at Secretary Hay's eulogy on McKinley. Is it geography? He may behold all the lands and peoples of the earth; he may look upon Pelée's eruptions or the work of the Mer de Glace, or, by the aid of specially-prepared maps, he may come to know in detail the city of Rome as it is. Is it nature study? Here is how bananas grow in Hawaii, or there is how the great trees of California reach heavenward. Is it commerce? Here is the hurrying traffic of the East River, or there a vast log-raft on the wide Columbia. Is it art? Behold the marbles of Michael Angelo and Phidias. Is it literature? Here is the home of Irving, or here the village of Grand Pré.

One other striking advantage of the stereoscope is that by the use of it children may be trained to see. We are always surrounded by the concrete, but familiarity has staled its interest for us. The eager curiosity of the fast-learning infant is thus too soon lost. And as interest lessens, attention lags. If a boy is to be trained to see accurately, his interest must be engaged by that to which he is directed. It is because of the interest born of novelty that we observe so vividly and remember so well what we see when travelling. But precisely this interest may be aroused and kept alive by the stereoscopic views; so we can attain through them the first requisite in training the powers of observations—sustained attention. This gained, the teacher may by proper questions gradually lead the child to see, whether in the scientist's way, analytically, or in the artist's way, synthetically. It is hard to say which way the stereoscope lends itself to the more readily and admirably. In this connection, too, no teacher needs to

be told how valuable the stereoscope could be made in relation to language work and composition. For the great trouble in these exercises is that too often the child has nothing to say, no fresh impressions to record that seem to him worth setting down; and unless what he has seen and is told to describe or tell about seems worth while, he has no interest in the matter, and the exercise is savourless, a failure.

May we not conclude, then, that the general introduction of the stereoscope into the schools would be of incalculable value in almost all lines of school work? Notably it would put new life and interest into the geography, the nature study, the language work, while enriching the children's minds with varied preceptions in many realms, which would remain part of their equipment and a source of their enjoyment for as long as they live. This newer, vivider appeal to the desire of the concrete is in line with the tendencies and aims of modern education, it accords with the teachings of psychology, and it has the sanction of the universal experience that the world is interesting and eternally worth knowing about. When Mahomet found that the mountain would not come to him, he went to it. But modern science has worked more miracles than could Mahomet's prayers. As our children cannot themselves go out into the world in body, to see and possess it, let us nevertheless take them to the world, not in words only, or even in pictures only, but in the most vivid and satisfying way available, in stereoscopic photographs. G. J. Smith, Ph.D.

THE "SINOP" COLLOTYPE PROCESS.

[Abstract of a pamphlet published by Messrs. Penrose and Co., 109, Farringdon Road, E.C.]

The routine of the process is that a plate is taken from the box, exposed in the printing frame under a negative for from two to ten minutes at most, then placed under the water tap for ten minutes, drained and soaked in glycerine for fifteen minutes, all surplus water blotted off, fixed to a printing bed, and inked up with a printer's roller in about another ten minutes, and then printed from, the impression being taken in an ordinary letter-copying press. The colour of the ink, the strength of the image, the nature of the paper, the size of the margins, are all matters under the control of the operator, who thus has it in his power to produce artistic effects such as no other process is capable of yielding. Post-cards, memos, Christmas cards, letter headings, etc., can be prepared, and prints may be done on paper, cardboard, silk, satin, leather, celluloid, etc. The three-colour process can be applied to this method of printing with the most charming results, and with greater ease than with any other process, because the pure white ground of the "Sinop" film enables the inking to be exactly judged.

The "Sinop" patented process consists essentially of the "Sinop" plates and the special iron bed plate and frisket for printing. The iron bed has hinged to it an iron frame to support the frisket sheet, which is cut out in the centre to a size suitable for the picture, so as to form a clean margin.

To save expense, beginners are advised to use a letter-copying press for the impressions. Sometimes either the bed or the iron plate which gives the pressure is wanting in flatness. In such case the impression would be bad, and the print accordingly grey and patchy. This defect can be quite easily remedied by having the platen of the press replaned. Any local engineer would attend to this for a moderate charge.

The various accessories contained in the "Sinop" outfit are:—1, the "Sinop" bed plate; 2, indiarubber pad for pressure; 3, inking board; 4, inking roller; 5, trimming knife; 6, indiarubber flat squeegee; 7, three tins of inks; 8, a bottle of glycerine; 9, a bottle of turpentine; 10, bottle of sensitising solution; 11, jar of crystals for making sensitising solution; 12, a soft sponge; 13, ink knife; 14, box of 1½ dozen "Sinop" plates; 15, portfolio, containing six sheets of frisket paper, 12 sheets black masking paper, strips of paraffin paper for margins, blotting paper, gelatine paper for fixing the plate to the bed, various papers for printing.

HINTS ON MAKING REVERSED NEGATIVES FOR THE "SINOP" COLLOTYPE PROCESS.

As with all photo-mechanical processes, where the printing surface is applied directly to the photographic negative, a reversed image is required, otherwise the final print would be reversed in relation to left and right.

Reversed negatives can be obtained in various ways.

The most satisfactory method when copying indoors in to have a reflecting mirror or prism attached before or behind the lens.

A simple method is to reverse the plate in the dark slide, so that the image has to pass through the glass to the back of the film. In this case the glass side should be carefully cleaned and the film side protected from contact with the spring by means of a sheet of black paper. A slight alteration of focus is made by this method, and must be allowed for by reversing the ground glass in its frame. With hand cameras there need be no trouble about the focus. Thin celluloid films can generally be printed from the reverse side without disadvantage.

Some dry-plate makers supply stripping plates. These are exposed and developed in the usual manner. When the negative is dry, the film is cut through to the glass with a sharp knife at about ¼-inch from the edges. The film can then be stripped from the glass with the greatest ease, and such film can be printed from either side.

Another way which is capable of dealing with any negatives already in existence is to immerse the plate (which must be unvarnished) in a bath of formaline for about ten minutes. It is then drained and dried over a spirit lamp. The film is now cut through a sharp knife about ¼-inch from the edges. Then it is immersed in a solution of 5 per cent. hydrochloric acid for five to ten minutes, drained, and dipped immediately in a solution of carbonate of soda 5 per cent. strength. Small bubbles are evolved, and the film will come off the glass easily. It can then be transferred the other side up on the glass. To avoid tearing the film in squeezing it down, a sheet of damp paper is placed over it.

PRELIMINARY PREPARATIONS.

Whilst it has been found possible to keep the "Sinop" collotype plates for several months in the sensitised state, and still obtain good results from them, there is the possible disadvantage that a gradually increased exposure and lengthened time of washing is required the longer the plates are kept.

As it would be impossible to forecast the time the plates would remain in the hands of agents and dealers before reaching the user, the manufacturers feel that the process might be seriously compromised by old plates being sent out, and they have accordingly decided to send out the plates plain-coated with the "Sinop" emulsion, leaving the simple process of sensitising to be performed by the user.

This sensitising simply consists in immersing the plate for three minutes in a 2 per cent. bath of bichromate, placing it in a draining rack and allowing it to dry. No drying box is required. The plates are simply allowed to stand over-night in a dark room, cupboard, or ordinary room darkened, and will be found ready for use next morning. They have been found to keep well for two months, with the usual precautions against light and moisture.

WORKING INSTRUCTIONS.

All manipulations of the "Sinop" plate can be done in an ordinary dark room, lighted by artificial light of any kind (except the electric arc), or in a photographic dark room illuminated with plenty of yellow light.

The preparation of the "Sinop" plate may be considered as divided into four stages—viz.:—1. Exposure under the negative. 2. Washing out the plate and damping. 3. Fixing the plate to the bed and preparing the frisket. 4. Inking up and printing.

I.—EXPOSURE.

A mask should be cut out of black paper the full size of the printing frame, the opening in the centre being cut out to suit the picture. This mask is laid on the front glass of the printing frame, and the negative laid squarely over the opening, taking care that only the desired picture is unprotected by the mask, and that the margins are symmetrical. Put down the "Sinop" plate gently with its emulsion side in contact with the gelatine side of the negative, care being taken to get the picture in the centre of the plate. The frame is closed up and its front exposed to diffused daylight. For an ordinary negative without stain or veil and with good gradation, two minutes will be sufficient time. One may see how the exposure is progressing on opening one half of the back of the frame, laid on a table in a dimly lighted room, and inspecting the back of the "Sinop" plate. When the image is faintly seen as a light grey positive, the shadows being scarcely distinguishable from the high lights and the whole without detail, the exposure must be stopped. A little practice will soon guide one giving the correct exposure.

II.—WASHING AND DAMPING.

The "Sinop" plate is removed from the frame in the dark room, and should show a positive image of a reddish colour similar to an underprinted proof on P.O.P. paper. If the image is complete in all its gradations the final result will be good. The plate is immersed in a dish full of water several times changed until it becomes quite white, the yellow colour being washed away, and the reddish image almost entirely disappearing. This operation requires about ten to fifteen minutes, according to the weather and the temperature of the water. It is better to wash thoroughly, and the operator can without

risk allow the plate to remain one or two hours in cold water. Once the plate is immersed in water it is no longer sensitive to light.

When the plate is sufficiently washed, it is drained and immersed in the following solution:—Glycerine, 75 parts; water, 25 parts. The plate must be quite covered with this solution, and should remain in it about fifteen minutes as a rule, though, if one desires to obtain only five or six prints, eight or ten minutes' damping will be quite sufficient. Should one wish to pull a greater number, say, 30, 40, 100, or more, it is advisable to let the plate remain a longer time, in order that it may retain its dampness during the printing.

N.B.—Always use the same dishes for washing and damping, in order to avoid contamination of the "Sinop" plate with foreign matter, which might be prejudicial to its successful working. Hypo, alum, pyro, and ammonia are especially to be guarded against.

III.—FIXING THE PLATE ON THE BED AND MAKING THE MASK.

Place the bed on the table with the frisket frame laid back to the left of the operator. Take a sheet of ordinary stiff paper (sample of which will be found in envelope A of the outfit), cut the exact size of the "Sinop" plate. Dip this paper in water so as to wet both sides evenly, and lay it down quite wet in the middle of the bed in accordance with the guide marks, applying the squeegee to force out all surplus moisture. Next take a sheet of the green-coloured gelatine-coated paper, wet it, and lay it down over the first sheet. Being larger, it projects over the edges and adheres by the margins. The squeegee must be used to spread it out quite flat.

The "Sinop" plate is now drained slightly, and the back wiped perfectly clean. Any speck of dust or grit might cause the plate to be cracked when the pressure is applied. The plate must be laid exactly over the under sheet, the edges corresponding. A light pressure with the fingers on the edges of the plate will be sufficient to make the plate adhere until the first squeeze in the press, which will finally fix it.

The surplus moisture is removed from the surface of the plate with a soft sponge, followed by blotting paper (see sample in envelope B of the outfit), and finally the drying is completed with a soft piece of clean linen.

The plate should now appear with a polished surface, without water-markings, and in the centre of it the picture will be seen like a fine engraving.

IV.—INKING-UP AND PRINTING.

Those who have never handled a printer's roller will probably anticipate great difficulty in the inking. Nothing, however, is easier, and a few hours' practice will soon render the novice skilful in this part of the process.

A small portion of ink, not larger than the size of a pea, is taken on the point of the palette knife, and smeared smoothly on the inking board at the end nearest the operator in a strip equal to the length of the roller.

The roller is taken in the right hand and pushed forward, starting on the ink which has been laid. On reaching the other end of the board it is lifted off, brought back to the starting point, and pushed forward again. This is repeated over and over again, quickly or slowly, until the ink is spread evenly and thinly all over the board and upon the roller. Should the roller not appear sufficiently charged with ink, a little more is added and distributed as before.

The roller, after thus being well charged with ink, is gently rolled backward and forward on the plate, so as to cover the whole image each time. One must begin slowly, and then gradually go more quickly. The image begins to come out, and we note that the more slowly we roll the more heavily and uniformly the plate is inked, whilst as we roll quickly the high lights and half tones are developed. The operator can therefore control his subject at will, according as he rolls more quickly or slowly.

A little practice will teach more than further explanation. After having used two or three plates the operator will understand exactly how to treat each subject properly.

When the plate has been sufficiently inked, the frisket is pulled down and a sheet of paper laid over the image. Pencil marks on the frisket serve as guide for the margins and centring. The rubber pad is laid on and the bed put in the press. A strong pull should be given without overdoing the pressure. Here, again, a little practice will teach best.

The iron bed is removed from the press, the sheet gently taken off, and the frisket lifted.

The inking is repeated, and operations go along in the same way until the requisite number of proofs is obtained.

Generally 25 to 40 proofs can be pulled without stopping to re-damp. The exact number will depend on the state of the plate.

When the proofs become grey, the plate is cleaned up by pulling one or two sheets without inking. Glycerine is then poured on, and allowed to remain five or ten minutes, after which the printing is resumed.

V.—FAILURES AND REMEDIES.

Here are a few hints concerning the usual causes of failure in the printing:—

1. Image comes out with a grey, mottled, granular appearance, and small white spots in parts.—Insufficient pressure or grain of paper is too coarse. Try pulling more heavily until the image is even.

2. Image very hard with little half tone.—Too long exposure. By inking slowly with plenty of ink tolerable proofs can be obtained; nevertheless, the printing is difficult.

3. Grey image without brilliancy.—Insufficient damping or negative poor and flat.

4. Image refuses to ink up.—Plate underexposed or too damp, or roller has become affected by dampness, or ink has dried up. Run up the roller briskly on the inking board; apply a little fresh ink if necessary; dry off the plate a little with a sheet or two of paper.

5. Whites refuse to clean up, and image becomes flat and grey.—Plate becoming too dry or too much ink on roller. Pull off the ink on waste sheets and pour on the glycerine solution, spreading with the finger. Allow glycerine to remain on ten to fifteen minutes. Run the roller on a clean slab to take off some of the ink, or wash off with turps.

6. Streaks and markings.—Due to not covering the image with the full width of the roller and to stoppages in rolling; also from scum from the damping solution.

7. Ink pulls off the image.—Too quick rolling or roller too tacky. In the last case, clean ink off roller and sponge with a saturated solution of alum. (N.B.—Don't use this sponge afterwards on the "Sinop" plate.)

VI.—CLEANING UP THE PLATE.

When the printing is done, it is necessary to clean it, so that it can be used at any subsequent time. A plate that has been handled with care is capable of supplying a considerable number of prints; up to 300 have been taken off one plate without showing any deterioration.

The ink should be removed by pouring on the plate a quantity of turpentine sufficient for diluting the ink, spreading the turpentine all over the plate either with the finger or with a soft linen rag. When so diluted with turpentine the ink can be readily washed away with a sponge and water until no traces remain. Wash the sponge carefully after this operation.

The plate is afterwards immersed in water for one or two hours, and is then allowed to drain and dry. When the plate is dry there is no longer any trace of the image. In this state the plate will keep good for years if preserved from damp. When required for use again, the "Sinop" plate is wetted by soaking in the water and flowing glycerine on, in the same way as for a new plate. It will then give equally as good results as the latter will yield.

It is recommended that the roller and inking board be cleaned up each time with turpentine after the printing is finished, otherwise the roller and ink cannot be relied upon to be in condition for the next plate.

Tidiness and cleanliness in performing the operations go a long way towards securing successful results. The instructions must also be carefully adhered to.

THE NATIONAL PHOTOGRAPHIC RECORD ASSOCIATION.

OFFICIAL REPORT.

REPORT OF MEETING HELD AT THE MIDLAND GRAND HOTEL.

A meeting of the National Photographic Record Association was held by the invitation of the president, Sir J. B. Stone, M.P., at the Midland Grand Hotel, Tuesday, November 4th, 1902, which was well attended by members and friends. The president exhibited a series of prints of the Coronation ceremonies, the Welsh Eistedfodd, the Kern Baby Celebration at Whalton, Northumberland, and the Installation of the Master of one of the City Livery Companies—the "Girdlers"; and other prints were shown by Mr. H. W. Fincham, Capt. G. W. Cosens, and by the hon. secretary.

The Hon. Secretary (Mr. George Scamell) read the following report: The council have again much pleasure in presenting their annual report, and to congratulate the members on the steady progress of the work, not only of collecting prints for the British Museum, but also on account of the general interest that is being taken in the object of the association throughout the country.

Since our last report 593 prints have been received, Sir J. Benjamin Stone has contributed a series of St. James's Palace, Sandringham Hall, Frogmore, and of some of the old mansions of England, including Hatfield House, Houghton, Norfolk, built by Sir Robert Walpole, Hunstanton Hall, Holkham, Lynedon, Charlecote, Warwick, the home of the Lucys, Ashby St. Ledgers manor house, Catesby's house, and a series of prints of the Tynwald Day ceremonies of the Isle of Man. Mr. Diveri has again favoured us with sixty prints from his valuable Scotch collection, including views of the Royal Palace, Linlithgow, Castle of the Boyne, Craigmillar, and Ballindallock Castle, and some of the old Incised Stones; Mr. Fincham has sent in a very fine series of St. John's Gate, Clerkenwell, and some of the old courts of that neighbourhood, and of St. John's Crypt, the remains of St. John's Priory; from Mr. A. Victor Haslam we have received a set from Iona, of the Cathedral, and some of the Monuments; from Mr. Armytage, some views of Buildwas Abbey, and some old bits of Pembridge,

Herefordshire; Mr. H. W. Smith forwarded views of Kirkstall Abbey and the Cloisters, Chester; to Mr. E. J. Felce we are again indebted for some of his fine examples of old Northampton work, some of the Carved Panels in Abington Abbey; Mr. Cecil Gethin, hon. secretary of the Herefordshire Survey Society, has favoured us with a set from Hereford Cathedral: from Mrs. Gandy some views of Wingfield Manor, Derby; Mr. Parkinson has forwarded a complete set of that most interesting monument, the Eastern Sepulchre, at Navenby, Lincoln; Mr. A. J. Loughton, Carvings of the Caps of the North Pier, Southwell Minster, Notts; we also have to acknowledge prints of interest from Miss Beedham, Mrs. Muriel, and Mrs. F. G. Emler, A. J. Loughton, F. Littledale, G. W. Cosens, G. W. H. Tyndall, and a series of the Churches of Herefordshire from the hon. secretary, Mr. G. Scamell.

The association have again to thank Mr. Horsley Hinton and the proprietors of "The Amateur Photographer" for having promoted a competition for record work. A large number of prints were sent in and prizes awarded. A selection was made and 132 prints were presented to the association. This year they are again promoting a competition on a larger scale, and in addition to offering medals for private work, a valuable prize is offered for the best collection of work of a photographic society.

Photographic survey work is now being seriously carried on in many districts, and since our last meeting a public meeting has been held in the Town Hall, Croydon, for the purpose of starting a survey society for the county of Surrey, when a strong committee was elected, with Mr. H. D. Gower as hon. secretary; and the Croydon Camera Club, Mr. Hector Maclean, president, have also joined in the movement, and have offered medals to their members for the best record prints. The Photographic Survey of Shropshire is making considerable progress. Mr. F. R. Armytage has arranged with the Corporation of Shrewsbury, and they have undertaken to mount suitable prints to be preserved in the Free Library. An exhibition of prints has been held in the Camera Club's rooms and at the School of Art, which was attended by a large number of the leading inhabitants. The survey of Leicestershire has been taken up in a thorough systematic way and gives promise of doing valuable work under the guidance of a strong committee, with Mr. H. A. Roechling as hon. secretary. Efforts are also being made to commence work in the Isle of Thanet, and in connection with the Hampshire Archæological Society. Many of the librarians of the public libraries are also interesting themselves in the collection of records of their particular neighbourhood, and we have been in communication with the librarians at Edmonton and other places. No doubt all these various fresh centres coming into existence will interfere to a certain extent with our own collection, as many prints will be added to the local museums instead of the British Museum collection, and although we may regret this, at the same time it must be a source of gratification that prints are being collected and preserved by responsible bodies for public reference.

A representative collection of Sir J. Benjamin Stone's record work has been arranged by Sir C. Purdon Clarke, which has been on exhibition at the Imperial Institute. Since then the prints have been put into circulation and have been on view at various local museums in connection with South Kensington, and are now being exhibited in the West of England.

The thanks of the association are due to the council of the Royal Institute of British Architects, who kindly lent their rooms in March last for a small exhibition of record photographs. Sir J. Benjamin Stone attended and opened the exhibition by an address, which was fully reported in the journal of the institute of March 8th, and the hon. secretary attended and gave a short account of the work of the association to the Architectural Association.

Whilst thanking their numerous friends for their contributions the council would again appeal, first for further contributions to the funds, as, when in a position to do so, they can obtain many valuable prints from negatives held by the professional photographer at a very moderate cost, and they would also ask the amateurs to look through their stock of negatives, as there must be an immense number of negatives in their hands from which prints of great value to our collection could be produced.

Sir J. Benjamin Stone was warmly greeted on rising to move the adoption of the report. He asked those present to excuse the fact of his being so palpably present amongst them, in so many parcels of photographs, whole plates and enlargements. What he had tried to do and show them was simply to be taken as an example of what could be done all over the country. Those before them were simply what he had done himself. Yet they exhibited in a pictorial form better than any printed description could convey what the incidents accompanying the Coronation were like, and these would carry the living presentation of the ceremony to all future times. (Applause.) There were in all about 300, and they included not only the street pageant attending the Coronation, but also the representation of the erections—such as the annexe to the Abbey, the appearance within the Abbey, the Coronation Chairs of the King and Queen, the appearance of the altar, the decoration of the streets on every part of the route, as well as the Royal progress through the City; but also the detachments of Colonial soldiers, the Royal guests, and many portraits of eminent men and women who were in London at the time of the Coronation. (Applause.) Then, besides these, he had visited different parts of the country and photographed some of the quaint customs which still survived from ancient times. Amongst these they would find a collection taken at the meeting of the Eistedfodd, in Wales, which would preserve the details of that ancient and interesting ceremony, and the portraits of those who took part on the occasion. Another interesting series consisted of the incidents attending the Kern Baby celebration in Whalton, in a remote corner of Northumberland. This was possibly one of the most ancient rites which existed, and descended from the festival of Ceres, established by the Romans during their occupation of Britain. In Whalton a sheaf of corn was arrayed in the white dress of a woman, the ears of corn forming the fingers, and the ears in a great bunch making up the head. This was borne to church on Harvest Sunday, and on the Monday was carried through the village on a pole, and finally set up at the Harvest Festival rejoicings. They had to acknowledge with thanks the presentation of a large number of gifts from different parts of the country, and he sincerely believed that the object for which the association was formed was being slowly but surely realised. (Applause.) Before resuming his seat he wished to bear testimony to the good services rendered the association by their hon. secretary, Mr. G. Scamell.

Mr. C. Welch seconded the adoption of the report, and congratulated the association on their work, and had no doubt of the advantages of having one leading record association to keep in touch with the various local survey societies, to be the means of communication, and so, to a certain extent, to centralise the work. As librarian of the Corporation Library of the City of London he was glad to find librarians generally were interesting themselves in making local collections. He had found the value of record work, and that it was now being appreciated was shown by the number of applications he had had from various gentlemen to search the City records, when preparing the lectures to be given (with photographic illustrations) at the board schools. The library committee of the City Corporation were arranging for an exhibition of Sir J. Benjamin Stone's Coronation ceremonies at the Guildhall.

The motion was adopted by acclamation.

The Rev. J. O. Bevan proposed a vote of thanks to the council and officers of the N.P.R.A. He did not agree with Sir J. Benjamin Stone, as he did not consider a society having such important ends could be an unimportant society; the work they were carrying on could no longer be considered of a local nature, but national. In the preservation of buildings, monuments, customs, etc., time was not on our side, in fact both nature and man are against us, so much the more necessary it is that a systematic effort should be made to retain records. In Ireland the old monuments have been much better preserved than in this country, and such a piece of vandalism as has taken place at Dartmoor, where an old stone circle has been removed, and used to make a road, could not have happened in the Sister Isle.

Mr. A. P. Graves seconded the motion. He said the first inception of the society was due to Sir J. B. Stone. As an Irishman he quite agreed with the Rev. J. O. Bevan, but still much remains to be done if we are to prevent interesting remains from being put to agricultural uses. As an inspector of schools he strongly urged the greater use of photography in schools, and now that most of the board schools have good halls he should like to see them hung with photographs of local and other views which might be turned to good account in the training of the scholars.

The motion was carried unanimously.

Sir C. Purdon Clarke moved the re-election of Sir J. Benjamin Stone as president for the year ensuing. After referring to the work already accomplished, he said he well knew the value of photographs, having some 160,000 under his charge at the Kensington Museum. He wished to draw particular attention to one set of photographs on the table—viz., the ceremony of the installation of the master of the Girdlers' Company, and trusted Sir J. Benjamin Stone would follow it up by obtaining records of similar ceremonies of some of the other livery companies of the City of London. He would also draw attention to the value of records of passing events, particularly on account of the costume, as that is often the only means of fixing the date of other events by comparison of costume.

Mr. H. W. Fincham seconded the motion, and trusted when funds would allow the association would prepare lists of all prints in their collection, so that workers might know what had been done, and so prevent duplication.

The Hon. Secretary replied he had already indexes of all prints, one of the subjects, and one grouped in counties, and would be at all times ready to supply any information regarding the collection to any one upon application.

The motion was then carried.

Sir J. Benjamin Stone thanked the meeting for his re-election, and then moved the following list of council and officers for the year ensuing: The Right Hon. the Earl of Crawford, K.T., Sir E. Maunde Thompson, K.C.B., D.C.L., Sir H. Trueman Wood, M.A., Harold Baker, C. E. Fagan, L. Fletcher, F.R.S., A. V. Haslam, A. Horsley

Hinton, St. John Hope, F.S.A., B. E. Lawrence, LL.D., A. Mackie, J. W. Marchant, Dr. H. R. Mill, Ralph Nevill, P. Norman, F.S.A., N. B. Stone, H. Snowden Ward, Mrs. Catharine Weed Ward, H. B. Weatley; hon. treasurer, Alexander Graham, F.S.A.; hon secretary, George Scamell; which was carried, and the meeting terminated.

Exhibition.

EDINBURGH PHOTOGRAPHIC SOCIETY'S.

Last year, or rather last season, for it was in the spring of this year, this society experimented. It abolished classification and gave only one class of medal, a bronze; but two sections were retained, one open, and one confined to members who had never gained a medal at the exhibitions of the society. This latter class is not exactly a novice class, as we have members exhibiting in it who have gained medals elsewhere. This season the same course is adopted, but the date of the exhibition is altered from Feb.—March to Nov.—Dec. The entries number in all 279, of which 141 are in "open" class. But even in the "open" class the very large majority of the work is by members, with the exception of two frames from E. G. Boon, Alassio, Italy, all the work is British, with a largely predominating flavour of E.P.S. The exhibition can, therefore, hardly be called representative, but it shows that the E.P.S. has in its 500 members not a few who are quite qualified to exhibit in any company, although the percentage of members' wins (i.e., medals won), two out of five, is lower than last year, when it was four out of five. The judges were Messrs. G. Ogilvy Reid, R.S.A., Edinburgh; Harold Baker, Birmingham; and Charles Sweet, Rothesay.

The need of a proper hall for their exhibitions is still very evident, but it is pleasing to know from the address of the energetic president, Mr. Burns, that the acquirement of larger and more suitable premises is a goal for which the society is unceasingly striving.

Following the catalogue, we find that W. J. Byrne, Richmond, gains one of the coveted medals with "Study of a Head" (2), much the superior of the two works he has submitted to the judges; the veteran he has had as a model has a magnificent head with a wealth of silver hair, and the strong, virile characteristics of the old gentleman have lost nothing at Mr. Byrne's hands; the clothing and background are subdued and the spectators gaze is rivetted on the head. Not only is it pictorial, but we feel sure it is a good likeness; here we have that rare combination of studio and exhibition work in one picture. R. S. Webster has several good pictures hung, but none better than his small, full-length portrait of "Mrs. Argyle Robertson" (17), in which that lady is charmingly posed and lighted; it may have been done in the studio, but it has a quite "at home" look, and "at home" work in its best sense is associated with Mr. Webster. "Woodcutter' (21), by Charles F. Grindrod, next claims attention. It is nearly, but not quite, a replica of his medalled "Woodcutters" of last year, the theme and treatment are similar. W. J. Croall gains a medal with "Bulldogs" (24), a picture we drew attention to at the Dundee Exhibition, where it took a "first" medal; it is a striking work, marred by a white dog in the foreground, which is not only obtrusive, but does not aid the picture in the slightest; with that blemish absent we could have a photographic "Landseer"; two landscapes and a large "Head of the King's Lion, Sultan," complete Mr. Croall's exhibit. "A Masterpiece (23), by James Patrick, represents one of Scotland's well-known painters, but his best exhibit is "When Love Laughs in her E'e (111), where he gives a telling interpretation of a rural scene; the composition is at once simple and complete—the various items combining to form a harmonious whole. Well might he be called, as one visitor was overheard baptising him, the Scottish H. P. Robinson. W. R. Lathbury, Bristol, has three good architectural pictures, the finest, perhaps, being "As Day Steals on Night, Melting the Darkness" (27), which has been medalled elsewhere. "Marcistee, Mich., U.S.A." (37), by W. Drummond Young, jun., gains a medal, it is a sand-dune picture, a symphony in tones; the other pictures he shows, with one exception, are unfortunately so inferior that one wonders he exhibited them. "A Scottish Professor" (40), is a breezy and life-like picture of Edinburgh's pet, Professor Blackie; his "John McWhirter, R.A." (95) is also strongly limned, while he has treated "Portrait of a Lady" (121) with reverence and presented a picture of a typical old Scots lady. "The Triforium Staircase" (50), by Vaness C. Baird, is an architectural "bit," redeemed from the commonplace, in fact, made by a gleam of light in the distance, which at once gives the picture depth and character, it is a real *multum in parvo*. Graystone Bird in "Good Morning" (52) and "Fair Innocence" (53) gives us examples of what dainty work we have come to associate with his name. "A Beech Study" (45), by G. G. Boon, is a strong bit of character drawing while the title of his other work, "Reflections" (70) sufficiently describes it. There is rare quality in "Portrait Study" (57), by T. Pursey, while "Study" (58), by Charles M. Wane, is a sample of studio work sufficiently out of the ordinary grouping to command attention. "Feeding the Sheep" (71), by Charles E. Warmsley, gains a medal, but probably no award in the exhibition has been more adversely criticised; the scene is evidently one hill-top, the arrangement of the sheep and pony are good, but the man is very evidently posed, and the picture foreground, distant hill and clouds, seem all on one plane; and yet we are informed it has been sold to an eminent artist—there must be something in it that we are unable to decipher. "Iris" (81), by John M. Whitehead, seems too cramped and his "Honesty and Apples" (120) is too hard and metallic, but his other contributions are in his best manner, general surprise was expressed that his R.P.S. medalled picture had been unnoticed by the judges; the more study given it the more the wonder grew; it is probably as fine a rendering of the lines which give it its title as could be imagined, and yet—. "By Banks o' Fleet" (82), by R. M. Readdie, is a delicate little work with a fine suggestion of atmosphere. "The Lonely Moor" (94) is a fine landscape, carrying out its title well, but marred by a sky.

A number of the members whose work we have had the pleasure of favourably reviewing at former exhibitions seem to have fallen from their high estate, at least the work they submit is not nearly up to the standard they have led us to expect.

Section II., taken all over, is weak, with good work scattered through it; we were suprised that the delightful work of Mrs. M. L. Herdman Newton did not gain recognition, her "Gossip" (259) being a lovely example of that class of work identified with the late H. P. Robinson, and considered by several to be the best thing in the section.

The following is a detailed list of awards:—

Open Section.—Medals—"Study of a Head" (2), W. J. Byrne, Richmond; "Bulldogs" (24), W. J. Croall, Edinburgh; "Marcistee, Mich., U.S.A." (37), W. Drummond Young, jun., Edinburgh; "The Triforium Staircase" (50), Vaness C. Baird, Broughty Ferry; "Feeding Sheep" (71) Char'es E. Walmsley, Ambleside.

Section II. (Members).—Medals—"A Misty Morning—Glasgow Exhibition" (209), J. A. Trevelyan Sturrock; "Ploughing' (233), John R. Sandilands; "The Evening Chapter" (239), J. Drummond Shiels; "A Lowland River" (247), Fawcett Clapperton; "An April Evening" (248), Robert Lees. Honourable Mention: "Thistles" (190), Ewen Kennedy; "Off the North of Ireland" (205), Professor D. W. Finlay, M.D.; "Portrait Study" (211), Mrs. Mary Cooper; "In the Cathedral, Amalfi" (274), Mrs. Mary Cooper.

The medals were distributed at the opening ceremony on Saturday. To-morrow Mr. Alfred A. Murray, LL.B., W.S., will deliver a lantern lecture entitled "By Stockholm to Lapland"; the following Saturday there will be a smoking concert arranged by Mr. John Anderson.

New Books.

"Photographische Bibliothek." Verlag von Gustav Schmidt. Vol. I. Vogel-Hanneke. Das Pigment Verfuhren.

This is the fourth edition of the late Dr. H. W. Vogel's treatise on carbon printing, revised and brought up to date by Paul Hanneke. The principles of carbon printing are dealt with in the opening chapter, and in those which follow we have a detailed account of the various manipulations and the recent modifications of the process known under the names of Gum-bichromate printing, the Artigue process, and Ozotype. The text is well illustrated, and the frontispiece is a charming study of a child, upon paper manufactured by the Autotype Company.

Vol. XV. Fritz Loescher. Vergrossern und Kopieren auf Bromsilberpapier.

The use of the hand camera and the tendency during the last few years to still smaller negatives than the quarter-plate size, have given bromide printing by enlargement a great impetus. The advantages gained by using a small camera are so evident, that we have little doubt amateur photographers will give much more attention to bromide enlargement than they have even hitherto done. The volume before us will be found a very complete guide, and we can recommend it with confidence to those who wish for information in this branch of photography.

A Substitute for Celluloid.—The extensive commercial use of celluloid has caused many people to seek for substitutions or imitations of it. In Germany, in the vicinity of Coburg, an imitation has been made by dissolving in 16 parts—by weight—of glacial acetic acid, 1.8 parts of nitro-cellulose, and adding 5 parts of gelatine. Gentle heating and stirring are necessary. After the mass has swollen, it is mixed with 7.5 parts of alcohol, and stirring is continued. The resulting product is poured into moulds, or after further dilution may be spread in thin layers on glass. Consul-General Hughes, of Coburg, is of opinion that "as an underlay for sensitive photographic films, the material has important advantages, not the least being that it remains flat in developing."—"Journal of the Society of Arts."

Commercial & Legal Intelligence

PATENT Law Amendment.—Last week, in the House of Lords, Lord Wolverton moved the second reading of the Patent Law Amendment Bill. His lordship said the President of the Board of Trade had long recognised the necessity for amendment in the patent laws of this country, firstly, because patents were often granted by the Patent Office and proved to be practically valueless, as that office at present had no charge upon them to enquire whether such applications had not been already allowed; and, secondly, because very frequently patents were taken in this country by foreigners and others who had no intention whatever of working them here, or of granting licenses to British manufacturers to use them. The proposed changes had been based upon the report of a strong committee, presided over by Sir E. Fry. Provision was made in the measure for a limited official enquiry into applications for patents, with a view to ascertaining whether they had been anticipated during the past 50 years. It also provided for the transfer to the Judicial Committee of the powers of the Board of Trade in respect to the granting of compulsory licenses. This would give a patentee some security, and would modify the amount of the fees. With increased business, the office would still be self-supporting. Already the Bill had passed its stages in another House, and obtained the approval of the trade communities. The Board of Trade felt sure it would effect a great amendment in the existing law.

OBTAINING a Camera by Fraud.—William Philip Dabbs, 23, commission agent, of Ringcroft Street, Holloway, was charged on remand, at the North London Police Court on Thursday last, for fraudulently obtaining a variety of articles from persons in various parts of London and the provinces. Mr. Gordon Cuming Whadcoat defended the prisoner. Detective-sergeant Jennings, of the Y division, said that the prisoner, under the aliases of G. White, A. Skipper, G. Walters, J. Robinson, and A. Shepherd answered advertisements in the "Exchange and Mart" newspaper, and thereby obtained a camera from Liverpool, a watch from Sheffield, etc. The cases of the camera and the watch were only now gone into, and Mr. Henry Norwood, of Yew Tree Road, Liverpool, and Mr. E. Harrison, of Fitzalon Street, Sheffield, deposed to sending these articles on the prisoner's assurance that he would at once remit the cash. Neither of these witnesses had seen the prisoner before, but letters and pawnbrokers' duplicates found in his possession showed that the property (now produced) had come into his possession. Henry Spencer (one of the aeronauts) was called by the police to speak to the prisoners' handwriting, but he could not say that the writing now produced was the prisoner's. From the cross-examination, it was gathered that the prisoner had been on one of the balloon expeditions, and had nearly become asphyxiated by the gas. There were several other cameras, opera glasses, and other articles found in the prisoner's room, as well as fifteen pawntickets, but the prisoner said that the tickets relating to a gold watch, chain, and pin were his own property. Mr. Whadcoat intimated that his defence was that the prisoner's senses had been dulled by his partial asphyxiation mentioned, and he added that the prisoner had given the police every assistance. Detective Jennings said he considered the prisoner remarkably acute, but as he had about a thousand letters to go through, he would like another remand. Formal evidence was given of the prisoner receiving letters and parcels addressed to him respectively at the shop of Mrs. Bateman, tobacconist, of New North Road, and Mr. Robert Thomas Wigmore, newsagent, of Gray's Inn Road, which addresses were those to which the watch and camera were respectively addressed. Mr. Fordham granted the remand, and on a question of bail said he would consider it next time. He would, however, require two sureties of £100 each.

RE George Francis Readwin, artist and photographer, Pelham Road, New Catton, and carrying on business at 131a, Magdalen Street, Norwich.—The first meeting of the creditors interested under this failure took place at the offices of the Official Receiver, Norwich, on Friday last, before Mr. H. P. Gould (Official Receiver). The statement of affairs filed by the debtor disclosed liabilities amounting to £180 1s. 9d., and assets estimated to produce £121 5s. 4d. He alleges as the cause of his failure "doctor's bills in connection with the ailments of my wife, bad trade, and ill health." The Official Receiver, in his observations, says that the proceedings were instituted by the debtor on his own petition in consequence of pressure from creditors. The debtor commenced business as a travelling photographer about 1892 without capital. Since September, 1899, he has carried on business as a photographer. There was no quorum of creditors present, and the Official Receiver remains trustee in the bankruptcy.

RE George Alfred Woodfield, photographer, New Brompton, Kent, formerly carrying on business in Hard Street and Week Street, Maidstone.—This debtor made an application for his discharge at the Maidstone Bankruptcy Court, before his honour Judge Emden, on Thursday last week. It appeared from the Official Receiver's report on the case, that the receiving order was made in January, 1899. The statement of affairs filed by the debtor discloses liabilities amounting to £134 2s. 4d., and assets estimated to produce £50 2s. 6d. In reply to questions, put by the Official Receiver, the debtor stated that his earnings now amounted to between 25s. and 35s. per week. He had two in family. Mr. Ellis, who appeared on behalf of the debtor, stated that the debtor's business rapidly declined in consequence of the severe epidemic in Maidstone a few years ago. The Official Receiver had alleged in his report that the debtor had committed an offence under the Bankruptcy Act by not paying his unsecured creditors a dividend of 10s. in the £. He, of course, could not dispute that, and unfortunately it was quite impossible for the debtor to make the dividend up to 10s. in the £, and so obtain an immediate discharge. He submitted, however, that this was a case of misfortune, and he hoped his honour would deal leniently with the debtor. His honour said it was one of those cases in which, if he had the power, he would grant an immediate discharge; but he was bound by the Act of Parliament to suspend the discharge for at least two years. He should therefore suspend the discharge for the minimum period allowed by the Act, viz., two years.

RE Francis Albert Woodcock, photographer, Douglas Head Road, and 15, Lodge Lane, Liverpool.—The above-named debtor appeared for his public examination at the Liverpool Bankruptcy Court on Thursday last, before Mr. Registrar Bellringer. The statement of affairs filed by the debtor disclosed liabilities amounting to £174, and nett assets estimated to produce £12 8s. The bankrupt attributed his bankruptcy to "the failure of the recent Isle of Man season." In reply to questions put by the Official Receiver, debtor stated that he had been a photographer in Douglas Head Road for about twenty years, and his father had been in the same line of business before him. He had lost about £250 the last two years owing to bad seasons and opposition, but before that he had made plenty of money and had banked plenty. Last year his earnings were not more than £40 a week during the busy season, which was from the end of July to the beginning of September. The whole season was from Whit week to September, 12 or 14 weeks usually, but a good portion of that time he lost money owing to bad weather and the visitors leaving. The best week was usually "Scotch week," or the last week in July, when the Scotch people took their holidays and came over in great numbers. That they termed the "Glasgow Fair," and was generally the best week in the season. If they had wet weather then, they (photographers), generally lost £100.—The Official Receiver: Do you mean that you get the Scotsmen to have their photographs taken over there?—The Bankrupt: Well, when they go to the Isle of Man they go to enjoy themselves, and they like to have their photos taken with the donkeys, or in boats with drowning scenes. (Laughter.) They spend their money freely in Scotch week, and if it is bad weather we have a bad time all through the season.—The Official Receiver: But there are other weeks that the weather is good?—The Bankrupt: Yes; but they are not there to spend their money. In reply to further questions, the bankrupt stated that he took about £250 last season, and a little more the year before, but they were both bad seasons, and the net profits would not be more than £50 on that amount after paying rent of ground, labour and materials. In a busy time he paid £18 a week in wages. His effects in the Isle of Man at the present time would not be worth more than 30s., and his Lodge Lane place was merely his home and winter studio. A place he had had at 91a, Great George Street, Liverpool, did not pay, and he was turned out for arrears of rent. He had also had a travelling wagon, but it did not pay, and he sold it twelve months ago. The examination was adjourned for further information.

CINEMATOGRAPH Profits and Losses.—At the London Bankruptcy Court on Tuesday a sitting was held, before Registrar Linklater, for the public examination of A. Duncan Thomas, of Manchester, Sheffield, Colwyn Bay, Edinburgh, and elsewhere, cinematograph operator. The receiving order was made on a creditor's petition in May last, the debtor now applying to pass his public examination on accounts showing gross debts of £9,472, of which £8,959 was unsecured, and assets £372. In examination by Mr. Boyle, Assistant Receiver, the debtor stated that for some years he was engaged in farming in Devonshire, with a relative. On the death of the relative in 1893 he purchased a phonograph, and went on tour with it until 1897, when he purchased one of Edison's projectoscope machines, and exhibited at the London halls. He exhibited the Spanish-American war pictures, which were also taken on tour on the Continent. He afterwards purchased other machines, and toured with them under management throughout the country. He had an exhibition in Edinburgh, which he afterwards handed over to his wife. At Colwyn Bay he used to show in a tent, and one windy night the tent was blown into the sea and most of his stock was lost. Just prior to that—in 1899—he sold his machines, which cost £1,000, to his brother-in-law, who had been his manager, for £200, and his brother-in-law completed the tours which were then open. In 1900 he opened at Newcastle on a large scale, and cleared £900 in three weeks. He extended his business to six shows, which he conducted with managers. The business increased, and in 1901 he had fourteen shows running. It was during that year that a proposal was made to turn the business into a limited company—the Thomas-Edison Animated Pictures Company, Limited, with a capital of £100,000. He was to be managing director. The prospectus was not sent out to the public. Towards the end of 1901 the shows began to fall off owing to the approaching end of the Boer war. Early in 1902 he was introduced to a Mr. Turner, who was forming a limited company to acquire and work cinematographs. The name was the British Bioscope Company, Limited, the capital being £50,000. He was to be manager. His profits on his prior working shows were put down at over £10,000. He was not aware that his stock was valued at £13,000. That he believed was the cost price of it. The company was not floated. It was after February last that his machines began to be sold for rent, and he estimated such loss and the depreciation on machine films, etc., at £6,706. The liability he was under in connection with the halls at Manchester and Sheffield was £894. He had received from his wife sums amounting in the aggregate to £900. The

money was not sent to him as the takings of the Edinburgh business. It was money lent. The Edinburgh business he gave to his wife in 1900, since which time he had had nothing to do with it. Acting on his advice, she agreed to sell it to the company for £2,000, half of which was to be in cash, but the company was not floated, and the business still belonged to her. She was not proving against him for the £900. The examination was ordered to be concluded.—"Morning Post."

PHOTOGRAPHIC Instruction in Australia.—We are unable at the present moment to note what is being done in the Commonwealth with the object of placing photography within the reach of the increasing army of young folk. In New South Wales, however, outside of the Government Technical Colleges, whatever movements have been made in this direction are almost entirely the result of the energy and enterprise of the firm of Messrs. Harrington and Co., Limited. We have previously referred, with pleasure, to the establishment by this firm of mid-day classes of free instruction to all and sundry who wish to make a more rapid advance than would be probable without advice. We have ourselves become associated somewhat with the management of these classes, and have recently, at the instigation of Messrs. Harrington and Co., approached the teachers and governing bodies of our public and private schools, with a view to giving free instruction to classes of the scholars. The result has been most encouraging. The masters and leaders have received the proposals with enthusiasm, and the result is an arrangement to carry on a series of lectures and demonstrations for the benefit of all those young people interested in photography. And they are many. Such schools as the Sydney Grammar School and the Fort Street Public School have eagerly seized the opportunity offered, and many of the lesser schools are equally enthusiastic. The masters are generally quite in accord with the view we have expressed—that photography ought to be placed in the school curriculum, but, so far as the public schools are concerned, this innovation cannot be introduced at once. The boys' classes, which have already been established, have quickly proved most successful, and encouragement has been given to the learners by several of the schools having notified their intention of holding competitions and awarding prizes periodically, and at the "breaking-up" for holiday time.—"Australian Photographic Journal."

THE Position of Art in Education.—A deputation from the Society of Art Masters waited on Lord Londonderry, the President of the Board of Education, last week. Mr. W. F. Lawrence, M.P., who introduced the deputation, explained that its members were headmasters of schools of art in the country, who wished to point out that the actual teaching side of the subject of art education was under present circumstances improperly represented. Mr. Stevenson and other members of the deputation then spoke. They complained of the insufficient qualifications of inspectors in art schools, and argued that art masters and experts should have a place on the advisory council for art purposes, and advocated co-ordination of study in elementary schools and institutions giving advanced art instruction. The whole of art subjects and technological subjects related to art should be kept absolutely separate from science, and be placed under the control of qualified art masters only. Although for convenience sake art and science schools might be carried on in the same building, the two subjects should be taught in separate schools. The present was considered an opportune time to bring the matter forward, as the Government Education Bill was before Parliament. In several cases science inspectors had ventured to report on art instruction in the schools. They contended that art teaching was just as important in elementary schools as science or anything else in view of the many industries in which knowledge of art in some of its branches was a necessity. Lord Londonderry, in reply, said that he understood that the deputation's opinion was that in view of the recent introduction of the block grant which created the necessity for more complete inspection, the inspectors in schools of art, art classes, polytechnics, secondary and elementary schools must be experts in art instruction. A detailed inspection at long intervals had been arranged for. The Board also had at their disposal the services of occasional inspectors, whose qualifications had been looked upon as of the most valuable kind; and steps had been, and were now being, taken to extend their operations to other schools, in addition to schools of art. As to the suggestion that it was desirable to co-ordinate the instruction in drawing and art in primary schools with that given in schools of art, he agreed that this was a very important point; but for the present it was necessarily mainly a matter for local arrangement. The Board of Education had encouraged such co-ordination and the employment of art masters in connection with it. In Birmingham, Leicester, and Burslem co-ordinated schemes were successfully working, and other localities would doubtless be encouraged to adopt similar schemes. The deputation had suggested that the age limit of inspectors, at present fixed at 35, be removed, as it deprived the Board of the services of the best qualified men. This age limit, however, was in force in other departments of the State as well as the Board of Education, and was in the interests of the public service. But where it was thought necessary to obtain the services of gentlemen of more mature age, it seemed better to utilise them in a temporary capacity. The Board had done this in the past, and intended to do so in the future. Respecting the deputation's desire for representation on the Teachers' Representation Council and on the Council of Advice for Art, he said that the regulations governing the matter were under the consideration of the consultative committee, and the recommendation of the deputation to include the Royal College of Art on the same lines as the Royal College of Science should be submitted to it.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Nov	Name of Society.	Subject
28	Borough Polytechnic	*Enlarged Negatives.* Mr. F. W. Bannister.
28	Croydon Natural History	*The Beginning of Photography.* By G. E. Brown, F.I.C. Illustrated by slides.
28	Croydon Natural History	*The Beginning of Photography.* Illustrated. By Mr. G. E. Brown.
Dec. 1	Glasgow and West of Scotland	*Enlarging.* Mr. J. W. Reoch.
1	Society of Arts	*The Future of Coal Gas and Allied Illuminants.* Professor Vivian B. Lewes.
1	Wolverhampton Photographic	*Mounting, and the Choice of Mounts.* Mr. H. Holcroft.
1	Southampton Camera Club	Demonstration of the "Wellington" Specialities. Mr. Harry Wade.
2	Devonport Camera Club	*Transparencies* W. H. Lethbridge.
2	Rotherham Photo. Society	"Photography," Prize Slides
3	Edinburgh Photo. Society	*Correction of Distortion.* Illustrated. J. Tudor Cundall, B.Sc.
3	Edinburgh Photo. Society	*Wild Animals as Depicted by Our Forefathers.* Illustrated. Mrs. Aitchison Robertson, M.D.
3	Society of Arts	*Some Aspects of Photographic Development.* Mr. Alfred Watkin.
3	Leeds Camera Club	*The Field Days of a Sun Artist.* Mr. Percy Lund.
3	Borough Polytechnic	*Some Notes on Gothic Architecture* Mr. J. Bothwick Panting, F.R.P.S.
3	Nottingham Camera Club	*The Possibilities of a Modern Camera.* Mr. F. Wardall (London).
3	Croydon Natural History	*The Development of Lantern Slides, with their After Treatment by Intensification, Toning, &c.* Mr. A. P. Hoole.
3	Croydon Natural History	*The Development of Lantern Slides with the after Treatment of Intensification and Toning.* By Mr. A. P. Hoole.
3	Southsea Photographic Society	*A Few Words to After-Supper to Photographers.* Messrs. J. J. Griffin.
3	Photographic Club	*Beck-Steinheil, Orthostigmat, and Telephoto Lenses.* Messrs. R. & J. Beck, Ltd.
4	Glasgow N.-W. Camera Club	*Carbon Printing.* Alex. Allan, jun.
4	London and Provincial	Open night. Last date for receiving pictures for the Hon. Sec.'s medals.
4	N.-W. London Photo Society	Christmas Card Competition.
4	Liverpool Amateur Photo.	Special Demonstration for Beginners. Part I. Mr. Fred Anyon.
4	Röntgen Society	*An Observation Bearing upon the Therapeutic Action of the Focus Tube.* Dr. D. Walsh. *X Rays in Ophthalmic Work,* With Lantern Slides. Mr. Stephen Mayou, F.R.C.S.

ROYAL PHOTOGRAPHIC SOCIETY.

NOVEMBER 18TH.—Mr. J. C. S. Mummery in the chair.

The first lantern meeting of the present winter session was the occasion of the delivery of a most interesting lecture by Mr. John Gunston upon the beauties of

CHAMONIX.

Chamonix is a centre offering great opportunities to the photographer, and that Mr. Gunston has fully grasped these the slides form ample evidence. His pictures of glaciers and the kind of mountaineering that it is within the power of the ordinary tourist to accomplish are probably second to none. There is a fine technical and pictorial quality about them that is too often missed by photographers working under similar circumstances, and this, added to his intimate knowledge of the country, which was obvious from his remarks, lent additional charm to the lecture.

A hearty vote of thanks was passed to Mr. Gunston for his entertainment.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

NOVEMBER 20TH.—Mr. A. Mackie in the chair.

Mr. R. P. Drage passed round two or three prints toned some ten years before with a combined toning and fixing bath. They did not appear to have perished or suffered in that time, and were not yellower than when produced. Mr. Drage also mentioned a difficulty he had experienced in preventing the cockling of certain negative films after stripping the paper support.

The Chairman said that if Mr. Drage mounted the negative, before stripping, on a piece of cardboard, paper support to the cardboard, and stripped when quite dry, there would be no trouble. Mr. Drage added that the film often stripped quite flat, but cockled in the printing frame.

THE CONVENTION SLIDES.

Mr. H. C. Rapson gave an interesting discourse upon the places visited this year by members of the Photographic Convention of the

United Kingdom. After making a progressive tour of the colleges and places of interest within the city of Cambridge, and explaining at length their features, he took his audience to Bury St. Edmunds, Lavenham, Milford, and other attractive places in the neighbourhood. The photographs and the accompanying descriptive notes were much appreciated.

CROYDON NATURAL HISTORY AND SCIENTIFIC SOCIETY.

When invited by the executive of this Society to lecture to the members on the subject of "Process Block Printing," Mr. J. J. Waddington realised that such a lecture would in itself be incomplete, and hit upon the happy idea of inviting the members to witness a practical demonstration at his works, 49, London Road, Croydon, on Friday evening. After welcoming his guests, Mr. Waddington gave a general description of the process, from the moment that the original picture is handed to him until the finished block, mounted type high, is ready for delivery to the publisher for whom it has been prepared. Mr. Waddington is a past master in the art of engraving, every detail of which he has at his fingers' ends, and, what is more, he possesses to a very high degree the ability to describe the intricacies and technicalities of the process in such a lucid style that even the most uninitiated of his hearers can follow and thoroughly understand him. The visitors were taken through every department of the works, and witnessed every incident and detail in the preparation of a process block in actual operation, accompanied by a running explanation or commentary, either by Mr. Waddington himself, or by members of his experienced staff of workers. They were greatly surprised to see how many delicate processes a plain plate of copper has to go through before it becomes a process block, and, interested as they were by the able description given at the outset, this feeling was as nothing compared with the rapt fascination with which they watched the process being actually worked out until they saw one of those beautifully-finished plates which have won the firm of J. J. Waddington, Ltd., a leading place among the illustrators of our high-class magazines. The visitors could not fail to be struck with the immense strides that have been made in this art in recent years, and it is largely due to Mr. Waddington, who is an enthusiast in his work, and others that England has maintained that pride of place which the Americans at one time threatened to take from us—if, indeed, they did not actually do so for a short time—in the production of process blocks. At the conclusion of the demonstration the delighted visitors cordially thanked Mr. Waddington for his lecture, and for the kindness which had prompted him to keep every department of his works going until so late an hour for their edification and instruction.—"Croydon Advertiser."

CROYDON CAMERA CLUB.

Crowded attendances have been the rule since the opening of the winter session, and Wednesday, the 19th inst., proved no exception, the members assembling in force to hear Mr. P. Leuthardt lecture on a new printing-out paper called "Mattos," the invention of a Mr. Tauxe, of Switzerland.

Its method of manufacture was stated to be a secret, but from what could be gathered it appeared that the paper is sensitised with an emulsion of albumen and a silver salt, and another metal not named, in conjunction with barium sulphate, and that several distinct operations are necessary to reach the finished article. That barium sulphate has the power of precipitating colloids has long been known to chemists, and apparently the inventor has turned this fact to good account. Be this as it may, Mattos paper produces vigorous prints of great beauty, and with an absolutely matte surface, but without the sunk-in appearance sometimes characteristic of plain salted papers. So fine indeed is the coating, that the sensitised side is indistinguishable from the back, the latter being marked to identify it.

The emulsion is coated on various grades of rough, smooth, white, and tinted papers, and can also be applied to fabrics, including silks, satins, and gauze. Even wood can be brought into requisition. Its applicability is therefore extensive. An opaline paper is deserving of separate notice. Thin and semi-transparent, colouring can be applied to the back, and in skilful hands with charming effects. Practically grainless, it would also seem a suitable medium for making a negative by contact from an enlarged positive; several small paper negatives were shown, together with excellent prints therefrom.

The tones obtainable range from red browns, through fine sepias, to a pleasing warm black. A lactic acid platinum bath is recommended in preference to others, and here a word of caution may not be out of place, for the lactic acid of commerce is of very uncertain quality, and if much under strength might materially affect results. The toning bath, Mr. Leuthardt said, need not be thrown away after use, but could be returned to a stock bottle and employed again and again, and if necessary replenished. He also stated that the papers required no special type of negative, and kept for a considerable time both before and after printing. Prints made from papers eight months old, and carelessly stored, showed not the slightest alteration. Exposure for 48 hours to nitrous hydrochloric acid vapours also failed to effect any change.

Mr. Leuthardt ascribed the "ill repute" of silver papers entirely to the use of gelatine, which he regarded as unsuitable for an emulsion. It was impossible, he said, to entirely remove the hypo-sulphite from gelatine, and in consequence supplementary sulphuration took place, which showed itself by yellow spots and blisters. This is an entirely new explanation of "blisters," and with all due deference to Mr. Leuthardt or Mr. Tauxe, the case made out against gelatine must be considered as distinctly "not proven."

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

SPIRIT PHOTOGRAPHY.

To the Editors.

Gentlemen,—The letter of Mr. Starling in your last week's issue, reviving the neglected subject of spirit photography, suggests a field of unlimited promise for those enterprising gentlemen to whom we already owe so much regarding the photography of colour.

In a standard work* on ghosts by Mrs. Crowe, it is laid down that an apparition when occurring after dark is always manifested by a sort of electric bluish flame, accompanied by a peculiar earthy and offensive odour.

I do not wish them to reproduce the odour; but why not an absolutely correct and scientifically-tested light-filter, which would transmit only that region of the spectrum represented by those blue rays? It would no doubt be in the form of a curve. Said colour curve could be sealed hermetically and without chance of escape between two pieces of plano-parallel and homogeneous glass, thus enabling every possessor of a quarter-plate camera to take up at a small cost this fascinating branch.

Then there would be the only "safe light" for the dark-room, the special plates, the gifted clairvoyant operator, in fact, everything necessary to make business hum during the coming hard winter.

Would the R. P. S. Process section take the matter in hand?—Yours faithfully, S. Tallon.

57, London Road, Derby.
November 22nd, 1902.

A LETTER FROM EGYPT.

To the Editors.

Gentlemen,—It has been said that a statement to be of any value should be correct. I don't want your readers to think that I require the proverbial operation performed. On the contrary, I verily believe that the Englishmen of the Sydney Smith period could not see that he meant sarcasm, and that they themselves required the operation. I still live in spite of the attack of cachinnation induced by "Solomon Sage." Now for the correction. Instead of my chartering three steamers I have chartered four, one N. D. L. 20,000 tonner, and three Cook's special Nile steamers to the Second Cataract. This gentleman takes first place in Egypt, Lord Cromer second, and the Khedive third. My negatives have already reached the summit of the Sphinx and the two largest pyramids. Egypt is fast becoming Anglicised. I have no difficulty with the language. Cairo is the most cosmopolitan place I have ever visited. The English and others are well catered for (vide a prospectus enclosed of a new restaurant) in four languages—viz., French, Arabic, Greek, and English. If you do not see me any more you must conclude that I have patronised the said restaurant.—I am yours faithfully, A. L. Henderson.

THE SOUTHSEA EXHIBITION.

To the Editors.

Gentlemen,—I shall esteem it a favour if you can kindly find space in your next issue to correct a misconception that seems to exist (as many exhibitors have written me on the matter) that it is necessary to have entered for the Southampton and Hove Exhibitions to also compete at the forthcoming Southsea Exhibition in December. This is quite a mistake, as the Southsea Exhibition is an entirely distinct organisation as regards all the fourteen open classes, and it is only in respect of a special award offered by the three societies that exhibitors need enter for all three. Entries for the Southsea Exhibition can, therefore, still be made until December 3rd, and I shall be pleased to forward full particulars on application to my address.—Yours faithfully, F. J. Mortimer, Hon. Sec.

Pembroke Road, Portsmouth.

WHERE ARE WE DRIFTING?

To the Editors

Gentlemen,—Your correspondent "Side Light" is correct in supposing that a concentrated light can be obtained from ordinary windows, in fact it is all concentration, but of the wrong sort. Yet tolerable work may be done with it in some cases; nevertheless, if two windows are used double lights in the eyes and double shadows everywhere must result.

He is also to be congratulated upon his sitters, who, if they have not yet developed the "large ears" he speaks of, must certainly be possessed of the other attributes; but he may find with longer experience that all patrons are not so undiscriminating, and regret that he ever confined himself to his keyhole, etc.

"Side Light" is, however, wide of the mark in speaking of my ideal lens; it was the ideal studio I mentioned. I recommended

* "The Night Side of Nature."

lens, that of the diffusion of the focus type patented by the elder Dallmeyer, as being the best suited to the requirements of artistic portraiture, but suppose that he is not acquainted with it.

Happily for our profession there are men with nobler aims that "Side Light" and less easily satisfied, as I know by numerous letters which I have received on this subject. I can, therefore, calmly leave this nameless one to the serene enjoyment of his natural productions. —Yours, etc., MICHAEL E. BANGER.

November 23rd, 1902.

INTENSIFICATION.

To the Editors.

Gentlemen,—The account of the action of the intensifier on the silver given by "Chemicus" is a statement of facts rather than an explanation of causes. The results of several experiments give me reason to think the suggestion was not altogether unreasonable, and I believe that it can be proved that electricity bears some part in the combination of the metals.—Yours truly, J. S. PIGG.

November 24th, 1902.

A CORRECTION.

To the Editors.

Gentlemen,—Kindly correct the statement in your journal of last week. I am reported to have left my apprentices unprovided for. This is not the fact. I arranged for their transfer to my successors before completing any agreement. The agreement itself bears witness to this fact.

I am sure you will not be a party to any misrepresentation of the truth, so I feel certain you will publish this correction,—And oblige, yours faithfully, EDWIN DEBENHAM.

3, Victoria Parade, Newquay,
November 25th, 1902.

KODAK, LIMITED, AND THE TRADE.

To the Editors.

Gentlemen,—I have read with interest the correspondence between the Photographic Trade Association and Kodak, Ltd., and also the comments of many others regarding the attempts of the Americans to create a monopoly in the photographic trade.

It seems to me that Kodak, Ltd., are playing the roll of the petted and injured child when they cry out so loudly about piracies, parasites, etc. They state in their letter of October 25th that it is absurd to contend that they have desired a monopoly in the photographic trade. Look for a moment at the conditions issued by them some time ago, and you will see that monopoly is what they sought. Evidently, having failed, however, they have since issued a new set of conditions.

Here is an extract from the conditions referred to:—"Our Kodaks, Kodak roll holders, and Kodak films are sold to you as a dealer and discount allowed thereon on condition that no other rollable film cameras and roll holders, and no other rollable films than those of our manufacture are sold by you." Yet they state they never wanted monopoly, but their own conditions give a direct negative to this contention.

I do not blame them for desiring to create a monopoly, but, on the other hand, I admire their adversaries, the British dealers, for teaching them a lesson. Also in the letter of October 25th Kodak, Ltd., say that others have copied the "get-up and outward appearance" of their goods so as to foist them on an innocent public as "just as good." This strikes me as being a poor cry when everyone knows that they have copied many designs in outward and inward appearance for printing frames, stands, stereoscopes, and many goods pertaining to the photographic trade.

Kodak, Ltd., ask why British manufacturers have copied their special sizes, but, on the other hand, I would like to ask why Kodak, Ltd., have copied, pushed, and advertised, the British sizes, namely ¼-plate and 5 by 4, and at the same time it should be remembered that ¼-plate is to-day the size which is most used and sells in the largest quantity.

If it is wrong for the British manufacturer to copy American sizes, surely it is equally wrong for the Americans to copy the British sizes. Kodak, Ltd., should not lower their dignity by accusing others of faults which they themselves commit. I think Messrs. Wellington and Ward and Edwards have as much right as Kodak, Ltd., to ask why Kodak reels are taken advantage of in winding on films, but, with reference to this, my answer to Kodak is as previous films of Kodak make were unsatisfactory the amateur is now exposing newer and better films and making use of old Kodak reels for receiving, hence the reason they sometimes get other films on Kodak reels. This is my answer to Kodak's query why they are receiving films of other manufacturers wound round the reels of Kodak manufacture.

It cannot be denied that Kodak, Ltd., among many others, have done a great deal to popularise amateur photography, but the childish cry of accusation against the British trader for "stealing" their roll films, reels, sizes, etc., is of no avail when we see now that they are "stealing" and pushing designs for printing frames, stands, stereoscopes, and sizes, etc., which were introduced many years ago by British and other manufacturers and long before Kodak, Ltd., existed.

It is evident that Kodak, Ltd., are feeling the competition of the British dealer more to-day than at any previous time, and therefore they resort to crying like a petted and injured child.—Yours, etc.,

THISTLE.

To the Editors.

Gentlemen,—Kindly allow me to say a few last words with reference to the reply of "X. Y. Z."

His first paragraph consists of sarcasm, which argues nothing and has no place in a discussion. His definition of monopoly is identical with mine, but in other words—exclusive control. But as I stated that he could flood the market and supply every dealer in the kingdom with photographic materials, as far as the P.T.A. is concerned there is no monopoly. Dealers are not restricted to P.T.A. goods, and the P.T.A. has no exclusive control, therefore there can be no monopoly. I regret having to labour this self-evident point.

"X. Y. Z." carefully avoids controverting my plain statement of fact as to the amount of dealers' profits, but contents himself with a re-statement, in different words, of his previous fallacy, bringing forward two cases; the first indicating nothing to the general public, the second being an argument from the special to the general—a fallacious method of reasoning. He pleads that a firm made 65 per cent. upon its capital. What is intended to be inferred from this it is impossible to say, but it has nothing to do with the question of profits. If two men each invest £5 in a cwt. of tea, the one selling his cwt. during the week for £6 (a small gross profit), repeating the operation each week for a year, while the other takes twelve months to get rid of his for the same amount at the same profit, one will have made £52, or a 1,000 per cent. upon his capital, whilst the other only £1, or 20 per cent. The question at issue was of gross profits, not as to how many times one or two fortunate people were able to turn over their capital. Had I £100 of stock, and should, after working nine or ten hours a day, in my shop, only succeed in making £65 at the end of the year I should realise, take a week off, and go in for a "rise" as junior assistant behind the counter without any responsibility.

With regard to the special article which bore 35 per cent., it is most probable that the cost of procuring it came to quite that; I have known it so, frequently. Dealers are not subsidised out of the rates to act as distributors of goods at cost price.

Ignoring that I stated that the profits are no greater upon photographic goods than upon any other article of trade, "X. Y. Z." again begs the whole question by repeating that dealers should sell at a reasonable profit. Repetition without argument is unconvincing; and personally, I am unable to find any reason why that which is a reasonable profit on, say, beef or sugar, should be upon our goods a wholly unreasonable one, and an exploitation of the public.

Of course, I do not affect not to understand the state of things that many like to see, namely, that all dealers should be undercutting one another (euphemistically termed "competition"); struggling from hand to mouth—as did many chemists—until absorbed or wiped out by some firm with a large amount of capital, "X. Y. Z." and others meanwhile taking advantage of the low and unremunerative prices obtaining, forgetting entirely that such is only another form of sweating. This is the alternative to foregoing these gigantic (?) profits, and is not for the benefit of the public as a whole.—Yours faithfully, A RETIRED DEALER.

November 22nd, 1902.

To the Editors.

Gentlemen,—With reference to the letter of Kodak, Limited, in reply to Mr. Lizars, may I be permitted to ask for a reply from the company to the following questions: (1) Are there reliable films and special cameras now protected by existing patents? (2) If not what is the objection, legal or moral, to the purchase of rollable film or cameras of a like design by the public? (3) Assuming that I possess a Kodak camera and wish to use in it a film not made by the Kodak company, which, rightly or wrongly, I prefer, either because it is of higher speed, or, say, because it is isochromatic, what is the objection, legal or moral, to my doing so? (I am aware that no isochromatic rollable film is on the market at present.) I may say that I shall not be surprised if Kodak Co. ignore these inconvenient questions.—I am, sirs, yours faithfully, AN AMATEUR.

[It is time, we think, that the closure should be applied to this correspondence, in the course of which every aspect of the controversy has been exhibited to our readers.—EDS. B.J.P.]

MR. BENNETT CLARK, of Ivydene, Penn Fields, Wolverhampton, writes:—It is with deep regret that I have to tell you of the death of my father, Mr. William Clark, of 87, Park Street, Bristol, at the age of 68, which took place on Saturday, the 22nd inst., at his residence at Bristol, after a painful illness of two months. He was one of the earliest members of our profession, having been 47½ years engaged in it, and was very well known and respected in Bristol, where he had been in business for nearly forty years in the same premises. He learnt his profession with a firm in Regent Street, London; at that time there were only three or four licensees of the Daguerreotype process in the Midlands and West of England. Although one of the oldest practitioners, he was wonderfully active till the time of his illness, and the careful production and high quality of his work had always gained him a foremost place amongst the photographers in his city.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY, 24, *Wellington-street, Strand, London, W.C.*" *Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C*

PHOTOGRAPHS REGISTERED:—

J. W. Clapperton, 23, Albert Place, Galashiels, N.B. *Photograph of Rev. R. Small.*
H. H. Wragg, 27, Railway Road, Leigh, Lancs. *Two photographs of J. Bates.*
E. Gray, 39, Wide Bargate, Boston. *Photograph of "The Stocks" Boston.*
W. A. Searle, Royal Military Avenue, Cheriton, Folkestone. *Photograph of an old recruiting foster of 1st R.D.*
H. Bown, 31, Jamaica Road Bermondsey. S.E. *Photograph of 1 Officer and 49 N.C.O. of 3rd V.B.R.W.S.*

LENS QUERY.—J. M. says: "I have a cabinet lens, branded with letter 'V,' etc. Can you tell me who is the maker?"—In reply: The lens is of French make, but by whom we cannot say for certain. We think, probably, the maker may be Vallentin.

BUSINESS AGENT.—A. G. PUGH asks: "Can you kindly give me the address of a reliable firm who undertake the sale and disposal of photographers' businesses, on commission?"—In reply: Mr. Arthur Mortlock, Venner Road, Sydenham, is an agent for the disposal of photographic businesses.

ROYAL ARMS.—SUBSCRIBER writes he would like to know if he would be allowed to use on his mounts coats of arms, if not appointed by Royalty; he is not sure if this is the true one.—In reply: Certainly not, as by doing so you would incur a heavy penalty. Neither must you use a colourable imitation of the Royal Arms.

STAMP PHOTOGRAPHS.—STAMPS asks: "Can you give us the address of a firm who do stamp photographs? They are just the size of stamps, and are in a sheet perforated ready to tear off, as you do stamps."—In reply: Messrs. Firman and Co., Gloucester Road, Peckham, advertise that they do stamp portraits. Others also do them; see the advertisement columns.

BOOK WANTED.—H. S. COUSENS says: "I should be much obliged if you would state what book you could most recommend on miniature painting."—In reply: We know of no book, at present in print, devoted entirely to miniature painting. Johnson's book, "Art of Retouching Negatives, and Finishing and Colouring Photographs," published by Marion and Co., will give you some information on the subject.

TONING BATH.—J. ANDERSON says: "Please say if enclosed formula, which I have copied from a book, is any good. How long would prints require to be fixed? Would they be permanent? No gold combined bath; hypo., 6ozs.; washing soda, ¼oz; lead acetate, ½oz.; water, 1 quart."—In reply: The prints should be fixed in about a quarter of an hour. We cannot say if the prints will be permanent, but we should very much doubt it, seeing that there is no gold used in the bath.

MOUNTING COLOURED PHOTOGRAPHS.—P. G. C. writes: "As I have got a few hundred Japanese coloured photographs to mount, I would be very pleased if you would kindly inform me through the JOURNAL which would be the best way to mount same. Also which mountant you would think best to use. They are printed on albuminised paper, and coloured with water colours as far as I am aware, so I am afraid to soak them before mounting, as it might take away the colour."—In reply: The photographs must certainly be mounted dry, and starch or other mountant may be employed. In the JOURNAL of November 7th you will find an article on mounting on Japanese paper, if the prints are required on that

FLASH LIGHT PHOTOGRAPH.—E. CARVER writes: "I am going to try a few flash light photographs, having one of Maloni's patent ball-room flash lamps; but I am really in doubt as to getting focus. For instance, say I wanted to take a view of a decorated ball-room, or a dinner party, how should I get a good all-round focus? If I focus one spot and stop down to get everything sharp, I shall require too long an exposure."—In reply: The only way to obtain objects in different planes in focus is by stopping down the lens. All we can suggest is that you adjust the focus so as to get the best general sharpness you can with the largest stop you can do it with. We do not reply to queries by post.

QUESTION OF CHARGES.—LANC writes: "Last month I was asked by a gentleman to go out about eleven miles to take views. I took eight different views, 12 by 10, and occupied (with the journeys) the whole day securing the negatives; and I then supplied sixteen platinotype photographs, i.e., two from each view, and sent in my bill £6 6s. Result, objects to the charge, saying 'inasmuch as the amount of £6 6s. is quite unreasonable for the sixteen photographs.' The work was acknowledged to be first class, and the small number ordered was sufficient as they were for a law case. Do you think the charge reasonable?"—In reply: Yes, we think the charges very reasonable. Indeed, they are less than most photographers would have charged under the circumstances.

FAULTY NEGATIVE.—AGFA says: "Kindly criticise enclosed print, and inform me reason of (1) such a dark sky and (2) general blurring towards sides of picture. The photo was taken with one of ———'s cameras (hand; fixed focus). I have some prints here which do not show the blurring taken with the same camera. The plate used in this instance was Imperial Special Rapid, and exposed for about 1-30sec. I do not wish the pinholes and torn film to be taken into account. (3) Kindly let me know, also, how I am to use the intensifier known as 'Agfa.'"—In reply: (1) The picture is much over-exposed, and the negative seems to be fogged. (2) Probably the camera was moved during the exposure, as no part of the picture is really sharp. (3) Directions for use are supplied with the intensifier.

STUDIO QUERIES.—SEMPER FIDELIS puts the following questions: "(1) I have built a studio of the lean-to design, with top and front lights; length of lights, 14ft. front by 3ft. length; top lights four in number, 4ft. wide by 7ft. long. The top lights I intend covering over with white calico stretched on frames, instead of ground glass. What I ask for (the studio facing south, with full sun on the top lights, but no direct sun on the front lights) is your advice re blinds. What colour, and how many would you recommend for top and front?—I intend running them on wires as suggested by Mr. Bolas. (2) Also, my studio is 24ft. long by 12ft. 6in. wide, with an additional 8ft. required in waiting room. What lenses would you recommend for cabinet, carte-de-visite, and also one for full length and group work. I mean to say, what length focus would be required for each of these conditions?"—In reply: (1) As the studio has a south light, we should recommend a tolerably dark green for the top blinds, and a similar colour for the sides. (2) For cabinet pictures a lens of from 11in. to 12in. focus will be suitable. The same lens will also do for cartes and three-quarter figure, but for full lengths one of shorter focus will be required. The size of the group picture is not stated, so that we are unable to answer this query.

RICHMOND Camera Club.—The meetings of the club will in future be held at the premises of the Freemason's club, Sheen Road, Richmond, Surrey.

NATURE Study in Yorkshire.—Last week an important conference of teachers and school managers from all parts of the East Riding was held in the Assembly Rooms, Beverley. Lord Harris, chairman of the Technical Education Committee of the East Riding County Council, presided, and amongst those who took part in the proceedings were Professor Miall, Mr. Loftus T. Monro, and Mr. E. H. Howard, His Majesty's inspectors of schools, and the Rev. Canon Nolloth. About 600 teachers and managers were present. After the chairman and others had spoken, Professor Miall delivered an address, and said that the good teacher questioned his class perpetually, and was not eager to pour out information. He did not seek merely to cultivate the memory, but tried to improve the reasoning powers, and to train the eye and hand. There was no possible substitute for a teacher who himself observed well, and it was unfortunate that a regular industry had been organised for the supply of ready-made object-lessons and lantern-slides. He advised his hearers not to use stuffed animals and dried plants in the class-room, but wherever possible to study living animals and plants. It was not wise at present to look to public bodies for guidance, as they already had too much work on hand. If they could only afford one hour a week for nature study they might as well let it alone, for three hours was the minimum for it to be of any use. Mr. E. H. Howard said much had already been done in nature study in a quiet way. In one school he knew the study was the means of securing good attendance. A representative committee to promote nature study in the East Riding and Hull was elected.

*** NOTICE TO THE TRADE, WHOLESALE AGENTS AND BOOKSELLERS.—*A Contents Bill is issued with each number of the* JOURNAL, *and copies may be had on application to the Publishers.*

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*** *The Editor can only be seen by appointment.*

*** *We do not undertake to answer letters by post.*

THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC FOR 1903.

Edited by Thomas Bedding, F.R.P.S.

The forty-second annual issue of The British Journal Photographic Almanac will be published during the present month. This year's Almanac reached a total of 1,560 pages, and the entire edition of 20,500 copies was sold out a fortnight before publication. Of no other photographic book ever issued can two such unique facts be recorded.

The growth in popularity of the Almanac is evidenced by the remarkable rapidity of its sales.

The 1900 Edition (20,500 copies) was sold within three months after publication.

The 1901 Edition (20,500 copies) was sold a fortnight after publication.

The 1902 Edition (20,500 copies) was sold a fortnight *before* publication.

The widespread interest in the Almanac grows steadily year by year, and in order to supply the increasing home, foreign, and colonial demand, we have decided to enlarge the 1903 issue to

25,000 COPIES.

The great addition to the circulation of this most popular annual (over 20 per cent.) undoubtedly enhances its value as an advertising medium, and the issue of the large number of extra copies will supply the wants of thousands of photographers, dealers and publishers who were unable to obtain the Almanac for the last three years.

The Almanac for 1903 will appeal to photographers all the world over as a daily reference guide in practical work. The standard matter and formulæ will be revised and added to where necessary, and the latest departures in theory and practice will be chronicled. The year's advances will be recorded, and wherever practicable new features of an informative nature will be added.

EX CATHEDRA.

Photographic Chemicals in Analysis.

The range of chemicals made use of in photographic technique has of late years become so widely extended that it now embraces quite a large number of chemicals that are almost a necessity for the laboratory shelves. For a long time we have had work in the ferro and ferricyanides, so valuable in testing for iron, though the sulphocyanides are still more delicate when testing for ferric compounds. For example, a drop of perchloride of iron solution being placed in a test tube filled with water, the liquid emptied out and the tube refilled with water, a distinct red colouration will be brought about upon a drop of sulphocyanide solution being added. Then we have oxalate of potash as a test for lime, platinum chloride for potassium, nitrate of silver for chlorine, and so on. But quite the latest addition to the list are the mutual reactions of formalin and amidol. For some time past the germicidal properties of formalin have been made use of in putting a check on the practice of some of the milk dealers and the meat jelly manufacturers. A very small quantity is sufficient for preservative purposes, but is contrary to law and public morality to make use of it for such purposes. It is recommended when the presence of formalin is suspected in a sample of milk to lightly powder the surface with amidol, or amido-phenol, and leave it for some moments. Normal milk, or milk treated with boric acid, develops a salmon colour, but if a trace of formalin be present the colour is yellow. When testing meat jelly the chemical is mixed up with it. It turns yellow if formalin has been added, and a dirty yellow upon the further addition of a drop of another photographic chemical ammonia solution. When the suspected adulterant is absent the colours produced are brownish rose colour and blue respectively. This photographic method is quicker and more sensitive than the usual, which requires a preliminary distillation of the substance under examination.

Photography and Aëronautics. Photography and aëronautics have been closely allied for a long time; the name of Glaisher and the greatest height attained will always be linked together, the ascent when the record was made being historical. We have had since then many ascents in which the photographing of the country below has been the main cause of the aërial journey, as recent pictures in several of the illustrated monthlies would show. We believe photographic apparatus formed part of the personal luggage of Mr. Santos Dumont when his machine collapsed, and he and his camera fell ignominiously into the sea. So popular has the mania for flying machines and navigable balloons become that the various aëronautical societies of the kingdom are to be asked to consider a scheme for preventing fatal accidents, such as have already of late befallen quite a number of aërial travellers. The suggestion is similar to that made for application to motorists—viz., that every would-be balloonist should be first examined as to his experience and ability with ordinary balloons before being allowed a certificate. Then every navigable balloon, flying machine, or airship, should be examined by a committee of experts before it left the ground; if passed as being safe and a certificated aëronaut accompanied it, the journey or flight might be made. Next, the permission was to be dependent on certain limitations as to height and speed being observed; if these were not observed, or if examination of the machine were refused, a criminal prosecution should lie in case of accident. If anyone made an ascent in a machine pronounced by the experts to be impracticable and certain to come to grief he was to be liable to be dealt with as an ordinary homicidal or suicidal lunatic.

* * *

The present Price of Silver. Although photographers are dependent upon silver in the majority of the processes they employ, they are at present but very little interested in its market price until it becomes a question of the sum they obtain for the residues sent to the refiner. The value of the metal has been gradually decreasing for some years past. One day last week its price was quoted at 21 11-16d per ounce, with a downward tendency. Standard silver at less than one shilling and ninepence three farthings an ounce, is, we believe, a record price. More than once we have alluded to record prices of the metal, but this beats them all up to the present. Some forty years or so ago the market price of standard silver exceeded five shillings the ounce—for some time it was quoted as high as 62d., nearly three times its present value. Now, when it is considered that in the processes now in vogue so little silver is used in camparison with what was the case in the wet collodion days, and when photographers sensitised their own papers and strong baths had to be employed for the purpose, it will be seen that the residues nowadays necessarily contain but very little silver as compared with what they did in the past. Added to this, the ashes from the papers—gelatine and collodion—are much heavier than they were from the old albumen paper, by reason of their being surfaced with the heavy sulphate of baryta and the paper itself being considerably thicker. Hence, say ten pounds of carefully-treated residue now may contain less silver than did a third, or less, that weight some years ago; and when it is considered that, when the metal is recovered, it is not worth much more than a third what it used to be, the small returns now made by refiners are fully accounted for. If nitrate of silver is received in return for the residues, the discrepancy does not seem so great, as its price is governed by the price of the metal; but it is when cash is returned instead that it seems the greater. Taking all these facts into consideration, it is a question whether it is worth the while of workers on a small scale—such as amateurs—to take any trouble at all about their silver wastes, seeing how little they will get in return for them after the cost of reducing them is deducted.

* * *

Stained Negatives in Cold Weather. In an article last week, "Winter Troubles in Photography," we alluded to the fact that complaints of stains, etc., on negatives and prints were far more prevalent during the winter months than at other seasons of the year. The trouble to which we are now referring might easily be avoided if photographers would only take the precaution to varnish their negatives. It would not be altogether a wild speculation to say that nine-tenths of amateurs at the present time do not varnish their negatives, or that a very large percentage of professionals do not varnish theirs. They take exceeding pains in getting the best results they can—intensifying, reducing, and retouching them, for example—and afterwards, for the sake of a little additional trouble, expose them to risks that may result in their practical destruction, which might otherwise have been avoided, the reason being, simply, that gelatine negatives may be printed from without mechanical injury. Collodion negatives cannot be, hence they are always varnished, and for this reason they are free from the risk we are now dealing with. Most workers are cognisant of the fact that if a gelatine negative is printed from while it is damp, or the paper is damp, stains are the almost inevitable result. In the winter, if the weather is fine, the printing is usually done in the open air; consequently the negatives, the frames, and the pads become exceedingly cold. Then they are taken into a warm room for the paper to be changed, and moisture at once condenses upon them, in the same way as it does upon cold glasses when they are taken into a warm room, or a lens is dimmed when it is attempted to be used in such a place as a warm conservatory, unless it has been previously warmed. Now this condensation is not manifest on the film side of the negative, though it is generally palpable on the glass side, but it is there all the same. This moisture is then absorbed, either by the film of the negative, or by that of the paper—probably by both—with the result that, after several printings, the negatives become stained with silver. These may possibly not make themselves manifest at once, but after they have been stored away for a time they show themselves, often to the surprise of the owners, and the real cause is but little suspected. But had the simple precaution been taken to varnish the negatives before they were printed from no such injury would have arisen, for in this case no moisture would have been absorbed by the negative, and that taken up by the paper would have been of no moment. It is, as we have more than once said before, surprising that photographers—professional and amateur—should expend so much time and care in the production of their negatives and then begrudge the little trouble of varnishing them as a means for their preservation afterwards.

* * *

Curious Actinic Power of Diamonds with Radium. Shortly after the remarkable discovery by Röntgen of the invisible opacity-penetrating rays from the vacuum tube there was brought before the scientific world another set of invisible actinic rays, somewhat analogous to those emitted by uranium and other bodies. These latter radiators have been investigated by a number of acute scientific workers with results of the highest interest; indeed, it is difficult to say what limit can be fixed upon their ultimate bearing on the most abstruse

problems dealing with the constitution of matter. New metals have been discovered in the course of these investigations, and entirely new and unexpected properties found to be possessed by some of the long known elements. One of these new metals, polonium, has the property of emitting certain radiations, some of whose properties—the electric—are foreign to the purposes of our journal; others have special photographic interest. Dr. Otto Rosenheim, writing from King's College, London, describes his experiment in the *Chemical News* in abstract somewhat as follows: If a diamond rendered phosphorescent by exposure be placed upon a dry plate and left there for twenty-four hours, no developable effect is produced. If a bar of polonium be placed on such a plate covered with a piece of tissue paper, no effect is shown on development. If, however, the polonium is placed in contact with the diamond a distinct impression is developed under the diamond, but not under the polonium. If the paper be removed, there issue from each object radiations that affect the plate. If the diamond and the polonium be kept in contact, but away from the plate, for a considerable time, the diamond has no action upon the plate. The diamond radiations (when it is in contact with polonium) are capable of passing through thin films of paper, celluloid, gutta percha, and glass, while these films are entirely opaque to the companion polonium radiations. No special deductions have been drawn from these phenomena, nor can they be said to have a practical photographic bearing; but it is highly desirable that they should be placed on record in these pages, as also any further results in the same direction when they are published, and this our readers may rely upon our doing.

* * *

The Smoke Nuisance. Practical photographers have often been amused at the remark very often made by ladies in their admiration for portraits taken on the Continent. They say, "You see the air is so much clearer over there." For the practical man knows well enough that as good photographic work is done in London as anywhere else, and that although November does bring us fog and mist, when daylight work is out of the question, there are plenty of times when work of the highest quality can be safely counted upon. Yet it seems hard that with all the protests which have been made, with the legislation against smoky furnaces, and all the other attempts to deal with the evil which have been pushed forward, we should still have the fog fiend in our midst. Simple white fog we can never hope to banish, for it is a natural produce of our island home; it is the yellow, sulphur-impregnated abomination that we want to kill. We look with envious eyes to most of the large Continental cities, which by some means or another manage to keep their atmospheres clean, and are prone to ask why they manage so much better than we do in England. Some light is thrown upon the question, so far as Germany is concerned, by a recent report of the United States Consul-General in Berlin, who tells how coal fires are largely superceded there by the use of briquettes, which are made of lignite, peat, and the dust and waste of coal mines, mixed with a certain proportion of mineral pitch. These briquettes are easy to handle, and to store; they burn with a clear, intense flame, and make practically no smoke. Their manufacture represents a very large industry, the output during the past year amounting to more than one and a half million tons. This form of fuel is used in private houses, in workshops, and in factories, and as a result Berlin is one of the cleanest cities in the world. The Consul attributes this cleanliness to three main causes:—(1) The use of this smokeless fuel, (2) the skilful, scientific construction of boiler furnaces and chimneys; and (3) the skill that is taught and enforced among firemen who stoke the furnaces for manufacturing purposes. He says, on this last point, "It is not every strapping labourer who can shovel coal who is permitted to stoke a boiler furnace in this country. Before he can assume such a charge he must be taught the theory and practice of economical, scientific firing, by which the fuel is distributed in such manner and quantity over the grate surface as to secure the most perfect combustion of the volatile elements." The English plan is to allow the volatile elements to escape up the chimney, and gradually form a pall over their chief cities, which brings widespread discomfort and loss to thousands. Among these photographers are the first to suffer, for the veil of smoke keeps light from entering their studios, and visitors from entering their doors.

* * *

The Sins of Celluloid. When the introduction of celluloid made the cinematograph a practical success, there were many prognostications of the disasters which must occur from the inflammability of that material. A few such episodes did happen, happily without any grave results, and these could be traced to the imperfect apparatus then in use, or to the foolhardiness, or the ignorance, of inexperienced operators. The London County Council took alarm, and ruled that no machine for exhibiting animated photographs should be employed in any of the halls under their jurisdiction, unless apparatus and operator were shut up in an iron box, where they were completely isolated from the spectators, and where they could frizzle away at their own sweet will. But if all the accidents arising from the inflammability of celluloid could be tabulated, we have no doubt that the majority would prove to be in connection with the use of that material other than as a support for the photographic film. There have been accidents, for example, from celluloid collars catching fire and inflicting terrible burns upon the wearers' necks. And there is no great reason to wonder at this, for tens of thousands of such collars must be in daily use—a silent protest against the destruction wrought in linen by the modern laundress. Combs, and other fancy articles made of celluloid, are responsible for several more accidents, and we have even heard of a billiard ball made of the material catching fire and deflagrating violently, to the utter ruin of the green cloth upon which it rested. But perhaps the most remarkable episode of the kind yet reported is that described by the Paris correspondent of the *Daily Telegraph* last week. A certain gentleman had, by an unkind turn of fortune, lost his nose, and as he considered that the absence of this very necessary appendage to a complete countenance might excite remark, he hied him to the surgical instrument shop and purchased an artificial olfactory organ. It was supposed to be made of horn, but sophistication enters into the composition of artificial noses as it does into that of most other commercial products, and the thing supplied to him for horn was really celluloid. He did not become aware of this until chancing to light a cigarette, the flame from the match set fire to his newly-acquired nasal organ, and in a moment he was running about with a small volcanic eruption coming from his face. We earnestly trust that the poor fellow was not badly burned, but while we sympathise with him in his misfortune we cannot help feeling glad that the accident was quite unconnected with the use of celluloid in photography. Those who use films of celluloid, either in the flat form or in the roll holder, are, we need hardly point out, running no more risk than if they were handling glass plates, for the necessary care exercised in keeping the material from access of light involves protection from fire as well.

HINTS ON WORKING VELOX PAPERS.

THE following method of working Velox paper has given such excellent results, and with such a minimum of trouble, that it has always been a matter of surprise not to have seen it more than suggested, much less reduced to a system. The chief feature is the use of magnesium wire for the exposing light, and depends on the fact that an equal length of ribbon at the same distance from the negative will always give the same result. Besides, the time taken in exposing is so short that the total time required to produce a dozen or more prints is materially lessened, as compared with lamp or gas light. The requirements are very few. The long, narrow table which is usually found in the dark-room is best, on which are arranged, in the following order:—First, at one end a candle or gas jet, in the flame of which the magnesium ribbon may be conveniently lit, then a space of, say, four feet marked off every six inches, so that the printing frame may be quickly set up any distance from the light. Next, the dish for the developer, then one for the hypo, and next to this a large washing tray; some sheets of white, clean blotting paper and a roller squeegee will also be very useful.

Now to classify: Velox may be had in grades which will suit almost any negative, and give results to satisfy any taste in the matter of surface, tone, or contrast. First, we have the regular or Carbon Velox, which will give contrasty results from ordinary negatives, and which will enable us to get good prints from negatives which are so flat that we are almost inclined to throw them away. This is made in rough, smooth, and glossy, and gives tones from jet black to red, according to exposure and developing. Then, if our negatives are too contrasty, we have the Special Velox, for giving soft effects. These papers are more rapid than the regular, and require perfectly fresh and pure developer to give good results. We should therefore carefully examine the negatives we propose to print from and classify them, first according to their density, and then to their contrast. We will find that Velox gives such latitude of exposure that three classes of negatives would be sufficient—that is, first, negatives of average density; second, those that are below; and, third, those much above the average. There will naturally be many that would come between these, but we should soon find that, having three known factors (that is, speed of paper, strength of developer, and intensity of light) always the same, the only other factor (distance of printing frame from the light, depending of course on the density of the negative) would be such an easy matter to judge, especially with the densitometers now on the market, that we will hardly ever make an error.

The method adopted is this:—A negative of ordinary density is placed in the frame with a piece of Carbon Velox. This is set up on end, exactly three feet from the light (note the appearance of the paper under the negative by reflected light, as this is one of the best guides to the density of the negative). All the magnesium ribbon is cut into lengths of exactly one inch. If pyro-stained negatives are used, the standard will have to be two or three inches, according to colour of negatives. One of these lengths of wire is taken in a pair of pliers, or on the end of a long hat pin, and held in the flame of the candle; as soon as it has burnt out the Velox is taken from the frame and placed into the developer without previous immersion into water, care being taken to flood the whole print and to avoid air bubbles. Now watch carefully, and the moment the whole picture is faintly up it is withdrawn by one corner on to a clean sheet of glass, and held so that all the developer runs off at once. It can now be held quite close to the candle light, and allowed to finish developing, while you examine it carefully. The moment it is quite to your fancy it is plunged into the acid hypo, which stops all action. If preferred, it can be plunged into clean water instead, and then examined more carefully, when, if not quite enough developed, it can be returned to the developer, or a drop of the developer may be applied with the tip of the finger to any spot requiring it; the amount of water on the paper preventing the too rapid action of the developer. The secret, however, is to withdraw it from the developer before it is quite finished and allow it to finish on the glass; if you have taken it out too soon, it is easy to replace it; on the other hand, you can stop it at the moment you like if it is over-exposed, and the chance of a spoilt print is very small after a little practice. As soon as a print is in the hypo the next can be exposed without risk of spoiling it, so that in a very short time a dozen or more will be in the hypo dish, from which they go to the washing water, where, if they are kept for ten minutes, and then squeegeed between sheets of white blotting paper, again placed in clean water, and once or twice again squeegeed, they will be quite free from hypo and dry in a very short time.

Any tone-finished print may be obtained by remembering the following:—A short, full exposure and strong developer give normal black and white results; the weaker and more restrained the developer the longer the exposure must be, but the further over to red tones the result will be. If upon development it is found that the exposure—i.e., the distance in inches of the negative from the burning wire, was exactly right, that distance is minutely marked in one corner of the negative—in this instance say 36in.—and this number will in any future exposure of the same negative convey the fact that the normal exposure—i.e., to get black results with normal developer, will be one inch of magnesium ribbon at a distance of 36in on Carbon Velox, and on Special Velox will have to be one half, or once again as far, as it is about three or four times as rapid; and likewise by exposing the same print at 36in. to two, three, or more inches of wire consecutively, and correspondingly restraining the developer, we can get any tone always repeated from that negative. If, on the other hand, the exposure had proved too much or too little on developing, we should alter the distance for the next print, and when the correct distance is once obtained it is scratched on the negative in the form of a single figure, which will at any future time give the correct distances in inches. Of course your developer must be as known a quantity as your light, paper, and distance if the best results are to be obtained; and nothing is better than the amidol tabloids in this respect; all that is required is the stock bottle of soda sulphite solution, from which the required amount is poured each time a batch of prints is developed, and into which are crushed two grains of tabloids, according to formula, and you have a perfectly reliable and fresh developer to work with each time, which will be specially appreciated when working with the Special Velox. It will be found, however, that greater control will be obtained by making the developer half the strength recommended on the package and regulating the exposure thereto. To sum up:—First, use plenty of light to work by; candles are best and safest. Second, remove print from developer before quite finished, and allow to finish on a glass plate. Third, alternate squeegeeing between blotting paper and placing into clean water gives quickest way of removing hypo, and a final squeegeeing in blotting paper leaves a print which will be dry in a few minutes. Fourth, always use fresh developer. By following the above we have a process which gives prints which cannot be beaten for beauty, and one which becomes a pleasure instead of a task to perform.

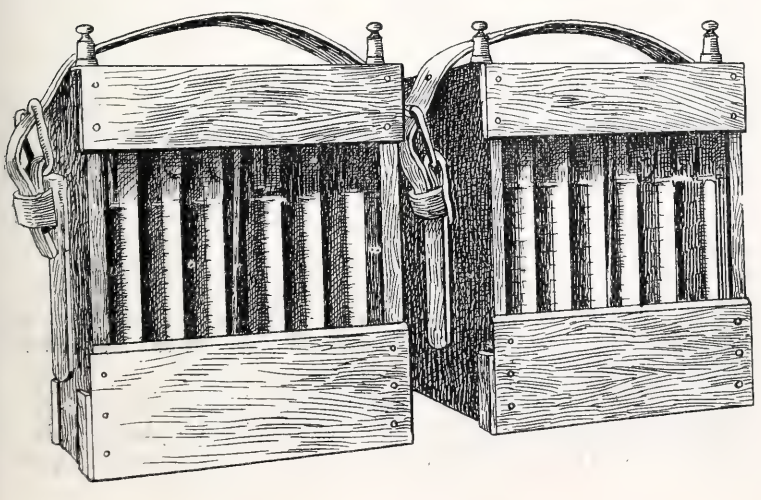
BATTERIES AND ACCUMULATORS FOR PHOTOGRAPHIC AND OTHER PURPOSES.

By The Amateur Optician.

An experience extending to some years—more particularly since the application of electric lighting to our business premises—confirms me in the view that accumulators or storage batteries are, and may be made by most persons, very convenient and of general utility for a variety of purposes. A small electric light is extremely useful, safely enclosed in ruby paper, to develop by; a cluster of lamps mounted in the bottom of a box, the lid or cover of which is a printing frame, serves as a good uniform, healthy, and economical illuminant in exposing lantern plates; when working the induction coil for X-ray work, I have the range of a set of batteries, and can couple up any number of cells, from one to ten—i.e., two to twenty volts.; in the purely domestic region, two or three batteries are in constant use, not to mention a night light which is only in occasional use to ascertain the time in the "wee, sma' hours," a light which can be switched on at the head of one's bed to read by, is a luxury not to be sneered at—clean, safe, and inodorous.

The cost of accumulators is a serious consideration; one suitable for working a 4in. coil will cost almost half as much as the coil itself; then the weight is somewhat of a nuisance, and the risk of breakage and damage by irresponsible porters and workmen is such that nothing but great and sustained enthusiasm will enable one to carry on the work. My first accumulator cost me nearly cent. per cent. more than the initial invoice price for repairs, the damage, consisting of such items as fused connections and cracked cells, being done by persons to whom the battery had been entrusted for recharging and by porters. Now, all that is at an end. I make my own, at a cost which is less than half that of a bought article. I make the weight such that I can do my own porterage, and, what is of supreme importance, the batteries are as effective as anyone could desire. Amateurs sometimes essay this work *ab initio*—i.e., they make models of, and cast their own "grids," fill them with the usual lead peroxide and spongy lead, and so on. It means no end of trouble, much needless cost, mess, and objectionable smell, and as a result a battery of cells which, weight for weight, is not to be compared for effectiveness to such cells, say, as the E.P.S. type. I write from personal and practical experience. No, in making accumulators, of all things electrical, attempt nothing beyond the putting together or building up of the parts, and you are safe. Take the chief essential, the "grids," positive and negative. No amateur living can model, cast, and turn out ready for "forming," grids equal in capacity, finish, and quality to those which can be purchased at less money, ready for use.

Below is a photograph of two four-volt. batteries, replicas of



others which I have made and used for some time past, their cost, exclusive of labour, works out for the two at 21s. 10d.! They weigh approximately 15lb. each, which means that one can be carried to and fro without undue fatigue; if you have them heavier, of greater capacity, they become unwieldy, and you have to employ others to carry them, and then come the risks and the expenses. In short, look after them yourself, and they are no trouble and small expense beyond the original cost. The first question, however, is, has the reader access to an electrical installation?

Before, therefore, giving the necessary instructions for making and fitting, a few practical suggestions will not be out of place relative to the "charging" of the accumulators when made. Obviously, this is a question of main importance.

Accumulators may be charged from primary batteries, e.g., chloride cells, Daniells', and so on; from dynamos, small or large, and part of one's installation; or from the corporation supply, which, however, must be continuous current. The first method I shall not consider on account of the cost, mess, and trouble; the owner of a private installation will know all about it already; the third, from a main supply, direct current, at a pressure of 100 to 200 volts., only need be commented upon here. Now, presuming we have a small pocket accumulator, two or four volts—i.e., one or two cells, each cell being equivalent to two volts—the method of charging this will be as follows:—Select any convenient lamp near a table, bench, or mantelpiece; find also, or lay open to view, the twin silk-covered wire which conveys the current to the said lamp, take one strand of this twin wire—which one does not matter—cut the wire, and bare the ends for about 1in. We have to find now which bared end is positive and which negative. To do this in the safest and easiest manner—an electrician would use "pole-finding" paper—I recommend the method following:—Place the two bared ends one on each side of a phial cork, and tie with string; let the ends project over the end of the cork, and be about $\frac{1}{2}$in. apart; holding the wires by means of the cork, immerse the bared ends into a glass of water, and switch on the current. Bubbles of gas will be seen, more or less freely, proceeding from the negative wire; a drop of acid (lemon juice will do) greatly facilitates the formation of the bubbles. Now, to save trouble next time by having to repeat this operation, mark the positive wire with a piece of red sealing-wax, the usual custom being to paint the positive terminal red and the negative black. All that is necessary now to "charge" is to connect the negative bared wire to the negative (marked —) terminal of the accumulator, and the positive wire to the positive (marked m) terminal. Substitute a 32 c.p. lamp for the 16 c.p. on circuit, and more current will pass. Arrange to do this when the lamps are in use, and the cost of charging is trifling, while the candle power of the lamp is not greatly decreased. The figure shows this clearly, remembering that the wires must be tested for polarity before being attached to the terminals of the accumulator.

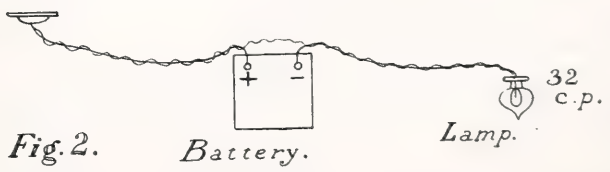
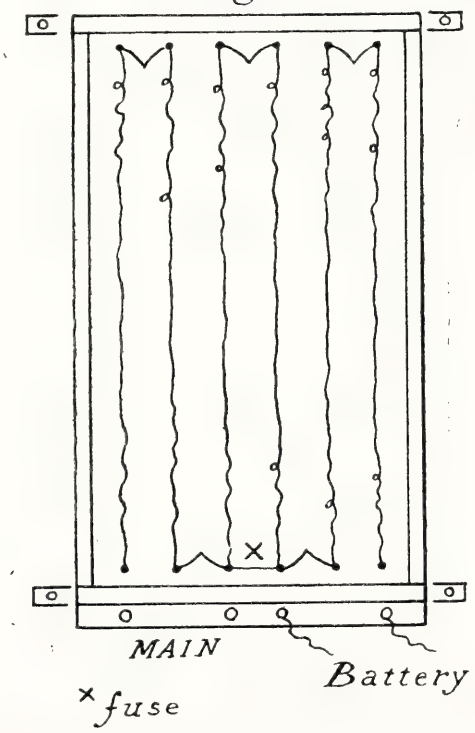


Fig. 2.

For charging accumulators of larger size, such as those to be described, it will be found more convenient to have a "resistance frame" made by a professional expert; the cost should not greatly exceed a guinea. A frame to step down a 200 volt. current is figured below (Fig. 3). It consists of half-a-dozen lengths of suitable platinoid wire arranged in spirals, and properly attached and connected to a stout iron frame.

From this we get a current of about three ampères, and can safely charge even the comparatively small batteries dealt with in this article, and in a reasonable space of time. In the case of the resistance frame figured, a length of the best silk and rubber-covered twin wire is first attached to the terminals, to be found on one of the porcelain pots through which come the branch wires, supplying four or five lamps; the other two ends of the twin wire are connected to the two "main" terminals on the resistance board (marked "main" on the figure). Attach another length of twin wire to the other two terminals, and test the polarities of the bared ends of this wire as before described; the wire which is found to be negative is attached to the negative terminal of battery, and the positive wire to the positive terminal as in the previous arrangement. If there are any spare terminals on the main switch-board, the connections might be made here; but the services of a competent electrician ought to be called in before making any such alteration, as a 200 volt. circuit is not to be played with. My own board is, however, fixed and at-

fig. 3.



tached, as required, to one of the "pots" mentioned, and by putting in fuse wire between accumulator and main wires, accident is reduced to a minimum. Now that I see how simple a matter it is to properly charge accumulators in this way from one's own supply, I wonder at my own timidity and innocence in paying, time after time, fees for recharging my batteries, fees, too, which may be reasonable enough, but still eighty per cent. above the cost when done at home!

The beginner must first master the rudiments of "soldering." This is a small art, easy of acquirement, and one which at times comes in very handy. Purchase a soldering iron of fair size, with a copper "bitt" at right angles to the handle; buy also some soft solder, resin, and some pieces of sheet lead; cut the latter into strips, and practise with them, soldering pieces together until able to make good joints. We want a clean "bitt," and just at the right heat, for making the lead joint. The heat required is not that required for brass soldering, and the only real difficulty will be the finding of the right temperature, and that is easily acquired. When able to make a good job with the pieces or strips of lead, one may safely tackle the putting together of a storage battery. Glass cells of suitable size (6 by 4 by 2 full, inside) cost 1s. 2d. each; these will comfortably take five "grids," 4 by 4, bought ready made and formed, at the price of 8d. each for the negative, and 9d. each for the positive. For the two cells we want six negative and four positive. Next we require six pieces of hard vulcanised fibre or vulcanite, $\frac{1}{2}$in. wide, $\frac{1}{4}$in. thick, and 2in., or the exact width of the cell, long. These pieces are required, two at the bottom and one at the top, to hold the grids in position, and keep them at a uniform distance of $\frac{1}{4}$in. apart; they have, therefore, to be cut to the following figure (Fig. 4).

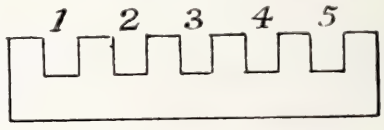


Fig. IV.

Having ruled off the distances, saw down to, say, $\frac{1}{4}$in., then use a small fretsaw to cut out the squares. Having prepared these, and tried them in the cell—they should fit easily—we now proceed to solder strips of sheet lead to the lugs with which the grids are provided; the length of the strip is not material, but the connection made should be well and neatly done. The negative grids are a trifle thinner than the positive, and grey in colour. The positive being chocolate, commence with a negative, and having fitted it with the strip of lead—lengthened its lug, that is—set it up to the left in two of the vulcanite separators; next lengthen the lug of a positive grid, and set this up, with the lug on the other side, next to the negative. The negatives occupy the grooves 1, 3, and 5, with their lugs all on one side, and the positives 2 and 4, with their lugs parallel.

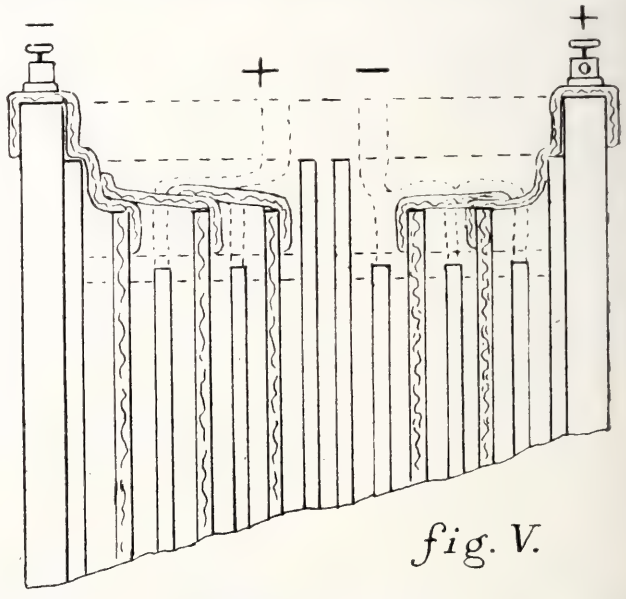


fig. V.

Fig. 5 shows a vertical section of the cells in outside case, looking at them from the front. Fig. 6 gives the arrangement as viewed from the top.

I invariably put a touch of seccotine into the ebonite grooves before setting up the grids, therefore by the time we have finished soldering the lugs and coupling them to complete the cell, the set of five may be lifted without all colliding. Double up a piece of string, pass the loop under the set of grids, and make a sort of sling by which the whole can be lifted and lowered into the cell, drawing out the string afterwards.

Having completed the fitting of the cells, they are encased in stout frames substantially, as shown in the photograph. I separate the cells slightly, by inserting a piece of good corru-

gated paper (rubber would be better), and practically build up the frame round the cells. The back and front are designedly left open, and you have consequently a clear view through each cell. In case of a "short circuit," or mishap by the falling out of any of the lead paste, which would lodge between the grids, you can at once see the mischief and remedy it when charging; also I like to see that each plate is "gassing" freely, thus demonstrating that all the connections have been properly made. All the wood casing, as well as the cover to be finally fitted and let in at the top, should receive several coats of shellac varnish. The battery is finished by screwing on a stout leather strap. I get the suitable article at 6d. each, very stout and strong, but whether it is all leather I could not say.

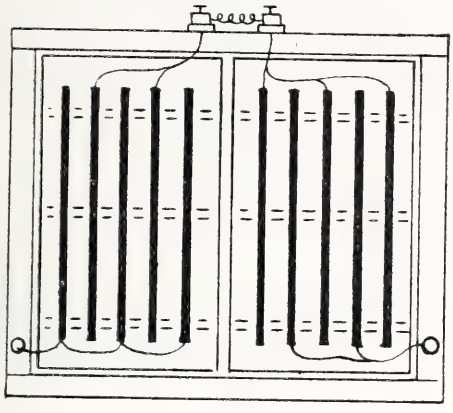
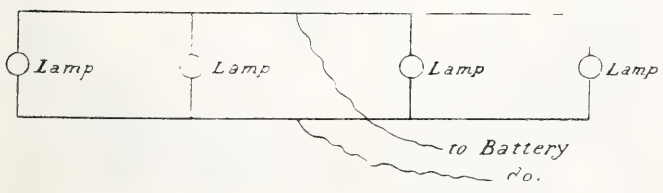


fig. VI.

The battery is now ready for charging. Prepare a solution (called the electrolyte) of the best strong sulphuric acid, 5 parts, to water, 21 parts. The acid should be added to the water gradually, and the solution should be cold before pouring into the cells; enough solution should be put in to just cover the grids. Me may now proceed at once to connect the battery to the wires, as described. The wires comprising the resistance will get hot, but should not get above a dull red, and after a couple of hours or so, the cells will begin to "gas" and spray —they should be covered with a piece of glass—and they may be allowed to go on like this for two or three hours for the first charge (better too much than not enough), and will take no harm, provided the terminals show no signs of getting too warm; but unless a very strong current is passing, this would not be likely to happen. In any case, the safety fuses would show it long before this. My own method, on a 200 volt circuit, is precisely as described, and I have never experienced any trouble. The battery just made will light a 4 volt h.e. lamp for several hours; it is well to get the best h.e. (high efficiency) lamps, as they last longer than the cheaper kind. It will also light four $3\frac{1}{2}$ or 4 volt lamps, for a shorter time, if they are placed in parallel, i.e.:—



Arranged in a cluster, these serve splendidly for contact printing, lantern slide making, etc., and being switched on for a few seconds only at a time, will last a long time. As shown in Fig. 5, the batteries are made so that one or two cells or more can be coupled together, to suit one's requirements. As a rule, however, the two cells are always connected positive and negative at the back, and usually two complete batteries would be "charged" together.

THE PHOTOGRAPHY OF THE INFINITELY LITTLE.

[Reprinted from the "Journal of the Photographic Society of India."]

"Photo-micrography is simply Photography applied to the Microscopic Image." —PRINGLE.

PHOTOGRAPHY has been called the recording pencil of science in all its branches; and perhaps its most signal services have been rendered in the domain of microscopical research. It would almost seem as if the sensitised plate and the developing solution were the predestined and natural allies of the improved achromatic compound microscope. The two run well in double harness. Without the addition of any special lens the microscope is its own camera. It faithfully projects on the ground glass, or on the sensitised plate, the images formed by its own system of lenses. It leaves the operator nothing to do but to develop, in the ordinary methods, the latent picture which itself has traced of the marvels of that world of the infinitely little which are its own special revelation.

Previous to the application of photography the observer was not without means of preserving a record of his work. Before the discoveries of Nièpce and Daguerre were announced, Dr. Wollaston, who died in 1828, had perfected his camera lucida, or grapho-prism, by means of which drawings could be executed of objects under microscopic observation. Amici's camera lucida, the steel disc, or mirror, of Sömmering, Beale's simple neutral tinted glass, the Zeichenprisma of Zeiss, the excellent vertical camera lucida of Beck, and numerous other appliances, enable the working microscopist to sketch with precision the minute details of the different objects which pass across the field of his instrument. We cannot yet afford to forget Dr. Goring's drawings, while the contributions of Tuffen West are absolutely accurate marvels of graphic art. The splendid plates which illustrate Smith's "Synopsis of the British Diatomaceæ" (1853), Wolle's "Diatomaceæ of North America," Pritchard's "Infusoria," the "Micrographic Dictionary," Kent's "Manuel of the Infusoria," and other standard works are conclusive proof of the scientific reliability of the hand-drawings of students whose hearts were in their work. For my own part, I have always held that for compelling an observer to look thoroughly into a microscopic object, sketching with the aid of a camera lucida possesses a higher educational value than photo-micrography. Moreover, the draftsman has it in his power to confine his attention to one particular feature, or class of features, in the field under observation; while the indiscriminate and non-selective accuracy of photographic methods often leads to the sensitive plate recording the debris and waste to be found in all but the best mounted slides. It has also to be admitted that the portability of the camera lucida is a distinct recommendation. On the other hand, we must recognise that sketching with any form of camera lucida is a distinct strain on the eyes, while the process is necessarily slow and tedious. On the whole we are forced to the conclusion that while hand-drawing was suited to a time, not long past, when life had some heritage of leisure, and graphic art was still a desideratum, photomicrography is thoroughly well up to date. It combines scientific accuracy with rapidity of execution; and it enables the observer to reproduce great numbers of his pictures at a comparatively small cost. Moreover, from the same negatives he can make those increasingly popular lantern slides which, when projected on the screen, will acquaint a roomful of people with the intricate elaboration of details to be found in the diatom-valve, or the "terrifically minute" organisations displayed in the structure of the eye of the house-fly or the bee.

Some interest having been evinced in the photomicrographs exhibited at one or two of our lantern evenings, I purpose in this paper to explain how they were taken. The apparatus employed in the process consists essentially of two parts—a

microscope and some kind of camera. The selection of both these instruments must to a large extent be determined by the amount which the amateur photographer is able or willing to expend. The price of an achromatic microscope will range from about five guineas to upwards of £100. A costly microscope is

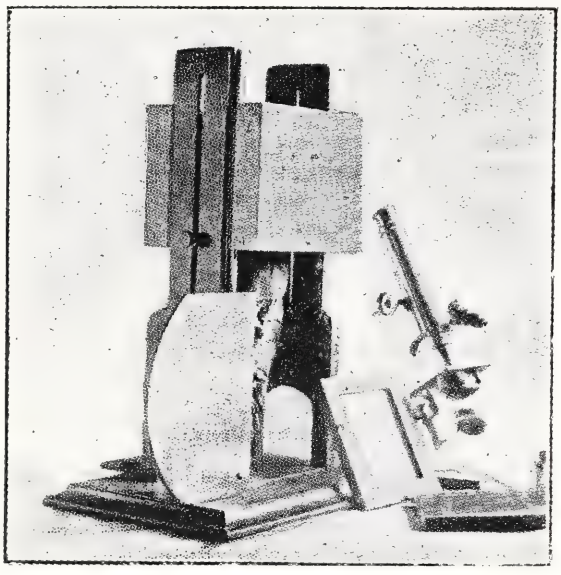


Fig. 1.

not, however, indispensably necessary. An intelligent worker will turn out better results with a reliable student's microscope than a dilettante bungler will achieve with one costing twenty times as much. Brains and perseverance count for a great deal in this matter, as in every other. Where all the leading opticians offer really excellent microscopes it would be invidious to name any one of them as being better than the rest. My own work has been mainly done with Beck's bacteriological "Star" microscope, which is supplied with two eyepieces, an inch and one-sixth inch objectives, and an Abbe condenser, for some seven guineas. Absolutely reliable scientific observations can

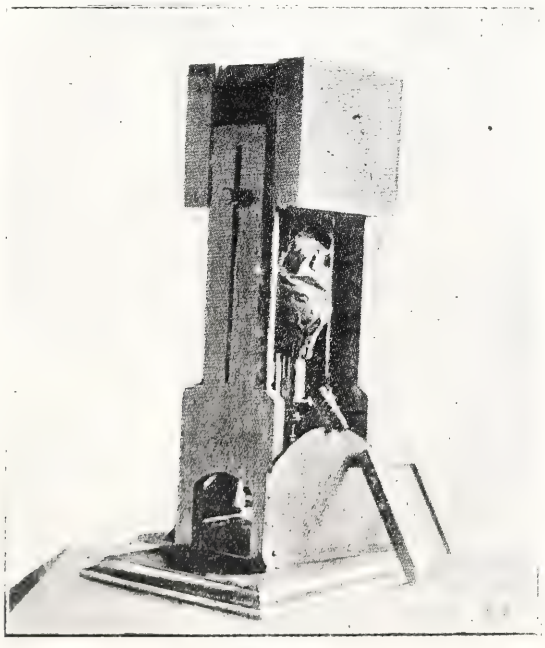


Fig. 2.

be prosecuted with its help, apart altogether from its suitability to our present purposes. Zeiss, Seibert, and Reichert sell excellent objectives which can, if desired, be substituted for those supplied by the English maker of the stand; many of my own best photomicrographs have been taken with German objectives. For the one-inch, half-inch, and quarter-inch object glasses a condenser may be dispensed with; but it must be used with the higher powers. When used with a low power, such as the one-inch, the upper lens of the Abbe condenser should be screwed off; and whenever used the condenser should

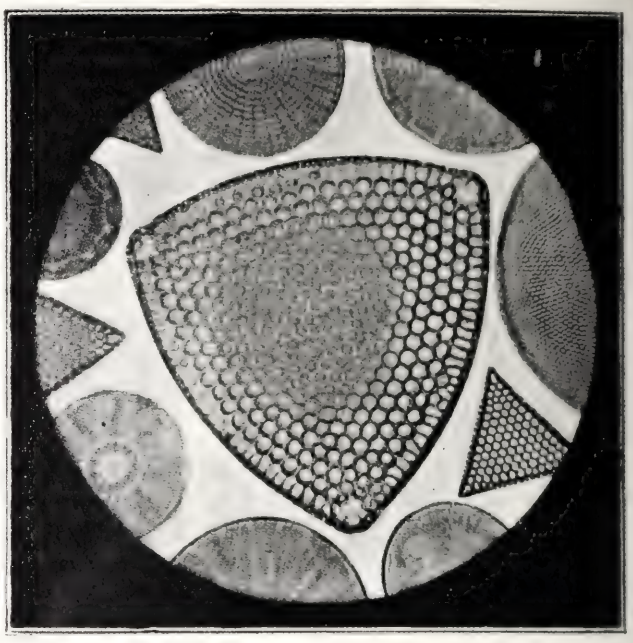


Fig. 3.

be focussed. The books on the microscope will teach you how to do this, and indeed you must learn the uses of the different parts of the microscope, and be able to apply them to advantage, if you want to turn out good work.

At starting the beginner is likely to experience some difficulty in securing an evenly lighted field. In this connection experience and repeated experiments will be necessary; the distance of the flame from the mirror, its height above the table,

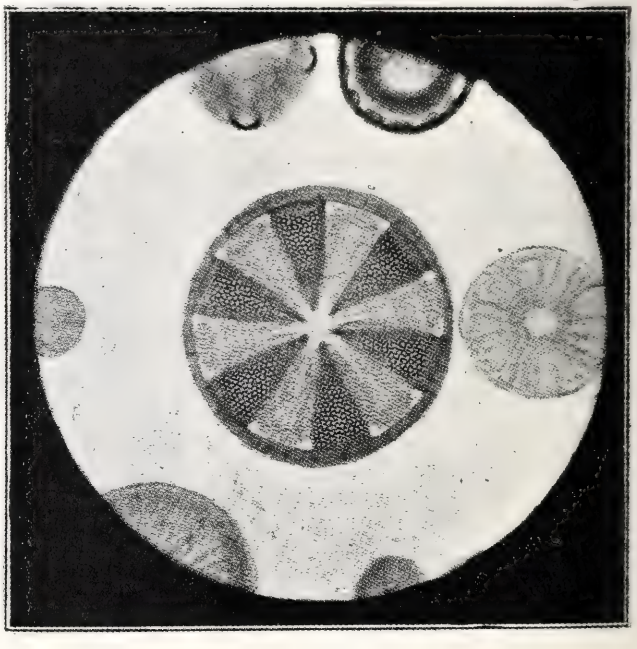


Fig. 4.

the angle of incidence, the position of the lamp (whether directly in front, or just a little to one side) are determining factors, and will have to be attended to. When successful results are secured, make a note of the exact positions and distances for future guidance. A notebook in which to record these matters

is a valuable help in photomicrography. All my own work has had to be done out of business hours, and at night, and beyond observing that daylight exposures are much shorter than those given to night work, I shall at once proceed to say that a Hinks' double-wick wall lamp, or, better still, one of Ditmar's little central draught "Favourites," is all that is necessary for an illuminant. My own experience does not lead me to recommend the electric light for microscopic purposes. You should not rely too much on Tulsi bearer's methods and honesty; but if you would work successfully, you will see yourself to the cutting of the lamp wick, the purity of the mineral oil used, and the general cleanliness of the air tubes, etc. To increase the whiteness of the light, add a little camphor to the kerosene oil, and do not fill the oil holder to excess when you have done so. I got this "tip" from a professional magic lantern exhibitor some years ago, and have found it useful as well for photomicrographical purposes as for the optical lantern or the enlarging apparatus. Both lamp and microscope must be placed on a firm table; remember the microscope magnifies motion as well as linear dimensions. Before I pass on to deal with the camera, let me say a word as to the exposure necessary for securing a good negative. It will depend on the power of your objective, the brightness of your light, the colour, and degree of transparency of the object you are photographing, the rapidity of your plate, and so on. A high power objective may necessitate an exposure of several minutes, while a few seconds suffice for a low power. Red and yellow objects require a much longer exposure than those of a bluish or violet tint. A section of rock, such as limestone, or basalt, or of wood-tissue, will require a considerably longer exposure than the wing of an insect, or any other transparent object. It is useful to bear this in mind when photographing a stained section, and your difficulties reach a maximum when you are dealing with a tissue stained in two colours, blue and red. This leads me to refer to the plates to be used; rapid plates are not necessary, while isochromatic plates are a distinct advantage. The Ilford Empress and chromatic plates are those I generally use, and good negatives can be obtained with the Ilford ordinary. In the matter of exposure the operator will find experience to be the best of teachers, provided he keeps a note of each object photographed, and of the exposure which secures the best results. Such note should include particulars of the plate used, the distance of the source of light from the mirror, its height above the table, etc. In no branch of photography is a systematic record of procedure and results more necessary than in the one dealt with in this paper.

I have next to deal with the camera. An ordinary quarter-plate camera may be used for our purpose, the camera lens being itself removed from its mount. The microscope should be laid in the horizontal position, and the eyepiece end of the body inserted into the lens mount of the camera. An outer sleeve of double black twill should cover the lens mount and part of the microscope, and it should be securely fastened to both by tape or rubber bands. Any leakage of light is fatal to success. Both the microscope and camera must be clamped, or otherwise secured to a stand, or table; and this must be done in such a way as not to interfere with the bellows and focussing adjustments; and the stage of the microscope must be parallel to the ground glass of the camera. If a microscopic object is now placed on the stage, its image will be seen projected on the focussing screen of the camera. Obviously what remains to be done is familiar to every photographer. I do not, however, recommend this method of taking a photomicrograph; and would advise all who wish to become proficient by regular work in the art to get some form of vertical camera, specially designed for photomicrography. And here again prices will be found to have a wide range—such an instrument may be purchased for £5 or £100. The vertical camera with which my own work is done was designed by Mr. S. J. Leslie, since deceased, and who, I believe, patented it under the Indian law. He got mine constructed for me, by a native "mistry" in a back verandah, at a cost of a few rupees. Messrs. Blees and Co. used to make and sell Leslie's camera for a little over thirty rupees. Its form, etc., will be best understood by reference to Figs. 1 and 2. As will be seen, it is a light wooden box, about 6in. square, working between two wooden uprights, about 17in. high, which are firmly fixed to a base-board measuring 9in. by 13in. At the bottom of the box a circular aperture is cut, to which is fitted a sleeve of black velvet or twill, lined with black or red twill so as to make it light-tight. This sleeve is shown in the illustrations as hanging from the bottom of the box, between the two uprights. When in use the tube, or body, of the microscope is inserted into the sleeve, the lower, or free, end of which is tied tightly to the body of the microscope. At the top of the box is a groove for receiving the focussing screen or the dark slide. Two clamping screws, one on each side of the box, work in slits cut in the uprights, and enable the operator to raise or lower the box, and thus increase or diminish the size of the microscopic image projected on the ground glass. The image can be thus roughly focussed, the focussing heads attached to the microscope being resorted to for securing a properly and sharply-defined picture. A thin plank is fixed to the bottom of one of the uprights; let us call it the cap-screen, as by its help light is cut off from the lamp. In Fig. 1 the several parts are shown separately. The ground glass, or focussing screen, is resting against the further upright. Immediately in front of it is the dark slide. The cap-screen is thrown to one side, disclosing the empty sleeve which is hanging between the uprights. The microscope—Beck's "Star"—stands to the right, with a double nose-piece attachment, a very useful, but not indispensable accessory; while the condenser and mirror are seen beneath the stage. In Fig. 2 the microscope, etc., are in position for taking a photograph. The microscope stands between the uprights, with the sleeve drawn over it. The camera has been raised almost to the top of the uprights, thus securing a circular field about 2 4-5in. in diameter; and the dark slide (not shown in the illustration) rests in the grooves at the top of the box. The cap-screen when the actual exposure is being made has to be thrown to the side, as in Fig. 1. In Fig. 2 the cap-screen is in the position it should be before and after exposure. Every photographer has the appliances required for the development of the latent image left on the sensitised plate after exposure. Though the favourite developer, pyro and soda, is suited to photomicrographical work, I prefer one of the quinol or quinol and metol combinations. At any rate, my readers would do well to give each a fair trial (by which I do not mean just two or three plates), and then adopt the developer which gives the best result in his hands. To revert to the apparatus above described very briefly before passing on, I use a roll of dead-black paper in the tube of the microscope; and I would note lastly that many prefer to use the microscope without its eyepiece.

So much for what I trust will be found an intelligible and practical description of the working appliances employed in photomicrography. If the exhibitor of lantern slides made from negatives taken with the help of the microscope would be a successful all-round man, he must read up something about his objects. It is useless to project a diatom on the screen, unless you can tell your audience what it is; or to show them a fly's eye without being able to call attention to the different parts of that organ.

It will serve the two-fold purpose of showing what can be done with the jungly-looking apparatus figured above, and of giving interest to the two illustrations which follow, if I briefly describe them. In Fig. 3 we have a photomicrograph of a triangular diatom—Triceratium Favus; and in Fig. 4 of a circular, or disc-like, diatom—Actinoptychus heliopelta. Around each of these may be seen portions of other diatoms, which suffice to show how varied are the forms and patterns on the valves of these interesting objects. Diatoms are vegetable organisms. They are found all the world over, and in both salt and fresh water. Typically they may be compared to a pill-box, the upper and lower valves of the diatom corresponding to the lid and bottom of the pill-box, which in the diatom are connected or bound together by a hoop or ring. They consist essentially of an outer siliceous covering, enclosing a protoplasmic mass, or endochrome. Their remains as fossils form deposits, many feet in thickness, and several miles in extent; cities stand upon them. Their pedigree, as diatoms, dates further back than ours as human beings. They have been found in volcanic ejecta; and to bring the matter nearer home to ourselves, they abound in the tanks, "jheels" and creeks of Bengal. One of my own favourite hunting grounds for specimens of living diatoms has been the tank known as General's Tank, at the head of Park Street, within a stone's throw from our Club rooms. Some species are fixed by stipes to objects in the water, while others are free; of these last many are motile. It is difficult to realise at the outset that many of the motile forms of organisms revealed to us by the microscope are vegetable and not animal in their nature; but one of the early lessons which the microscope teaches us is to abandon the idea that motility is characteristic of the animal kingdom. In the case of the Diatomaceæ the way in which locomotion is effected is a moot point. Some hold that the endochrome streams through the orifices in the flinty covering (frustule) in the form of cilia; others that motion is due to endosmotic changes, that is, to the transmission of fluids from without; others, again, attribute the movements to the action of a delicate layer of protoplasm which invests the frustule. The ordinary mode of propagation obtaining amongst these minute objects is by cell division, or fission, a process not peculiar to diatoms, and which they share with all other vegetable cells, though the Diatomaceæ get their name from it ("dia" through, and "tomé" a cutting). They also multiply by conjugation, a true sexual act, which has been observed in several species. Probably, after going through many generations by fission, conjugation occurs as a recuperative act preceding another series of generations by the simpler method of fission. While all these biological processes are of fascinating interest to anyone who will take up the study of these simple life-forms, it must be confessed that what chiefly attracts the ordinary observer is the rare and chaste beauty of the markings on the siliceous coat of the diatom. No photographic method can give any adequate idea of the real appearance of a well-illuminated group of diatoms. The markings on the valves not only vary in mere pattern, but their investigation discloses a marvellous elaboration of detail. With a low power nothing but lines (striæ) are visible. A higher power breaks these lines up into rows of hexagonal dots or apertures; and in many cases a still higher power shows that behind the hexagonal dots is another and still more minute system of punctures, which perforate an underlying film of silica. Fig. 3 will give some idea of what I mean. Owing to the valves of Triceratium not being flat, but bearing a boss in their central area, we are easily able to focus the lower siliceous stratum for the boss simultaneously with the surface of its margins for the hexagonal apertures. We can thus see, or photograph, both at once. As test-objects for the microscope, diatoms have done more than any other to develop and perfect objectives; and a lens which can project such an image as is reproduced in Fig. 3 is reliable for all scientific or photographic purposes. My readers have now got some idea of the complex structure of a diatom, apart altogether from its beauty. To proceed:—In Fig. 4 we have a fluted valve, and for this reason the surface of the rayed convexities of Actinoptychus heliopelta will be in focus simultaneously with an underlying siliceous coat of the concave rays. This I consider is the correct interpretation of the appearance of the diatom as a whole. Members who have seen the lantern slide printed from the same negative projected at our meetings, giving a diameter of about 3ft. to the disc of A. heliopelta, will recollect that it makes a most effective object. The actual diameter of Triceratium figured above is not more than 1-240th of an inch, while that of A. heliopelta is even less.

It may seem that all this is leading on to branches of science which in no way concern the Photographic Society of India. Perhaps, therefore, it would be well for me in closing to explain myself. I hold that photography is only an illustrative art; a means to an end, but not an end in itself. Mere proficiency in negative-making, and in the subsequent printing processes, should not be the be-all and end-all of any photographer's studies. If he works at landscapes, he should aim at the pictorial representation of scenery, or the preservation of a record of some view which has a tale to tell. If portraits be his speciality, he quite as much as the painter in oils, should study effective posing, and possess some knowledge of art. So, too, if he would take up with photomicrography; beyond the necessary acquisition of technical proficiency, he must endeavour to learn the lessons which his objects have to teach, and be able to at least popularise the tale they tell. Only those of my readers who are willing to do this need carry their pursuit of photomicrography beyond the restricted limits of this paper. But, let me add, if they will take the trouble to work up the subject in the way indicated they will never have reason to regret it. An extract from Mr. Pringle's "Photomicrography" heads this paper. An extract from another recognised authority on the subject may appropriately close it. Mr. Jennings, in his book entitled "How to Photograph Microscopic Objects," says:—"To become a skilful photomicrographer it is first necessary to be a skilful microscopist; for if the operator does not know how to display an object to the best advantage, his photographs will be useless."

W. J. Simmons.

Royal Photographic Society ordinary meeting, Tuesday, December 9th, 1902. Dr. R. Norris Wolfenden will read a paper on "Photography applied to marine zoology."

Mr. Lathbury informs us that the publication of "The Pilot" (a weekly review of politics, literature, and learning), price 3d., will be resumed on Saturday, December 6th.

The Scotch Affiliation.—There is every prospect of the affiliation of Scottish photographic societies becoming a reality. The majority of the societies seem to be taking up the matter with enthusiasm, and a goodly attendance may now safely be prophesied for the first meeting.

Mr. W. Calder Marshall, F.C.A., 41, Glenton Road, Lee, S.E., hon. secretary of the South London Photographic Society, writes:—Our 14th annual exhibition will be held from 7th to 14th March, 1903 (both dates inclusive), at the Public Baths, Camberwell. The open class entry forms are now in the press, and will be sent in response to a postcard addressed to me.

The Nottingham Camera Club 1903 exhibition will be held in the Mechanics' Lecture Hall, Nottingham, on Thursday, Friday, and Saturday, February 12th, 13th, and 14th, 1903. The judges are Messrs. W. R. Bland, F.R.P.S., Saml. Bourne, J.P., and C. Barrow Keene, F.R.P.S. The following are the open classes:—(a) Champion class, any subject which has been previously medalled in open exhibition (previous awards to be stated on entry form); (b) landscape, seascape, and river scenery; (c) portraiture, figure studies, animals, and still life; (d) architecture, and any subject other than above; (e) stereoscopic work (sets of four prints); (f) lantern slides (set of four, any subject). Further information and entry forms may be obtained of Mr. Arthur Black, 9, Bowers Avenue, Nottingham.

PHOTOGRAPHIC SURVEY AND RECORD OF SURREY.

We have received the following circular:—

The work of the society is divided into sections, each being under the direction of a committee.

The whole collection will be housed at the Public Library, Town Hall, Croydon. It is hoped that, later on, local collections will be similarly deposited in other centres.

Members of the Survey and all others interested are earnestly invited to help the work by communicating with the hon. secs., and particularly by sending in photographs of objects as classified below.

CONDITIONS.

All photographs are subject to approval by the Council of the Survey; must be sent in trimmed but unmounted, preferably of whole plate, half-plate, or quarter-plate size, but larger sizes will not be excluded; preferably in platinotype or carbon, although under exceptional circumstances, untoned bromides may be admissible; must be accompanied by the following particulars, written on a separate slip:—(*a*) Subject; (*b*) Date of negative; (*c*) Compass point where known; (*d*) Name and address of contributor; (*e*) Brief description; (*f*) Process. Printed slips will be provided on application. It is desirable to indicate in some manner the scale of pictures.

CLASSIFICATION OF SUBJECTS.

Architecture Section.—All buildings of interest, whether ancient or modern. Churches, including monuments and all church furniture. Public buildings and dwelling houses, exteriors and interiors. Street architecture, illustrating the relative positions of houses and boundaries at the present time. Engineering works. Ruins.

Art and Literature Section.—Art: 1. Paintings, drawings, and engravings. 2. Sculpture and carvings (not architectural). 3. Art work in metals. 4. Pottery and glass. 5. Tapestry, lace, and other fabrics. 6. Art furniture and other objects of art. Literature: 1. Printed books, when old, curious, or rare. 2. Manuscripts. 3. Maps and plans.

Note.—The committee will be glad to receive information of the existence of objects of interest falling within their province, since a great deal that is most valuable is in private hands, and may otherwise remain unknown to them.

Anthropology Section.—Antiquities. Prehistoric and historic (non-architectural). Physical anthropology. Folk lore: 1. Material objects. 2. Ceremonial. 3. Traditions (games, holy wells, social, and religious subjects).

Geology Section.—Land contours. River courses. Sections.

Note.—It is advisable that a geologist be present when a geological photograph is taken.

Natural History Section.—Zoology: 1. Mammals—(*a*) Rare species; (*b*) Habits; (*c*) Homes and young. 2. Birds—(*a*) Rare species; (*b*) Habits; (*c*) Homes and young; (*d*) Migration. 3. Reptiles. 4. Fishes. 5. Insects (including economical entomology). 6. Pond life.

Botany.—1. Trees, peculiarities of growth. 2. Shrubs and herbaceous plants. (*a*) Habitat; (*b*) Peculiarities of flowering; (*c*) Galls and other forms of parasitism.

Meteorology.—Halos. Remarkable cloud appearances. Hailstones and frost effects. Lightning. Auroræ.

Photo-Micrography.

Astronomy.—Eclipses. Comets. Meteors, etc.

Scenery and Passing Events Section.—Scenery: 1. Landscapes. 2. Views of places of special beauty or interest, other than architectural.

Passing Events.—1. Scenes of every day life. 2. Processions. 3. Carnivals. 4. Bonfires, etc.

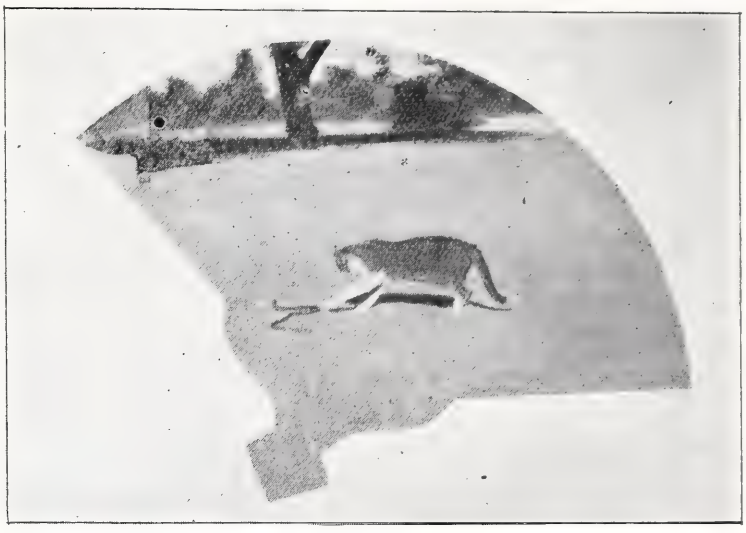
Hon. Secretaries.—General: J. M. Hobson, M.D., B.Sc., 1, Morland Road, Croydon. Survey: H. D. Gower, 55, Benson Road, Croydon, to whom all photographs should be sent.

Liverpool Amateur Photographic Association.—The ordinary monthly meeting of the above association was held in the clubrooms, Eberle Street, on Thursday week, when a crowded attendance of members and friends assembled to welcome Mr. James A. Sinclair, who lectured on "A Journey through Spain." Mr. E. R. Dibdin (president) occupied the chair. Mr. Sinclair, in the course of his remarks, mentioned that he visited Burgos, Madrid, Toledo, Cordova, Seville, Granada with the wondrous beauties of the Alhambra, Ronda, and finally Gibraltar. The lecture was illustrated by upwards of 130 slides of the highest order taken by the lecturer. A hearty vote of thanks was accorded Mr. Sinclair at the close.

The Glasgow Southern Photographic Association's Exhibition.—The hon. secretaries write from 28, Bank Street, Hillhead, Glasgow:—Our second annual open exhibition is to be held from 24th March to 7th April, 1903. There are to be nine open classes, in addition to four for members and one for the trade, and the hall we have secured this year is much larger than the one we had last year, and is well suited for the purposes of an exhibition. We trust that your readers will give us the same kind support this year as they gave us last year. The prospectus will be issued as early next month as possible, but, in the meantime, any further information will be gladly given on application being made to us.

THE CAT AND THE COBRA.

An Indian correspondent writes:—I enclose you a little print of my cat playing with a cobra. This was taken with a cheap hand camera, and the print done with rodinal. With a reading glass it



will be seen that the cobra is just raising his hood. Cats will generally kill a cobra if they have him in the open; they simply worry him to death, and are very sharp at avoiding a bite.

THE ROYAL SOCIETY AND MODERN EDUCATION.

In the course of his annual address to the Royal Society on Monday last, the president said that since the last anniversary the society had lost by death nine Fellows and two foreign members. The deceased Fellows were Sir Joseph Gilbert, died December 23, 1901, aged 84; the Marquis of Dufferin and Ava, died February 12, aged 75; Maxwell Simpson, died February 25, aged 86; Sir Richard Temple, died March 15, aged 76; George F. Wilson, died March 28, aged 80; Sir Frederick A. Abel, died September 6, aged 75; Dr. John Hall Gladstone, died October 6, aged 75; William Henry Barlow, died November 12, aged 90; Sir William C. Roberts-Austen, K.C.B., died November 22, aged 59. The foreign members were Alfred Cornu, died April 12, aged 61; Rudolf Virchow, died September 5, aged 80.

France lost in Alfred Cornu one of the most distinguished of her men of science. Possessed of rare perspicacity of intellect and of resourcefulness in experiment, by his numerous researches, especially in the domain of optics, he had won no mean place as an original contributor to science. On his part, Mme. Cornu wrote in a private letter that he especially appreciated and reciprocated the friendship and sympathy of his English colleagues. Cornu was born in 1841; he was elected a foreign member of this society in 1884; he received the honorary degree of Doctor of Science from the University of Cambridge in 1899; and died, in the spring of this year, mourned and deeply regretted by the whole scientific world. It was with deep regret that he recorded the loss which the society had sustained by the decease of Sir Frederick Abel, who held for many years a conspicuous position in the world of science, and in public life, in connection with technical education and the Imperial Institute. His services were recognised by a baronetcy, by K.C.B., and by the G.C.V.O. In 1887 he was awarded a Royal medal by the Council. They had also to record with sorrow the death of Sir Henry Gilbert, the fellow-worker with the late Sir John Bennet Lawes in the famous agricultural experiments carried on for a long series of years by them at Rothamsted. Dr. Gladstone's work was remarkable for its varied nature, and he was among the first to labour in the borderland between chemistry and physics. He was awarded the Davy medal in 1897. He was the first president of the Physical Society, and later president of the Chemical Society, and he served on two Royal Commissions. They bade a hearty welcome to the new society which had recently received a Royal Charter for the organisation and promotion of those branches of learning which, in foreign academies, were usually included in the philosophico-historical section. This new body, under its adopted title of "The British Academy for the Promotion of Historical, Philosophical, and Philological Studies," would, they sincerely trusted, take a worthy place by the side of the older and very distinguished institutions, the Royal Society and the Royal Academy, in representing the intellectual activities of the kingdom, though, in accordance with the sentiments and habits of the national character, each society retained its complete independence, and was in no way subservient to the State. The present council having reaffirmed the view taken by the council of last year that it would not be desirable to attempt to include the studies

undertaken by the newly-formed body as an integral part of the work of the Royal Society, they might rejoice that they would now be cared for by an independent society. Though the words of the charter granted by Charles II. were wide enough legally to include historical and philosophical studies, yet, as a matter of fact, with some few exceptions in early days, the work of the Royal Society had been confined for two centuries and a half to the studies with which it was now occupied. It would be their pleasant duty, as the Acting Academy of the International Association of Academies, to recommend the new society for admission into the "Association of Academies" as the body representing philosophico-historical science in the United Kingdom. After referring to the National Antarctic Expedition, and the arrival of the "Morning" in New Zealand, which place she was leaving this month in search of the "Discovery," the president referred to the establishment of a National Physical Laboratory, the opening of which had taken place since the last anniversary. He then described the work of the Physikalisch-technische Reichsanstalt, of Berlin, which was largely due to the scientific foresight of von Helmholtz. The original cost of the institute was over £200,000, and its yearly maintenance was not less than £17,000. During the five years that it had been at work its influence upon the science and the manufacturing interests of Germany had been most remarkable. It was, therefore, with feelings of high satisfaction that he had to record the opening in March last of a similar national institution in this country. The sum voted by the Government for the physical laboratory, an institution second to none in its national importance, was the very modest one of £13,000 for the buildings and equipment, and an annual grant of £4,000 for five years in aid of the expenses of conducting the work of the institution. It was, therefore, "to the liberality of the public," as the Prince of Wales at the opening pointed out, "that we must look, not only for money, but also for presents of machinery and other appliances." The supreme necessity in this country of a more systematic application of scientific methods, both in theory and in practice, to our manufactures and industries, which was so wisely insisted upon by the Prince of Wales on the occasion of his admission to the Fellowship of the society, and again in his address at the opening of the National Laboratory, had since been confirmed and enforced in a remarkable way by the individual testimonies of thirteen Fellows of this society, in the evidence which they recently gave from their own knowledge and experience, either as teachers of science or as leaders and technical advisers in manufactories or commercial undertakings, before a committee of the London Technical Board. The evidence seemed clear that the present inappreciative attitude of our public men, and of the influential classes of society generally, towards scientific knowledge and methods of thought must be attributed to the too close adherence of our older universities, and through them of our public schools, and all other schools in the country downwards, to the traditional methods of teaching of mediæval times. With the experience of Germany and the United States before us, the direction in which we should look for a remedy for this state of things would seem to be for both the teacher and the student to be less shackled by the hampering fetters of examinational restrictions, and so for the professor to have greater freedom as to what he should teach, and the student greater freedom as to what line of study and research he might select as being best suited to his tastes and powers. In the United States the candidate for the highest degree, Ph.D., must spend at least two years, after obtaining his bachelor degree, in carrying out an investigation in the field of his main object of study, and then submit the dissertation which embodied the results of his research. One way of bringing about reform in this direction would be to make individual research an indispensable condition of proceeding to degrees higher than the B.A. The first steps in the direction of true reform must be taken by the universities in the relaxation to some extent of the established methods and subjects of their examinations, which had been carried down with but little change from the Middle Ages. It was some satisfaction to know that a new section of the British Association for the Advancement of Science had been formed for the consideration and discussion in detail of the reforms which were needed in the educational methods of the country.

Mr. W. Barry, of Hull, writes re our article on judging the light by Crooke's radiometer:—Nigh on twenty years ago the idea occurred to me to use this instrument for this purpose, and I gave it an exhaustive and fair trial, but found it of little use, if any at all, as in practice it registers more heat than actinic value of light. Its fate was destruction by the studio cat (? biped or quadruped). However, the idea is again revived, and I shall watch its evolution with interest.

At the Grantham Industrial and Fine Art Exhibition, to be held at the Exchange Hall, Grantham, on January 14th, 15th, and 16th, 1903, Section J (photography) will be open to amateurs in the United Kingdom: 45. Landscapes, Seascapes, and Interiors, in sets not exceeding six pictures; 46. Portrait and animal studies, in sets not exceeding six pictures (each picture judged separately); 47. Collection of framed photographs, any size (open to the radius), for amateurs only; 48. Bromide enlargements (open to the radius), for amateurs only. The general manager of the exhibition is Mr. George Jackson, Launder Terrace, Grantham, to whom all communications should be addressed.

PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION: LIVERPOOL BRANCH.—ANNUAL DINNER.

A meeting was held at headquarters, Alexander Hotel, Dale Street, on Friday, November 14th, 1902. Present—Messrs. G. Watmough Webster, E. T. Vanderbilt, F. S. Bains, A. Priestley, H. Dowden, R. H. Waite, S. M. Hebberd, W. T. Smith, W. Warrington, Thos. Foulds, W. Saronie, Joseph Cooper, W. N. Cooper, A. F. Mowll. Mr. G. Watmough Webster occupied the chair.

The final arrangements were made for the first annual dinner of the branch. An advertisement appearing in a Birkenhead newspaper offering free photographs, the photographer, being a member of the branch, having been referred to the branch by the central committee, a lively discussion took place. It was the general opinion that the free portrait system was derogatory to the dignity and inimical to the interests of the photographic profession, but it was an evil which had a tendency to provide its own remedy. The member whose name appeared on the advertisement frankly stated that although he had honestly supplied his best work, the venture was a complete failure.

Mr. H. Dowden gave the particulars of a claim he was making against the Post Office for a negative broken in transit by parcel post. It was decided to submit the matter to the central committee.

The first annual dinner of the branch was held on Monday, November 21st, at the Alexander Hotel. Mr. G. Watmough Webster, chairman of the branch, occupied the chair. The dinner was admirably served. The toasts, loyal and general, including the Professional Photographers' Association and the Liverpool Branch, were duly honoured. The after-dinner entertainment, musical and otherwise, was capital, and it was altogether a complete success.

The following letter was read, in the course of the dinner, from Mr. T. C. Turner, of Hull:—I have the greatest faith in the future of the P.P.A. It must necessarily be a slow progression, because photographers as a body have for so long been accustomed to read in the Press that their capacity for union is non-existent, that they have grown to believe it. We have this to break down, not any surly, unwise determination to live in solitary disunion. The time is ripe for the successful development of the movement if we are content to achieve results in patience, and not imagine that the nominal subscription of 5s. is sufficient to make a powerful machine of our association.

What we urgently require at this moment is personal enthusiasm in backing up the work in each local centre as it is formed. I believe that, could we but persuade a dozen men in Liverpool, Edinburgh, Birmingham, Hull, and Aberdeen—the branches already working, in fact—to discuss professional matters fearlessly and report the discussions fully, we should soon carry the whole country with us. At present too many good fellows are waiting for something to be done for them, by some one else! It is a mistake, because the improvement of photography as a profession, can only be achieved by the efforts of the live men in harness at the moment.

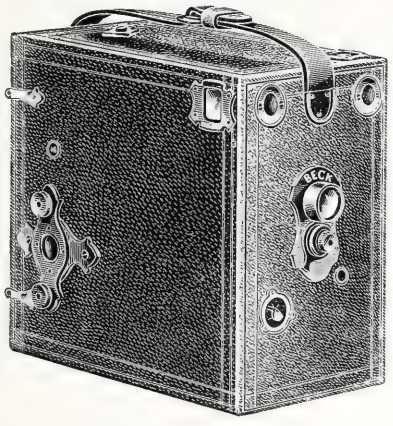
I have been struck by the wonderful growth of influence which even our little group of local members shows. We are but a fraction of the photographic body, but because we are united and interested sufficiently to meet and discuss professional subjects, these discussions assume an importance quite out of proportion to our numerical strength, and, who knows, they may have a modest share in shaping a general agreement as to business procedure in many directions. Now, only consider the effect if the association could rely upon the country, providing the London committee with a true reflection of professional opinion on the difficult questions arising in the conduct of perhaps the most harassing calling known to modern man! I believe that in three or four years the public recognition of it as a business would be completely altered. It should be possible, too, for if men are clever enough to make money at photography they are clever enough to see this association made fruitful of good results. There are men who keenly feel the sting of the sneers thrown at the professional, men who only want the encouragement of their fellows, the powerful "moral" support of members behind them, and in agreement with them, to take up this work with zest and purposeful vigour. And, after all, the desire to lift up one's own head in the world and at the same time help the business confrères to do the same is no ignoble aim.

Royal Institution.—A general monthly meeting of the members of the Royal Institution was held on Monday afternoon (the 1st inst.), Sir James Crichton-Browne, treasurer and vice-president, in the chair. The following were elected members: Edward Divers, M.D., Miss Amy French, Winifred Lady Howard of Glossop, and Mr. J. H. Whitehorn. The special thanks of the members were returned to Mrs. Hickman for her donation of £21, and to Dr. Frank McClean, F.R.S., for his donation of £40 to the fund for the promotion of experimental research at low temperatures.

New Apparatus, &c.

The Frena Max Camera. Manufactured and sold by R. and J. Beck, Limited, 68, Cornhill, E.C.

The Frena Max is a development of the long familiar Frena. The instrument before us takes either forty cut films or twelve glass plates in sheaths. Using the former, the well-known alternate notch system is availed of; so, too, with regard to the plate sheaths. Messrs Beck evidently aim to reduce the use of the hand camera to its utmost simplicity. They very properly remind photographers that in the Frena system three manipulations repeated for each exposure are all that is actually required of the operator: (1) Wind the shutter; (2) expose by setting off the shutter; (3) change the film by turning a handle.

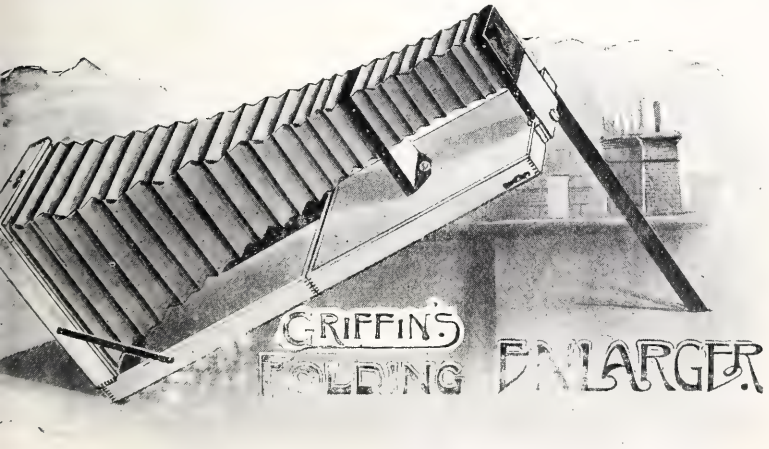


We may enumerate the principal features of the Frena Max: It has two "Cornex" brilliant view finders; a rectilinear lens; four adjustable diaphragms; an automatic counter to register the number of plates used; two tripod sockets; one movement of the handle changes the film and makes ready for the next exposure. The film is changed with the camera in the same position as it is when the photograph is taken. The instrument measures 8½in. by 9½in. by 4¼in., and it is well and strongly made. Upon testing the various movements we find them simple and reliable. Indeed, nothing could be more effective than the changing system, which is controlled by the lever at the side. One merely pushes it to and fro and *voila tout*.

The "Velox" Folding Enlarger. Sold by John J. Griffin and Sons, Ltd., 20-26, Sardinia Street, Lincoln's Inn Fields, W.C.

This compact and easily mastered piece of apparatus appears at a time of year when enlarging is a favourite evening recreation with amateur workers. It is of the collapsible kind, and packs into a small space. The sample submitted to us struck us as exceedingly simple to set up. A reference to the illustration will show the instrument in actual use. Messrs. Griffin's own description may be quoted to more fully emphasise the ready manner in which it may be availed of:—

To open the enlarger, release the three spring catches which hold the parts together, and extend the folding base-board. Then pull out bellows and attach the lens and negative supports to the base by means of the thumb-screws. See that the holders are vertical and well screwed down. The negative must be placed in the grooves at the small end,



film side inwards. If films are to be enlarged, place the same between the two pieces of glass supplied and insert as you would a glass negative. To charge the enlarger with the sensitive paper, remove the wooden back and insert a piece of Velox or bromide paper, sensitive or film side towards the glass. Then replace back and turn the hold-fast spring until held by the supports. Exposure: Carry the enlarger out into daylight—an even, diffused light is essential—if sunlight cannot be avoided, cover the negative with a piece of ground glass or fine tissue paper—and place on the ground with the negative pointing to the sky. The length of exposure varies according to the time of year, of day, and condition of negative. The following may assist as a guide, the figures being for good, bright negatives, with almost clear glass in the shadow, and Special Velox as the sensitive medium:—Feb.-April: 11 a.m. to 2 p.m., 1½ minutes; 2 to 4 p.m., 3½ minutes. May-July: 11 a.m. to 2 p.m., ¾ minute; 2 to 4 p.m., 1 minute; 4 to 6 p.m., 1¼ minutes. Aug.-Oct.: 11 a.m. to 2 p.m., 1¼ minutes; 2 to 4 p.m., 2½ minutes; 4 to 6 p.m., 3½ minutes. Nov.-Jan.: 11 a.m. to 2 p.m., 2 minutes; 2 to 4 p.m., 5 minutes.

Payne's Exposure Calculator. Issued by Mawson and Swan, Mosley Street, Newcastle-on-Tyne.

This exposure calculator avails itself of the slide rule principle, and the data are printed on both sides of a cardboard slip, which in its case may be comfortably carried in the pocket. Quoting from the descriptive particulars, this calculator is based upon the principle that the light is always the same on the corresponding days in each year. The atmospheric conditions, however, differ, and the alterations in the quality of the light thus produced are arranged for in the calculator by dividing this possible variation into three kinds—mean, very bright, and very dull. "Mean" is accepted as that quantity of light which is present when the sun is just casting a shadow. "Very bright" is readily appreciated by every photographer. "Very dull" is understood to be that quantity of light which is present when it is only just possible to take a photograph. The slide rule is divided so as to give a direct answer when exposing upon an ordinary landscape and using a lens working at f/8 during the months of May, June, July, and August. An ordinary landscape is taken as one in which there are no heavy shadows in the immediate foreground. Any variations from these conditions may be readily met by multiplying the exposure which is first found for the standard conditions by the requisite exposure factors which are given at the back of the slide rule. Example: To find the exposure for an ordinary landscape, "Castle" plate, lens f/8, time 10 a.m. June, light "very bright." Adjust the slide rule until the division marked "Very bright" is opposite to the division marked "Castle," and then, as 10 a.m. is between 9 a.m. and 3 p.m. against the division marked 9 to 3 will be found the exposure, which is 1-40th. of a second. If it be desired to use f/16 instead of f/8, from the list of exposure factors on the back of the rule, the multiplying factor for this stop is found to be 4, and 1-40th of a second multiplied by 4 gives 1-10th of a second as the answer. Knowing that the exposure for a "Castle Plate" with f/16 upon an ordinary landscape is 1-10th second, it is easy to calculate the exposure for "Shipping," which will be 1-30th second, or "Clouds," which is 1-100th second under similar conditions. In the cases of the exposure being made in January or December, it is necessary to multiply them by 4, in February or November by 3, in March or October by 2, and in April or September by 1½.

The intelligent use of this little device should, as Messrs. Mawson and Swan claim, convert it into a useful plate saver.

The Kodak Sensitised Post Card Competition.—The following is a list of the prize winners:—Class A, portraiture and figure subjects: 1st prize, Miss A. M. Walters, Forthampton Vicarage, Tewkesbury; 2nd prize, Mr. A. Ashe, 27, Elm Grove Road, Barnes, Surrey; 3rd prize, Mrs. Turnbull, 11, Slitrig Crescent, Hawick, N.B.; 4th prize, Mr. J. Peat Millar, Braehead, Beith, N.B.; 5th prize, Mr. J. A. Wilson, B.A., Westminster College, Cambridge; 6th prize, Miss M. J. Adnams, 71, Newborough, Scarborough; 7th prize, Mr. H. Montgomerie, Laigh Croft, Kilmaurs, Ayrshire, N.B.; 8th prize, Mr. A. M. Scott, 2, Woodville Gardens, Langside, Glasgow; 9th prize, Miss E. Wheelwright, 18, Grosvenor Road, Watford, Herts; 10th prize, Mr. F. E. Huson, 53, Gleneagle Road, Streatham, S.W.; 11th prize, Mr. R. Burnie, 162, Cambridge Drive, Kelvinside North,, Glasgow; 12th prize, M. Le Maillot, Vice-President of the Photographic Society of St. Malo. Class B, landscape and seascape: 1st prize, M. Le Maillot, Vice-President of the Photographic Society of St. Malo; 2nd prize, Mr. R. Burnie, 162, Cambridge Drive, Kelvinside North, Glasgow; 3rd prize, Miss E. A. Burton, 21, Finsbury Square, London, E.C.; 4th prize, M. G. Herwig, Onderwijzer, Oude Pekeld, Holland; 5th prize, Mrs. J. Anley, 39, De Parys Avenue, Bedford; 6th prize, Mr. C. Ponting, 26, Hill Top Mount, Roundhay, Road, Leeds; 7th prize, Mr. F. W. Beken, Blenheim House, Cowes, I.W.; 8th prize, Mr. H. G. Ayers, 110, Sunny Hill Road, Streatham, S.W.; 9th prize, Mr. W. E. Blackstone, 2, Olive Villas, Kimberley Street, Hull; 10th prize, Mr. A. E. Relph, 43, Aberdare Gardens, West Hampstead; 11th prize, Mr. R. Booker, 6, Alexandra Terrace, Bognor; 12th prize, M. J. Dantinne, Imprimeur, Skee, Hainault. Class C, architecture, interiors and exteriors, street scenes, and other subjects not included in classes A and B: 1st prize, Mr. E. R. Bull, 53, Bovill Road, Forest Hill, S.E.; 2nd prize, Mr. J. H. Pratt, 21, Finsbury Square, London, E.C.; 3rd prize, Mr. J. R. Jewson, Virginia Cottage, South Street, Epsom; 4th prize, Mr. J. Peat Millar, Braehead, Beith, N.B.; 5th prize, Fleet-Surgeon S. T. O'Grady, R.N., Royal Naval Hospital, Great Yarmouth; 6th prize, M. J. Jacobs, Rue des Bogards 83, Louvain, Belgium; 7th prize, M. G. Marie, Le Puys; 8th prize, M. E. Leveng, 50, Rue Tronchet, Lyons; 9th prize, Miss Mills, Elm Lea, Old Windsor; 10th prize, Mr. C. A. Gandy, Arcot, Margate Road, Herne Bay; 11th prize, Mr. J. W. Smith, 66, Sarah Street, Darwen; 12th prize, Mr. H. R. Flanders, 85, Tavistock Street, Bedford. The judges were Sir H. Trueman Wood, M.A., and Mr. Thomas Bedding, F.R.P.S.

Commercial & Legal Intelligence

Messrs Lindsay, Hemery and Co., of Regent House, Brockley Road, S.E., write:—We are retail agents for the "Teb" Christmas Cards, and forward boxes of same—also descriptive circular—post free to any address. Probably many of your readers in out-of-the-way places would be glad of the information.

A Receiver Appointed.—In the Chancery Division of the High Court on Friday last, an application was made by Mr. Parker to Mr. Justice Byrne in the matter of an action in which the Automatic Photo Printing Syndicate were concerned, for the appointment of a receiver. There was no opposition. Counsel stated that he applied on behalf of Sir George Newnes, who owned nearly half the amount of the £12,000 capital of the company which was issued. There was a clause to the effect that the whole principal money should become due if the company stopped payment. There was evidence that the company had drawn cheques which were dishonoured, and there was really no money to go on with. His Lordship appointed Mr. Geere, accountant, of Cockspur Street, S.W.

The Select Committee which has been considering the sale of articles containing poison used in agriculture and horticulture has, the "Field" understands, almost completed its labours. A draft report has been prepared and practically approved. This, it is understood, will recommend the addition of a third schedule to the Pharmacy Act, by which persons other than those authorised by the Pharmacy Acts will be licensed to sell articles containing poisons that are used in agriculture and horticulture, subject to regulations to be drawn up by the Privy Council. These regulations, it is expected, will provide that the articles shall be in special bottles and have special labels, and their general effect will be that articles like sheep dip and insecticides will be free from some of the restrictions that now exist.

At the Marylebone County Court (London), on Monday, before Judge Stonor, Mr. George Garet-Charles, photographic artist, 49, Acacia Road, Regent's Park, W., brought an action against Mr. John F. Lovering, 3, Church Passage, Guildhall, E.C., receiver and liquidator for "Press, Limited." claiming £13 13s. in respect of photographs said to have been lent with a view to their reproduction and publication. Mr. J. Scott, counsel, appeared for plaintiff, and Mr. A. Koe, counsel, defended. Mr. E. Morant, in the service of plaintiff, stated that he had called upon the editor of "The Candid Friend," which publication had been connected with "Press, Limited," and left certain 8in. by 6in. photographs. He was requested to leave the pictures, it being clearly understood that the charge to be made for permission to reproduce and publish them would be a guinea each.—The Judge: You say it was understood that the charge would be a guinea each?—The witness: It is the custom of the trade to charge a guinea each for the first use of the pictures. In answer to further questions, the witness said that he had several times called for the pictures, thirteen of which had never been returned. Counsel for the defendant submitted that there was no proper contract on the part of the editor to use at least certain of the photographs. It appeared also that at least one of the photographs had not been used for publication.—The Judge: It appears to be the custom of the trade to charge a guinea each for these pictures. I find for the plaintiff for twelve guineas, with costs.

Re George Francis Readwin, artist and photographer, of 7, Pelham Road, New Catton, and carrying on business at 131a, Magdalen Street, Norwich.—The above-named debtor appeared for his public examination at the Norwich Bankruptcy Court on Friday last, before the Registrar. The statement of affairs filed by the debtor disclosed gross liabilities amounting to £180 1s. 9d., and a surplus of £32 7s. 9d. Mr. W. J. Sadd for the debtor. In reply to questions put by the Official Receiver, debtor stated that he had been in the employ of Singer and of Brand and Co., Dereham Road, photographers. He had no capital when he started, and was not in debt. For a short time previously he had been in partnership with Mr. Quinton, a travelling photographer, but that was dissolved. He had never been bankrupt before. He had never kept any books of account. The business had always been a small one, and lately it had been very slow. In August, 1901, his wife died of cancer after a long and expensive illness, and debtor had himself been in bad health. He had been compelled to pawn his large lens, for which he received £5, and this had gone in rent and living expenses. He consulted Mr. Bracey, and later on Mr. W. J. Sadd (Sadd and Bacon). He had an interest under his grandfather's will in which a life tenant aged 84 or 85 had a life interest. It amounted to about £100, but he had mortgaged it to Mr. Wilson Gilbert for £30. Consequently, instead of there being a surplus, as he had estimated, there would be a deficiency of £50 or so. His drawings from the business amounted to about 30s. or £2 a week. The examination was closed.

Ilford, Limited.—The sixth ordinary general meeting of the shareholders of Ilford, Limited, was held on Thursday week, at Winchester House, Old Broad Street, E.C. Major-General G. F. Blake (chairman of the company), who presided, said:—The first matter to which I invite your attention is an item on the balance-sheet under the heading "Freehold land, buildings, plant, etc." You will see that that item shows an increase of £9,000 beyond the amount that that particular entry showed last year. No inconsiderable portion of this expenditure was for effecting a very important improvement in one of our factories at Ilford. Further, we have found it necessary to build another factory. A very advantageous freehold site has been secured at Warley, and on it is being erected an auxiliary factory of a most important description for the work we have in hand. This improvement at Ilford, and the new factory, we are confident will tend to the development of our business, and, of course, that improvement and the additional factory will materially increase the value of our assets. Notwithstanding the outlay upon these works, I am glad to call your attention to our list of investments, which show practically the same amount of money invested as was invested last year. (Applause.) As to sundry debtors, they show an increase of rather over £2,000 on the amount shown last year, but that is explained in a manner which will be satisfactory to you. Our sales during the month of October, the last month of the year we are reviewing, were very considerable. The next item is stock, and it is put in our accounts at a valuation which possibly conveys a wrong and unjust impression. The stock there is our largest item—it is £26,000 odd, or some £7,000 more than last year. It is, however, only put down at actual prime cost; but as you can readily understand, the value is unquestionably more than it appears in the balance-sheet. It is significant, and a significance which should be pleasing to you, that, although our stock is more than £7,000 in excess of what we really had at this time last year, yet our creditors are more than £700 less. Referring back to our freehold land and buildings, I ought to call attention to the fact that we have again this year made an ample and liberal depreciation on our property. As a matter of fact, I have not the slightest doubt that our property is just as valuable as it was; in fact, some portions of it are more valuable to us than they were last year. In this matter of depreciation we have met with the cordial approval of our searching auditors. On the matter of sundry debtors, I may say that we have thousands of customers, and an immense number of open accounts. That the year under review should have passed without incurring a single bad debt is due to the unceasing vigilance of our managers. This is a testimony and proof of the sound principles on which your business is being conducted. In our report there is a feature that I must deal with, and that is, that, although and in spite of antagonistic circumstances which seemed to be unpleasant—I mean bad weather—our sales have been practically the same as last year. Our net profits may be less proportionately—rather less than an infinitesimal reduction—but when we consider the amount of business we do, that need scarcely be taken into consideration. However, we do not wish to be unnecessarily optimistic by putting before you pleasing things and glossing over others. As to our commercial manager, I am glad to tell you that we are in every way satisfied with the efficient manner in which he carried out his onerous and responsible duties. Acting a good deal on his advice, but after careful consideration, we came to the conclusion that is would be expedient to incur a larger outlay in certain matters, notably advertising. We have incurred a certain amount of expense which has lessened our net profits, but I can confidently assure you that we shall reap the benefit in the near future. As to the report, I feel that you will welcome our dividend again of 10 per cent., and also the bonus which we declare. This year we felt it right to give you a bonus, rather than write off a larger sum than £3,000 for goodwill. We have thought it better rather to increase the amount we put to reserve by an additional £1,000, bringing the amount this year up to £9,000, instead of £8,000 as last year. I hope that will meet with your cordial approval. (Applause.) At this point I feel it right, at the end of our fifth year, to review a little the satisfactory position which this company now occupies. In our prospectus, it will be remembered, it was set out there that the average profits for four years previous to the taking over of the business by the company, was some £46,000—the net profits I mean. In each of the past five years we have considerably exceeded that amount; in fact, the average for the five years comes out at £53,010. That is satisfactory, but in addition to that we have built up a reserve of £41,000, written off £61,000 from the goodwill, and depreciated the property by over £10,000. (Loud applause.) I have now a further piece of information to give you, which I am sure will be received with gratification, and that is that both our managing director and our colleague, Mr. Hughes, whose excellent work it would be invidious for me to mention in their presence, have consented to renew their agreement with us for another five years. (Renewed applause.) I have also another piece of information to give which will also be exceedingly gratifying to you. I am exceedingly glad to be able to tell you that a few days ago Mr. Harman, the founder of the original company—the Britannia Company—has agreed to accept a position on the Board of the company. From the year 1330 up to the time that this company was formed Mr. Harman presided over the affairs of the first company with signal success, and now he has consented to join our Board. (Applause.) That is a matter for congratulation, as his presence with us means enormous strength being given to our counsels by his vast experience, not only as a photographer, but as an expert in our business. When Lord Crawford could no longer hold the chairmanship of this company, an attempt was made to induce Mr. Harman to take his place, but that gentleman declined the honour, though urged by Mr. Knobel and myself. Now, at the end of our fifth year, Mr. Harman, finding our affairs so satisfactory, has come back to his old love, and to support the Board by his valuable counsel. I now beg to move: "That the annual statement of accounts and balance-sheet, and the reports of the directors and auditors, be and they are hereby adopted, and that the dividend declared and the bonus be paid in accordance therewith." Mr. Charles J. Cox (deputy chairman) said he had great pleasure in seconding this motion. Mr. Lee Smith congratulated the directors on the admirable result of their working during the past year. It was exceedingly gratifying to hear that the founder of the company was about to join the Board. It was known that in their trade there was much competition, and therefore the acquisition of Mr. Harmon was of vast importance in the guidance and counsel which he would be able to afford the Board. He proceeded to refer to the position of the preference shares on the Stock Exchange, stating that he could scarcely comprehend how it was that they stood at the present figure, more especially when they had in liquid assets £190,000, in buildings £46,000, in investments £92,783, in stocks £6,836, and with other items making

a total of £168,619. He could only understand the position of these preference shares by the fact that in the market preference shares in industrial companies were mere shuttlecocks. Mr. Lyall also congratulated the directors on the successful year they had had. They were quite prepared, owing to the recent bad summer, to hear of a smaller turnover, but he saw that the Ilford company had increased their business. Considering the great advance of film photography, he hoped the Board would make arrangements for the introduction of this branch. The resolution was then put to the meeting and agreed to. The chairman then moved that Mr. Charles J. Cox, the retiring director, be re-elected. Mr. Knobel, in seconding the motion, said that competition had been referred to, and he might say that such competition was a very good thing for them. (Hear, hear.) It kept the whole of their staff up to the mark, and it was very necessary that all members connected with the management of this company should be vigilant in every department, whether relating to the trading of the company or in the manufacture of their articles. In the balance-sheet they would notice they had a reserve fund of several thousand pounds sterling; but he might tell them that at Ilford they had another reserve of skill and energy which the directors could draw upon to meet any demand that might be made. The resolution was agreed to. The auditors, Messrs. Turquand, Youngs, Bishop, and Clarke were re-appointed on the motion of Mr. Helby, seconded by Mr. Lockhart. A vote of thanks to the chairman, the directors, and staff having been passed, the chairman returned thanks, and proceeded to say that they had placed on the market this year two new photographic papers, and the result had been, as far as they had gone, most satisfactory to them. Late in the season they had introduced an excellent camera, of patented designs. The result as yet had not been very pronounced. It was so late in the season when they produced it; but they were not without confidence that that would also materially affect the prosperity of their business.

THE Christmas number of "Photography" (published by Messrs. Iliffe and Sons, Limited, 3, St. Bride Street, London, E.C.) contains reproductions of well-selected "photographs of the year," with accompanying letterpress of an appreciative and critical nature. The book makes a handsome present, and should lead the novice to aspire to the production of good photographs.

USE of Photographs as Evidence.—Ever since its inception, photography has rendered valuable assistance to justice by the popular nature of the data it is capable of producing. One of its earliest services along this line was the improvement of the various "Rogues' Galleries" scattered throughout the country, writes Mr. James G. McCurdy, in "The Scientific American," where efforts were being made to keep a record of portraits of leading lawbreakers. Prior to the advent of photography, likenesses of criminals, as sketched by the artist and reproduced by the wood engraver, offered but little aid to the officers of the law for purposes of identification. The camera, however, capable of catching each facial characteristic and fleeting expression, together with the ease with which its results could be duplicated without loss of any essential qualities, proved a most effectual help in the detection of criminals. The United States government endeavoured for many years to perfect a system of identification by description merely, in the matter of Chinese certificates. But so many frauds were perpetrated that at last Congress was compelled to adopt the amendment of November 3rd, 1893, requiring every such certificate to have attached to its face the photograph of the person applying for the same. This clause in the exclusion Bill was very distasteful to the Chinese, who fought it with great energy throughout the country, but without avail. When at last the Chinese found that they must comply with the new regulation or suffer deportation, the photographers of the Pacific Coast could hardly meet the demands of the excited Celestials, all of whom had become very anxious to be photographed before the expiration of the time limit. Certificate photographs are not retouched, and any scar or other prominent marking upon the face is made as conspicuous as possible, to aid identification. The effect of the new law was most salutary, and while frauds are still occasionally attempted, they are rarely successful. When the foregoing facts are taken into consideration, it is not at all surprising that the camera is held in wholesome respect by those who would seek to break or evade the law. This point was emphasised last winter during the great teamsters' strike in Boston, where policemen riding with the drivers found cameras more formidable weapons than firearms would have been. Somehow, when those bent on mischief realised that any act of violence on their part would be duly recorded by the all-seeing lenses, to be brought up against them later, the very boldest among them shrank from making a demonstration. Although the photograph has been used for years as a means of identification, it is still looked upon in many courts with a degree of suspicion, when submitted in general evidence. This is largely due to the fact that photographic negatives, in the hands of skilful manipulators, are capable of much "doctoring," and can readily be made to bear witness to untruths. Yet realising that all evidence is open to question and must be thoroughly sifted, and trusting to photographic experts to unearth attempted fraud, the photograph is being admitted in courts of justice as evidence more extensively each year. Finding by experience that a well-taken, untouched photograph bearing upon a case in point often makes valuable evidence, many railroads, steamship companies, and other corporations are making it a practice to keep cameras within easy reach of their employees, to be used when necessity arises.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Dec.	Name of Society.	Subject.
5	West London Photo. Society	Show of Work done at Outdoor Meetings, and Miscellaneous.
5	Leicester Literary	Exhibition of *Photography* Prize Lantern Slides for 1902.
5	Borough Polytechnic	*Lantern Slide Making by Reduction* Mr. F. W. Gregg.
8	Oxford Camera Club	Demonstrations by Mr. H. Minn.
8	Southampton Camera Club	Demonstration of the Lumière Process of Colour Photography.
8	Society of Arts	*The Future of Coal Gas and Allied Illuminants.* Professor Vivian B Lewes.
9	Leeds Photographic Society	*Selections from a Year's Lantern Slide Work.* Mr. Godfrey Bingley.
9	Isle of Thanet Photo. Society	Club Competition: Lantern Slide Making. Prize, Silver Medal presented by Mr P. F. Weeks.
9	Roy. Photo. Soc. of Gt. Britain	*Photography in Marine Zoology.* Dr. R. Norris Wolfenden.
9	Birmingham Photo. Society	*Birmingham Markets and Fairs.* By Mr. Walter Barrow.
9	Brentford Photo. Society	*Colour Photographer by the Lumiere Process.* Demonstration by Mr. Turner.
10	Ashton-under-Lyne Photo.	Discussion on *Winter Photography in its Various Aspects.*
10	Leeds Camera Club	Yorkshire Photographic Union Portfolio (Members' Work).
10	Borough Polytechnic	*Practical Enlarging.* Mr. J. H. Gear, F.R.P.S.
10	North Middlesex Photographic	*A Trip to Eastern Ireland.* Mr. C. H. Oakden, F.R.P.S.
10	Nottingham Camera Club	*The Two Rivieras.* Mr. S Bourne.
10	Southport Photo. Society	*Practical Working of Rotograph Papers, &c.* Mr. W. A. Sims.
10	Photographic Club	Demonstration. G. Houghton & Son.
10	Society of Arts	*French Rural Education and its Lessons for England.* Mr. Cloudesley Brereton.
10	Southsea Photographic Society	Animated Photographs. Mr. Luther Dyer.
11	Roy. Photo. Soc. of Gt. Britain	*The Great Photographic Star Map.* Professor H. H. Turner.
11	Society of Arts	*Domestic Life in Persia.* Miss Ella C. Sykes.
11	London and Provincial	Exhibition of competing pictures.
11	N.-W. London Photo. Society	*A Ramble Round the Tower of London.* A. Bedding.
11	Goldsmiths' Institute Photo	Welford's *Photographic Flexibilities.*
11	Liverpool Amateur Photo.	Lantern Lecture. *Bridgnorth.* Mr. Joseph Marples.
11	Woolwich Photo. Society	*Camera Notes by an Amateur Field Naturalist.* Mr. Douglas English, B.A.
11	Richmond Camera Club	*Night Photography.* By Mr. Ellis Kelsey.

ROYAL PHOTOGRAPHIC SOCIETY.

TECHNICAL Meeting, November 25th.—Mr. Leslie Selby in the chair.

A frame of photographic enamels, for the presentation of which the Society is indebted to Mr. A. L. Henderson, who made them in 1866, was passed round for examination.

In the absence of the author through indisposition, the secretary read a paper on "Halation," by Mr. Harold Holcroft, M.A., F.C.S. The paper was in some respects supplementary to one read before the Birmingham Photographic Society, and published by us in our issue for January 31st of the current year. The present paper points to the necessity for further investigation into the cure of halation, and with this view, the importance of isolating each of the causes. The effects upon an unbacked plate, classed as halation, are complex, and attributable to various causes. The author refers to three separate principal forms of halation:—(1) That due to lateral spreading of light in the film; (2) that due to reflection from the back internal surface of the glass plate; and (3) that due to reflection from the separating division of the dark slide. Considering what takes place in the case of an unbacked plate when a bright spot of light is focussed in the centre of an otherwise black field, and the possibility of accurately accounting for the destination of the whole of the rays proceeding from the bright spot, one should include all the separate causes of halation. Some are radiated forward, and are absorbed by the black interior of the camera; some radiate laterally into the substance of the film, and produce a ring of what is called lateral halation round the spot. This lateral halation will be chiefly in the upper parts of the film. Other rays will radiate into the glass plate, and some of them will be reflected from the internal back surface of the glass, and produce a ring of halation on the inner surface of the film. The extent of the halation will depend upon the intensity of the light, the thickness of the glass, the physical condition of the film, the length of exposure, etc. The author describes the method adopted for measuring the area of the lateral halation and the reflected halation, and in the course of these remarks develops the possibility of a further cause of halation due to the lens itself. It has been assumed that the lens projects a clean image of the spot on the black field, and the possibility that it

is a factor in halation comes as a surprise. A photographic lens usually consists of several distinct lenses, bounded by surfaces of varying radii; the lens not only transmits, but reflects, light at each surface. Flare spot is caused by light reflected from one of the back surfaces and reflected again at one of the front surfaces, being brought more or less to a focus upon the centre of the plate. The correction of flare spot is brought about by such an adjustment of the curves and the position of the stop that the spot is enlarged and distributed over the whole surface of the plate with reduced intensity. There are other reflecting surfaces, however, in addition to the principal surface to which the flare spot just discussed is due, and these cause what the author describes as secondary and tertiary flare spots, which are likely to manifest themselves under critical conditions. Mr. Holcroft sees little possibility of correcting this form of halation if it is rightly ascribed to the lens, seeing what a wonderful compromise of conflicting conditions the modern lens already is. The author sets himself the following programme: (1) To resolve halation into its constituent parts, and to determine the exact part played by the lens; (2) to ascertain the amount of lateral spreading of light in the film under varying conditions; (3) to examine the distribution of halation in the film by preparing cross sections of the film for the microscope. Variable factors, many in number, have to be considered—the actinic intensity of the light, the stop valve, speed of film, exposure, the developer (its strength, temperature, and penetrating power), physical constitution of the film, its thickness and colour, thickness of the plate, the actinic absorptive power of the glass, etc. It is also necessary to work under standard conditions, which the author also details. The experiments are still proceeding.

A long discussion ensued, which it is understood will be submitted to the author for his consideration and reply.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

NOVEMBER 27TH.—Mr. A. E. Smith in the chair.

Mr. J. W. Hodges read a paper on "The Photography of Architecture." At the outset, he made a strong plea for more specialising in photographic work, pointing to the greater pleasure to be obtained by the thorough mastery of one subject than the superficial knowledge of many. His own speciality lay in the study of architecture and its photographic rendering. Throughout the lecture the meeting had ample opportunity for appreciating the extent to which Mr. Hodges has carried his specialising, in the shape of numerous splendid examples of architectural slides. An elementary knowledge of the history of Gothic architecture gives to the beginner in architectural photography a strong inducement to acquire more, and greatly increases his chances of quickly acquiring a knowledge of the photographic treatment of the wealth of subjects which abound in this country. Mr. Hodges discussed the use of backed plates, the best forms of camera for the work, the utility of rising and cross fronts, levelling devices, slow versus fast plates, the use of the actinometer, etc. Full exposure is a sine qua non, and exposure meters appear to be of little value in the dark buildings. He advocated the employment of two cameras, especially in places where very long exposures are called for, the second being devoted to the photographing of details, which offer an ever-ready excuse for an exposure. As the slides were shown, Mr. Hodges gave interesting data about them and their originals, and it was generally agreed that his paper and illustrations had afforded a valuable series of hints to those thinking of pursuing the subject further.

THE SOUTHAMPTON CAMERA CLUB.

A MEETING of the Southampton Camera Club was held at the club-room, Philharmonic Hall, on Monday evening, November 24th, under the presidency of Mr. W. Burrough Hill, who takes a paternal interest in the club, which, under good officership, is making pleasing and satisfactory progress. At the outset of the proceedings 100 slides of Canadian scenery, lent by the Royal Photographic Society, to which the club is affiliated, were thrown on the screen by Mr. Vivian; and Mr. S. G. Kimber, the energetic hon. secretary, added to the enjoyment of the entertainment by making a few concise descriptive remarks as the slides "passed through." Subsequently, at the invitation of Mr. Hill, who presided in the absence of the Mayor (Mr. H. I. Sanders), the hon. secretary gave a brief history of the club, which, he said, was started six years ago in an underground kitchen at Northam with a membership of eight. To-day they could boast a membership of over 100, and could honestly lay claim to being one of the strongest clubs in the South of England. (Hear, hear.) Speaking of the recent exhibition, held in the Art Society's Gallery, Marland Place, in behalf of the club he tendered their heartiest thanks to all who contributed to the success of their annual venture, and congratulated the members on the excellent photographs exhibited by them, which earned the encomiums of the judges. There was no doubt, he added, when the accounts were gone into they would have a balance of £20 on the exhibition, and the committee proposed to spend this amount on the purchase of apparatus for the use of the members. (Applause.) The president complimented the club on the successful exhibition, which, he said, was the most perfect of its kind he had ever attended. Mr. Hill subsequently presented the medals and certificates won by the members at the exhibition.

A vote of thanks to the president concluded the proceedings.

The members met on the 1st inst., at their headquarters, Philharmonic Hall, under the presidency of Mr. G. Vivian, and after the election of new members, Mr. Harry Wade, representing Messrs. Wellington and Ward, gave demonstrations on the specialities of the firm. The utility of the film and paper negatives was explained. The slow contact paper was then ably demonstrated with.

The paper can be safely worked by gaslight, and exposure made by an artificial light, or very short exposure in daylight. A new method of procuring warm tones on slow contact paper by development was shown. The developer used being edinol and hydrokinone, well restrained with potassium bromide, and the tones obtained ranged from sepia to red chalk, according to the exposure given, a long one being necessary. The results were highly appreciated. Mr. Wade then showed the process of carbon printing by both single and double transfer, and was given a hearty vote of thanks for his interesting and instructive demonstrations.

CROYDON CAMERA CLUB.

THE meeting on Wednesday, the 28th ult., was devoted to lantern slides, a selection being made for the seventieth lantern show to be held at the Art Gallery, on December 10th. It was announced that an interesting series of Paul's animatographs would also be displayed.

During the evening a demonstration of Messrs. Butcher and Sons' Maxlite generator, and four burner acetylene lamp, was given by Mr. W. H. Smith. The lamp burned with great steadiness, without smell or smoke, and gave a brilliant disc of good colour. The general opinion of all present was, that when the limelight or electric arc was not available, the Maxlite formed a most efficient substitute.

LEICESTER AND LEICESTERSHIRE PHOTOGRAPHIC SOCIETY.

MR. J. PAGE CROFT, one of the most original and best abused workers of the day, was announced to lecture before the above society on Wednesday last. He demonstrated the gum-bichromate process, and remarked as follows: "Photographic technique has been mastered, the future progress in photography will come from the artistic workers, and gum is the ideal process for the photo-artist. It is also the simplest process under the sun; a touch of the brush here, the finger there, a dash of hot water somewhere else, and there you are; just the effect you want and just what no other process will yield. For latitude no other process equals it; you can have enough rope to hang both in the Salon and Royal. If you tire in developing a gum print, dry it, put it away, and start again when you feel inclined." Mr. Croft is a practical preacher, his efforts were just incomplete enough to make a man want to try for himself, and as an encouragement he offered a guinea's worth of apparatus for the most artistic bi-gum print by any of the members.

NEWCASTLE-ON-TYNE AND NORTHERN COUNTIES PHOTOGRAPHIC ASSOCIATION.

ON November 25th, Mr. A. B. Gardiner, a well-known local photographer, gave a lecture and demonstration before this association. Mr. Gardiner is a firm believer in the merits of modern gelatine dry plates, expressing the opinion that the man for whom a first-class gelatine slide was not good enough must be hard indeed to please. The lecturer explained the manner in which slides can be made by contact, and also by reduction in the camera, the former method being usual in the case of small negatives or where a small portion only of a large negative was required, while the reduction method is absolutely necessary where it is required to make a slide from the whole of a large negative. The lecturer recommended beginners to commence with strong plucky negatives, as it is easier to judge the exposure from them than it is from softer negatives, although no accurate rules can be given on this head. As conditions vary so widely, such as density of negative, source, strength, and distance of light and effect required; Mr. Gardiner said the secret of doing good work lay in choosing a suitable negative, full exposure and tentative development carried far enough. With regard to development, he said that to get the best results in all cases the maker's formulæ should be used, and condemned the indiscriminate publication of formulæ by persons lacking scientific knowledge. The Howard-Farmer reducer was recommended for clearing off fog and generally adding brilliancy to the finished transparency. Many useful hints as to binding, spotting, increasing and decreasing, contrast by the use of different sources of light and the interposition of various coloured glasses between the light and the negative, and many other matters were given by the lecturer. Mr. Gardiner exposed some plates, developed, fixed, cleared, washed, and finally put them through the lantern, demonstrating in an interesting manner an absorbing branch of photographic work.

LONGTON AND DISTRICT PHOTOGRAPHIC SOCIETY.

MR. F. W. PILDITCH, of Birmingham, entertained a fair number of members of the Longton and District Photographic Society with a lecture at the Court House, recently, entitled "Stories of Dartmoor." Mr. Pilditch had many interesting and amusing stories to tell, and he spoke in warm praise of the charming physical beauties of the county which Baring Gould describes in "Uriah." The lecture was very enjoyable, and was illustrated by a number of splendid lantern slides, by means of which the audience were able to appreciate the irresistible picturesqueness of Devonshire scenery. At the close of the lecture a series of members' slides were tested through the lantern.

DEVONPORT CAMERA CLUB.

BEFORE the Devonport Camera Club recently, Mr. W. D. Welford delivered a lecture on "Photographic flexibilities, in the camera, the developer, the printing process, and in general work." The lecture was of a practical character, and was rendered additionally interesting by demonstrations and the exhibition of a large series of photographs. A splendid set of slides was also shown with the lantern. Among some people, the lecturer remarked, there was an idea that the camera could not lie; but the first three slides proved that it could lie artistic-

lly. A fine set of night pictures, taken in New York, and a number aken in the course of a week in camp in "Shakespeare country" ere also much appreciated. Mr. R. J. Lamb presided, and announced hat a conversazione and exhibition of members' work would be held n January. Two new members were elected.

BLAIRGOWRIE AND DISTRICT.

AT the monthly meeting, in the club room, recently, Mr. Jas. Richardson, V.P., presided, and Mr. Maclachlan gave in a report on he meeting at Dundee to consider the question of affiliation amongst he societies. The action of the delegates—Messrs. Richardson and Maclachlan—met the approval of the meeting. The result of last nonth's competition—wild birds' nests, in situ—was announced as ollows: 1, D. G. Monair; 2, J. W. Petrie; 3, Jas. Richardson. Mr. . D. Petrie then gave a paper on "Gum Bichromate Printing," vherein he advocated that process for bold work where broad effects vere aimed at. He demonstrated the method of sensitising and coating he paper, and was bombarded with questions from the members present, which resolved itself into an animated discussion.

News and Notes.

THE telegraphic and cable address of the Imperial Dry Plate Co., Limited, of Cricklewood, London, N.W., is now "Impeople, London."

"DOGS and Doggerel."—Mrs. Carine Cadby writes:—"We were very much amused at your wag's humorous remarks about our little pamphlet. We just had enough brains left from our plate coating to produce this little book I am enclosing. Perhaps it may inspire that wag to further witticisms." The little book is published by the Art Record Press, 144, Fleet Street, London, E.C., price sixpence. The "doggerel" concerns itself with the doings of a couple of Airedale pups, who appear to have a very good time indeed. The nine photographs are extremely well done, and, with the lines, further testify to the remarkable versatility of those accomplished photographers, Mr. and Mrs. Cadby.

THE year book of the Gateshead Camera Club is a capital production. Here are some of its contents:—A frontispiece; list of officers and council; rules; syllabus; an open letter from F. M. Sutcliffe; local spots of interest; exposure guides; finding due south; notes on the construction of a picture; weights and measures; development; formulæ; general hints; federation of Northumberland and Durham photographic societies; and a list of members who offer special help. Well done, Editor Hewitt!

MESSRS. MARION AND CO., Limited, of Soho Square, London, W., are issuing a series of negative masks for printing Christmas, new year, and birthday mottoes on photographic papers. The masks are on translucent cloth, and the positive is in dark pigment. A set of six different designs in obtainable for one shilling and sixpence

PHOTOGRAPHIC Society for Bowes Park.—A meeting was held at the Collegiate School, 111, Myddleton Road, Bowes Park, on Wednesday, the 26th ult., for the purpose of forming a photographic society for the district, fifteen gentlemen being present, and a number of others having signified their intention of becoming members. Mr. Craston having been voted to the chair, it was proposed and unanimously agreed that a photographic society be formed for the district, to be called the Bowes Park and District Photographic Society. The following gentlemen were appointed to form a committee to draw up the rules of the society: Messrs. Cob, Duncan, H. C. Bird, A. J. Craston, Hornsey, Richardson, and Young. Mr. A. Kerwin was elected hon. secretary pro tem. It was agreed that the fee for adult members be 5s. per annum, and junior members, under 18 years, be 2s. 6d. per annum, no entrance fee being charged to members joining during remainder of the present year. It was also agreed that ladies be admitted to membership.

A GOOD many more of our readers know of Mr. F. C. Tilney than think they do. Amongst photographic critics he is one of the most active, although his name is not usually found at the foot of his articles. We are now in a position to criticise him on his own ground, which is that of art, for he sends us a pack of Shakespearean playing cards, designed and schemed throughout by himself. All the kings, queens, and knaves are taken from Shakespeare's plays, with appropriate quotations. He claims that the usual objections to fancy cards have been entirely avoided, for the kings are instantaneously distinguishable from the Jacks, both by their dignified appearance and by the crowns on their heads. The Jacks look unmistakably the knaves they are. The quotations have evidently been chosen with great care, and very happily give the cue to the character depicted, of whose utterances they consist, and bear a metaphorical allusion also to the vicissitudes of card playing. The cards are undoubtedly the most artistic ever yet produced, and for 2s. 6d. make a capital present for Christmas time. The Queen has graciously accepted a pack. Altogether, we heartily congratulate Mr. Tilney on his artistic success, and wish him a financial extension of it.

THE Bausch and Lomb Competitions.—A new booklet relating to these competitions has been issued by Messrs. A. E. Staley and Co., 35, Aldermanbury, London, E.C., of whom copies may be obtained. We extract the objects of the competition:—The main object of this competition is to demonstrate the possibilities of our photographic lenses from the optical standpoint, that is, under the most trying conditions optically. The properties of a lens which we seek to obtain in the highest degree in our lenses are freedom from astigmatism, defining power, depth of focus, flatness of field, and speed, combined with proper focal length to give the best pictorial results. Photographs demonstrating these qualities in the highest degree will have preference over those of equal pictorial excellence in which such qualities are not so clearly demonstrated. Interesting subjects should be selected. A photograph may show perfect lens work, artistic composition, proper lighting, and have all the qualities that go to make up a picture, without exciting the least interest in the beholder. Photographs should appeal in some way strongly to those who have no knowledge of the particular subjects or incidents depicted.

EXHIBITION at Leith.—The second annual exhibition of the work of members of the Leith Photographic Association was opened on Tuesday week in the Wilson's Hall, Hope Street, Leith. The exhibition is most interesting for its examples of what photography is capable of giving us. All the work on view, some 110 frames in number, evidences a distinct appreciation of the pictorial on the part of the exhibitors, generally combined with a very high technical ability. The atendance of the public has been extremely gratifying, and goes to show the place photographic art is making for itself. Mr. J. Gibson is a prominent exhibitor, and his works seem to us to point to the deep sympathy that exists between him and his subjects. This is very strikingly suggested by his "Early Spring," where we have a splendid rendering of that singular feeling we are all so apt to experience on its advent. So, similarly, with "Sunset," another very successful contribution. Mr. Wm. Duncan, S.S.C., the hon. secretary, has been wonderfully successful with his picture of the woodyard fire. It must be reckoned an especial success. "Stacking Hay" is another good thing, this time from the camera of Mr. T. Wilson. As a transcript of country life it will be hard to beat. This also applies to the "Haymaking" of Mr. W. J. Melville. "Mirth," by Mr. G. B. Massie, shows a masterly treatment, and the print is of a rare quality. Other workers whose contributions should on no account be passed without notice are Messrs. Robertson, Hayes, Clark, Laycock, Ewart, and Oliver. To the visitor who is interested in lantern slides and stereoscopic work, the exhibits in this section must prove interesting, they are of so high quality generally. Altogether, the exhibition as a whole is marvellously good, and full of interest to all who have an outlook in photographic practice.

HOVE Camera Club Exhibition.—The following is the award list:—Open classes: Class A, landscape, river scenery, and marine, silver medal, No. 32, A. Fenn; bronze medals, No. 19, C. E. Etches; No. 66, D. Deeley. Class B, figure, portraiture, and animal studies, silver medal, No. 297, H. Lawrence; bronze medals, No. 257, Douglas English, F.R.P.S.; No. 172, Mrs. R. M. King. Class C, architecture—interior and exterior, silver medal, No. 323, Rev. H. R. Campion; bronze medal, No. 339, W. A. Clark; certificate, No. 341, S. A. Pitcher. Class D, flowers, fruit, still life, etc., silver medal, No. 379, H. Lawrence; bronze medal, No. 375. A. Tauxe; certificate, No. 367, Mrs. Alice Dumas. Class F, lantern slides—landscape and marine, silver medal, No. 391, W. A. Clarke; bronze medal, No. 384, F. Parkinson; certificate, No. 385, Ellis Kelsey. Class G, lantern slides—portraiture and animal studies, silver medal, No. 414 H. Wade; bronze medal, No. 408, D. J. Gadsby; certificate, No. 426, Grun. Class H, lantern slides—architecture, etc., silver medal, No. 432a, H. Wade; bronze medal, No. 420, D. J. Gadsby; certificate, No. 426, W. Harvey. Club classes: Challenge salver, "Gladys," No. 509, F. R. Richardson. Class J, landscape, silver medal, No. 465, Victor E. Morris; bronze medal, No. 459, R. C. Ryan; certificate, No. 480, A. R. Sargeant. Class K, marine, silver medal, No. 489, Victor E. Morris; bronze medal, No. 488, F. J. Phillips; certificate, No. 492, C. Berrington-Stoner, Class L, portraiture, silver medal, No. 509, F. R. Richardson; bronze medal, No. 513, C. Berrington-Stoner; certificate, No. 523, H. Lawrence. Class M, architecture, silver medal, No. 533, F. J. Phillips; bronze medal, No. 529, D. J. Gadsby; certificate, No. 526, W. Bailey. Class N, lantern slides (any subjects), silver medal, No. 551, Victor Morris; bronze medal, No. 553, Capt. Davidson; certificate, No. 547, F. R. Richardson. Class O, novices (in sets of three), bronze medal, Nos. 575-577, F. Northen; certificate, Nos. 565-567, W. A. Ellington. Class P, lantern slides (novices), bronze medal, No. 588, W. Bailey; certificate, No. 586, H. W. Bailey.

THE View from Richmond Hill.—The Parks Committee of the London County Council have issued a report in connection with the negotiations with Sir Whittaker Ellis for preserving the amenities of the view from Richmond Hill. The committee point out that the properties at Twickenham, known as Cambridge Park Gardens and Haversham Grange, which are within the view from Richmond Hill, are at present owned by Sir Whittaker Ellis. Recently the Cambridge Park Gardens property was offered for sale by auction, but was bought in. The owners of these two properties and of Meadowbank adjoining to the westward are under covenant each with the other not to build in advance of a certain line. It was the desire of the committee that an agreement embodying this covenant should be scheduled to the Act of Parliament authorising the purchase of Marble Hill; but they were not able to obtain the consent of the owners of the properties to this course in sufficient time to enable this to be done in the Bill then before Parliament. In October, 1901, Sir Whittaker Ellis wrote, forwarding a plan showing the line above referred to so far as his properties were concerned, and stating that he would undertake not to build below that line provided the Marble Hill property were retained as an open space. He afterwards wrote stating that if the Marble Hill estate and such other adjoining properties were secured by the London County Council as would, in their opinion, preserve the view from Richmond Hill, he would be quite willing to give such undertaking as the Council might desire that the land he held on the opposite side of the river, being Cambridge Park Gardens and Haversham Grange, should not be further built upon than at present, except conservatories or other buildings of that nature for garden purposes. When, however, Cambridge Park Gardens were recently offered for sale, there was no reference in the conditions of sale to restriction of building other than the covenant with the adjoining owner. On Sir Whittaker Ellis's being asked to cause an announcement to be made in the auction room that the property

would be sold subject to the undertaking he had given not to build upon it, he replied, "I certainly never contemplated binding the property in other hands than my own, and of course it will now be for any purchaser of the property to deal with the question." The committee are advised that Sir Whittaker Ellis can be required to enter into the undertaking indicated by his letter, and accordingly recommend the Council to pass a resolution to the effect that such steps as may be necessary be at once taken for the enforcement of the promise, and generally for the protection of the Council's interests in relation to the view.—"The Times."

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

THE UNIVERSAL EXPOSITION, ST. LOUIS, 1904.

To the Editors.

Gentlemen,—After the formal acceptance, by the British Government, of the invitation to take part in the Universal Exposition, it was thought desirable to prepare some special descriptive literature for the guidance of intending exhibitors and visitors from the United Kingdom.

In pursuance of this purpose, I forward, for your information and with my compliments, the accompanying illustrated pamphlet. An attempt has been made to set forth, with all possible brevity, but with completeness, the scope and plan of the Exposition, estimates of the men, and the historic events to be commemorated, descriptions of the grounds and buildings, a comprehensive review of the various exhibits, notices of the organisation, the work, and the financial resources available, and the relations which foreign countries, the Government of the United States, and the States of the Union, bear to it.

It is believed that readers may thus obtain a fair idea of the scheme, its aims, and its progress, in all of which the people of the foreign countries accepting invitations have an interest scarcely less vital than those of the United States themselves.—I am, yours very truly,

GEORGE F. PARKER.

Sanctuary House, Tothill Street, Westminster, S.W.
November 27th, 1902.

[In the interesting pamphlet sent by Mr. Parker photography is classed with the liberal arts.—EDS. B.J.P.].

THE GOERZ COMPETITION.

To the Editors.

Gentlemen,—May I ask you to kindly inform your readers that, at the request of numerous photographers in the British Colonies, the latest date for receiving prints for my £300 competition has been extended from December 31st, 1902, to June 30th, 1903.—I am, dear Sirs, yours faithfully,

C. P. GOERZ.

4 and 5, Holborn Circus, London, E.C.
November 27th, 1902.

THE TRAILL-TAYLOR MEMORIAL LECTURE.

To the Editors.

Gentlemen,—I shall be much obliged to you if you will permit me to remind your readers that the fifth Traill-Taylor Memorial Lecture will be delivered at the rooms of the Royal Photographic Society, 66, Russell Square, W.C., on Thursday evening, the 11th December, at 8 o'clock, by Professor H. H. Turner, F.R.S., of Oxford Observatory. The subject of the lecture is "The Great Photographic Star Map." The president of the Royal Photographic Society, Mr. T. R. Dallmeyer, has kindly consented to preside.

Admission tickets were sent by me last week to all the London and suburban photographic societies, but if it should be found inconvenient to obtain them through these channels, I shall be happy to send others to anyone upon receipt of a stamped addressed envelope.—Yours truly,

P. EVERITT, Hon. Sec.

88, Evering Road, London, N.
December 1st, 1902.

STILL DRIFTING.

To the Editors.

Gentlemen,—This is a melancholy fact as may be seen by the hyperbolical effusion signed by one A. V. K. The unparalleled presumption of this writer is on a par with the ignorance he displays on the essential points of his subject matter, and I, writing in the cause of our art, will endeavour to check the one and correct the other. I will admit that A. V. K. is well veneered and highly polished, and writes with a certain easy grace, but it is the flimsy grace of a fop, rather than the solid grace of strength, in fact, I think under his panoply of words and quotations, may be decerned the amateur. It is to be hoped this is so for his own sake as it is a bad bird that would so foul its own nest. I will pass over the elegant platitudes with which he commences his paper and will come at once to his first error, this is fundamental, and proves that he is wanting in logic and perception; I allude to his statement that the "Art of poetry is the greatest of all arts," let me correct him here. The art of writing or composing poetry cannot claim a higher plane than other fine arts, as it is merely a different means of expressing the same thing. On the other hand, poesy is the divinity of every art and the cachet of all that is beautiful. His mistake here consists in confounding poetry with poesy, and the error must be obvious to all.

Photography also is an exquisite means of expression and thus stands on the same plane as the monochromes of the painters, for it matters not how a work of art is made if the result be good. It is said that there is but a fractional division between the sublime and the ridiculous, and when A. V. K. after soaring in the mental ether of mythical abstracts concludes that the "Amateur is the best on the whole," he reaches his climax, and inextinguishable laughter shakes the skies. Could greater ignorance be displayed than he shows here? We will, however, examine this statement which is large and lofty, and quite in the writer's vein. The amateur as we know him is generally a pleasant fellow and goes forth merrily in the morning with his kidnapper slung on his shoulder and feeling like Alexander, seeks new worlds (of art) to conquer, and then returning to his portable dark tent at even, what raptures are his on finding something on his plate, and how sincerely do we all envy him! But put him for one day in a studio with ten or twenty sitters to photograph, and what havoc he would create. But we must give the devil his due, and acknowledge that in landscape work he excels, but the excellence is more due to his lenses than anything else, and his merits cease here. Let us, however, suppose that after long experience and tuition by some competent professional he should reach the top of the tree (he is a long way off yet), he would then discover that the best work he was capable of would be no better than what had been done thirty or forty years before he commenced to learn. The crass ignorance of this writer on matters of photographic art will be enlightened when I tell him that perfect gems of portrait art have been produced by photographic means more than thirty years ago. There was one artist at Hastings, a miniaturist, who did such exquisite work that he obtained a guinea for each cart. vig. picture; later on Mr. Van der Weyde charmed the world with the exquisite portraits he produced with the "Van der Weyde light," portraits whose perfect beauty could not be excelled by work of any kind. There were of course many others who did excellent work in those days, and this I think rather knocks the bottom out of A. V. K.'s hypothetical amateur who we may suppose to be living (in the near future) in a tub, gnawing bones to save expenses in the pursuit of this writer's ideal of art.

And now we will consider the most serious portion of A. V. K.'s offence, I mean his tirade on the imperfect knowledge of art shown by a section of our fraternity, this, however just or unjust it may be, is quite inexcusable in the pages of our journal and is wholly uncalled for, as precisely the same condemnation might be pronounced upon some members in all ranks of art, for the same relative degrees of knowledge or want of knowledge may be found in all the arts, witness for instance the indifferent and sometimes atrocious work occasionally turned out by painters who are not artists, even the great masters themselves fail miserably at times and they know it. But it is not the place of such men as A. V. K. to pronounce judgment in these matters, and before he presumes to do so he should see that he is fitted for the task. We have so many of these ready writers and scholarly know nothings flooding the pages of our literature with their crude imaginings and learned twiddle twaddle that the air grows thick and obscure.

We want more daylight, as someone has said, and I think in order to preserve our professional status it is time we instituted a Guild of Art Photography having power to award diplomas of art to all who pass the examinations, and providing competent teachers in all departments of our portrait art. We can leave the landscapes to the amateurs. There would then be an end to all these peripatetic philosophers, and we should stand in the broad light of art proudly conscious of the dignity of our profession.—Yours, etc.,

MICHAEL E. BANGER.

WHERE ARE WE DRIFTING?

To the Editors.

Gentlemen,—I have read with interest the letters published in your columns, re "Where are we Drifting?" and should like to say that I agree with Mr. Banger's views on the matter. I have seen some of these "side light" photographs, and can only say that if the public are going to choose this style of picture against the "Banger" style they have a very poor idea of art. Some of these "side lighters" take a portrait, giving very exaggerated shadows and high lights, and call them "Rembrandts." Why, they are enough to make that great artist turn in his grave. Again, how is a man going to treat all subjects with this "side light?" Why, it would be impossible to take

a large group in this style. While disapproving of this mode of photographing, I will say it is possible to do some really beautiful work with "side light" only, but these cases are few and far between, and at the same time require such an assortment of reflectors that the light in the eyes must be false, and therefore give an unnatural expression in most cases; therefore, I think it would be much more sensible to adhere to the top and side light system and work with a more reliable light.—I am, gentlemen, yours faithfully,

F. VIGOUREUX-CHILDERSTONE.

55, Mervan Road, Brixton, S.W.

To the Editors.

Gentlemen,—Any person who attempts to take a portrait in a studio without the usual window in the roof has less "noble aims" than our friend, Mr. Banger. "Happily for our profession," there are men who are not so narrow-minded. Apparently he has not studied light and shade thoroughly, though in his own mind he is an adept, else he would not have been so emphatic and conclusive respecting the side light studio. It will, perhaps, surprise him that, although I use both windows, there is only one light on the face, and not the slightest suspicion of a double shadow. He should read the article which set me thinking—viz., "A Chat with W. J. Anckorn," in the "Photogram," August, 1894, who states that "the studio is not nearly so much wanted as it used to be," for almost any lighting can be obtained in a drawing-room." He also says that, respecting at-home work, "the great advantage of this work is that it gives the operator a splendid variety of opportunities for artistic lighting and posing." No two persons who are photographed have features exactly alike, therefore each should be treated separately; there can be no fixed rule for lighting, a certain light may bring into prominence good points in one face, the same light would disgrace another. I should like to know how Mr. Banger lights his "interior" portraits, seeing that he clings so tenaciously to nature. I presume he will have sittings where indoor furniture is used, which, if lighted from above, cannot be called a natural lighting. If he cares to forward me a sample of his "nature" lit photographs unretouched, I have every confidence in being able to supply the same style of lighting with my two windows.—I remain, yours truly,

SIDE LIGHT.

December 1st, 1902.

THE STEREOSCOPE IN THE SCHOOLROOM.

To the Editors.

Gentlemen,—Your interesting article on the "Stereoscope in the Schoolroom" omits to mention another valuable use of the stereoscope for instructive purposes—viz., the substitution of stereoscopic slides for solid models in the study of such branches of physics as the polarisation of light. The diagrams of the text books are often difficult of realisation, and some time ago I completed a set of stereoscopic drawings, illustrating a number of such diagrams, in a way that makes the student see and understand the laws of reflection, refraction, etc., as clearly as if he could handle the very rays. Many of these stereoscopic diagrams are unpublished, but those on the polarisation of light are issued by Messrs. Newton and Co., of Fleet Street.—Yours faithfully,

CHARLES E. BENHAM.

"Essex County Standard" Office, Colchester.

November 29th, 1902.

THE GEM DRY PLATE COMPANY'S DEMONSTRATIONS.

To the Editors.

Gentlemen,—I should be much obliged if you will kindly inform your readers that I am now prepared to give demonstrations of the "Gem" Duplex paper, if secretaries of societies care to communicate with me.—Yours faithfully,

T. THORNE BAKER.

The "Gem" Dry Plate Company, Ltd., 92A, Villiers Road, Willesden Green, N.W.

November 29th, 1902.

AN IMPROVEMENT IN CARBON PRINTING.

To the Editors.

Gentlemen,—In "Ex Cathedra" last week you alluded to a statement, in the "Deutsche Photographen Zeitung," that an improved carbon process is shortly to be introduced by a Herr Carl Zink. The process is to be exploited as a secret one, and the charge for the formula is to be 35 marks, equal to as many shillings English; not a large sum, it is true, although, as you said last week, past experience has not often been quite satisfactory where processes have been introduced in such a way. Nine special claims are made for Herr Zink's process, and if the formula supplied meets them, the introducer will have kept faith with the purchasers. But when reading through these nine claims it seems to me that all of them are fulfilled with several other methods that have already been published. Did not the first carbon process—that of Pouncey, now called the gum-bichromate process? Did not the "Mariotype," and Mr. Foxlee's modification of it? Does not the Ozotype process? Also the starch-gum process of Mr. Foxlee, alluded to in your issue of October 31st, in connection with the continuing action of light in carbon printing? Still, Herr Zink's may be something quite different from anything that has been done before, or it may be an improvement on existing methods. It is a little noteworthy that, practically, the present method of working the carbon process in everyday work is the same as when it was first introduced by Mr. Swan nearly forty years ago. Improvements and modifications have been made in other printing processes, but, to all intents and purposes, the carbon process remains as it was, with, perhaps, improvements in the manufacture of the material employed. No photographic process can be looked upon as being so perfect that it cannot be improved, and it cannot be claimed that the carbon process is an exception.—I am, yours, etc.,

A CARBON PRINTER.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY, 24, *Wellington-street, Strand, London, W.C.*" *Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

PHOTOGRAPHS REGISTERED:—

M. Baker, 10 Horncastle Road, Boston, Lincs. *Photograph of the "Sham Ruins," Boston.*

C. H. Skillman, 22 Uxbridge Road, Shepherd's Bush, W. *Photograph of Mr. Commissioner Kerr.*

ANXIOUS.—Better communicate with the local superintendent of police.

ARTISTIC LIGHTING.—"FAN" asks: "Could you tell me the publisher and price of "Artistic Lighting," by J. Inglis?"—In reply: The price of the work is 4s. 6d. Any photographic dealer will procure it for you.

PHOTOGRAPHIC MOUNTS.—C. J. writes: "I should be glad if you could let me know where I can purchase photo mounts of every description wholesale, but not at fancy prices?"—In reply: Surely our correspondent is not a reader of the advertisement columns of the JOURNAL, or he would not need to put such a query as this. We refer him to them.

STUDIO QUERY.—"PUZZLED": So far as we can judge from the sketches the studio will be (as the only light is from the roof with the sun on it all day) a rather awkward one to work, particularly as it is so short. We should advise you to have the roof glazed to within three feet of either end, and to as near the eaves as possible. The glass need not be carried more than two-thirds to the ridge. You can utilize the little side window as opportunity occurs.

LEAD INTENSIFIER.—G. BARKER writes: "Re formula for the lead and hydrosulphuret intensifier used by Mr. J. I. Pigg, as per his experiments referred to in the issue of November 14th, 1902. I shall esteem it a favour if you will give me the above formula."—In reply: Immerse the negative in nitrate of lead 20 grains, ferridcyanide of potassium 30 grains, water 1 ounce; thoroughly wash, and then pour over ammonium sulphide one part to ten parts of water.

TAKING GROUP AT NIGHT.—WALTER SMITH asks: "Will you please give me instructions or advice as to whom I should apply to, to come down to Spalding, at a date I should be able to fix, and bring apparatus (flash light) and take me a negative of a dinner in a large public hall, some one thoroughly reliable, and able to guarantee good negative? It would be at seven o'clock at night."—We do not know of anyone who would undertake the work. Most photographers do it for themselves. Probably if you inserted an advertisement in our columns you would obtain what you require.

LEGAL POINTS.—ORIENT asks: "(1) If A (trading under an assumed name) sells his business, with goodwill, etc., to B, and has not given any undertaking not to start in business in the same town, is A (in his own name) justified in making a start in the same line of business there? Has B any reparation against A? (2) Are agreements between masters and servants and employers and apprentices wherein the employees agree not to start in business in opposition according to law binding?"—In reply: (1) All will depend upon the terms of sale as to the legality; but, apart from that, it would be very dishonourable for A to do so after selling his business to B. (2) Certainly.

GLAZING PRINTS.—GLAZING asks: "Would you be so good as to tell me, through your valuable paper, what I have tried and tried to find out? It is this: What is the word or name of the spirit or acid that is used to pour on glass for glazing prints, instead of using French chalk? I know there is such a thing used, for I have and do know people who use it, but they cannot tell me the word or speak it."—In reply: We are not quite sure

that we clearly understand this query; but if it is for a substitute for French chalk in the preparing glass for stripping films from a solution of beeswax, five grains to the ounce of benzol, is what is generally used. The solution is first rubbed on and then polished off with flannel.

RECOVERY OF DEPT.—C. D. V. says: "About three years ago I photographed for the tenant his house and supplied him with photos, etc., to the value of 11s. 4d. He has since left the place and gone clear away, leaving me in debt the above sum. His parents are in this neighbourhood, and I have, of course, made repeated applications for his address to them. And the reply I got the last twice I asked was that he was leaving his place and going to another, and they did not know his address. I know he was seeing them a few days back with his wife, but did not hear until afterwards. So how am I to obtain his address and the money?—In reply: We can only suggest that you find out the man's address, and then summon him in the County Court. It is obviously impossible for us to tell you how to find his address.

SALE OF POISONS.—O. P. SUISSE says: "Cyanide of potassium and all metallic cyanides and their preparations belong to the scheduled poisons. One chemist says that sulpho-cyanide of ammonium is not a scheduled poison (sulphur is no metal), and the other is positive that it is a scheduled poison. Similar ideas exist in the case of red prussiate of potash. Can you inform me which is right? Here is another query: That I as a dealer (I am a dealer now) can buy unquestioned cyanide of potassium, etc., in small bottles and resell single bottles to bona fide photographers, that is to the trade (quasi wholesale), so long as I do not touch the original packing or sealing, put on the bottle by the manufacturer?"—In reply: (1) There is no restriction of the sale of sulpho-cyanide of ammonium in England. (2) What you propose would be quite illegal; cyanide of potassium can only be vended by pharmaceutical chemists, whether in bottles or not.

PHOTOGRAPHING MIRRORS.—"FURNITURE" says: In my work I have a large number of mirrors to photograph. Could you kindly give me any advice as to the best way of treating these. I have tried soaping them and also whitening and water, but these cannot be put on evenly. I would like to know of something that will stop the reflection, and also prevent halation? Trusting you may be able to give me a reply?"—In reply: In place of coating the glass with anything we should prefer to arrange the mirrors so that the light falls upon them at an angle—say of 45 deg.—so that any reflection from them will be away from the lens. Care must, of course, be taken that there are no objects so situated in the studio as to be reflected in the glass as to be seen by the lens. Putty dabbed on the glass will avoid reflections, and if carefully done, will not be patchy. Halation may be avoided by backing the plates.

SPOTTY PRINTS:—"TONING" writes: "I am sending two cabinet prints for your inspection. You will observe some grey mottled spots on them; you would be doing me the greatest favour if you will tell me the cause. I toned about 100 cabinets and 12 by 10 on Thursday; they were all quite free from the marks on Friday; they did not show till Saturday morning, being mounted Friday afternoon. There are twenty cabinets marked in this way, and the others appear to be quite free from the spots. My opinion is that they were not washed long enough, but our manager gave me orders to dry them at once as he said they had washed enough. I am printer and he is operator, and he knows when a thing is right. He says the prints were not fixed, but I timed them fifteen minutes in hypo; 16 pints, hypo 50ozs.?"—In reply: The spots appear to us to be due to air bubbles adhering to the surface of the prints while they were in the fixing bath. We think the washing had nothing to do with them.

PRECIPITATING RESIDUE PLATINOTYPE.—G. LANGTON asks: "Would you be good enough to inform me (1) What proportion of liver of sulphide is required to 'throw down' the residue of 'hypo' which has been used for prints? Also, what is the tests used to ascertain when the operation is complete? (2) Recently, while developing platinums with the cold-bath process, and working exactly as usual, immediately on floating a print, a dark-coloured discharge came from it. This happened to each print, but does not appear to have had any subsequent effect upon them."—In reply: (1) The quantity of sulphide required is, of course, dependent upon the quantity of silver the solution contains. The test is when no more silver is thrown down on a further addition of the sulphide. (2) We think that some extraneous matter must be present in the developer or on the surface of the paper. But the mere statement of "a dark-coloured discharge" is not sufficient data to form a definite opinion as to what it was, if you were working exactly as usual.

BRITISH ASSOCIATION GEOLOGICAL PHOTOGRAPHS.—Probably no instrument—not including the bicycle—has more facilitated the labours of the geologist than the photographic camera, which has for some time past become almost as necessary a part of his outfit as the indispensable hammer. Professional and amateur workers alike carry it, and photographs of geological features do increasingly abound. This was already true in 1888, when the happy idea occurred to Mr. Osmund W. Jeffs of forming a public collection of geological photographs, which should be lodged in some central and readily accessible place. As he rightly pointed out, "photographic records of sections and other geological features . . . are not only invaluable aids to geological instruction, but serve also to preserve for future reference the details of many exposures of strata and other landscape features, which in course of time . . . are in danger of becoming obliterated." At Mr. Jeffs's suggestion, a Committee of the British Association was appointed at the Bath meeting, charged with the duty of obtaining geological photographs, which were to be duly preserved, catalogued, dated and described. The Committee commenced its labours by inviting contributions from all British geologists, and its appeal met with a most generous response. Photographs at once began to flow in, and have continued to do so ever since, so that a vast mass of valuable material is now accumulated in the Museum of Geology, Jermyn Street, which was selected as the home of the collection. The usefulness of the collection has now been largely increased by the action of the Committee in resolving to publish a selected number of its best photographs, and geologists are greatly indebted to the secretary of the Committee, Prof. W. W. Watts, for the admirable manner in which he has carried this resolution into effect. The success of his efforts is witnessed by the first issue, now before us. It comprises twenty-two photographs, contained in a neat portfolio case; each is accompanied by descriptive leterpress, the date when it was taken, and the name of the photographer. The descriptions are terse and to the point, as might be expected when it is added that they are all contributed by well-known geologists; among others, we notice the names of Sir Archibald Geikie, Prof. Bonney, Mr. J. E. Marr and Prof. Watts himself. To show how thoughtfully even smaller matters have been attended to, we may point out that a duplicate copy of the letterpress is provided, printed on one side of the paper only, and gummed on the other, so that when mounted each photograph may bear its own description secured to it. Further, in addition to the paper prints, which are platinotype and therefore permanent, there is another issue in the form of lantern slides, which should prove of great value in the lecture room. The issue is the first of three, the second of which may be expected to appear before the end of the current year. The price of these photographs is so small that they are sure to be much used in museums, colleges, and schools for teaching purposes. The subscription list is nominally closed, but we understand that subscribers will still be admitted on the original terms until the end of November. In congratulating the Committee of the British Association and its secretary on this admirable piece of work, the hope may be expressed that now the way has been shown, foreign societies, if they have not already done so, may follow suit; the subject is one that might well be brought before the notice of the International Geological Congress at its meeting next year in Vienna.—"Nature."

TRICHROMATICS ON PAPER.—In view of the interest excited by the various announcements that have been made with regard to the adaptation of trichromatics to the production of paper prints, our readers will no doubt be interested to learn that shortly before this number of the JOURNAL went to press, some interesting specimens by a modified process were placed before us. These we examined with very great interest. The subjects were fruit studies and a copy of a painting; and a careful scrutiny of the colours satisfied us that the process constitutes a great advance on anything of the kind that has hitherto been placed before us. We are not at liberty to divulge details of the manipulations of this modified system, but it has evidently reduced colour photography on paper to such a simple form that it is placed within the capacity of all photographers to successfully practice. We may say that this trichromatic paper process has been worked out in the laboratories of the Lumière North American Company.

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EX CATHEDRA.

Novel Method of Remedying Coloured Fringes in Telescopic Images. Mr. T. Thorp, famous for his diffraction gratings, has recently described in the "English Mechanic," an ingenious, simple, and novel method of attaining this object. He says "It may not be generally known that the coloured fringes to telescopic objects due to atmospheric refraction, and which so greatly affect definition, may be got rid of in a very simple manner, although in this case again, the device is only a makeshift. . . . All one has to do is to bring, in front of the eye-lens, another lens, say of 6-in. focus (a spectacle lens either convex or concave will do very well), and re-focus. Upon now moving this lens across the eye-lens a point will be found where the chromatic aberration has entirely vanished."

* * *

Photographs in Law Suits. Some judges have refused to receive photographic portraits as evidence of identity, and rightly too, in some instances. In the evidence in a sensational divorce suit a photograph was, last week, shown to one of the witnesses, and the learned judge asked to see it, with these remarks: "I ask to see it because I often find photographs are a very slight representation of the person concerned." The learned judge was quite right in his remark. Many portraits are but a slight resemblance to the persons depicted, but where does the fault lie? certainly not in the photograph pure and simple. Photographers have to please their sitters, and have to look to the "bread and butter" side of photography, and, as a rule, the more they flatter their sitters the better are they pleased with their portraits, although the likeness may, and often does, suffer. Retouching, particularly bad retouching, has done much, it must be confessed, to throw doubt on the veracity of photography. An anecdote occurs to us of a Chinese artist who was called upon to paint a miniature of an English lady, and he, with the idea of pleasing, blandly asked the lady in the best English he could command: "Ladee likee likee, or likee prettee?" Most photographers need not put this honest Chinaman's query, for they assume what the answer would be if they did, and act accordingly.

* * *

Pure Anhydrous Peroxide of Hydrogen. Peroxide of Hydrogen, though not a common occupant of the photographic laboratory shelves, has yet a distinct place in photography. Among other things it has been recommended as a hypo-eliminator, but its price has been against its use for that purpose, if indeed, a hypo-eliminator is any use at all. Hitherto it has been sold in 10 volume and 20 volume and 30 per cent. strength, and not stronger. A communication, however, has been made to a foreign technical journal by Wilhelm Stadel, to the effect that he has succeeded in making the chemical in a crystallised form at a low temperature, when, of course, it is evident that melting of the crystals should give a very pure sample. Herr Stadel finds that, contrary to recent assertions, peroxide of hydrogen readily crystallises and in a very distinct manner. He first obtains solid crystals of the chemical and then drops a small portion into a strong solution—at 8° or 10°—how prepared he does not say, but this communication was only of a preliminary nature, and immediately the whole mass is permeated with crystals. Repeating this process with these crystals obtained from another liquor and re-melted he obtained peroxide of hydrogen free from water. It will be interesting to await further developments with details of cost, etc.

* * *

Electrical Thermometers. An article in the "Chemical News" last week shadows forth a far-reaching improvement in the means of measuring temperatures.

Mercurial thermometers of great accuracy are obtainable almost anywhere and at a low cost, and there is no reason why every photographer should not have one in the various apartments he uses. Certainly one each in his dark room, his studio, and his printing rooms; and, indeed, wherever the temperature is subject to fluctuations a thermometer is a most useful aid to his work. But if a busy man had these views presented to him he would probably reply, "I trust to my operator, or my printer, to see that things are comfortable, I can't go running about the place looking after thermometers," and so on. But the new plan would prevent the possibility of such a reply. The Cambridge Scientific Instrument Company working upon the lines of electrical thermometers devised by Professor H. L. Callendar, and Dr. E. H. Griffiths, and endeavouring to render them capable of withstanding the rough treatment of commercial work without sacrificing their well-known scientific accuracy, have succeeded in producing thermometers fulfilling all these requirements, and not only these but others of a startling character. These new electrical thermometers are of two kinds, the second the thermo-electrical, being most germane to our remarks. These may be placed almost anywhere, and in positions where it would be absolutely impossible to use or read a mercurial one, and any one might sit on his office stool and by means of a switchboard can read on the indicator in front of him the temperature of any one or a number of the thermo-electric thermometers about his premises. Various other advantages possessed by these instruments are set forth in the "Chronicle News" as follows: "They can be used for the measurement of very high or very low temperatures, their indications can be read at a considerable distance without appreciable error. In conjunction with a Callendar recorder they will give a complete record of the temperature for a day or a week." Judging from mere description we should say the new instrument promises to be epoch making as regards temperature indicators.

* * *

Pyro Redivivus. Pyro was for so many years the standard developer for professional work that many an old worker notwithstanding the introduction of the newer developers, still swears by his own particular formula. The discovery of the use of amidoacetate of soda and the improved action of pyro, will, though at present unconfirmed, have therefore rejoiced the hearts of these old conservative workers, and now Professor Valenta, of Vienna, announces in the current number of the "Photographische Correspondenz," yet another fact in connection with pyro, which may possibly induce many who have abandoned its use to again revert to it. In early dry-plate days plain pyro-ammonia with bromide was the accepted best form of using this reagent, and then probably due to the inconstant strength of the ammonia solution and the smell which was said to be extremely unpleasant in its action on some people, the fixed alkalies gradually came into favour, and in amateur circles the use of Beach's developer was so great that one journal had a standing announcement that the formula for the same would be found on certain pages. With the use of the fixed alkalies, increasing quantities of sulphite were taken, and finally, pyro-soda without bromide was widely adopted as a standard developer for plate speed testing and other experiments. The use of caustic alkalies was never general, for their action on the skin and the gelatine were not beneficial, and even with sodium sulphite the developer could not be used for more than one or two plates, rarely more than one, because of the deep stain produced by the oxidation of the pyro. Valenta points out that pyrogallol is a triatomic phenol of the formula

$$C_6H_3\begin{matrix}OH\\OH\\OH\end{matrix}$$

and that in the presence of excess of caustic alkali, the hydrogen atom of each hydroxyl group OH, can be replaced by one of the fixed alkalies, sodium, potassium, or lithium, and the formula would therefore be

$$C_6H_3\begin{matrix}ONa\text{ or }K\text{ or }Li\\ONa\text{ or }K\text{ or }Li\\ONa\text{ or }K\text{ or }Li\end{matrix}$$

alkali be added to saturate one or two of these hydroxyl groups, we may have mono—or di-phenolates or pyrogallol, as in the formula

$$C_6H_3\begin{matrix}OH\\OH\\ONa\text{ or }K\text{ or }Li\end{matrix}$$

and

$$C_6H_3\begin{matrix}OH\\ONa\text{ or }K\text{ or }Li\\ONa\text{ or }K\text{ or }Li.\end{matrix}$$

He therefore made a series of experiments and found that the sodium and potassium monophenolates of pyrogallol gave developers, which were $3\frac{1}{3}$ and $3\frac{2}{3}$ respectively more rapid than a normal pyro-soda, and further, that the solution remained colourless, so that three negatives could be successively developed in the same solution without any loss of gradation, and without any staining, the developer being far more like one of the newer developers than a normal pyro developer. The actual formula used was as follows:—Stock solutions: A., crystallised sodium sulphite, 160g.; pyrogallol, 25g.; water, to 1,000c.c. B., caustic potash, 11.5g., or caustic soda, 8g; water, to 1,000c.c. For use, mix 1 part of A, 1 part of B., and add 1 part of water.

* * *

Suburban London. It is an idiosyncrasy of our human nature that we should pass over the attractions which may be found in our immediate vicinity, in our endeavour to seek imaginary ones at a distance. The country at the other side of the hill is, to us, although we know little or nothing of it, a land of promise which must be visited. This was the text of a pleasant discourse by Mr. Henry Davis last week at the Camera Club, who illustrated his remarks with a variety of photographs taken on the borderland of the Metropolis, a veritable *terra incognita* to most of his hearers. He pleaded for a little more photographic recognition of the various outlying villages, some of them possessing features of no small artistic value, and he pointed out that in those places adjacent to the metropolis no time should be lost in taking a camera there, for the jerry builder is at work, and is fast doing his best to extinguish all relics of the past sleepy-hollow kind of life, and to replace them by buildings with all the advantages of modern sanitation, and as ugly as sin. That some picturesqueness still hangs about these outskirts of our teeming city, Mr. Davis proved by the exhibition of a number of pictures, taken chiefly in the North-west of the metropolis, and he expressed the hope that others would find an opportunity to go to similar places and secure photographic records of suburban London before the country undergoes a complete change. What would we not give now to have photographs, had such

pictures been possible, of Islington when it was a village quite detached from London; of Marylebone, when it was surrounded by fields, or of Primrose Hill, when it justified its name? In the same way a few decades hence people will value pictures of places which have now a rural character, but will then be the centre of a brick-bound population. Most of the photographs illustrating lectures at the Camera Club, complained the speaker, were of places abroad, and the members were too fond, he thought, of leaving the beauties of their own country undiscovered, because unsought for. There is, of course, a good deal to be said on the other side. A man, most of whose time is spent in the pursuit of his business, or profession, is anxious, when holiday time comes round, to go somewhere which presents such a thorough change of scene, of people, and even of language, that he is for a time in a new world, where manners and customs, and even eatables and drinkables, are different to what he is accustomed to. All this means a change of ideas, and the mind is refreshed at the same time that the body gains health. Such benefits could hardly accrue to the man who contented himself with a holiday in the home counties. Still, we sympathise with the aims of Mr. Davis, and think that when opportunity presents itself for a day's, or perhaps two or three day's, outing, a most enjoyable time might be spent, and useful work prosecuted in carrying a camera round suburban London. Although he confined his attentions almost exclusively to the north and west of the metropolis, there is a fine field for photographic work in the south, especially if the camera bearer extends his walks far into Surrey. It is, as he reminded his hearers, often a case of "Eyes and no eyes"; one man will see and garner much, while another with better opprtunities will reap little.

* * *

Daylight Deveiopment. A few weeks ago we were invited to witness the demonstration of a photographic process, the nature of which was not stated, but we were told that it was associated with a discovery that would work a revolution in the method of negative production, and that it represented generally one of the greatest advances in photographic procedure, which had been brought forward for many years. We were further told that this mysterious process had been highly extolled by some of the first experts in Germany, and that it had already been protected by patents in all countries. Full of anticipations as to what this wonderful thing might be, anticipations which, we must confess, were tempered by a few years' experience of, so-called, secret processes, we went to the rendezvous named in the letter of invitation, and witnessed the demonstration. A plate was exposed in a camera, in a special form of single back; this back was held over a dish of exactly the same size, a spring was touched, and the plate dropped into a bath of dark coloured liquid. In this bath the film was stained a dark red, an operation which occupied about a miute, when it was transferred to the developing dish, the whole of these manipulations being conducted in daylight. In a word, the much vaunted process was a method of developing plates in ordinary light. Upon being asked to give a candid opinion of the process, we were constrained to say that there was no novelty in it, and nothing, in our opinion, that would warrant its protection by patent. Moreover, we were able to refer its promoters to a little pamphlet published more than twenty years ago, by Mr. Morgan, of Greenwich, before he went into partnership with Mr. Kidd, and started the well-known works at Richmond, in which a somewhat similar, but more simple, process was described. In this old method the exposed plate was dipped in water, and then plunged in a developing bath of ferrous oxalate, covered with a layer of paraffin, to preserve it from the action of the air, the red colour of the developer permitting the dish to be carried into unfiltered daylight, and that the progress of development might be watched without the usual restrictions of the dark room. Now, if there had been any notable advantage in this method of procedure we may be quite sure that it would have been improved and generally adopted years ago. But, as a matter of fact, it is easier to develop a plate with one of the almost water-white developers in common use, by the liberal light allowed in a properly furnished dark room, than it is to watch its progress through a necessarily dark dye. We were requested not to make public any details of the recent German experiments, but as we see that the matter has already found its way into print, in last Friday's "Westminster Gazette," the seal of secrecy is removed, and we publish this short account of the process as a specimen of a novelty which is not new.

* * *

Pictures by Telegraph. It is to be hoped that the Bill for the amendment of the law relating to patents, which is now before Parliament, will pass, for it provides for an official search of existing specifications, which will for the future prevent the same idea being protected (?) over and over again. The system has been proved to work well in America and other countries, and it has been long needed here. As an instance of the way in which time and money have been wasted in the past by inventors following the same path, we might instance the many contrivances which have been produced for the transmission of pictures by telegraph. Three of these inventions will be sufficient for our purpose. The first was Bakewell's, in which the message, or picture, was drawn in resinous ink on tinfoil, the tinfoil being afterwards attached to a cylinder, which, as it rotated, was touched by a stylus attached to a screw, like the tool-holder of a screw-cutting lathe. This stylus would therefore traverse every part of the foil as the cylinder turned. A similar cylinder at the receiving end of the circuit was covered by a chemically prepared paper, also touched by a stylus in the same way as the transmitting cylinder, and so long as an electric current flowed through the point it would make a stain on the prepared paper. But when the current was broken by the resinous ink on the tinfoil at the transmitting station, no mark was made. The resulting picture, therefore, was a kind of negative image, white on a background of coloured lines. This telegraph of Bakewell's was invented in 1850, and it found many imitators. The best of these was the apparatus of d'Arlincourt, and here again we have pictures produced in parallel lines, by means of the interruptions caused by the introduction of a non-conducting substance. This invention appeared, if we remember rightly, in 1880—or thereabouts. We now find illustrated, in a recent number of the "Scientific American," what is described as an improved electrograph, which really differs little in principle from Bakewell's contrivance of more than half a century back, although its performance is certainly better, judging from the specimens shown. In this case the transmitting agent consists of a zinc plate, bearing a photographic image, the shadows of the picture being filled in with an insulating compound. This plate is bent, so as to fit upon a cylinder, where it is traversed by a stylus. At the receiving end is a cylinder covered with paper, upon which acts a drawing pen, the pen being lifted from the paper by the passage of the stylus over the insulating material

at the other end of the line. The speed at which a picture can be "wired" by this means is about the same as that involved in telegraphing words which would cover, when in type, the same space. The result is a line drawing, which can very quickly be turned into a printing block. But, granting that the apparatus works well, of what use is it? In these days a block can be duplicated and sent from place to place very quickly, and a big business is done in stereotypes and electros. Would this telegraphing of pictures help in such a business? We think not, for if the demand had existed we may feel quite sure that Bakewell's telegraph, which showed so suggestively how the thing might be done, would long ago have been at work producing such pictures. It is sad to see so much ingenuity exercised in vain, and the new provisions of the patent law will help to cure the evil.

* * *

A Novel Bath.

It has often occurred to us, when listening to a lecture by a traveller, that some of the most interesting items are left to verbal description only, pictorial illustration being conspicuous by its absence. Very often an excuse is made that that particular negative went wrong, or, unfortunately, it was a very wet day, or something else happened to prevent a photograph being taken. There was an instance of the kind in the course of Mr. Cutliffe Hyne's lecture, at the Camera Club last week, on "Arctic Lapland," the lecturer having been one of the very few people who have carried a camera into that inhospitable region. He describes the peculiar way in which the Lapps cleanse themselves, and a few photographs of the operations would have been most interesting. Possibly he took pictures, and did not like to show them, forgetful of the national motto, "Honi soit," etc. At any rate, his hearers had to content themselves with a verbal description, which perhaps would have been thought rather exaggerated had there not been other travellers to corroborate him. Sophus Tromholt, for one, the man whom we believe was the very first to introduce photography to the Lapps, gives a full description of the process—but even he, amid a host of other pictures, does not give any of this particular function, which has a strange similitude to the Turkish bath, as known to Europeans. There is a common bath room, known as the Savna, attached to every farm, and every Saturday this bathroom is used by the whole family, the servants of the farm, and any visitors desirous of joining. A beehive arrangement of bricks, or stones, in the middle of the room, has a fire lighted within it, and when the stones are red hot water is poured on them, so as to fill the place with steam. Then the bathers, of both sexes, and all ages, in the primitive costume of our first parents, proceed to the Savna—although the temperature may be many degrees below zero, and disport themselves round the hot stones, and belabour each other with birch twigs, until they are all in a profuse state of perspiration. Then they go outside, roll in the snow, and finally betake themselves homeward in the same "clothing" in which they came. If the scene in the hot chamber were not photographable, the final roll in the snow would, at any rate, have made an amusing picture. Some will possibly remember the sketch in "Punch," by the late Mr. du Maurier, in which couple of men were shown, stewing in a hot room of a Turkish bath. One was giving a dinner invitation to the other, with the words, "No ceremony, come just as you are." So that we really have a good precedent for the picture we are suggesting. A series of photographic illustrations of bathing customs all the world over would, if such a collection could be made, be of very great interest. We have seen pictures of the natives indulging in "mixed bathing" in the hot springs of New Zealand, and have also been shown similar pictures of the public baths at Japan. But the land of the chrysanthemum is becoming far too modern in its ideas for these old customs to remain long. Even already in some places the edict has gone forth that the sexes should be separated whilst bathing, the separation being carried out by stretching a piece of string across the surface of the water. Before such customs entirely disappear every opportunity should be seized to obtain photographic records of them. Had photographs been possible in the past, the contemptuous term, "Traveller's tales," would never have been invented, and the "Adventures of Baron Munchausen," which was written in order to cover travellers with ridicule, would have lost its point. The camera stands as sponsor for the tales told by modern travellers, and no man can impeach its evidence.

PHOTOGRAPHERS' WINTER TROUBLES.

When writing, a fortnight back, on some of the troubles that photographers meet with, just as a sudden snap of cold weather sets in, we alluded more particularly to such as were also unsuspected. There is another trouble that is often met with. It is one that is at once palpable, though often not readily overcome, namely a frozen water supply, although, in most instances, it might easily have been avoided had a few timely precautions been taken. The inconvenience caused by the water supply being stopped is always great, but it is sometimes added to in the shape of burst pipes, flooded rooms, damaged ceilings, etc., when the thaw sets in. In nine cases out of ten, these troubles would not have arisen had a little care been taken at the advent of the cold weather. At most ironmongers there is now sold a material, "hair felt," three or four thicknesses of which, if bound round or nailed over exposed pipes will prevent their freezing; so will the straw bands with which trusses of hay are secured. When the supply pipe from the street main to the house is laid near the surface, as is too often the case, it will require protection. If, say, six inches of stable manure be laid on the ground above, and well trodden down, that portion of the pipe will be well protected. When these precautions have been taken, if the taps at night be left just dribbling, there will be little risk of a frozen water supply. Of course, the water companies will not approve of this latter procedure, unless indeed, the water is supplied by meter, but we suspect they do not always know what takes place in photographic establishments? Should, however, timely precaution not have been taken, and the pipes get frozen, the next thing is to avert further trouble, such as would arise from burst pipes. The pipes, when they are found to be frozen, should be examined throughout their length to see if they have burst anywhere. That is easily seen by the pipe being swollen at that point, caused by the expansion of the water at the time of freezing, and the aid of a plumber should be sought without delay and the fracture repaired. The services of the plumber can be more easily obtained while the frost lasts than when the thaw sets in—then so many are requisitioning his aid. If, however, a burst pipe is not discovered until its presence is made painfully manifest, and the place is being flooded with water, the best and the quickest way of dealing with it is to with a hammer batter up the pipe a few inches from the fracture. This, of course,

entails the plumber having to make two joints instead of one; but the little extra cost it involves is more than compensated for in saving damaged ceilings, soaked walls and floors, that may take even months to dry. When the working supply of water is taken from a cistern the pipes, if they are much exposed, may freeze. This may be avoided if the precaution is taken to empty them when the day's work is done—as they never freeze while the water is continually being used. The most convenient arrangement for doing this is to have a cock fixed just below the cistern and, below that, a small air cock, then, when the former is shut off, and the latter opened, and all the taps are left open, the pipes will be emptied, and there will be nothing in them to freeze. An extemporised arrangement that fulfils the same end, may be made in this way—get a piece of gas pipe, say "iron barrel," smaller than the outlet from the cistern, and a few inches larger than its depth. Next wind some rag round the end, and plug the pipe with it; then, if the lower taps are opened, the pipes will be emptied by reason of the air admitted by the plugging pipe.

SNOW.

Snow has an attraction to most people. The first fall of the light swirling flakes begets an agreeable feeling whether the observer sees them against a dead wall twenty feet distant through the office window, against the cathedral across the Close through an oriel window, or with tall elms as a background through the leaded panes of an old farmhouse window. The pleasure is characterised by a sense of vagueness due to the factors that generate it. The multitudinous moving flakes produce a soothing physical effect. The eye gives up as vain its usual effort to determine size and position, the optic nerve drifts into a kind of quiescent, mesmeric condition, and the brain as a whole accepts with relief the resulting temporary reduction of demand in attention and action upon it. When the snow has fallen and lies a white carpet upon the ground, the eye, and through it the mind, still experiences a holiday feeling of relief in the lack of need for taking in the usual petty detail of the face of the world. A man's thoughts take a broader cast when looking out over a snowy landscape than over the sweetest summer scene. The same is the case in looking out over broad reaches of sand, and for the same reason, there is no distraction due to a sub-conscious recognition of detail. This quality being physical, and acting unconsciously, is responded to by all men. Other factors, such as the comparative unusualness of snow, its suggestion of purity, and the alteration it produces in the appearance of a landscape, appeal with more or less force according to peculiarities of temperament and training. But it can be safely stated as a broad fact, that snow, at its first appearance anyway, is pleasing and suggestive. The former quality should be sufficient to determine the taking of a picture, and the latter its kind.

From a technical point of view there is no reason why a photograph of snow, even on a dull day, should not prove a success. Using a landscape lens, four seconds exposure, at F/16, upon a rustic gate in a country lane on a dull November day, with the snow falling fast, gave a capital result. The tendency is to be deceived by the prevailing whiteness and under expose. The light shading on the surface of the snow that indicates form and contour is what should be aimed at, and this needs a fairly long exposure. Otherwise the picture is certain to be flat and expressionless. A slight over exposure is less important in a snow scene than under normal conditions. But there is less risk of failure on the technical side than in the selection of the best type of picture. In determining the latter an important consideration to be borne in mind is, that if snow is itself vaguely suggestive, the picture should tend to produce the same effect. It would, for instance, be better vignetted gently off than square sided. Indeed it is extremely difficult to gain a snow picture to fill in the full, orthodox demands of "a picture." The detail that is so valuable in ordinary composition is absent. We grumble, it is true, at its excess ordinarily, but anyone who has tried to compose a picture on his screen with snow well on the ground will be ready to admit that it is better to have over much detail than none at all. Blank white spaces do not make effective elements in pictures, and it is not snow, as snow that we need so much, as snow in its modifying effects upon ordinary scenes and life. The usual way out of the difficulty is to take a scene after a fall light enough to have reduced, but not altogether obliterated, detail. This is very well as far as it goes, but it is not often practicable to be on hand at the right time. Snow does not give notice of its exact time of coming, and bread and cheese must be worked for, snow or no snow. Even if successfully taken, the result is apt to show too clearly the conditions under which it was gained. It looks what it was, a sprinkling of snow, and not "snow." The only way out of the difficulty, and it is a good one, is not to aim at a picture, but a scrap in which there is no doubt as to the amount of snow, and which in its frankly acknowledged incompleteness as a picture, allows the imagination to fill in the full scene for itself. The porch with a figure warmly clad coming out will do, so will the waggon or market cart, with their wheel tracks in the lane, the cathedral tower, or the elms—preferably from a distance with a telephoto lens. However heavy the fall may have been, there are always objects, a steep-pitched pinnacle or roof, tree trunks, rails of gates, and so on, on which snow cannot lodge to the extent of full obliteration. The darker bit of detail is what is needed to give contrast, and that touch of crispness instinctively craved for where all lines and contours are so soft, wavy and fleecy. The subject will naturally vary in different parts of the country, for each has its own peculiar winter scene, as characteristic under snow as without it. The typical should always be selected, and treated less as a formal orthodox picture than a soft, sketchy suggestion of a piece with the evanescent character of snow. One drawback to any extended taking of snow scenes, beyond the slight physical discomfort of the actual work, is the chilly suggestion they give. In our country and climate suggestions of warmth and sunshine are most humanly attractive and agreeable. Snow scenes would be more effective, psychologically, hung upon the walls of a bungalow in the tropics. Still, apart from merits in such other directions as those already touched upon, there are occasionally piping hot days in an English summer when the coming suddenly across a good snow scene in turning over the leaves of an album, gives a strong feeling of pleasure in its grateful suggestion of coolness. The philosophic worker should hold himself ready for the opportunities—probably not far distant at this time of the year—for gaining the material for such pleasure. He will gain more out of photography, and help to lighten the dullest season of the year in so doing. It is far better than following the usual plan of

laying by the camera in the late autumn until the following spring. Life is short, and its pleasures should be heightened and increased as much as possible. Catching artistic suggestions of the fleeting beauties of snow is one means to that desirable end.

PHOTOGRAPHERS AND APPRENTICES.

PHOTOGRAPHERS who take apprentices are under more obligations to them than many seem to be aware of. A case bearing on this point was reported in our columns a few weeks back. Briefly, the case, as stated in the report, was to recover the sum of £50 on behalf of each of two apprentices for alleged breach of contract to teach them the art of photography, and for the indentures to be cancelled. It appeared, from the evidence, that the defendant sold his business at Gloucester and went to Newquay without making any arrangement for his apprentices. This, however, was confuted, by the defendant, in our next issue, for he there says that "I arranged for their transfer to my successors before completing any agreement." In the end, however, judgment was given for the plaintiffs for £25 in one case, and £15 in the other, each with costs, and the indentures were to be cancelled. Now this case illustrates more than one interesting point in connection with those who take apprentices with premiums, and also to those who apprentice them. One is this. When a heavy premium, or a premium at all, is paid to an experienced, and say a well-known, photographer, to teach an apprentice his trade, and he sells his business to a less skilful man, and possibly one less known, is he fulfilling his undertaking when he transfers the apprentice to his successor? Higher premiums are paid to high-class photographers than to those of lesser status; therefore, is it fair to the apprentices to transfer them to others—or to expect them to go a hundred miles or more, from the place, or the establishment to which they were bound apprentices?

The object with some photographers seems to be to obtain a premium, or the services of apprentices at a nominal rate for a term of years, rather than to teach them their trade. We have frequently received letters from apprentices, when out of their time, complaining that they have been taught nothing practically, of studio work, and asking how they can acquire knowledge in that direction. Now, such cases should not arise, neither would they if the master had fulfilled his contract namely, to teach the apprentice his trade, or at least so far as he was capable of doing so; for it should be borne in mind that there are some who are carrying on business who know very little indeed of it themselves — either theoretically or practically — sometimes nothing at all, but are simply carrying on the business through a manager or operator. Such men, it is obvious, are quite incapable of teaching apprentices their trade, though according to the indentures, they undertake to do so. Therefore it behoves parents or guardians to satisfy themselves as to the ability of those to whom they bind their charges to fulfil their part of the contract —willing as they may be to do so. We are sometimes asked by parents what is a fair premium to be paid in the apprenticin of a youth to be taught the trade of a photographer. This is a difficult question to answer, seeing that all will depend upon the status and class of business carried on by the master. It is manifest that in a high-class business, with a *recherche clientèle*, a much higher premium is demanded—and is well given—than in a second or third-rate one. However, whatever class business it may be, the owner of it is bound to teach his apprentices their trade, and if he fails to do so, the law will give redress, and this must be kept in mind by all who take apprentices.

ON THINGS IN GENERAL.

The question of the possible connection between photography and fine art is, like the poor, "always with us," and though it is late in the day to refer to it, it is worth while saying a few words regarding the utterances of the *Daily Mail* on this burning topic. Now, although it is impossible to argue with any prospect of satisfaction upon any thesis whatever without the admission of some postulates, or the adhesion to some axioms, yet it is usually the case when this eternal subject comes into prominence that each disputant either argues in a circle, begs the question, or propounds a theory of his own, generally illogical, and often too amusing to be taken seriously. The *Daily Mail* critic's dicta will be classed by any well-balanced mind under the latter heading. He founds his argument on an imaginary principle which he, in the usual manner, proceeds to demolish. Here are his words: "Not even an indignant enthusiast like Mr. Ball will maintain that the camera can idealise." Did ever any one credit the camera with that gift of the gods—imagination? Great Britain is the home of the highest class of camera making, and I have seen some of its finest examples, yet never one that had any imagination worth speaking of, though I have met many camera owners with very exalted, not to say vivid, imaginations, most frequently exercised, perhaps, in their accounts of the number of first-class negatives they obtained from a given number of plates, a proportion frequently figuring out at ninety-nine and a fraction per cent. The *Daily Mail* critic will, perhaps, argue that this is mere trifling, so I will shift my ground and speak of artistic imagination, and not of fish stories. There, I have done it—"artistic imagination"—at the outset I use a debatable term. Let us for once try to set out our premises with precision. Who shall be our authority? The "New English Dictionary" will be accepted, perhaps, as the highest possible work of reference, for upon a question of meanings, as of spellings, a dictionary cannot be termed an authority—it is merely a mirror in which are reflected the practice and the etymological usage of eminent men whom all would recognise as authorities. Under the word "Art" we find, in paragraph 6: "The application of skill to the arts of imitation and design, painting, engraving, sculpture, architecture; the cultivation of these in its principles, practice, and results; the skilful production of the beautiful in visible forms. This is the most usual modern sense of 'art' when used without any qualification. It does not occur in any English Dictionary before 1880, and seems to have been chiefly used by painters, and writers upon painting until the present" (the nineteenth) "century." Mr. Gladstone is quoted: "By the term Art, I understand the production of beauty in material forms palpable; whether associated with industrial forms or not." So far we are on sure ground: a photograph may be capable of classification under any of these descriptions. But, it may be argued, it is "Fine Art," not "Art," that is in question. Let us turn over the page and see what is said in this direction: "Fine arts, those in which the mind and imagination are chiefly concerned." The most apt of the quotations under this heading is that of Ruskin, who, writing in 1854, in his "Two Paths," says: "Fine art is that in which the hand, the head, and the heart of man go together." Can any one not blinded by partisanship or polemical obliquity

deny the possibility of producing by purely photographic processes results in which evidence of hand, heart, and head working together are shown? The strongest argument ever employed in this connection is that photographs are mechanical. True, many are; but it could not be gainsaid that if, say, the President of the Royal Academy were an expert mechanical user of a camera, he could put into a purely photographic print enough of his heart, head, and hand to differentiate his photograph entirely from the work of a mere mechanic. There have been photographs produced which, apart from mere questions of imitative technique, no one could say were not reproductions of paintings, so much did they appeal to the imagination and the idealisation of form or beauty. But—and here is the true crux of the whole question—such works are the exception, and the most powerful exponent of Fine Art requirements has never got beyond the point of differentiating photography and Fine Art merely by the tools used in each style of work. Put in their baldest form, such arguments approaching those of *Daily Mail* critic may be expressed thus: "A painting is a work of Fine Art because pigments and brush are used; a photograph is not a work of Fine Art because a camera is used, and a camera cannot think." Can a brush and palette think? Is the Bear's Paw or the Bull's Head that attracts the wayfarer with alcoholic thirst a work of Fine Art? The possibilities in this direction are extremely limited; but the argument has not yet been penned which logically proves that a photograph can never be a work of Fine Art, which is very different from claiming that it is necessarily such.

The true artist is supposed to disdain such sordid considerations as filthy lucre, hence a leaning towards the pecuniary aspect of his work might, on *a priori* grounds, incline the purist to deny the application of this much-abused term to the protégés of Mr. Hector Maclean, who, writing in the *Morning Post*, paints such a glowing picture of the commercial possibilities of photography, as will arouse the envy of nearly every trade in the country. His statements are quoted in THE BRITISH JOURNAL OF PHOTOGRAPHY for November 21st, and some of them I here reproduce: "...the comparative affluence to which a very large number of humble, or not well-to-do individuals have attained through joining local photographic societies. I could mention one instance of a gentleman now receiving a 'four-figure' income entirely through taking up amateur photography and attending photographic societies' meetings. The number of those who, through similar means, have risen from positions of a few shillings a week to distinguished appointments of from £500 to £1,000 per annum are too numerous to mention." Talleyrand said that words were given us to conceal our thoughts, and truly Mr. Maclean's words must have been employed with a similar object, for, taking what he says in the ordinary significance of English words, no other criticism would fit them better than that of the Hibernian who said of a tale of similar truthfulness: "If you had been living in the time of Ananias and Sapphira you would have been dead now." A new novel by a great politician and successful novelist, many years ago, was brutally likened by one of the leading magazines of the day to the "gin-inspired dreams of a barber's apprentice." I don't wish to suggest any such crapulous condition in Mr. Maclean's case, but I do think a doctor should be called in.

The accounts of the doings of the Professional Photographers' Association, as published from time to time, are very satisfactory reading, and show that real substantial work is being done by its committees at its various centres. Take the question of Fire Insurance alone; it has brought home to photographers the fact that the sums that some of them have been paying are simply outrageous. I don't quite like the idea of the Fine Art Insurance Society's way of doing business: it is perilously akin to the one practice of all others that has been, and is, the bane of the photographer's existence—cutting prices. There is a certain foreign firm in London whose traveller would come round and ask for orders for, among other things, nitrate of silver. "What is your price?" "Oh, half-penny an ounce under anybody else." However, this is by the way, and the fact remains that the Society is a power, and a growing power. I have not often read a more eloquent and stirring letter than that given in these pages last week from Mr. Turner to the Liverpool branch. These various branches are doing much to break down the barriers of masked or open hostility that unfortunately too often, indeed, almost invariably, characterises the attitude of professional photographers to one another. Like the Photographic Convention the Professional Photographers' Association has brought together into amicable relations many worthy men who hitherto entertained for one another sentiments the reverse of amicable. But too many of the successful photographers still hold aloof. whether from pure inertia, or from disinclination to meet some of their professional brethren, it is difficult to say. Sydney Smith spoke in one of his sermons of the class of people who are so sorry for the poor, and "do wish someone would do something for them." And in the same way are depicted in Mr. Turner's letter those "too many good fellows who are writing for something to be done for them by someone else." That is the exact position, and if they are not careful they will be left in the lurch. Professional photography is passing through a great crisis at the present time: with few exceptions the whole country is bitterly complaining of bad business, and I fear it will be worse before it mends, if ever it does. Combination is wanted, and, in his own best interests, I urge every professional photographer to join the Professional Photographers' Association. There is, generally, a funny side to the most serious subject, and to an Englishman a big dinner is always a matter of moment, though, from all accounts, the dinner of the Liverpool Branch of the Professional Photographers' Association was a function very far from serious. I believe it was considered to be about as successful and enjoyable an evening as could be imagined. But that is not the point I was getting at. One of the visitors, or invited guests, in his speech was deploring that he had not been brought up as a photographer, for a reason shortly to be mentioned, because he said he should "keep his hair on." Now, in the face of another portion of Mr. Turner's letter—his unquestionably correct description of photography as "perhaps, the most harassing calling known to modern man," one would scarcely expect such views as those of the visitor. Yet I am credibly informed that of all the photographers present, not far short of fifty, there was not a single one who had not kept his hair on, not a single one who was either bald or showing even a tendency to be a "little thin on the top, sir." Here is a very fertile theme for discussion—why should photographers have such good heads of hair?

There is an excellent paper upon "Microscopic Photography" in last week's JOURNAL, though, by the way, that was not the title the author gave to his subject. Those who have not hitherto done any such work should carefully read this paper; it contains most useful reading, and it emphasises what should be learnt by every beginner in this branch of photography—you cannot get good negatives unless you have good slides to work from. Indeed, if it be required to make enlargements of any popular subject, such for example as that most hackneyed one, "the tongue of a blow-fly," seen in almost every beginner's

collection, it should always be borne in mind that the utmost care should be taken in obtaining or selecting an original of the very highest quality. Another word as to the practical work. Mr. Simmons recommends a piece of black paper to be put into the microscope tube to avoid reflections. If the eye-piece be removed for the work it will be found that unless this provision be made, most of the negatives will be entirely spoiled by fog. This is caused by reflections of the strong beam of light passing through the micro-objective being reflected from the blackened inner surface of the tube. Mr. Simmons recommends this to be got rid of by a piece of black paper being placed in. Now, there is black paper and black paper, and some of it might be no better than the inner surface of the tube itself. The plan I have adopted myself has been to get a piece of thin cardboard of such size that it will roll into a tube capable of passing into the micro tube, and then to paste black velvet on this cardboard and insert it rolled up, velvet side visible, into the microscope. It is surprising to see how great an increase of brilliance will be seen in the negative.

FREE LANCE.

SOME PRINCIPLES OF PAINTING APPLIED TO PHOTOGRAPHY.

[Reprinted from "The Journal of the Camera Club."]

MR. RIMINGTON said he felt in the first place that he ought to make an apology for appearing there at all, as he was not a photographer. He would address the audience only from a painter's standpoint. It seemed to him that photography had invaded largely the fields once occupied almost exclusively by painting, such, for instance, as those of illustration for books, newspapers, and scientific purposes. It was also preparing to attack the ground of colour illustration, for which he was sure there was a great future. He thought painting and photography were more closely allied than some people imagined. Photography was an art and not merely a science. It had been said that a photograph was a raw slice of nature, and a picture was a cooked one, but there was a happy mean between these two extremes, and he thought that some of the principles of composition and selection which assisted painters might be more applicable to photography than had been quite realised. In considering these principles of painting, he would say a few words generally upon how far definite principles might help artistic feeling, in order to explain his position.

There were two great currents in art, one of which tended towards realism and the other towards decorativeness. Forty or fifty years ago there was a great movement towards extreme realism, personified first by the pre-Raphaelite school and others, and a very powerful movement it was. Then came, some ten or fifteen years ago, a reaction towards decorativeness, or, in other words, towards the belief that one of the first essentials for a good picture was that it should be a harmony of colour and an interesting and decorative piece of black and white or line and form. Personally, he thought that the true ideal lay between those two sets of pictorial conditions. It was quite possible for a picture to reproduce nature truthfully, and at the same time to be decorative, though a far easier course for the artist was to abandon the attempt to combine the two qualities and produce a literal and topographical transcript or a mere impressionistic colour and form pattern, with no idea behind it. Unless there was a desire to unite these positions and to use and develop the principles which had been handed down from the past, as well as take advantage of any modern technical methods, art would not advance as rapidly as it otherwise would. He assumed that was the position some of them would like to take up. Those principles to which he referred were in any case derived directly or indirectly from nature. Any principle which had been handed down from the old masters meant their repeated observation and adoption of some striking effect, perhaps some telling contrast, or some delicate harmony of line or form, and its gradual interpretation in the light of some principle. There were many principles which were very broad, and upon which painters were all more or less agreed. If they went to India or Japan or the Far East, where non-European forms of art had been developed, they could still find some of these principles recognised and incorporated in the art of each country. He was quite sure, however, that some present would dissent from his views, and he put them forward with due deference to their opinions.

He would now go on to examine a few of those principles to which he had referred. The first he would take was the very broad one of concentration, or simplicity—familiar enough, no doubt, and apparently rather trite to give so prominent a position to, but it was constantly forgotten or overlooked, and yet it lay at the root of almost all great art. The painter should have one simple aim, one main idea to express, and all else should be more or less subservient to its expression. Turner's "Burial of Wilkie" appealed to one at a first glance, apart from its other fine qualities, by reason of its breadth of aim and composition. As one approached nearer further detail showed itself, and yet the broad main decorative effect was preserved. It would not be very difficult to apply this simple, yet far-reching principle to photography. Many photographs were displeasing because they included too much, and nothing was subordinated to the general effect of the subject as a whole, which was too often frittered away and breadth lost in a crowd of details. A photographer could, however, choose his effect with an eye to breadth and unity, and a good deal could be done in the method of printing in obtaining simplicity and condensation, but it was unnecessary to labour the point. The second set of principles were those referring to line, to which all painters worthy of the name paid great attention, and knew how much depended upon them. Lines, to be harmonious and to be beautiful, must be grouped. If one took a tuft of grass or a group of foliage, one found their lines were usually grouped and harmonious. But if the same tuft of grass were converted into hay, the same line was there, but it was no longer orderly, and would become confused, meaningless, and more or less unpleasant to the eye. In art a very important thing was to have leading lines—lines which led to the picture, which helped the perspective and bound the picture together. Some classes of lines were more beautiful than others. The lines of the figure were almost all lines of low and subtle curvature approaching straight lines; the boughs of trees were also full of lines of mathematical curvature of great beauty. None of these very beautiful lines could be drawn by a compass, and are generally difficult of analysis. In the two Corots he had placed upon the wall, almost all the lines of the tree trunks were very subtle. One would find the same very beautiful character of line in portions of the reproductions of Alma Tadema and Burne-Jones, and in Turner's and Lord Leighton's pictures, which are also hanging there. From the very earliest times, lines of low curvature and belonging to radiative systems had been seized upon by sculptors and artists. In the sculptures of the Parthenon or in the Gothic statues of the Porches of Chartres, radiation played an important part and had been deliberately selected. Drapery arranged in lines which had some tendency to converge towards a point were exceptionally pleasant, and many other instances of beautiful radiative systems would occur to their minds in stone forms, shells, and plants. Now as to the application of

this to photography, which was, perhaps, not very obvious. Supposing a photographer had chosen his subject, the question then arose, where should he place his camera, and upon the choice of position the arrangement of the lines of his picture would largely depend. Suppose he were taking a photograph upon a heath with a road running across it, and he wished to take in the road—t slight movement of the camera will alter the whole position of the road, and the character of the lines of its edges. If he moved his camera a little to the right or left, the lines would be perhaps a little pleasanter, and his knowledge of what constituted good lines would help him. So, too, with regard to his relative position towards stems of trees, palings, margins of a lake or a stream, the contours of a recumbent figure, and so forth. Another set of principles in painting were those concerning quality or texture, which played an enormous part in suggesting substance, form, solidity, transparency, and luminosity. Textures might be classified to a certain extent into those which were granular, linear or fibrous, crystalline or reticulated, and those which were a combination of two or more of these. Texture helped to prevent monotony, to introduce variety, and to express scale. Contrasts and harmonies of texture played a considerable part in good pictures, and it undoubtedly performed a prime function in giving colour its true value in painting. In photography contrasts and harmonies of texture might be made of greater use. A photographer could, by choosing his time and position as regards lighting, degree of moisture, angles of reflection and absorption, modify relative textures more or less in his pictures. If the lighting were at the side of the subject of his photograph, instead of being immediately in front, the apparent texture would be largely increased, if behind it there would be very little texture. Dry and wet objects had more or less texture in many cases, and so forth. Atmosphere also played a large part with regard to texture—if there was much moisture in the air there would be less texture, especially in the case of objects at a distance. There was another very well-known pictorial principle, and that was that of balance. Without any balance at all, no picture was quite satisfactory—the belance need not be very obvious. There was the formal balance of the old masters and the extremely subtle balance of the Japanese. The Japanese were masters of artistic balance, and their decorative use of it was often extremely subtle and difficult to analyse, yet most beautiful, he thought. Turner understood balance in a way which very few people did, and there was a reaction towards more balance in many present-day schools of painting.

Closely associated with balance was the principle of interchange used quite unconsciously very often by the artist as most of those principles were, but often very deliberately carried out with great advantage in what would have been otherwise an unsuccessful picture. In those extraordinary beautiful Rembrandts a small portion of dark carried over into the light increased the luminosity of the light, and a small portion of light carried into the dark made the dark seem deeper and to give harmony to the picture. The lecturer instanced many examples upon the walls.

The next point was "relationship." Painters concentrated their efforts upon obtaining just values and true relationships. It was an absorbing study, and with many a matter of the greatest difficulty. There could, however, be no such thing as absolute truth of relationship and absolute truth of value. Nature had a much longer scale than the painter had. Her darks were far darker than those on his palette, and her lights a thousand times lighter. In order to obtain appearance of true value, the painter had to make adjustments more or less all along the scale. It was impossible to say that such and such a scheme of values was absolutely true. The photographer, it seemed to him, was a good deal at the mercy of his medium, of his sensitised film, and of his system of development, but if he (the photographer) had studied fine pictures, he would be more likely to succeed in getting a suggestion of the truth and beauty of nature than if he had not. After all, in photography, as no value could be nearly right, convention came necessarily more into play, and it became really a question of obtaining pleasing ones and an artistic arrangement of them. Photography was halfway between a pencil sketch and a picture. In photography one had fewer resources than in painting, and had to make the most of them. With regard to both value and breadth, he ventured to touch upon two principles which were more or less recognised by a great number of artists, and which were a great source of beauty both in nature and painting—large masses of darks should be intensified and deepened and broadened, and as the counterpart of what he said just now about interchange, it should be remembered that lights were broadened and intensified and made more luminous by having other lights placed upon them, and *vice versâ*. If one took a picture like "The Fighting Teméraire," of Turner, the lights were placed upon lights, as also in that Watts hung near it. In Rembrandt the principle of dark upon dark and light upon light was carried further than with any other artist, side by side with interchange, and in photography the advantages of this principle might well be borne in mind. In the photograph of a landscape, it very often became a question of whether a dark figure should be placed upon a dark background, or a light figure upon a light background. It would be merely a question of moving the figure to give either increased force in the one case, or increased subtlety and repose in the other. Delicate transition from dark to light was also a great source of beauty—the subtlety depends very much upon the transition from half-tone into light and from the half-darks into dark, and this could be remembered by the photographer in choosing or arranging his subject. The next point he would mention would be that of what for want of a better name he would call essential forms. What struck the eye in a picture very much more than the actual objects depicted were the forms of the colour patches or the shapes of the darks and lights, quite irrespective of what they represented, and upon these really depended the decorative effect of the picture. To take an example in the picture behind him, there was a tree casting a shadow on a field. That shadow really made more impression on the eye than the tree, and its form was more characteristic. In many cases that shadow would be of much more artistic importance than the shape of the object casting it. That applied not only to shadows but to half-tone and patches of colour, and the selection of their abstract forms was one of the great things that distinguish the really good painter and sculptor, and stamped him as a fine composer. Turner, their very greatest landscape painter, unrivalled in all the world, considered and felt out his essential forms more than anything else. The actual outlines and shapes of the material with which he dealt were to him of relative unimportance, as he knew the poetic impression could not be produced without beautiful essential forms. So, too, were Rembrandt and Sir Joshua. If they took "Christ Healing the Sick," of Rembrandt—the figures counted for little decoratively—it was the essential forms produced by their shadows, and those subtle half-tones distributed into the light, that, coupled with the beauty of the idea enshrined in them, made the etching one of the greatest, if not the greatest, the world had ever seen. The consideration of essential forms was one of the very greatest importance. The photographer would, he thought, gain by giving some of his attention to them deliberately, and learning to watch for, and abstract them, noting what happened during certain changes of light, or cloud, or atmosphere, and pose of figure. Art would make a very great step forward when

those forms were more fully considered than they were now, and those wonderful inter-relations more studied. In many cases one found a picture was almost universally admired, and yet that picture had very little actual intellectual interest in it; the reason often was that the forms were extremely beautiful.

Another very important principle in painting was the sacrifice of minor to major truths. In many cases it seemed impossible for the painter to express in one picture more than a few of the greater truths of poetic impression or colour or light, or whatever might be his object. He must make very considerable sacrifice of truth of tone, truth of elaborateness of detail, and truth of line, in order to be able to express some other more important quality. If one took a landscape with a large distance in it, a good deal of detail must be suppressed to get the major truths of space and atmosphere. A picture must, like a good speaker, sometimes say little in some interesting points in order to hit harder with the most important ones. Occasionally, in photography, the major truths of an effect could be better suggested by the lens being a little out of focus. On the other hand, we did not want all photographs to be blurred. The rendering of delicate and elaborate detail was one of the things in which photography excelled, and there is no reason that we should not with advantage have pre-Raphaelite photographs as well as impressionistic ones. The art was wide enough to include both, and one of the art diseases of the day was the narrowness of cliques and critics, and want of catholicity of view. Many of his brother artists felt very strongly as to this. The man of culture should be able to appreciate both pictures and photographs differing widely in aim, method, and idea.

His next point was individuality, or the personal element in art. There were two schools, one of which asserted that the personal element was everything, and everyone was more or less weary of the reiteration of this half-truth. The other and broader school knew the importance of individuality, but realised that it should develop itself without effort, and that the constant harping upon it and straining after it tended to produce an art of self-advertisement and mere eccentricity or sensationalism. Perhaps even in photography those two currents of feeling were to some extent also in existence, and some deductions might be drawn from what had happened in painting. Some people said there could be no poetry in photography (from which he absolutely dissented), some said that photography was a piece of nature spoilt. It would at any rate be admitted, even by those who were so fond of juggling with the words objective and subjective, that it was at least possible that there was some poetry in nature. If so, even a simple transcript from nature in a photograph might reflect some of that poetry.

Photography had enormous possibilities before it, and it was quite probable it would in the future occupy many more fields than it did at present. He saw no reason also why it should not prove to be a great help to painting, rather than a dangerous competitor. Photography would do, and was doing for painting to some extent, what the printing press had done for literature by its reproductions of pictures. Photography would undoubtedly in the future help to unravel some of the obscure problems of electricity and non-visible light, of astronomy and physiology. Certainly it could do a great deal in colour reproduction. Mr. Menpes' book on Japan showed what the three-plate process or four-plate process could do if the painter worked with it and assisted the printer.

In conclusion, Mr. Rimington said:—I am sure that we as painters realise to the full how very much we are indebted to photography in many ways; it has taught many of us new modes of looking at things, and dispelled some fallacies. We have realised artistic possibilities from photographs which we had scarcely appreciated fully before, and, happily, the old prejudice against a new rival has been to some extent dispelled, and so I venture to hope that you will look with some leniency upon what I have said about the points of contact between the two arts, and perhaps think it worth while to consider some of these principles, which, rightly or wrongly, are dear to us painters.

A. Wallace Rimington.

The Professional Photographers' Association.—There will be a meeting of the general committee at the rooms of the Royal Photographic Society, 66, Russell Square, W.C., this (Friday) evening at 7 p.m. Business: Report for members' meeting; exhibition of members' work; general business.

The autumn season has produced a fair number of good engravings and etchings, though not so many as used to be the case fifteen years ago, before photogravure had completely established itself. It is a painful fact that nowadays there are only five or six mezzotinters who can command a market, so keen is the competition of "process." One must be a very first-rate engraver, and employed upon a very attractive picture, to be at all sure of success; and this fact is so well known to the print publishers that they naturally hold their hands or employ "process" in the majority of their reproductions.—"Times."

Process Work.—Mr. J. Wallace Bennetto writes us concerning the Miethe colour portrait, about which, as he very properly says, so much nonsense has been written. He informs us that so far back as 1896, he produced several portraits both in and out of the studio in colour prints which were considered perfect. The exposure in the studio was 30 seconds, and out of the studio (figure and landscape) 3½ seconds. Some of these were shown at the Society of Arts. Mr. Bennetto concludes by saying:—I can now take a portrait in the studio in 15 seconds—one exposure, one developing, and one printing—in three colours.—"Process Work."

The British Association in South Africa.—Reuter's Agency is informed that the suggestion that the British Association should hold its annual meeting for 1905 in South Africa emanated from the new South African Association of Science, of which Sir D. Gill, Astronomer Royal for the Cape, is president. Before the last meeting of the British Association at Belfast invitations were sent from the municipalities of Cape Town, Kimberley, Bulawayo, and other centres in South Africa, and it is understood that these have been accepted, and that the session of 1905 will be held in South Africa. Scientific papers will be read at various centres in the South African Colonies, and visits will be paid to numerous places of interest. A sum of £7,000 has been collected in South Africa for the entertainment of the Association. While in Rhodesia the scientists will be the guests of the Chartered Company, who will place their railways at their disposal, and, among other things, take them by special train to the Zambesi, where they will stay at the new hotel to be erected near Victoria Falls. Probably the guests will leave England in a special steamer.

A Protective Solution for Lantern Slide Bindings.—Messrs. George Houghton and Son, of 88 and 89, High Holborn, London, W.C., are placing a solution on the market for this purpose. As they properly point out, all who use lantern slides know the annoyance and trouble the binding or edging (usually paper) gives, owing to its frailty and liability to get torn up on the slightest provocation. "Limpet solution, when painted over the binding of the slide, acts as a protective coating, and renders it perfectly waterproof and dustproof, and very durable, so that slides so treated can be properly washed, and even roughly handled without fear of the binding being thereby removed. This, of course, renders re-binding entirely unnecessary and greatly facilitates cleaning. The solution is of a sea-weed green colour, and transparent. It turns the ordinary deep purple binding paper black, and gives to it the appearance and feel of leather. It takes but a few minutes to dry, and when once dry never becomes sticky, not even with the heat from the lantern." We have put Limpet solution to practical test, and find it an admirable protective medium.

From Messrs. Newton and Co., 3, Fleet Street, E.C., we have received a supplementary list of lantern slides for the season 1902—1903. The following scenes are included:—Abide with me; Ambulance—First Aid; America, North; Armada, Story of the; Armies and Navies, Types; Asia, Central; Astronomy, "Knowledge" series; Astronomy; Nasmyth's Moons; Botanical series; Bright-line Spectra; British Birds; Cambridge and its neighbourhood; China; Coronation of Edward VII.; Coronation of English Sovereigns; Cromwell's Life and Times; Dickens, Characters from; Durham Cathedral and City; English Scenery; Famous Artists; Fiji Islands; Flowers; France; Garnot's Physics; Garden Produce; Good Samaritan; Henley Regatta; Herb Yielding Seed; Humorous Drawings by Phil May, and others; Hymns; India; King's Procession through London; "Knowledge" series of Slides; Kumatology; London; London Poor; Mexico; Milton, Life of; Miscellaneous Pictures; Miscellaneous Sacred Subjects; Moons; Motors; Navies and Armies, Types; National Gallery; Natural History; New Testament; New Zealand; Nitrifying Organisms in Soils; Old Testament; Ophir, Voyage in the; Paradise Lost; Paris; Peru; Portraits; Prayers, Church; Russia; Scenery at Bidford; Scripture Scenes; Sea Pictures; Sports and Pastimes; Straits Settlements; Teneriffe; Ten Virgins; Texts; Transvaal War; Trees and Plants; Up-to-date Subjects; Volcanoes; X-Ray Photographs; Zoological Gardens.

A NEW DEVICE FOR STEREOSCOPIC PHOTOMICROGRAPHY.

[Reprinted from the "Journal of the Franklin Institute."]

I HAVE recently made a one-plate-one-exposure stereoscopic photomicrographic camera, which is interchangeable with the single camera on the adjustable base, described in the "Journal of the Franklin Institute" for May, p. 375. It consists of a light telescopic box camera for plates 3⅓in. by 6in., which is provided at the front with a small prism box containing three equilateral prisms, so disposed as to divide the light at the eyepoint above the eyepiece of the microscope, and project the divided rays upward to form the two stereoscopic images. Fig 1 shows the parts drawn to scale. A is the camera, B B B/ are the prisms, C is the microscope tube with objective and low-power eyepiece, D is the object slide, and the dotted lines show the path of the axial rays from the back of the objective.

It is the usual practice to divide the light at the back of the objective, but inasmuch as the spot of light at the eyepoint, above the eyepiece, is an image of the back of the objective, it answers the same purpose, when working with an eyepiece, to divide the light at this point; and in the present device this is accomplished by the small equilateral prism. If this prism is perfectly accurate, the result is two images as perfectly stereoscopic and as perfectly defined and evenly illuminated as the images projected one at a time in the usual way; in fact, the images may be more evenly illuminated than is possible in the usual way when the objectives have long mounts.

By adding a lens of the focal length of the camera, for which there is room by using it as a cap for the eyepiece, the camera can be used without even refocussing, in the manner described in my communication already referred to.

The prism box has a lateral fine adjustment by screw on the camera front, in order to readily set it so that the apex of the small prism exactly bisects the circle of light at the eyepoint. This adjustment can be made by looking through the prisms from the back of the camera.

I think it is a mistake to divide the light anywhere back of the objective when working with high powers on transparent objects, because some of the diffraction pencils, which define very minute details, emerge from the half of the objective opposite to that which belongs to the respective dioptric projection. It is probably for this reason that the Wenham binocular cannot be made to perform satisfactorily with high powers. This stereoscopic camera, for precisely the same reason, should only be used for subjects which may be satisfactorily shown in the binocular microscope. With a 2in. Huyghenian eyepiece, amplifications from x10 (3in. objective and short tube and camera) to x120 (⅛in. objective and long tube and camera) can be made satisfactorily by employing colour-sensitive plates and a yellow screen. With Zeiss's 16-millimeter apochromatic objective and the "finder" (2) compensation eyepiece, ordinary plates can be used without the colour screen.

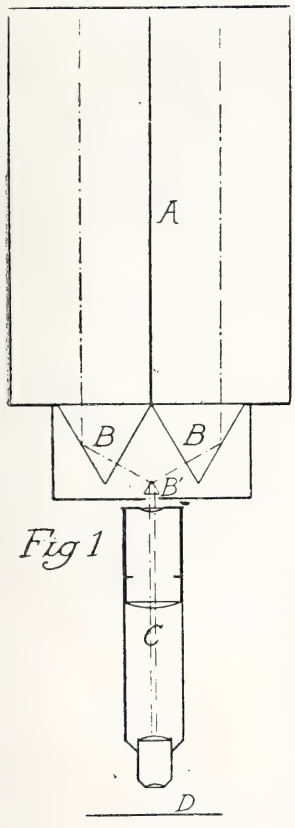
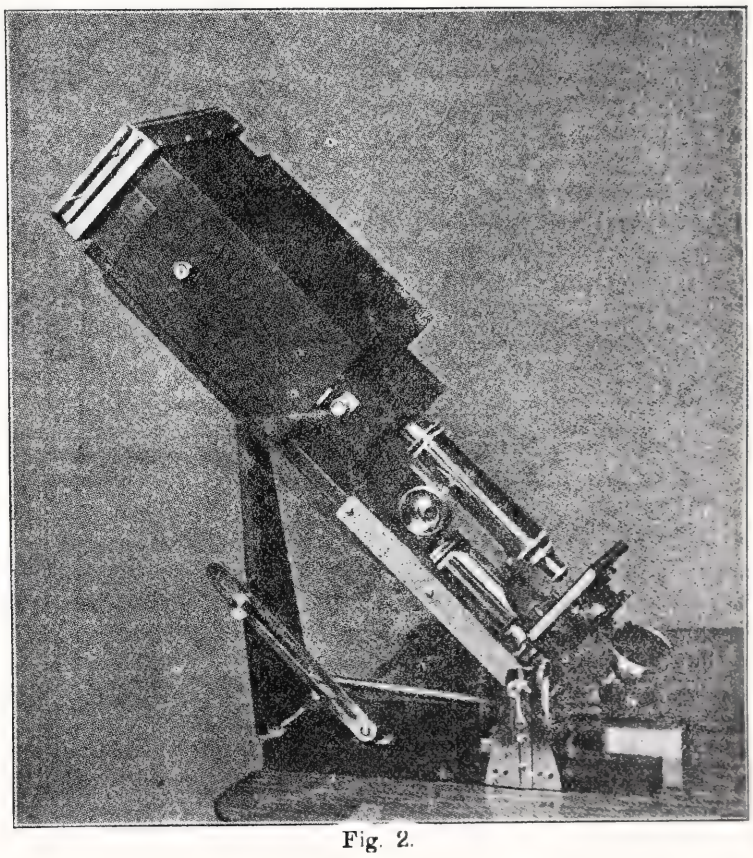


Fig 1


Fig. 2.

The negatives produced in this camera are ready for printing from, no transposition of images being necessary, and for this reason only I prefer it to two otherwise equally simple and efficient combinations with which I have worked.

Fig. 2 shows the stereoscopic camera used on my adjustable base, as recently improved. This combination can be adapted to the microscope at any inclination and brought into action in a few seconds; and, after exposing, it is removed as a rigid whole by a single rectilinear movement of one hand.

FREDERIC E. IVES.

THE Teb Competitions.—Messrs. Charles Tyler and England Bros. draw our attention to the fact that this competition closes on December 24th. The results will be published early in the new year. Prizes are awarded for every size of print from half-plate size to midget, and for quarter-plate size alone there is to be awarded no less than 33 prizes, ranging in value from £5 5s. to £1 1s. The competing prints will be judged by Messrs. R. Child Bayley, Thomas Bedding, Arthur C. Brookes, and A. Horsley Hinton. Prints may be by any process, the only stipulation of the competition being that the coupon, which is included in each box of mounts, shall be returned with the prints.

THE PHYSIOLOGY OF CERTAIN COLOURS.

Havelock Ellis, several months ago, had an article on "The Psychology of Red" in "Popular Science Monthly," in which he showed that red has an unmistakable effect on the psychical organism. Incidentally, he also demonstrated the fact that colour has likewise a physical effect both upon plants and upon animals. He does not, however, discuss the physiological causes for each effect. It is the purpose, therefore, of this brief paper, writes Mr. James Weir, junior, in "The Scientific American," to bring out the probable action of colour on the basic principles of life as far as we know them. Thousands of years ago, it was noticed that plants reared in darkness were colourless and of weak and fragile habit. It was also observed that men who passed their lives in darkness or semi-darkness were not as robust as those who lived in the light of day. So the general conclusion was reached very early in the history of the world that the light of the sun directly influenced both animal and plant life. Recently, it has been determined that the rays of the sun exert dynamic, chemic, and physiologic effects on the *vis vitæ* of plants and animals. The three forces through which the rays of the sun act, viz., the dynamic, the chemic, and the physiologic, are, to a certain extent, intercorrelated; therefore, they must be studied together. It will hardly be necessary to point out the fact that white light or daylight is a combination of all of the primary colours, violet, indigo, blue, green, yellow, orange, and red. It is highly important to my thesis, however, to demonstrate that certain of these colours exert a selective or elective influence on the physiology of animate organisms, and, individually, affect such organisms in some degree. Flammarion's beautiful experiments at the climatological station at Juvisy, have shown beyond question of doubt, the widely different effects of the red and violet rays on plants. The plants chosen were of the genus Mimosa or "Sensitive Plant," and were subjected to the same environments with the exception that some were reared beneath dark blue glass and others beneath red glass. In four months the plants grown under the red glass had attained extraordinary development, while those subjected to the violet rays had made no progress whatever. Similar effects were noted in the case of strawberries, and numerous other vines, plants, and shrubs. The plants grown beneath blue glass did not die, but seemed to remain in a dormant condition without growth or further development.

Zacharawietz, of Vaucluse, has also shown that plants are strongly affected along the lines of rapid growth and development by red and orange rays. As early as 1883 I demonstrated and published the fact that typhoid fever germs would not live when subjected to the blue or violet rays. Ward, Finsen, Berghold and others have shown that the blue, violet, and ultra-violet rays are fatal to bacteria and that the other colours are not, while Finsen has made successful use of this knowledge in the treatment of zymotic skin diseases, such as smallpox, measles, and scarlatina. It would appear from these observations that the red and orange rays have a distinctly favourable physiological action on plants, while the blue, violet, and ultra-violet rays are as distinctly deleterious. When we come to observe the action of the violet rays on animal life, we see that such action is, apparently, markedly different from that to be observed in vegetable life. But, as Davenport has pointed out, this difference is more apparent than real; for these effects on animal and plant physiology are due to the same chemical metabolic changes, but, "while plants succumb to the influence of the violet rays, animals, being more highly organised, are able to take advantage of them and flourish." In 1883, while studying tinctumutation or the colour-changing function in certain animals, I reared a large number of newts, or salamanders, from the eggs. The eggs were placed in shallow vessels which were covered by coloured glasses, blue, orange, green, and red.

The eggs under the blue glass hatched out first; under the orange, second; under the red, third; and under the green, last of all. The young larvæ under the red glass were much more active, at first, than those under the other glasses, and attained full maturity several days earlier. The larvæ under the blue glass, however, grew to be much larger and in the end were much stronger and more agile. Under the green glass, the larvæ were sluggish, and of slow growth. I noticed, moreover, that whereas there were no monstrosities or deformed animals under any of the other glasses, there were many under the green and the orange glasses. The animals under the blue glass were distinctly darker than those under the other glasses, and, under the microscope, the chromotophores, or colour-bearing cells, were seen to be much more numerous.

The violet, and ultra-violet rays have a pronounced chemical as well as a physical effect on the human body. They have, also, in all probability, a dynamic effect, which is shown by the feeling of well-being or otherwise. The "summer-girl" who, in the early days of her vacation, cannot stand the sun, will, in the middle of summer, welcome the embraces of Phœbus Apollo and will revel in his kisses! She says that she has become accustomed to the rays of the sun and that she no longer feels them because it has become her "habit to walk abroad without hat, parasol, or umbrella." Thus she gives credit to the wrong agent; for her feeling of well-being is not due to habit, but to the thin brown veil of tan which the violet rays with ever busy brush have spread out on the surface of her body wherever it has been exposed to them. The violet rays thus erect a barrier against themselves, for they cannot pass the tan. Nature always takes care of her children, that is, if they will give her time, and do not in their ignorance, attempt to hasten her. It is true that, primarily, the violet rays are superficial in their effect; yet they are, nevertheless, sometimes destructive in a high degree. Ask the boy who awakes in the night after an afternoon in the river, and "moans, and moans, and moans" on account of the intolerable fire between his shoulder blades, what he thinks of the ultra-violet rays; or, ask the blind and helpless traveller who stumbles across the weary waste of Arctic snows what he thinks of them? Both sun-burn and snow-blindness are due to the violet and ultra-violet rays. Yet the violet rays are absolutely necessary in the up-building of the normal, healthy man. Their action must be, I take it, primarily through stimulation of the vaso-motor nerves, i.e., the nerves which control blood-vessel action. The first effect is dynamic in character; there is dilatation of the blood vessels with a consequent increased flow of blood. The second effect is chemical in nature, the increased flow of blood incites the blood-producing organs to manufacture new blood-cells, consequently the plasma of these cells differs chemically from the plasma of the old cells. There is, also increased oxidation and oxygenation due to increased flow of blood through the lungs. The third effect is purely physiological. Owing to the increased flow of new blood cells to the tissues, cell growth is excited and new tissue is formed. Of course, waste is going on all the time; the violet rays merely act as a tonic in stimulating the organs of the animal economy towards repairment of waste by renewing and building up tissue. These beneficial rays are present in diffused daylight, hence the direct rays of the sun are not absolutely necessary in order to produce their good effects on the animal organism. Direct sunlight is, however, an exceedingly efficacious tonic when used moderately and understandingly. There can be intemperance however, in the use of every good that Nature has given us.

Exhibitions.

NORTH MIDDLESEX PHOTOGRAPHIC SOCIETY.

The fourteenth annual exhibition of this flourishing society, which was held at its headquarters, Hanley Hall, Sparsholt Road, N., on the 1st, 2nd, and 3rd inst., showed that the reputation the society has earned for the excellence and soundness of its pictorial work is in no danger of being lost. The exhibition was confined entirely to the work of its own members, and there are no less than 206 pictures and 43 exhibitors, a striking testimony to the enthusiasm no less than to the industry of the members.

As the exhibition was not divided into classes the comparative popularity of the various branches of pictorial photography was not easily determined, but landscape naturally predominated, and, as at all exhibitions, was of the best average quality. Of course, a local society is not conducted on altruistic lines, and cannot be expected to keep its exhibitions open longer, at its own expense, than suits its immediate purpose, but such an exhibition as the North Middlesex organises yearly is worthy of being supported at the public expense, in consideration of the benefit the public would derive from it if the opportunity were offered.

Though there was no lack of variety in the subjects the members had chosen, the almost complete absence of portraits was noticeable, and the neglect of this, perhaps the most important of all the branches of pictorial photography, is very much to be regretted. The society is one of the few which adheres strictly to the custom of giving the printing process of the pictures, and from a summary published in the catalogue, it appears that of the 206 exhibits there were 91 bromide, 36, carbon, 21 gum bichromate, 44 platinum, 8 silver, and 6 not stated, a very interesting basis for comparison of the popularity of the various processes.

The judges, Messrs. John H. Gear and James A. Sinclair, made the following append to their list of awards: "The judges are pleased to congratulate the members on the high average standard of work, and which they think fully maintains the traditions of the society. They consider it the best exhibition of work confined to members only, which they have seen."

THE AWARDS.

"Across the Common," H. Smith; "The Wayfarer," S. E. Wall; "Evening," H. Stuart; "Evening," F. J. Pitts; "The Norman Transept of Winchester Cathedral," R. R. Rawkins; "The Japanese in China," S. H. Bentley; "A Son of Algiers," R. Child Bayley; "Chrysanthemums" (lantern slide), J. Carpenter; "A Fairy Tale" (lantern slide), A. H. Lissett.

STONEHOUSE CAMERA CLUB.

The second annual exhibition of the Stonehouse Camera Club was opened at the Kent Unity Hall, Stonehouse, last week. The entries, about 250, were not quite so numerous as last year, but the quality showed a great advance. The lantern slides formed a splendid collection. There were loan collections from Mr. J. Trouern Trend, Mr. G. T. Bayley, and Mr. Ralph H. Walling, the hon. secretary. Unfortunately, the loan collection from the Royal Photographic Society was despatched to Stonehouse, Gloucestershire.

In the unavoidable absence of Mr. John Lockie, M.P., who was in London, Dr. Waterfield declared the exhibition open. Although the entries were not so numerous this year as last, they were certainly better in detail, quality, and finish. They had enrolled some new members during the year, but they had lost several by removal. They had laboured under difficulties, but had been successful. There had been a rumour that they would be provided with accommodation at the Town Hall. Where there was a society like theirs, offering congenial employment to young men, it should be encouraged by the town. He was sorry there were not any members of the District Council present. In many towns the municipal authorities fitted up a room for photography. They were indebted to Mr. Bayley for providing a room, but they were cramped for accommodation. The exhibition was well worthy of patronage, and he hoped it would induce others to join the society. The awards were:—

Members.—Silver medal, "On the Lew," W. Luxton; first bronze medal, seascape, R. H. Walling; second bronze, "The Old Mill Wheel," W. G. Rose; third bronze, "Reflections," A. J. Catford; special bronze, portrait of a child, Dr. W. H. Waterfield. Certificates: "Plym Bridge," E. V. Hearn; "Barnpool and Drake's Island, from Mount Edgcumbe," W. Full.

Affiliated Societies.—First silver medal, "Harvesting," F. C. Bowtell, Plymouth Photographic Society; second silver, "Toilers of the Sea," A. J. Catford, Devonport Camera Club; first bronze, "A Study," W. Clayden, Plymouth Society; second bronze, "Loiterers," Captain E. H. Haig, R.E., Plymouth Society. Certificates: "Old Dave" and "The Nave, Winchester Cathedral," S. G. Kimber, Southampton Camera Club; "Fareham Creek," Captain Haig; "Critics," A. B. Fellowes Prynne, Plymouth Society.

Three Towns Amateurs.—First silver medal, "A Misty Morn," W. Clayden; first bronze, "The Age of Innocence," C. H. Dymond, Devonport; equal award, "Cattle, Valle Crucis Abbey," F. Johnson, Plymouth; bronze, "After a Storm," F. C. Bowtell. Certificates: "The Young Fisher," J. C. Smith, Stonehouse; "In Sutton Pool," R. H. Walling.

Class D, Open.—Silver medal, "Feeding Sheep," C. Walmsley, Ambleside; first bronze, "The Light Steals Softly Across the Aisle," W. R. Lathbury, Bristol; equal award, "The Hour of Rest," Graystone Bird, Bath. Certificates: "The Widower," R. Burley-Moss, Truro; "The Mill Stream," W. R. Lathbury; "Good Morning," Graystone Bird.

Lantern Slides, Open.—Silver medal, F. C. Bowtell; bronze, Graystone Bird. Certificates: Dr. G. H. Rodman, East Sheen; A. Bailey, Leicester; special, J. C. Smith.

The judges were Messrs. H. R. Babb, J. Trouern Trend, and W. D. Snell.

New Books.

"Knowledge Diary and Scientific Handbook for 1903." Published at 326, High Holborn, London, W.C.

Over 300 pages of this comely volume are set aside for the purposes of a diary; and the literary contents, as may be judged from the appended list of articles, appeal to workers in a variety of scientific fields. "Knowledge Diary" is one of the few books that reach us year by year which we set aside for leisurely reading when the mind craves for a change from the mass of ephemeral twaddle which the exigencies of modern civilisation oblige one to wade through. The articles referred to are as follows:—Practical work with the Spectroscope, by A. Fowler, F.R.A.S.; The choice of a Microscope, by M. I. Cross; Suggestions to Amateur Meteorological Observers, by Hugh Robert Mill, D.Sc.; Crustaceans: How to catch, keep and comprehend them, by the Rev. T. R. R. Stebbing, M.A., F.R.S.; Systematic Botany, by R. Lloyd Praeger, B.A.; Planetary Observation, by W. F. Denning, F.R.A.S.; On the Observations of Variable Stars, by E. E. Markwick, F.R.A.S.; Pond Life Collecting for the year, by Charles F. Rousselet, F.R.M.S.: The articles by Mr. Fowler, Mr. Cross, and Dr. Mill should prove of interest to photographers.

"White's Natural History of Selborne." Illustrated from photographs by Cherry and Richard Kearton. 320 pages. Published by Cassell and Co., Limited, La Belle Sauvage, Ludgate Hill, E.C.

A publisher's note informs us that some two years ago the Kearton Brothers conceived the idea of preparing a photographically illustrated edition of Gilbert White's "Natural History of Selborne," and have since that time been collecting pictures for it in almost every quarter of the British Isles. Many of the photographs have been taken at arm's length from the interiors of stuffed oxen, sheep, artificial rocks, and other ingenious contrivances. Over forty miles were tramped with camera and field-glass for one picture; days of patient waiting exhausted for another; a cold Highland loch waded and waited in armpit deep for a third; several pounds spent for the bare opportunity of trying, for a few minutes only, to take a fourth; a fifth that cost a round sum in plates alone; and a sixth that was actually secured whilst the photographer waited, with the airball of his apparatus in one hand and a loaded revolver in the other, for his subject to put in an appearance whilst momentarily expecting a mad bull. A number of photographs of Selborne as it is to-day have been specially taken by the illustrators. The plan adopted by the authors is to illustrate the text of most of the chapters of Gilbert White's classical work. The annotations and the introductions are by Mr. R. Kearton. Better natural history photographs, even by the Brothers Kearton, have never come under our observation. The book is a strikingly beautiful production, the outcome of a rare combination of skill and sympathy. The Kearton "White" must unquestionably rank high amongst the successes of the present publishing season; it is a book which, irrespective of the theme upon which it is based, does the very highest justice to photography in its best and most convincing aspect, namely, as a recording agency. Some of the representations of bird, animal, and insect life printed in these pages are really marvellous camera studies. We shall always cherish this fine volume.

New Apparatus, &c.

Kodak Pelloid Plates (cut films). Manufactured and sold by Kodak, Limited, 43, Clerkenwell Road, London.

From the November Kodak Trade Circular we take the following extract:—"We are prepared to enter the field with what are known as cut or flat films in a form that will do away with the inconvenience of glass plates. We have long had this in view. The Pelloid Plates as now to be issued are the first stage in our opening up along this line. It is the general and increasing demand for light and portable apparatus from the photographic public that has set us to work to perfect our plans and produce an article which will not be a fancy but a real substitute for the glass plate, a substitute possessing its special utilities without its disadvantages. Briefly, the Pelloid Plates consist of a light unbreakable film which is attached at the edges by metal retaining clips to a card support, and they are so devised that they can be used in ordinary plate holders or sheaths wherever glass plates can be used, and in precisely the same manner as glass plates, without any preparation whatever. The Pelloid Plates are developed and fixed in the manner usual with glass plates. Although thin, they lie quite flat. After washing, they are pinned up by one corner or edge to a lath, or shelf, or stretched cord to dry. No glycerine bath whatever is required, as they do not curl in drying. They are much thinner than the average cut film, and can therefore be printed from either side—an important point with carbon workers. The back also has a surface which can be worked upon, so that they can be retouched on both sides."

Much water will probably flow under the bridges before the often-threatened photographic glass plate is abolished; but there is no doubt that in the latest attack upon it the Kodak Company have shown considerable acumen. Hitherto one of the drawbacks to the general use of cut films has been the difficulty of providing sheaths, holders, or backing pieces which should be suitable for the ordinary dark slide, and not cause trouble to a person chronically indisposed to take trouble—the amateur photographer. Pelloid films step in to remedy this omission. Clipped to the card on all four sides, they handle, as it is claimed, as easily as a glass plate, from the moment they are taken from the package until after exposure. The thin clips are readily removed, and development proceeds as usual. Qualitatively the film appears excellent.

Commercial & Legal Intelligence

Messrs. A. and M. Zimmermann (of 9 and 10, St. Mary-at-Hill), have removed to 3, Lloyds Avenue, London, E.C.

Photographer's Claim for Water.—At the Derby County Court on Thursday last, Frank Burch, photographer, of Victoria Street, Derby, claimed damages from Edward Clulow, stationer, also of Victoria Street, Derby, for cutting off his supply of water, and an injunction to restrain him from doing so. Mr. R. S. Clifford appeared for the plaintiff and Mr. J. E. Ducher for the defendant. The plaintiff's case was briefly as follows. The defendant sub-let the top portion of his premises to the plaintiff for the purposes of a photographic studio. The rent agreed upon was £50 per annum, payable quarterly, inclusive of rates, taxes, and water. Soon after the plaintiff entered into tenancy he found he was unable to obtain any supply of water for his business purposes after 7.15 on most nights of the week, whilst on Wednesdays (the early closing day) he found he was unable to obtain water after two o'clock. He saw Mr. Clulow about it. He said he (defendant) must safeguard his stock from possible damage by water by cutting it off at night. Mr. Ducker contended that it was understood from the first by the parties that the water should not be allowed to be turned on all night. The defendant, when sworn, said that when they were arranging terms the plaintiff pointed out that his predecessors (the Imperial Photographic Company) had intimated to him that it was inconvenient to have the water supply cut off at such an early hour as required by the defendant. He (the defendant) gave the plaintiff to understand that he closed his shop at 7.30 in the evening, and that he would not have the water turned on after that time having regard to the danger of the pipes bursting and spoiling his stock, etc. The plaintiff then accepted the terms. The water was now supplied as he agreed to supply it in the first instance. In cross-examination the defendant admitted that he did not allow the use of any water on the premises on Bank Holidays. His Honour accepted the defendant's statement concerning the original arrangement as to the water supply as the correct one. He dismissed the action with costs.

The Copyright of a Photograph.—Boucas v. Cooke and others.—This case came on for hearing in the King's Bench Division of the High Court on December 8th, before Mr. Justice Ridley and a common jury. The plaintiff, a photographer carrying on business in Mile End Road, brought this action to restrain the defendants, Mr. Claude Hanbury Cooke, the boy preacher, his manager, and a printer named Reynolds, from infringing the plaintiff's copyright in a photograph of the youth. The defendants denied that the plaintiff had the copyright in the photograph in question, and that consequently there had been no infringement by them. The plaintiff's case was that in January of this year Mr. Cooke and his manager called at the plaintiff's studio, when it was arranged that Cooke's photograph should be taken, and that some silver prints should be produced for the purpose of appearing in some pamphlets which were going to be distributed amongst the congregation at the Great Mission Hall, Mile End Road, where Mr. Cooke was then preaching. The copyright in the photograph was to be the property of the plaintiff, but in the event of the plaintiff receiving a sufficiently large order for copies, viz., several thousand, he (the plaintiff) would assign the copyright to Mr. Cooke. However, the parties could not agree as to the price to be charged for the copies, and the arrangement fell through, and the copyright consequently remained the property of the plaintiff. The defendants then, it seemed, entered into an agreement with Mr. Reynolds that he should print some 20,000 copies of the photograph, and the plaintiff now asked for an injunction to restrain this being done. The plaintiff having been called in support of his case, and other witnesses having been examined, the defendant, Mr. Claude H. Cooke, went into the witness box. He said he was a native of England, and was in his seventeenth year. He had preached for many years in London and the provinces to large congregations. He had also visited America. When he went to the plaintiff's studio, it was arranged that the negative of the photograph should remain his (the defendant's) property. The plaintiff would not agree to terms, and consequently the arrangement to print copies went off, and he suffered damages in consequence.—Cross-examined: He knew he was only in his seventeenth yaer because he had counted his birthdays since he was two years of age. (Laughter.) Mr. Colam and Mr. Dwyer appeared for the plaintiff, and the defendants were represented by Sir Arthur Collins, K.C., Mr. Herbert Reed, K.C., and Mr. Turrell. His Lordship, in summing up, said the only question for the jury to decide was whether or not the negative was the property of the photographer. The jury, after a short consultation, said that the negative was, in their opinion, the plaintiff's property, and they gave judgment for him for £20, and for £5 in respect of penalties under the Copyright Act. His Lordship granted an injunction against the defendants, restraining them from dealing with the copies in their possession and from producing further copies, and ordered all copies at present in their hands to be delivered up to the plaintiff.

Why are the Germans ahead of us in chemistry asks "T. H.." in "The Pharmaceutical Journal." The fact of the Germans having got ahead of us is of course an important factor in their being ahead of us, but any one who compares the system of things in Germany with the system of things in England, must come to the conclusion that they are very likely to keep their lead or even improve it. That is to say, unless we wake up in England. I now wish to draw the attention of the readers of this journal, not to the inferiority of the English method of making chemicals, but to the inferiority of the English method of making chemists. There are undoubtedly many who receive a special education as manufacturing chemists both in England and in Germany. With these and their training I do not propose to deal. It is often, however, in the laboratory of the apothecary that the inquisitiveness of the chemist first manifests itself, and to have served an apprenticeship to an apothecary in Germany is a good groundwork for the making of a chemist. Is this so in England? The English apprentice at the close of his apprenticeship knows that Epsom salt is sulphate of magnesia, that it is soluble in water, perhaps has learned the degree of its solubility, or even a little more if he is a curious youth; but he has the opportunity of spending a four-years' apprenticeship without learning a scrap of chemistry. This is not at all as it is in Germany. If the German chemist will have an apprentice at all he must bring him up to his profession. He is as responsible for the education of his apprentice as the English father is responsible for the education of his child. There is an Inspector of Apothecaries in Germany, as there is an Inspector of Schools in England. This may not sound well in the ear of the English chemist, but the result is that after a three years' apprenticeship the German youth can pass an examination which, it is safe to say, not one in fifty English youths at the close of their apprenticeship could pass. Then goes out the English youth as junior, dabbles a little in chemistry, learns a little botany, perhaps—and perhaps not. He may then go to college, study for six or nine months, and enter for his minor examination. If he has worked hard he may succeed in passing the same, but what he has learned during these months he cannot retain like the German chemist, whose term of study extends over six or seven years. During his time at college he has "no time." He is studying for his exam. If he has an inclination for research he is behind with his botany. If he has a turn for analysis he is behind with something else, and he has no time. From his examination he emerges again into business life, and after a few short years he has forgotten a great deal. He will tell you so himself, and it is impossible for one to disbelieve him. The German, on the other hand, after a probation of seven years, has become a chemist and remains a chemist—indeed, finds it a part of his business to be one. He will have an apprentice? Then he must teach him chemistry, he mus'

teach him his profession, or have him taught. The result is that the one learns and the other doesn't forget. In Germany there may be too much law. As to its sufficiency or over sufficiency I will not stop to question, but I venture to offer the opinion that this system is better than the English one, by which the one forgets and the other doesn't learn.

SCIENCE Teaching in Ireland.—Mr. W. A. McKeown writes to "The Times":—There is an institution in Dublin named the College of Science, which was until recently under the direction of South Kensington. It was an excellent institution, gave a scientific education of the highest character, and had as its professors very eminent men. It has been transferred to the Agricultural and Technical Department, which is directed by clerical influences; and it would seem as if a deliberate attempt were being made to destroy science teaching in Ireland. There are 40 scholarships in connection with the Royal College of Science, and free education and the keep of these scholars costs the State between £3,000 and £4,000 a year. They are nice prizes, and should only be obtained on a stiff examination. I have received a copy of the paper set at the scholarship examination in 1902, of which the following is a copy:—1. Write an essay on any one of the following subjects: (*a*) The value of advertisements of his goods to a pharmaceutical chemist; (*b*) motor-cars; (*c*) the child is father to the man. 2. What do you consider the best English prose work written by an Irish author? Give a general outline of the work and point out its most striking features. 3. Give five lines from some well-known English poem by a poet born in Ireland. Briefly describe and criticise the poem from which the quotation is made. This is certainly a remarkable paper to set at such an examination. Not long ago some 40 students at this college were turned out by the professors because they did not possess a sufficient education to profit by instruction. It is surely time for the Government to interpose and prevent the ruin of this college and the grabbing of public money in clerical interests.

ROYAL INSTITUTION.—The following are the lecture arrangements at the Royal Institution, before Easter:—Professor H. S. Hele-Shaw, six lectures (adapted to young people) on Locomotion, on the Earth; through the Water; in the Air (experimentally illustrated); Professor Allan Macfadyen, Fullerian Professor of Physiology, R.I., six lectures on the Physiology of Digestion; Sir William Abney, three lectures on Recent Advances in Photographic Science; Sir Robert Ball, three lectures on Great Problems in Astronomy; Mr. A. J. Evans, three lectures on Pre-Phœnician Writing in Crete; and its bearings on the History of the Alphabet; Sir Clements Markham, three lectures on Arctic and Antarctic Exploration; Mr. G. R. M. Murray, three lectures on the Flora of the Open Ocean; Mr. C. H. Firth, three lectures on Society during the Commonwealth and Protectorate; Sir Frederick Bridge, three lectures on the Bi-Centenary of Samuel Pepys, his Musical Contemporaries, Criticisms and Compositions (with musical illustrations); Mr. A. B. Walkley, three lectures on Dramatic Criticism; and six lectures by the Right Hon. Lord Rayleigh. The lectures on Tuesdays and Thursdays during the season 1903 will be delivered at five o'clock instead of at three, as in previous years. The Christmas course of juvenile lectures and the Saturday lectures will continue to be delivered at three o'clock. The Friday evening meetings will begin on January 16th, when a discourse will be delivered by Professor Dewar on Low Temperature Investigations; succeeding discourses will probably be given by Dr. Tempest Anderson, Professor W. E. Dalby, The Right Hon. Sir Herbert Maxwell, Bart., M.P., Professor S. Delepine, Principal E. H. Griffiths, Dr. A. Liebmann, Professor J. G. McKendrick, Professor Karl Pearson, Professor E. A. Schafer, Professor W. A. Herdman, The Right Hon. Lord Rayleigh, and other gentlemen.

WHO Discovered Photography?—The amateur photographer is usually averse to studying the base degrees by which his pastime has been rendered easy and inexpensive; but that is because the facts of history are generally presented in a bald and unattractive manner. Clothed with illustrations, and brightened with a touch or two of humour, a disquisition on photographic history proved interesting to members of the photographic section of the Croydon Natural History and Scientific Society. Most people probably put down Daguerre as the discoverer of photography, but from the lecture on Friday evening by Mr. George E. Brown, editor of "The Photogram," it was seen to be impossible to name any one man as the inventor or discoverer of the art-science. The camera was proved to be very much older than the photographic use of it, and some amusement was caused by the directions of an ancient writer to "correctly appropinquate" the picture upon the ground-glass. The lantern slides included portraits of the early workers to whose combined labours photography is due. The earliest was Niepce, whose camera was shown to be fitted with an iris diaphragm—a curious fact, inasmuch as only some years ago photo manufacturers were listing this addition as an instance of their up-to-dateness. Daguerre and Niepce together worked ont a process, but no details of it were made public until six months after an Englishman named Fox Talbot had published a practical process, so that, as regards actual publication of methods, England is the home of photographic discovery. Moreover, Talbot's process produced a negative from which other positive prints could be made, whereas the Frenchman's process resulted only in one picture. Some interesting views of the dark-room used by Talbot, his printing establishment, and a collection of his cameras were shown. A print from the first negative on glass was also exhibited, in addition to many interesting scenes connected with the labours of these early workers.—"Croydon Advertiser."

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Dec.	Name of Society.	Subject.
12.....	Croydon Natural History.....	*The Development of Bromide Papers.* J. H. Baldock, F.C.S.
12.....	Borough Polytechnic.....	*Trimming, Mounting, and Framing.* Mr. F. W. Bannister.
12.....	Photo. Society of Ireland.....	*In the Cevennes, &c.* Hugh Pollock.
15.....	Southampton Camera Club	*Resumé of the Summer Rambles.* Illustrated Lecture. Mr. G. T. Vivian.
15.....	Society of Arts	*The Future of Coal Gas and Allied Illuminants.* Professor Vivian B. Lewes.
15.....	Glasgow and West of Scotland	Demonstration of the "Lumière Process of Colour." Lumière N. A. Co., Ltd. Exhibition of "Photography" Prize Slides.
15.....	Camera Club	*French Stonehenge*, illustrated. Mr. Cato Worsfold.
16.....	Devonport Camera Club	*The Possibilities of a Modern Camera.* Mr. Wardell (London).
16.....	Birmingham Photo. Society ...	A Demonstration by Mr. Harry Wade.
16.....	Newcastle-on-Tyne Photo.	*Pictorial Treatment of Architecture.* By Mr. Walter Scutt.
17.....	Society of Arts	*The South Russian Iron Industry.* Mr. Archibald P. Head.
17.....	North Middlesex Photographic	*Elementary Optics.* J. McIntosh.
17...	Leeds Camera Club	*Kallitype.* Mr. E. Heslop Chapman.
17.....	Borough Polytechnic.....	Lantern Night. (Monthly Slide Competition.)
17.....	Photographic Club	*Plain Paper Printing: Formulæ and Methods.* G. T. Harris, F.R.P.S.
17.....	Wolverhampton Photographic	Dutch Auction.
18.....	Richmond Camera Club	Demonstration by Mr. Cembrano.
18.....	London and Provincial	Illustrated paper by Mr. Thos. E. Freshwater.
18.....	N.-W. London Photo. Society	Demonstration: The Carbon Process. Thomas Illingworth & Co.
18.....	Liverpool Amateur Photo.	Lantern Lecture. *A Month in Jamaica.* Mr. Geo. E. Thompson.
18	Camera Club	*A New Apparatus for Testing Lenses*, with demonstration. Mr. C. Beck.

PHOTOGRAPHIC CLUB.

NOVEMBER 26TH, Mr. J. R. Gotz in the chair.

Dr. Grun gave a paper on his fluid lens. He introduced his subject by describing briefly the difference between old and new achromats, and some of the conditions the optician endeavours to fulfil in designing a lens; and then gave a brief description of his own lens. He stated that purchasers could have at their desire either lenses with a flat field and little depth of field, or with a round field and greater depth, saying he had come to the conclusion that lenses with a round field had greater depth of field than those with a flat field. For cinematograph purposes lenses had been made by him with an aperture approaching f/1, and in reply to a question said the focal length was 1.5 inches and aperture 1.25 inches. For general use on a quarter-plate camera a lens at that aperture was much too heavy and bulky; for instance, a 5″ lens would require an aperture of 5″ to work at f/1. For most purposes an aperture of f/2.5 was quite sufficient, and most of his pictures had been taken with such a lens. While allowing that lenses of that reputed aperture and larger were made by Dallmeyer, Voigtlander, and others, he claimed that his own lens was infinitely superior to them in rapidity, depth of field, and covering power. He had taken photographs in the theatre in two cameras side by side, one with his own lens and one with an ordinary lens with identical aperture and exposure, and at the same instant, and compared the results. While the one taken with his own lens gave a satisfactory negative, he could get nothing at all out of the other plate. The other lenses also had no depth of field, and very limited covering power. He passed round a 1-1 plate print of the interior of a room taken with one of his quarter-plate lenses, showing good definition all over. He could not say what aperture had been used, as it had been taken by a stranger A large number of pictures taken with his lens, most of them at the Theatre Royal, Brighton, with ordinary stage lighting and unknown to the performers, were now shown by means of the lantern. The first two slides were photographs of a Rudolph's focimeter, with twelve angular vanes at 6″ distance, giving a total distance of 6ft. between the first and last vanes. One of the slides was taken with a Grun lens and one with an anastigmat of identical focal length and aperture. Purporting to show the great depth of focus possessed by his lens, the conditions being dissimilar, the comparison was not fair. While both were supposed to be accurately focussed on the middle vane, only the Grun lens was actually, the first and last vanes being shown fairly sharp. The anastigmat was actually focussed on the farthest vane, and only the last half of the vanes were in focus, the nearer ones getting more and more fuzzy as they approached the lens.

The Chairman, Mr. Conrady (designer of the Holostigmat), Mr. J. H. Agar Baugh, Mr. Purser, and Mr. W. Thomas, F.R.P.S., took part in the discussion which followed.

On Wednesday evening, December 3rd, Mr. Wilkins, of Messrs. R. and J. Beck, Ltd., attended and gave a lecture, illustrated with lantern slides, showing the work done with the firm's orthostigmat and telephoto lenses.

CAMERA CLUB.

THERE were two great travellers at the Camera Club on Monday night, and a most enjoyable evening was spent in their company. Mr. Cutliffe Hyne, perhaps best known to the world as the creator of the redoubtable "Captain Kettle," gave a lecture on Arctic Lapland, and Sir Martin Conway, the conqueror of many peaks, undertook the more passive role of chairman. It is not generally known that Mr. Hyne travels even more than he writes, and that ten thousand miles is about his yearly record.

Sir Martin Conway said that he hardly knew what particular functions were expected of him in the exalted position of chairman, but he would endeavour to do his best. He could only express the great pleasure he felt in taking the chair for Mr. Cutliffe Hyne. We had all been charmed by Mr. Hyne's well-known volumes, and were pleased to see him at the Club. For his own part, he was looking forward very keenly to what the lecturer had to say, for Mr. Hyne held the unusual position of one who could speak from personal experience of any part of the habitable globe. Lapland was a peculiar country, for it had no boundaries, and belonged to nobody; but it had inhabitants, and their lives gave an undoubted interest to the land. But he would not trespass upon the lecturer's province, but would at once ask him to tell his story.

Like many other lecturers, Mr. Cutliffe Hyne began with an apology for the poor quality of the pictures he was about to show. He said that if he had known that the Camera Club members were such masters of the art of photography, as he judged them to be by the many beautiful specimens hanging on the walls, he should have waited long before he presented himself before them. His were all bad ones; some worse than that, and others again took a still lower grade of worseness. Arctic Lapland, although it was credited in the summer months with twenty-four hours' daylight, was only so described as a matter of courtesy. As a matter of fact, fog, rain, and other climatic disturbances reduced the twenty-four hours considerably. He took with him to Lapland a friend, in the person of Mr. C. Hayter, the artist, and a quarter-plate camera. He exposed 120 films, and got about 120 bad negatives. You could distinguish what some of them were meant for, but all were bad. The difficulties in obtaining pictures were great. Thus, he changed his first lot of films on board ship, and got the steward to carefully cover up a certain skylight while he did so. In the middle of the operation the steward came and uncovered the glass, and called out "Have you finished, sir?" I answered, "NO!"—at least, it wasn't no, but something equivalent. On other occasions he had to change his films with his head thrust into a sleeping sack, with sundry clothes above, and his friend sitting on top of all. "It was hot work, changing those films."

The travellers went north on the s.s. "Windward," the vessel which is identified with the Jackson-Harmsworth expedition, and the same which brought Nansen home on her return voyage. They disembarked at Vardo, on the northern coast of Lapland, and here they had an opportunity of studying the modern method of whale capture. The right whale is now almost extinct, and the animal now hunted is the Finner whale. The harpoon, with the boat towing after it at railroad speed, is a thing of the past, and the present method is to shoot the animal with a gun which carries a lyddite shell, which strikes the creature dead. A picture was here shown of two whales being towed behind the whaling steamer to the factory, the lecturer explaining that progress was necessarily slow with such a burden to drag through the water. (The rumour which was current some time back to the effect that Andree's balloon had been seen floating on the sea, probably originated in the circumstance of a blown-out dead whale having been seen at a distance. A photograph indicated how easily such a mistake might arise.) The whales are towed to a factory, which is generally situated in some quiet fiord, and are there cut up. Behind the towed whales there is an oily wake in the water, and a pungent smell which persists for at least twenty-five miles. The photograph of a whale factory gave the lecturer an opportunity of stating how the animal's oil, bone, etc., were utilised, and we trust that he exaggerated when he said the meat was canned and sent south as "beef," with a Chicago brand on the tin. "The whale factory also smells; nothing is wasted, even the smell is not wasted—the people appropriate it, and it sticks to them."

It was a venturesome overland journey which the travellers undertook when they decided to go on foot from Vardo to the Gulf of Bothnia. It looks a small distance on the map, but it in reality means a journey of about 800 miles. No horses were to be had, and the travellers had to content themselves with some very indifferent porters to carry their belongings; and even these deserted them after a time. At first there was no trace of vegetation, nothing but hills scantily coated with snow. But as they went inland, first moss appeared—the moss upon which the reindeer feed—and after a time birch trees, about six feet high, but very old.

Many photographs of Lapp families were shown, and the lecturer explained that they might be divided into three groups: Swedish, Norwegian, and Russian (Finland) Lapps. Some were fishers, others acted as herdsmen, and still others might be called farmers. The travellers were much troubled by mosquitoes, and although the speaker had had experience of these pests in tropical countries, those of Lapland are so much the worse, that he believes that they have the power of "biting at both ends." The country traversed was alternately rocky and swampy, and the best time for visiting it is in the winter, when sledges can be used and there are no mosquitoes. "Only a fool of an Englishman would attempt to travel there in summer."

The natives live in turf-roofed bee-hive huts chiefly, but there are also wooden houses. A map bought in London gave the travellers an idea that there were roads and towns all over the country, and they had a notion that if they carried a few luxuries, such as fois gras, and larks in aspic, they would be able to purchase such simple things as bread, meat, cheese, etc. But they were disappointed. A place marked on the map as a town would turn out to be a log cabin, perhaps uninhabited except by the ubiquitous mosquito, and they could buy nothing, for there was nothing to buy. They were also told that there was plenty of game, but they saw none, and sold their guns in order to save weight of baggage. The wants of the Lapps themselves are very few. They get milk from their cows, and grow rye for bread-making. But their notions of farming are peculiar. They let the rye grow up encumbered with any amount of weeds, and then they cut it down, chop it up—weeds and all—and make it into bread. The loaves are flat cakes with a hole in the middle for the convenience of stringing them together. There are two varieties of bread, one like concrete and the other like rubber; the first is the preferable variety, but it takes so long to eat that you are finishing your breakfast when lunch time comes round. The milk is not drunk fresh, but sour, and fish is not considered eatable until it is half rotten.

The lecturer showed a number of pictures of reindeer, and gave many interesting particulars concerning these animals. The lecture was punctuated throughout with many little quaint conceits, which were much enjoyed by the audience.

Sir Martin Conway said that he was sure that Mr. Hine deserved and would get a most cordial vote of thanks. He himself had long had a desire to traverse that same strip of country; but now that he had heard so much about it and its inhabitants he felt as if he did not hanker after it so much. Mosquitoes and stinking fish may be interesting to hear about, but he did not care for a close acquaintance with either. The lecturer had revived many reminiscences, and especially it called to his mind the overpowering, pungent, and all-pervading odour of the whale factories. He knew nothing that smelt quite so loudly as an old whale—old, he meant, since it had died. He should take the memory of that smell home with him to-night, and it would haunt his dreams. Then there was also the codfish smell, and the cod liver oil smell, and these together with the Lapps themselves, made up an olfactory symphony that was beyond description. As to the Lapp himself, it was like peeping back to neolithic, or perhaps palæolithic times; our own ancestors were probably like these people.

After a few remarks by Mr. O'Shea and others who had visited Lapland, the meeting closed with a hearty vote of thanks to Mr. Cutliffe Hyne for his instructive and entertaining lecture.

CROYDON CAMERA CLUB.

"EXPERIENCES of a Holiday on the East Coast," being an anecdotal lecture by Mr. P. C. Harpur, a member of the Club, was the subject for Wednesday, the 3rd inst.

Mr. Harpur's narrative covered so wide a field that it is only possible to mention a few of the points he dealt with. He very strongly believed in the advisability of all amateurs joining a photographic society, and instanced himself as a "hopeless spoiler of plates" before he joined the throng he was addressing. Considering the quality of Mr. Harpur's present work, the moral is obvious, and one to rejoice the hearts of all honorary secretaries. Mr. Harpur also believed in the too-frequently neglected sky shade, and showed a very neat one constructed out of a piece of stiffened cloth, which fitted on to the hood of the lens by means of a circular piece of clock spring. His preference was to work against the light, and a shield against the direct rays of the sun was almost essential.

In dealing with groups, such as harvesters, fishermen, and the like, the lecturer thought far more failures resulted from trying to take them unawares, than in getting them to join in the proceedings, with a strict injunction that they were to appear oblivious of the camera. He generally found a willingness to enter into the spirit of the thing, though children had a misguided tendency not to miss anything that was going on.

Mr. Harpur spoke for over an hour, and much that he had to say was worthy of attention. A little judicious compression here and there, and interspersing the narrative between the slides, instead of showing the latter at the termination of his remarks, would have been preferable. This is offered as a suggestion, and in no wise detracting from a lecture which a hearty vote of thanks emphasised as excellent.

NEWCASTLE-ON-TYNE AND NORTHERN COUNTIES PHOTOGRAPHIC ASSOCIATION.

CARBON printing formed the subject of a lecture and demonstration before the members of the above Association, at the headquarters, Y.M.C.A., Blackett Street, Newcastle-on-Tyne, on Tuesday evening, December 2nd. The demonstrator was Mr. William Thompson, who in the course of his remarks said that of all printing processes, carbon undoubtedly yielded the most beautiful results, the ultimate colour of the print being absolutely determined by the selection of a suitable pigment, there being no possibility of double toning or degradation of the high lights as with printing-out papers, while errors in printing can be corrected by lowering or raising the temperature of the water used in

developing. The difference between single and double transfer was fully explained, the lecturer showing that the necessity for the double transfer process could be avoided by taking the negative with the glass side towards the lens, instead of the film side, or by using thin films and printing through them, the thickness of the film support making no appreciable difference in the definition. Several very fine prints were developed during the course of the demonstration, these being supplied by the Autotype Company and Messrs. T. Illingworth and Co., Ltd., to whom the lecturer expressed his great indebtedness for their kindness. Some excellent prints by Messrs. Thompson and Lee were also exhibited, and greatly admired.

LEICESTER LITERARY AND PHILOSOPHICAL SOCIETY.

Members of the photographic section of this Society had a very pleasant and profitable evening on Friday, when the monthly meeting took place in the Council Room at the Town Museum. Mr. Wardell (of London) gave the members of the section many useful and interesting hints in his address upon "The possibilities of the modern camera," which was illustrated by some very up-to-date photographic apparatus. Special attention was given by the speaker to telephotography, its difficulties and advantages, and the audience received with manifest interest a number of admirable pictures taken at distances varying from three-quarters of a mile to 1½ miles—pictures, for instance, of the Clock Tower of the Houses of Parliament, the top of the Nelson Monument, etc., in which an astonishing amount of detail was apparent. Other matters of interest to devotees of the camera were touched on, and some knotty points elucidated.

The chairman of the section, Mr. H. Alfred Roechling, who presided, expressed thanks to the lecturer, who in acknowledging the compliment paid a tribute to the capabilities of Mr. A. Newton as the lanternist.

WEST LONDON PHOTOGRAPHIC SOCIETY.

There was a very full programme and a large audience on the 5th inst. A show of work done at the outdoor meeting was held, and the secretary exhibited and explained Messrs. Wallis Bros'. Perina camera, which affords a range of exposures from 1-5th to 1-1,000th second, by means of a focal plane shutter with a wide and narrow slit in the one blind, either being useable at will. A collection of prints upon Mattos paper, kindly lent by Mr. P. Leuthardt, were next passed round, and their fine tone, richness of image, and variety of surface were much admired. A series of stereoscopic prints from Stereo-weno negatives, as well as three Stereo Daguerrotypes (in perfect preservation) were then examined, and Mr. L. Selby afterwards explained the working of the Kodak developing machine, which he said had in his hands produced very satisfactory results.

LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

At the last meeting, Mr. Fred. Anyon, of Bootle, gave a demonstration specially for beginners on "The Management of the Camera, including Hand Camera Work and the Development of Negatives." The lecturer entered fully into the various movements of the modern camera, and explained the objects of them. He emphasised the advisability of amateurs mastering the stand camera before tackling the hand camera, and spoke of the difficulties attending the latter branch of the art. Speaking upon development, Mr. Anyon gave varying formulæ for different types of negative, and afterwards developed a negative in the presence of the members.

WOLVERHAMPTON PHOTOGRAPHIC SOCIETY.

On December 1st, Mr. Harold Holcroft lectured upon "Mounting and the choice of Mounts." He dealt with the subject for the benefit of the amateur of all varieties, but more especially to assist the picture maker. The objects of picture mounting were stated to be:—

(1) To preserve the print from mechanical injury, tearing, etc.
(2) To hold the print flat so that it could be seen properly.
(3) To isolate the picture from its surroundings.
(4) To aid the effect of the picture by enhancing or minimising certain features.

He said that the mount should occupy a subordinate position to the picture, that the relation between them should be as the accompaniment to the song, as the dress to the man, and cautiously refrained from dogmatising upon the relationship between woman and dress. He pointed out that after some years of universal framing close up at the exhibitions, mounting of suitable subjects was now receiving proper attention, and that mounting must be necessarily largely a matter of individual taste and fashion of the moment; that this taste must be cultivated by observation, and especially by the careful study of the work of leading men.

In dealing with the effects of the different variations in mounts which effects were illustrated practically, he ventured to differ from the critics who condemn the plate mark as applied to a photographic holding that the maxim "Intention constitutes the crime" applied, that there was no intention to deceive, and that no person of reasonable intelligence would mistake a photograph for an etching; but this use of a plate mark was not false pretences, but a legitimate borrowing from a sister art of a useful form of relief or ornament. A collection of many different kinds of paper, and other materials which may be effectively used for mounting was shown, amongst them being examples of the art mounts stocked by the "Photographic Art Journal," Percy Lund, Humphries and Co., and Messrs. Wesson and Co., The proper use of these materials for different kinds of prints was illustrated, and the application of ornament where the character of the subject would admit of it was dealt with. Some fine examples of mounted pictures by Pugo and Yarnall Abbott, from the Salon exhibitions, effectively enforced the various points of the lecture.

SOUTHAMPTON CAMERA CLUB.

A meeting of the members of the above Club was held on the 8th inst., under the presidency of Mr. G. Vivian, when, after the usual preliminary business, Mr. Steadman, representing the Lumiere N.A. Co., gave a lecture and demonstration on the most advanced process of colour photography, and received a hearty vote of thanks for his elucidation of the subject.

News and Notes.

The Royal Photographic Society's lantern lecture on Tuesday, December 16th, at 8 p.m., will be "Photography in the Hunting Field," by Mr. H. M. Lomas.

The death is announced of Prof. O. N. Rood, known by his work in experimental physics. He was the author of "Modern Chromatics." Prof. Rood was born in 1831, and was professor of chemistry and physics at Troy University from 1858 to 1863. For the past thirty-nine years he had been professor of physics in Columbia University. He had been vice-president of the American Association for the Advancement of Science, and was a member of the National Academy of Sciences.

Patent Law Reform.—Notice has been given by the Commissioners of Works and Public Buildings that they intend to promote a Bill in the next session of Parliament for extending the existing buildings of the Patent Office. It is proposed to acquire the premises east of the existing office, and those to the north and south as far as Furnival Street and Staple Inn and Took's Court. This is the outcome of the recommendations of a committee appointed in May, 1900, while Mr. Ritchie was at the Board of Trade, and is in anticipation of the greatly increased accommodation necessary for carrying out the provisions of the Patent Amendment Bill which has just passed the third reading before the House of Lords. Some idea may be formed as to the effect which the new Bill is likely to have by comparison with the working of the United States Patent Office under the system of an absolute search for anticipations. The examination staff numbers 662, and cannot keep pace with the work. The staff at the British Patent Office, at present under a system of "no search," numbers 267. Under the present Bill a fifty years' search is guaranteed. The expenses of the American office amount to £242,356 yearly, and the income to £225,091; the present expenses of the British office yearly are £123,216, and the income £225,700.

Marple and District Photographic Society's First Annual Exhibition was held on Saturday, the 29th ult.,. It was opened by Mr. C. F. Budenberg. The attendance during the afternoon was moderate in number, but influential in character. Mr. Budenberg, in the course of his introductory remarks, gave an exhaustive consideration of the value of photography in the principal arts and sciences, including an account of a recent visit he made to the Zeiss works, and the use at that place of stereoscopic photography for the purpose of astronomical measurements. He congratulated the Marple Society upon the excellence of their exhibition. About 250 pictures were displayed, two important sections being lent by members of the Manchester Amateur and the Ashton-under-Lyne Societies respectively, representing the best work at the exhibitions recently held by them. The spirit of goodwill shown by the two Societies named in thus helping a younger Society is most praiseworthy. The work shown by the Marple Society was highly creditable, having regard to the short time the Society has been in existence. The principal exhibitors were C. J. Atkinson, J. W. Wood, G. Holmes, and B. Leech. Other features were stereoscopic views, transparencies, microscopes, process printing blocks, etc. At 7.30, Mr. Atkinson, the President, gave his illustrated lecture, entitled "A Holiday at Hexham and Carlisle," which was very well received, and was followed by a general collection of lantern slides, chiefly by Mr. Chayne, of Ashton-under-Lyne. In the evening the attendance was quite large enough for the capacity of the room. The financial result will be a slight gain; and in all other respects the Society have received encouragement to repeat the venture. Th present occasion was largely experimental, and was undertaken in the hope of increasing public interest in the art and practice of photography. It was a matter of surprise to many of the visitors upon finding that photography was something more than a mere hobby, and that it is indeed a capable medium for the expression of artistic feeling and cultured taste. The impression left by the exhibition is already taking form in the enrolment of new members; the Society has also gained a recognised position in public estimation as a social and educational influence.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

A VISIT TO THE TATE GALLERY.

To the Editors.

Gentlemen,—Without seeking to enter into the doubtful controversy whether or not photography is an art, the assertion may be safely made that the photographer is at his best when he takes counsel of those truths which Art alone can teach him. An afternoon spent in contemplation of a good collection of paintings will send him forth with a keener relish for his work and a broadened horizon. The Londoner is especially favoured in this respect, for he can take his choice among several of the finest art collections in the world. Hardly second in interest to the famous National Gallery is that known as the Tate Gallery, at Vauxhall, whose light and graceful dome is a river-side beauty. A visit we lately paid there served to convince us more than ever of the immense value of a close study of pictures, such as are here contained, with special reference to their suggestiveness, photographically speaking. A few appreciative remarks on some of the many treasures here shown, and an endeavour to trace out one or two of their more obvious lessons for us, may not, perhaps, be without interest.

Entering, and pausing to admire the dainty fountain court under the glass roofed dome, with its tesselated pavement, slender columns, and arcaded gallery overhead, we pass into the room on the right by preference; curiously enough, everyone seems to do that, and we merely follow popular example. The first thing that immediately rivets our attention is that beautiful creation, "The Glitter, Grime, and Wealth of a Flowing Tide," by W. L. Wyllie, A.R.A. Carrying out our intention of looking at everything here with an eye for photographic hints and suggestions, we are at once impressed with the fact that this was eminently a subject for the camera, and one where photography would have fully distinguished itself. It is true that the silvery greys and low tones of the smoke-cloued river, with its crowd of shipping, are rendered by the painter with a superb harmony of colour that we cannot yet attain to; true, also, that the subject is idealised and rich in suggestiveness that only the artist could give; yet how many a chance have we photographers of catching instantly some fleeting effect of light and shade, some momentarily happy grouping of tall-masted ships, with a faithful naturalness of ripple and movement in the water peculiarly our own, as so many fine river pictures have already proved. "The Vigil," by J. Pettie, R.A., is an impressive and poetic presentment of a mediæval knight, keeping his silent midnight watch before some saintly altar. While admitting without cavil that in such subjects Art must always of necessity be easily first, it is certainly borne upon us that many most effective genre pictures might be accomplished by photographic means, in which the interiors of churches and similar buildings should form the suitable and fitting background. Of course, we know that such things are difficult of management, and are far from wishing to suggest anything that might tend to detract from the natural reverence that should be observed in such surroundings. We are fully aware also of the almost impossibility of avoiding artificiality when any kind of posing or arrangement of suitably dressed models is attempted; still, we think it must be admitted that much might be done in this direction, photographically, that has never even been attempted. As yet another example of what might at least be experimented in, though it need hardly be said that photography can scarcely hope to meet Art successfully entirely on its own ground, may be instanced the lovely painting, a little lower down, "Harmony," by Frank Dicksee, R.A. This picture is so well known that it is almost superfluous to describe it. Who has not seen prints or engravings of the lovely maiden playing the church organ, a soft and dreamy light falling upon her glorious auburn hair from a "storied window richly light?" At her side, leaning his face on his hand, is seated a handsome youth, whose eyes, full of affection and feeling, fixed upon the maiden, proclaim that the harmony indicated is not solely connected with music.

"Ayesha," by Val. C. Prinsep, A.R.A., is a painting which the portrait photographer may study closely and attentively. It is one of those pictures which, lovely of colour though they be, owe their chief excellence to beauty of outline and lighting; in a word, it is a work which we can imagine would lose little if translated into monochrome. It represents a slender Eastern girl, with a proud, beautiful face, holding a large burnished copper water vase. The attitude, lighting, and entire expression of this successful picture are worthy of minute inspection, carrying, as they do, many valuable suggestions of photographic possibilities.

By this time we are content to wander aimlessly from room to room, looking rather at a specially striking work here and there than trying conscientiously to see all, in catalogue order, a method of inspecting artistic treasures, which to some minds robs the process of half its charm. "St. Martin's in the Fields," by W. Logsdail, seems to have a peculiar fascination of its own. The handsome spire, so familiar to Londoners, the wet pavements, passing vehicles, newsboy running across the road with the "latest edition," the flower girl, offering bunches of primroses, are most realistically rendered, in a way that makes us at once acknowledge the truthfulness of the presentment. And yet throughout there is that evident touch of selection and suppression which the photographer, before all others, knows so well the necessity of, and can perhaps best appreciate. "Morning Glory," by M. Ridley Corbet, A.R.A., is so eminently photographic a subject that one might almost suspect the artist of having sought inspiration from the camera, although to be sure very much of the beauty of this picture depends on the glowing sunrise behind the sky line of tall, drooping trees. The photographer, however, in dealing with such a motive, would certainly have to make his foreground more interesting than the artist, in this case, relying more on the power of making colour take the place of outline, in subdued tones of green grasses, has done. The narrow curving path at the right is dexterously and cleverly introduced.

"Upland and Sky," by A. Stokes, is a most interesting study of a breezy hill top, with cattle browsing or in repose, sharply outlined, with telling effect, against a majestic cumulous sky. "Pilchards," by C. Napier Hemy, A.R.A., is a glorious triumph of colour, which must make the photographer frankly confess himself beaten. The splendid grouping of the many picturesquely dressed fishers, hauling in the shimmering, silvery burden of their laden nets, is, alas! beyond us. "Carnation Lily, Lily Rose," by J. S. Sargent, R.A., although essentially a triumph of colour, has many lessons for us. It is an admirable example of breadth and largeness of effect, and of how intention and suggestion may be subtly and tellingly expressed, yet in such a way that it is felt rather than seen. The intent, flushed faces of the two sweet young girls, lighting Chinese lanterns, amid an exotic wealth of tall, gorgeous flowers, form a picture that is not soon forgotten, but recalls itself with pleasant persistence, long after its rich colours and charming outlines have passed from the actual vision of the observer. "Ethel," by Ralph Peacock, is a most suggestive example of portraiture. The dark background of carved oak panelling, the naturalness of the golden-haired young girl seated against it, the unconventionality and careless abandon of the pose, have each a lesson for us. If a photographer had done it, it is questionable if it would be so much admired. We should have heard severe remarks passed on the commonplace and homely attitude, the absence of effort in the lighting, the lack of smartness and artificiality about it; in a word, condemnation of just those very things which the artist knows how to admire, and deliberately chooses. "The Pool of London," by Vicat Cole, R.A., has a superbly grand sky effect. The clouds of smoke, half obscuring the vista of multitudinous sails and masts, behind which, in the distance, keeps watch the weather-stained dome of St. Paul's; the air of busy labour and toil, the very romance and mystery of a great city, are here suggested and portrayed with wonderful intensity and power. "The Sisters," by Ralph Peacock, is another beautiful and refined portrait study, extremely interesting and instructive. The elder sister is reading a Bible, the younger, sitting by her side, but with her attention evidently wandering, a lovely expression of affection and trustfulness is visible in the attitudes and faces of both. The grouping, too, is an excellent example of well-balanced composition.

Yet another portrait, and we must leave specific discussion of the many gems to be found in this collection. "Mrs. William Morris," by Dante Gabriel Rossetti, is a work which, it goes without saying, cannot have justice done to it in a few minutes' inspection. It will well repay much longer attention, and the photographer may find food for thought in the admirable arrangement of the hands, and the extremely simple yet highly effective accessories. We have purposely avoided mention of the many world-famous pictures that may here be seen amid such architecturally beautiful surroundings. Who has not heard of Millais's "Huguenot," Calderon's "Renunciation," Leighton's "Bath of Psyche"—to mention but three out of a host? It is certain that the visitor to the Tate Gallery, be he photographic or not, will find the hours pass all too quickly, and hear, with surprise and regret, the voice of the attendant warning him of "closing time."—We are, yours, etc.,

LENS, CAMERA, AND DRY PLATE.

December 8th, 1902.

THE BRENTFORD EXHIBITION.

To the Editors.

Gentlemen,—So as to make our annual exhibition more attractive, both for exhibitors and visitors, we purpose introducing a new feature. The exhibition, coming towards the end of March, always includes a lot of work that has already been the rounds of the exhibition, and is well known to us and to the judges also. Now, we want some new material, and I hope you can insert this letter in your next issue. This will give workers three months to prepare what we want.

We propose having one open class for pictures—any subject—that have never been previously shown at any other exhibition. A prize—choice of the winner—consisting of material or apparatus to the value of two guineas, will be given on the condition that there will not be less than twenty entries (1s. per frame entrance fee). The same picture may be entered in any one of the other "open" classes, and

may also stand a chance of winning a medal. As our rooms are within easy access of London, both by train and by tube and electric car, we are looking forward to a ready response to our offer and realisation of our desires. Entry forms will be ready shortly, and will be sent post free on receipt of a post card.—Yours, etc.,

HILTON GRUNDY.

30, Whitestile Road, Brentford. December 5th, 1902.

A PHOTOGRAPHIC SOCIETY FOR WIMBLEDON.

To the Editors.

Gentlemen,—Will you allow me to announce, through the medium of your paper, that a photographic society is about to be formed in this district, and if those desiring particulars of same, or wishful of joining such a society will forward their names and addresses to me, I will appoint a time and place to hold the inaugural meeting, if they will kindly give a list of evenings in the week which would be convenient for them to attend a meeting for this purpose.

It is sincerely hoped that every inhabitant of this district interested in photography will send in their names, as they need not pledge themselves to join by so doing. Residents in the surrounding districts will be heartily welcomed, so that the proposed society may be a great success.—Thanking you in anticipation, I remain, yours faithfully,

C. F.

136, South Park Road, Wimbledon.

WHERE ARE WE DRIFTING?

To the Editors.

Gentlemen,—Although I never heard of Mr. Michael E. Banger until last week I have not the slightest doubt he is as highly esteemed by the photographic world as he evidently is by himself. His "still drifting" letter in this week's Journal induced me to read his former ones, and wonderful reading I found them. "Without top light, all power of concentration is lost," etc., is one of his statements, which, taking open-eyed, at the risk of being annihilated, I bluntly say is utter rubbish. Leaving, however, all his other assertions aside, I shall confine myself to the subject of "side lighting." Mr. Banger speaks from theory; I speak from nearly four years' practice. I work with one high window, which is fitted with three opaque blinds, to push upwards, and three to pull down. In less than a minute I can open and shut the lot. I can get any and every effect of lighting in about a quarter of the time it took to manipulate my old skylight studio, and I do not find the exposure anything different. As it happens, my acquaintance with portrait painters, eminent and otherwise, is extensive and peculiar. I cannot recall one that ever worked with a top light, or even had one to work with. Fifteen grown-up persons is the largest group I have attempted in my studio, and the work will bear comparison in every way with any I ever did in my old place. The truth is, Mr. Banger, and men like him, either forget or don't know that, whether the studio is side or sky lighted, everything depends on the man behind the camera.

As I shall probably be pulverised anyhow, I recklessly add that, when "Sidelight" says he'll take his dose of light through a keyhole if he thinks fit, it shows, in my opinion, he is a much greater artist than Mr. Michael E. Banger has proved so far.—I am, gentlemen, yours truly,

WM. RALSTON.

259, Sauchiehall Street, Glasgow. December 5th, 1902.

To the Editors.

Gentlemen,—In reply to Mr. Banger's criticism of my recent article, "A Stray Conversation," I have only to say that I regret that he has misunderstood my meaning.

In endeavouring to emphasise the necessity of a complete correspondence with his environment on the part of a photographer claiming to be an artist, it was necessary for me to use, to a certain extent, metaphorical language, in order to at once introduce the reader to a fundamental principle of the ethical side of the subject.

Mr. Banger chooses to omit this in his criticism, and to regard it merely as literary veneer. This being so, the very essence of the dialogue—the string on which the whole conversation is hung—is destroyed, and what remains must necessarily be disconnected remarks. Criticism is therefore useless, and so I will not reply seriatim to your correspondent's complaints. The amateur I was thinking of is a very different person to the one your correspondent refers to; and, in conclusion, I would wish to remind Mr. Banger that among gentlemen of liberal education it is quite customary to introduce apt quotations into their conversation when these tend to make the meaning clearer, and that these should not be confounded with the extravagances of a fop.—Yours, etc.,

A. V. KENAH.

December 7th, 1902.

To the Editors.

Gentlemen,—I must call "Side Light" to order once more. In his jumble of distortions and misrepresentations which appeared in your JOURNAL last week, he commences with a wilful perversion of my meaning by saying: "Any person who attempts to take a portrait in a studio without the usual window in the roof, has less 'noble aims' than our friend Mr. Banger"—ascribing this sentiment to me. This I think anyone will admit is a misrepresentation of my meaning. I said, "Happily for our profession, there are men of nobler aims than "Side Light," and less easily satisfied," referring to those photographers who desire to vindicate the art claims of our profession, and repel the attacks which are so often levelled at it by persons ignorant of its possibilities.

That he should term me "narrow minded" is rather amusing, as the designation is more appropriate to himself and those who, advocating the abandonment of top light, restrict themselves to the use of side light only.

In what I said about double lights and shadows I was merely stating facts, as it is well known that light travels in straight lines, and therefore two separate lights must cast two shadows. This may of course be modified by placing the sitter in certain positions, but the delineation cannot be so perfect as that obtained by proper studio lighting. In order to avert further misrepresentation by "Side Light," I will state that, while opposing the idea of constructing studios with side light only, any deprecating the abandonment of top light, I have said nothing against the use of side light in the studio, which we all know is most necessary in combination. My words were, "The ideal studio will then be the lecturer's abomination—i.e., with as much glass as possible," etc., etc.

I think my meaning is clear, and nothing but the mental obliquity of "Side Light" could misconstrue it.

The information he gives when saying that "No two persons who are photographed have features exactly alike," is peculiar and funny, as it seems to imply that all who are not photographed are alike in features; or does he mean that his side lighting differentiates the features of his sitters, and thus stamps his own personality upon their portraits?

That different faces require different lighting is true, and distinctly makes for my contention—viz., as much light as possible to be at the disposal of the artist.

As to my knowledge of light and shade, that is a quantity of which "Side Light" is quite incompetent to judge, and he rather gives himself away by sending me a parcel of his "natural living likenesses" to criticise after discounting my knowledge on this point. While thanking him for his recommendation of the book that "set him thinking" (save the mark), I can assure him that nothing he could say would me more surprising than the confidence he asserts in his own ability, although from the way in which "Side Light" occasionally expresses himself, such as calling the sky-light "a window in the roof," and specimens "samples," it would seem that he has had more experience behind a counter than in a studio. His proposal that I should send a "sample" of my work for him to compete with is declined with thanks, but should my idea of a Guild of Art Photography be ever realised I can promise him an opportunity for distinguishing himself.—Yours, etc.,

MICHAEL E. BANGER.

December 8th, 1902.

AN APPEAL.

To the Editors.

Gentlemen,—Will you allow me to bring to the notice of your many readers the sad case of an old photographer, named Webber. He is between 70 and 80 years of age, and came to Salisbury about two years ago, and has been living, sleeping, and working in one room, doing, I believe, chiefly lantern slides. He is now in the workhouse infirmary, having had a bad fit some eight or ten days ago, and is still very bad.

He is in debt to his landlady about £3, and as she is wanting her money and has other uses for his room, she intended to dispose of the few articles he has, such as camera, dishes, negatives, etc., and these being of an antiquated type would not realise much, so I have arranged to pay the debt and take the goods, intending to hold the same until the owner is able to redeem them (that is, if he recovers). The goods are worth very little, if any, more than the £3.

I believe he was at one time in business for himself, and is well known to many photographers in the country, and it is with the hope that they and others may feel disposed to help him, either by paying off his debt or providing him with clothes and food when he leaves the workhouse, that I am thus writing.

Any remittances which may be sent, shall be well and faithfully used, and, with your permission, Mr. Editor, I will acknowledge the same in the Journal.—Yours truly, H. C. MESSER, M.P.P.A.

(Member of the Board of Guardians).

Photo Stores, 29, Castle Street, Salisbury.

December 8th, 1902.

MR. W. F. SLATER of 5, Firs Parade, High Road, Lee, S.E., writes:—I beg to inform you that I have the following lantern lectures, which I shall be pleased to circulate amongst photographic societies: "A Trip up the Rhine with the S.L.P.S.," by special arrangement with the South London Photographic Society, to whom the slides belong: "From Liverpool Street Station to the Continent" (the Great Eastern Railway Co.'s route via Harwich), this will be ready by January 1st, 1903, and will include Hamburg, Belgium, Bernese Oberland, Holland, Rhine, and Moselle; "The Land of Windmills," will be ready by February 1st,

1903, which is Holland from Brielle to the Zuyder Zee. Each of these lectures are illustrated with 200 slides, and occupy from 1½ to 1¾ hours. Conditions: (1) That a fee of 3s. 6d. be paid at the time of booking to cover working expenses; (2) That the Society borrowing the lecture pay carriage one or both ways; (3) That each Society be answerable for any damage done while in their possession; (4) That the slides be forwarded to address given directly after use, carriage paid.

THE Lumiere Film.—The Lumiere N.A. Co., Limited, of 4, Bloomsbury Street, New Oxford Street, write:—We beg to inform you that Messrs. Lumiere and Sons, of Lyons (of whose products we are sole proprietors for Great Britain, the Colonies, and North America), have acquired control, by purchase, of the Societe des Pellicules Francaises (Planchon Film) who have hitherto been licensed to supply film coated with the Lumiere emulsion. The enormous demand which followed the introduction of this film to the English market resulted in inability to cope with the volume of business received, and necessitated large additions to the manufacturing plant and buildings. In order to obviate any further shortage of supply, which has resulted solely from the overwhelming demand, the arrangements for manufacture have been largely extended, and the output considerably increased. Many improvements have also been made in the film itself, and it will re-appear under the name of the Lumiere Film (Planchon process).

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY, 24, *Wellington-street, Strand, London, W.C.*" *Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

PHOTOGRAPHS REGISTERED:—

W. E. J. Church, 119 High Street, W., Sunderland. *Three photographs of the Mayor of Sunderland.*

ADDRESS WANTED.—H. WEBBER writes: "Will you kindly inform me where I can get the Shakespearean playing cards designed by Mr. F. C. Tilney?"—In reply: They are published by Messrs. Swann Sonnenschein and Co. We do not answer letters through the post.

ADDRESS WANTED.—F. W. CLIFFORD asks: "Could you kindly let me know where to get the paper by Dr. Rigollot on 'Electrical Actinometer' mentioned in your issue of April 12th, and oblige?"—In reply: We must trouble this correspondent to give us the correct date. No JOURNAL was published on April 12th of this year.

LENS QUERY.—HEHI says: "I have a lens engraved 'Ross, London. Actinic Triplet No. 4.' I should be glad if you would inform me what special kind of work it is for, if any; also value."—The lens is now obsolete, and is not now made by the firm. It may be used for any class of work, but it is slow in action as compared with modern lenses. You will find it a very good lens for copying. It has but little market value.

RECOVERY OF DEBT.—T. W. G. says: "I have an eighteen months' standing debt owing for photos. The goods were ordered by post, and sent per return. I have written many letters asking for remittance, which they decline, saying 'You can sue me in county court; I will not pay.' Now, the distance to travel to sue would cost me more for return fare by railway than the amount owing. Can I sue in my district, and so avoid the above expense?"—In reply: Sue in the county court of the district in which the debt was contracted. If that is where you are now living sue there.

WM. MELLING.—There are so many "tricks" by which alleged "spirit photographs" can be produced. The two specimens sent appear to have been made by exposing the plates to very indistinct transparencies, either before or after the plate was exposed in the camera—notwithstanding the alleged vigilance of the so-called investigator. We know nothing of the photographer who produced them, or his address. Of course, if you desire to produce spirit photographs you must have the "spirits" clothed in the orthodox white sheet when their portraits are taken.

FLASH LIGHT STUDIO.—FLASH LIGHT says: "I should be obliged if you could let me know if I can take good work with Maloni's patent studio lamp, as I am about to take premises where I cannot erect a studio for portraiture. I have not seen any work (portraiture) done by that light. Perhaps you may be able to give me some information?"—In reply: We have seen good portraits that were taken with the light. You ask if you can take good ones with it; of course, we cannot say, as, whatever light, whether daylight or artificial, be employed all must necessarily depend upon the skill of the operator as to whether the work is good or bad.

LIGHTING THE SITTER.—REMBRANDT says: "From time to time I have noticed in your valuable journal answers to questions in reference to the lighting of studios. Some of the queries have evidently been from amateurs or at least amateur professionals. Could you kindly let me know what you consider to be really the best text book published on the 'Lighting of the Figure in the Studio,' likely to be of assistance to a professional photographic portraitist? A reply will greatly oblige."—In reply: You will find either, or both, the following books useful to you: "Artistic Lighting," by James Inglis; "The Studio; and what to do in it," by H. P. Robinson. The former is published at 4s. 6d., and the latter at 2s. 6d. They may be had through any of the dealers, or through a bookseller.

DEFINITION OF TERMS.—COMPETITOR asks: "Will you kindly define what is a snap shot and a time exposure. In entering a competition, say a photo was taken with a camera on a tripod in 1-100 sec., and one was taken with camera held in the hand at 1-50, would they both be classed as snap shots, or would it be time exposure if the camera is fixed to tripod and a snap shot when held in hand, or at what speed of the shutter does a snap shot become a time exposure if snap shots are allowed on a tripod?"—In reply: The term "snap shot" is very vague. It is, however, generally applied to hand camera work, whatever the exposure may be. By time exposure it is generally assumed that the camera is used on a stand, and that a somewhat long exposure is given, such as may be made with the pneumatic bulb.

COLLODION EMULSION.—J. HUGHES writes: "Will you kindly give me the formulæ and directions for preparing this emulsion, also say about what period it will keep in good condition in its unwashed state? I have tried one or two emulsions as given in the B.J.A., but find them too slow to be of much service in regular work whilst some of the above supplied commercially was everything to be desired—except the price, which was too expensive—as compared with the regular wet plate work."—Formulæ for different collodion emulsions are given in the "Almanac" for the current year on pp. 1088-10, all of which are good. But whether any of them are the same formulæ as that of the makers whose name you mention we cannot say. Any collodion emulsion must, of course, come more expensive than wet collodion, and it is also much slower than a gelatine emulsion. In the unwashed state the emulsion will keep for several days.

LIGHTING—BACKGROUNDS.—H. W. B. writes: "I should esteem it a favour if you can tell me (1) By what means the effect is obtained in full length and three-quarter length figure portraits by some of the leading London photographers of the concentration of light about the head and falling away into shadow towards the extremities of the picture. It is evidently not done in the lighting of subject, as it would be impossible to concentrate daylight to produce such an effect? (2) I have several canvas backgrounds which have been discarded, and I wish to know if by first applying a strong solution of size over the existing scene (which I should say is painted in distemper) it would so fix the image that another scene could be effectually painted over it?"—In reply: (1) We scarcely understand the style of picture you desire information upon. If you send us a specimen we shall be able to help you. (2) Yes, but probably the backgrounds will require a coating of plain distemper, to effectually cover up the old scene, before the new one is painted.

INSTRUCTION IN PHOTOGRAPHY.—"PHOTOGRAPHIC NOVICE" sends the following letter: "Will you be good enough to give us a little information? We have the idea that by getting a good negative taken of the various machines we make we could print our own photos in quantity from these negatives after a little practice. If so, what number could be taken from one negative, what outfit, or what articles of equipment should we require, and about the cost of them—we mean for cabinet size prints? If you think our idea is a practical one we should be glad to receive any information and advice you feel disposed to give us."—We suggest that you get an elementary work on photography and learn how to print from negatives. When you have done that you will be able to judge what appliances you will require to produce the number of prints of your cycles that will supply your wants. The cost of them you can ascertain by consulting the catalogues of the firms that advertise in our columns. Are you sure that any good photographer will take negatives for your company and then hand them over to you to print from?

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*** *The Editor can only be seen by appointment.*

*** *We do not undertake to answer letters by post.*

EX CATHEDRA.

Direct Photographs in Colours. We have already recorded the researches of Dr. Neuhauss and Herr Wörel in the direction of obtaining a mixture of light sensitive dyes which will bleach out under the action of light and give us prints in colours. Dr. Neuhauss has been continuing his experiments, first as to increase of sensitiveness, and secondly as to a more perfect method of fixation than the original one with copper salts. Numerous new dyes were tested and the addition of many oxygen-giving substances and the persulphates of ammonium and potassium were alone found of any value, and the former as preferable on account of its greater solubility in water. The mixture now recommended by Neuhauss is erythrosine, thiazol yellow, uranine, auramine, chlorophyll (fresh alcoholic solution from grass), and methylene blue, these with a 10 per cent. to 12 per cent. gelatine solution with hydrogen peroxide and a few drops of ammonium persulphate, proves to be most sensitive. A soft emulsion gelatine is the best. The method of fixing now recommended is to first wash the plates and then to bathe them in a 10 per cent. solution of tannin to which some sodium acetate is added for 15 minutes, and then rinse and immerse in a saturated solution of tartar emetic, then rinse and then immerse in a saturated solution of acetate of lead and again wash. The colours are in no way affected and will stand an hour's exposure to sunlight without showing any change. At present Dr. Neuhauss states he has been unable to develop the plates, but it is obvious that considerable advances have been made, and we may yet hope for the ideal colour process—namely, one that will give us colours direct in the camera and enable us to print in colours from the results thus obtained.

* * *

Trichromatic Filters. Professor Dr. Fritsch recently read a paper before one of the Berlin societies upon the manufacture of trichromatic filters, the gist of which was to the following effect:—The best emulsion gelatine is soaked for two hours in sufficient distilled water to completely cover it, and then the excess of water poured off and the gelatine melted by the aid of a water bath. A sufficient quantity of the necessary dye is dissolved in distilled water and 5 per cent. alcohol added. To the dye solution half its volume of gelatine solution is added and the whole well stirred on the water bath and well cleaned patent plate glass, which must be accurately levelled, is then coated with the mixture, which should be filtered through a double thickness of mull muslin. For large filters to be used in contact with the plate it is advisable to coax the solution over the plate with a glass rod. When coated the glass should be covered with a bell jar, in order to prevent dust spots and a capsule of anhydrous calcium chloride or fuming sulphuric acid also placed under it, when the plates should dry in about 48 hours. Too much gelatine will cause striæ and too little gelatine separation of the dye in crystals on the surface, which can however, be removed by rinsing with water. Dr. Fritsch recommends cementing another plate glass to the front of the filter with thick Canada balsam dissolved in turpentine. (Mr. Alfred Watkins has pointed out that xylol is preferable as a solvent.) The dyes recommended are Congo red for the orange filter, brilliant green and napthol yellow for the green filter, and Victoria blue for the blue-violet filter, or dahlia or methyl violet may be used for this, and by far the best green, or rather minus red, filter is one which is not green and is made with milon blue, or naphthol or double green may be used for this. Dr. Fritsch suggests the term "substractive" filters for those used for negative making. and "additive" or zone filters for those used for positive work.

* * *

Eders Filters. Dr. Eder, in that section of his famous Handbuch just published, which is entitled "Die Praxis der Photographic mit Gelatine-Emulsionen," suggests the following filters, the trichromatic inks being chrome yellow, Krapp lake (alizarine red), and milon blue (Prussian or Berlin blue). For the violet filter a solution of methyl

violet 1 in 10,000 of water, in a thickness of 1 centimetre. For the green or minus red filter he strongly recommends the use of a blue and a yellow dye, as by alteration of the proportions of one or other of the same the filter may be adjusted to the plate more correctly; thus, if the plate is not sufficiently sensitive to green, the yellow filter is lessened in strength, whilst if the yellow is wanting then the blue compound is weakened. With an erythrosine gelatine plate the formula runs:—

Water	80 ccm.
Ammonium picrate solution 1:200 ...	40 ,,
New Patent blue B solution 1:1000 ...	15 ,,

For Lumière yellow-green sensitive plates the blue in above formula should be reduced to 10 ccm. For eosine collodion or the more sensitive ethyhreosin collodion the above green filter is satisfactory, but if collodion sensitised with monobromofluorescine be used, then a yellow filter only is required, and 40 ccm. of ammonium picrate solution should be added to 100 ccm. of water. For the orange or minus blue filter, a solution of naphthol orange or orange II. (Badische anilin und soda fabrik) 1:500 is the best, and this may be used with commercial red sensitive plates or ordinary plates sensitised by bathing with wool black or dianil black N (Meister, Lucius, and Brunig) (for method see the forthcoming B.J. Almanac), and also for collodion sensitised with ethyl violet.

* * *

Urea as a Developer. The *Photographisches Wochenblatt* publishes a communication from Hendrik Lübke concerning the use of urea as a developer. The question is of more scientific than practical value. Dr. Reiss, in August last, published a statement, that from his observations fresh urea, with addition of an alkali, even in small quantity, would develop the latent image. General Waterhouse tested this statement, and found that urea with alkali alone did not possess any power of development. The Editor of the *Wochenblatt* remarked that under certain pathological conditions other reducing substances might be present. Herr Hendrik Lübke now points out that urea of human beings and horses sometimes contains catechol sulphuric acid, and that this combined with an alkali forms a developer.

* * *

A New Colour Sensitiser. It will interest those who are engaged in three-colour processes to learn that Professor Miethe gave a lecture on the 27th November, at the Charlottenburg Technical School, upon the advance made in this direction during the year. The interest, of course, centred in the work Professor Miethe has done, as illustrated in the German photographic Press a few months ago. We have made reference to it in these columns. Dr. Miethe's results seem to have been largely dependent upon the use of ethylroth as a sensitiser, by means of which a dipped orthochromatic plate, sensitive from the infra-red to the ultra-violet, can be obtained. Not only is the plate of good keeping quality, but its sensitiveness for red exceeds that for blue, and its speed is sufficient for instantaneous exposures. The dye should be used at the strength of 1 in 50,000, and the plates should be well washed after they have been dipped. A number of lantern slides by the three-colour process were shown to illustrate the sensitiveness and true rendering of these panchromatic plates. The subjects included genre studies, portraits, landscapes, a sunrise, forest glades, misty mornings, and other very effective pictures.

Photography through Water. We hear, from time to time, of adventurous individuals who take cameras with them on submarine excursions, and who tell of the wonderful things they have accomplished. For some reason or other these subaqueous pictures never get published; they are only talked about. Mr. Martin Duncan, who lectured at the Camera Club last week, on "A Naturalist's Rambles on the Seashore," was not content with talking of what he had done in the way of photographing living fishes and other denizens of the deep, but he showed what excellent work he had actually accomplished. It is true that he does not go down into the depths with his camera; he finds it more convenient to bring the fishes to terra firma, and to photograph them in a tank, or marine aquarium. This tank is made especially for the purpose, with a large pane of patent plate-glass in its front, free from spot or flaw. The sides are also of glass, but the back is of slate. In addition to this permanent back, Mr. Duncan has others covered with rockwork, seaweed, shells, etc., to help him in his picture-making, a series of solidly-built backgrounds in fact, any one of which he can introduce into the tank at will. The inmates make a terrible fuss whenever their abode is invaded by one of these rocky backs, but they gradually settle down again, and as soon as this is the case their ingenious proprietor commences to move the sheet of rockwork nearer and nearer to the front glass of the tank, until the space between it and the glass is reduced to a few inches. Once more the creatures in the tank are allowed to get accustomed to the circumscribed space, and then Mr. Duncan, waiting until the best pose is assumed by his unconscious "sitters," takes the photograph. All the work is done in the open air. Artificial illumination of different kinds has been tried, but it is found that the effects secured are not half as good as those afforded by daylight exposures. Moreover, the inhabitants of the tank are strongly opposed to any kind of illumination except that which nature provides, and manifest their displeasure by sundry movements which do not conduce to good photography. Perhaps the most effective of Mr. Duncan's pictures is one in which an octopus has seized a star-fish, preparatory to making a meal of him. The star-fish, in this case, is of the brittle variety, and one of his legs, or rays, has broken off in his struggles to get free from the awful embrace of the cephalopod.

* * *

A Trichromatic Carbon Process. M. Léon Vidal has been at some pains to work out the details of a three-colour printing process, and gives the benefit of his experiments to the readers of the *Moniteur de la Photographie*. The process may be described in a few words as a composite one, in which three images, in primary colours, are produced upon a transparent support of collodion, in pigments held in bichromated gelatine made insoluble by the action of light. These three images are then combined to form the picture, by cementing them together and mounting them upon white paper, if to be seen by reflected light, or upon glass for the production of a transparency. For the use of those who may wish to try the process, we give the following summary. Further particulars may be found in the *Moniteur*. Coat talced glass with tough collodion made by the following formula:—

Absolute alcohol	50 c.c.
Ether	50 ,,
Pyroxiline (not powdery)	2 grammes.

When the film is dry coat the plates again with a solution

of very soft gelatine, such as Nelson's, in the following proportions:—

Gelatine	30	grammes
Water	200	„
Loaf sugar	6	„
Glycerine	6	„

The colouring matter should be added to this solution and selected from red, blue, and yellow pigments of the nearest shades to satisfy theoretical considerations. The pigments should be ground as fine as possible in gum-water, a tedious process, which may perhaps be avoided by using artists' water-colours, as supplied in tubes. The quantity of colour must be determined by experiment. Filter the solutions through muslin, coat the plates to a depth of 2 m.m. in each case, and when the gelatine is set transfer them to a drying cupboard containing trays of chloride of calcium. Sensitise the plates just before use with a 5 per cent. solution of bichromate of ammonium, in which they should be left during five to ten minutes. Place them again in the drying cupboard, and when perfectly dry cut round the margins with a knife and straight-edge, and strip the films ready for printing under the three negatives made for the primary colours, using an actinometer for the exposure. Develop the films with warm water, laying them down for this purpose on sheets of glass coated with—

Pure indiarubber	10	grammes.
Benzine (crystallisable)	100	„

Wait until most of the benzine has evaporated, and whilst the indiarubber is still tacky lay the print upon it, collodion side downwards, and roll the film with a soft roller into perfect contact. After development, and when the film is perfectly dry, cut round the edges and strip. Clean off the indiarubber by friction with the finger. The three films may be cemented together with Canada balsam, if small, or with a 5 per cent. solution of gelatine, if large. Retouching may be done with pigment, before the films are cemented together, by mounting them once again upon glass with indiarubber cement. For making transparencies, instead of pigments, use aniline dyes, recommended by M. M. Lumière, according to the following formulæ:—

Red Bath.

	Grammes.
Water	1,000
3 per cent. solution of Erythrosine J No. 398	25

Blue Bath.

3 per cent. solution of pure blue diamine FF No. 192	50
15 per cent. solution of glue	70

Yellow Bath.

Water	1,000
Chrysophenine G No. 207	4
Dissolve at 70deg. C. and add alcohol	200

The red and blue dyes are from the catalogue of the Badische Anilin and Soda Fabrik, and the yellow dye from that of Leonhardt and Co. The red and yellow prints may be used without fixing, but the blue should be dipped in a 5 per cent. solution of sulphate of copper and then rinsed. The pigment prints, when cemented together, should be mounted on paper with a solution of gelatine. The process would be much simplified if suitable carbon tissues, true to colour, were purchasable.

* * *

Photography and the German Government. The organisation of industry proceeds apace in Germany, whether for good or ill. The following condrtions have been laid down by the Government, as a direction to the Chambers of Handicraft, for the examination of photographic assistants. They are required to produce as tests of proficiency:—

1. Six negatives, not under cabinet size.
2. Rough prints from each of these negatives.
3. Finished, mounted prints from each negative, after they have been retouched. At least two printing processes must be shown by these, and one must be in silver.
4. An enlargement at least 18 x 24 cm. from a carte de visite. Photo-mechanical assistants must show at least six negatives from line and half-tone subjects, suitable for some process of reproduction.

Further specimens may be shown, if in harmony with the nature of an examination for assistants, regard to time and expense being the chief considerations.

The specimens of work must be of a nature to show that the candidate has sufficient manipulatory skill in the usual course of photographic work. They must be done upon premises selected by the Board of Examiners.

If the candidate has taken up a special branch of work, he must show more proficiency in that branch, and the tests in others may be reduced in proportion.

In the theoretical examination the candidate should show a sufficient knowledge of the value, condition, conservation, use and treatment of the raw and subsidiary materials employed in photography; also of the underlying principles of the art, and the nature and use of photographic apparatus. As a rule this should begin with a discussion of the candidate's specimens and work-test, and should embrace the following questions:—

1. The discrimination and use of apparatus and accessories.
2. The discrimination and use of materials.
3. Knowledge of the outlines of photographic processes in general use.
4. The examination may also extend to the following questions, so far as the candidate may have had opportunity to acquire the necessary knowledge, by general education, or training at continuation classes, or at a technical school:—
   - (*a*) A knowledge of the principles of chemistry and optics to the extent requisite for the comprehension of ordinary methods of work.
   - (*b*) A knowledge of the most important historical facts in the development of photography.
   - (*c*) A knowledge of the principal points in photographic copyright.

The Government order concludes with a request to the Chamber of Handicrafts to see that the examinations be framed in a manner to comply with these requirements, and that they be not exceeded.

The Beverley Photographic and Sketching Society's public exhibition of photographs, paintings, and drawings, will be held in the society's room, Butcher Row, Beverley, on Thursday, Friday, and Saturday, January 28th, 29th, and 30th, 1903. The following are the photographic classes:—Section A (open): 1. Landscape, seascape, river scenery; section B (members): 1. Landscape, seascape, architecture; 2. Portraiture, figure studies. (Direct or enlarged prints alike eligible).

Borough Polytechnic Photographic Society.—The eighth annual exhibition of the Borough Polytechnic Photographic Society will be opened on Saturday, December 27th, 1902, at 7 p.m., by Sir Wyke Bayliss, President of the Royal Society of British Artists, at the Borough Polytechnic Institute, 103, Borough Road, S.E., continuing open until the following Saturday, January 3rd, 1903. As in former years, the exhibition will consist exclusively of members' work, and will be open entirely free to the public. In addition to the exhibition, there will be a lantern entertainment each evening, and displays of animated photographs, X-rays, and wireless telegraphy at intervals, whilst photographic demonstrations for beginners will be given in the society's meeting room.

MR. SANGER SHEPHERD'S NEW COLOUR PROCESS.

THE problem of producing photographs in the colours of nature is one which must have occupied the thoughts of many men ever since the first camera obscura was devised, and long before that instrument joined partnership with the chemical laboratory. A picture as formed by the lens on the ground glass screen of the modern instrument, or indeed upon any suitable surface provided to receive it, is certainly one of the most beautiful things which the eye can look upon, perfect alike in form, and in purity and gradation of colour. How many men of artistic aspirations must in past times—and the first of such observations dates from the time of Aristotle—how many must have feasted their eyes on that chromatic wonder, and longed to have the power to make that permanent, which is, at best but ephemeral—"the baseless fabric of a vision?" Tradition has it that Daguerre himself was induced to prosecute his first experiments by the constant viewing of these pictures in colour daily revealed to him in the camera obscura, which he employed as a help in painting his famous dioramas.

Almost as soon as Daguerre had made public the process with which his name is associated, the adventurer appeared who had gone one better, and had, as was declared, succeeded in producing sun pictures in colour. He showed daguerreotypes which were most exquisitely tinted, and he deceived a number of persons, among them the astute Mr. Morse of telegraphic fame, into the belief that the colours owed their origin, like the image upon which they rested, to the bountiful light of the god of day. After collecting a goodly sum of money from his dupes under promise of revealing his secret, the gentleman, who appended the prefix "Rev." to his name, disappeared and was never heard of again. He has the unenviable distinction of being the prototype of a large class of swindlers who have during the past half century traded upon the ignorance of their fellows.

Colour photography is indeed a discovery which has cropped up regularly during that period at intervals of a few years, and Mr. Sanger Shepherd, in his address to the Camera Club last week, was not too severe upon the editors of certain journals when he suggested that they must keep an account of the discovery ready set up in type for use when space admitted. Everyone knew that the process which he had promised to describe would be something practical and that it would be founded upon scientific principles. In this there was no mistake. It will be seen from our report of the proceedings that the system advocated is a modification of the now well-known and successful method by which he produces transparencies for the lantern.

That it will be taken up readily by amateurs we have no doubt at all. For amateur photographers are greedy of novelties, and some are so eager in pursuits of new processes that they will try all that are presented to them. The amateur has time and means at his disposal as a rule, and it is good for all that he should act as he does, for a process receives a trial at his hands which will often decide whether it is worthy or not of general acceptance. This salutary ordeal the Sanger Shepherd process has yet to go through.

Mr. Shepherd devoted a portion of his discourse at the Camera Club to the advantage which would accrue to professional portraiture by the adoption of the new process, and it goes without saying that an efficient means of producing portraits in colour would cause a rush to the studios of people eager to benefit by the novelty. But the new method would necessitate such a revolution in apparatus, as well as in procedure, to say nothing of a thorough revision in the scale of charges, that the professional man must seriously consider whether it is good enough to justify him in making such a thorough change.

Mr. Shepherd told his hearers the other night that any lens of decent quality would do the work, and that the necessary additions to a photographer's ordinary apparatus could be covered by an expenditure of two pounds sterling. But he was addressing an audience of amateurs, who would be satisfied with landscape, fruit, and flower studies, and perhaps an occasional open-air portrait. With the professional worker it is very different. If the photographer could hypnotise every sitter who came to him into a state of immobility directly a favourable pose and pleasing expression were secured, so that the subject would be perfectly still while three separate exposures were made, he might retain the camera with which he has always worked, it would merely want the addition of a repeating back furnished with the necessary three-colour filters. But we know that this is impossible. Nervous women and lively children make up a large proportion of his clientèle, there must be only one uncapping of the lens, and the operation must be a short one. This means that an entirely new form of camera must be brought into use. Ten years ago, Mr. Ives saw the necessity for a simultaneous exposure of the three negatives even for subjects other than portraits. He said, in one of his lectures, "In photographing objects in a changing light, landscapes, for instance, it is important that the three sensitive plates be exposed simultaneously, and in order to accomplish this I devised a triple camera, having three lenses." If such a provision is necessary in landscape, how much more is it called for in portraiture, albeit a three-lens apparatus is inadmissable for near objects, if the images are to be afterwards superposed, because of the stereoscopic difficulty.

Supposing that the professional worker has made up his mind to remodel his apparatus, he must next consider the serious question of skilled assistance. The printer of ordinary negatives needs little more skill than that exercised by a kitchen maid in toasting a slice of bread; in each operation exposure must be stopped at the right moment. But the work of printing the gelatine reliefs on celluloid, and still more the operation of charging each with its proper complement of dye, and transferring those coloured images to their final support, seems to demand the possession of qualities not generally found in the ordinary worker. We may pass over the necessity of having an extra well-lighted room in which the colour operations are carried on as a difficulty which is easier to meet.

Lastly there comes the very important item of the revision of the price list. It is obvious that a process which involves the production and employment of no fewer than six printing surfaces must be far more costly than that which requires but one, nor must we lose sight of the fact that when operations are multiplied the risk of failure and breakage is multiplied in the same proportion.

Such are some of the considerations which must be weighed by the professional photographer as he asks the question which we have suggested regarding the new process, "Is it good enough?" And in suggesting it, it must not be assumed that we wish in any way to detract from Mr. Sanger Shepherd's achievement. To him is due the credit of putting upon a practical footing the possibility of producing transparencies in colour of great excellence, and he has now shown how, by a modification of the method, pictures on paper may be made. It remains to be seen whether the process is certain enough in its results in ordinary hands to tempt the professional photographer to make a radical change in the work upon which his bread and butter depends.

FIFTH TRAILL TAYLOR MEMORIAL LECTURE,
Dec. 11th, 1902.

THE GREAT PHOTOGRAPHIC STAR MAP.
I.

LECTURER:—H. H. TURNER, D.Sc., F.R.S., Savilian Professor of Astronomy, Oxford.

IF there be a difficulty in selecting an astronomical topic on which to address photographers, it arises from the number and importance of suitable topics, and not from their scarcity. In almost every department of astronomy photographic methods are to-day in constant use, and have become indispensable. The surface of the sun is photographed daily at several observatories, and on the occasion of a total solar eclipse the observations made are chiefly photographic. The surface of the moon is being mapped and surveyed by means of photography; hundreds of new planets have been discovered by the inspection of photographic plates; pictures of comets supplied by the camera have practically superseded drawings, and in many instances provide the material for determining the orbits of these bodies; the configurations of stars and nebulæ, which were imperfectly and laboriously recorded a quarter of a century ago by visual methods, are now caught with accuracy in a few minutes by the sensitive film; and prolonged exposures reveal to us objects of which even the existence was not previously suspected. I might go through the category of the heavenly bodies again, and point out in each case other photographic methods, as yet only imperfectly developed, which are certain to be used in the near future. In the case of the sun, for instance, Professor Hale and others have shown how we may photograph not only the spots and the ordinary solar surface, but the faculæ and prominences; and there is no reason why a daily record of these by photography should not be added to that of the spots—no reason, that is to say, beyond the impossibility of answering all the bewildering new calls on the attention of astronomers which the photographic method has made. Or, in the case of the moon, I might point to several methods of observing her orbital motion by photography, which only await someone with time and energy to carry them out. I might go through the category a third time, and describe what has been done with the spectroscope added to the camera; and this would take us into a department of astronomy so vast as to be practically a separate science.

With so embarrassingly rich a choice, I may perhaps be forgiven if I felt it hopeless to determine what would be most likely to interest my audience, and took refuge in the less ambitious but safer alternative of speaking about my own particular work. For the last nine years the Oxford University Observatory has been steadily busy on its share — a one-eighteenth share—in the making of a great map of the stars by photography; and it is my hope that some account of this work — not a complete historical summary, but rather a few notes on points of photographic importance — may interest you to-night. Fortunately for me, though the topic was selected for a personal reason, it is one of both national and international interest. The eighteen observatories taking part in the work were selected from all countries at an International Conference held in Paris, in 1887; and the details of the work have been from time to time superintended by subsequent conferences of the same character. Of the eighteen partners six are British, so that our Empire is bearing a worthy share of the total burden. As an indication of the magnitude of this burden, it may be safely said that the map will not be completed within a quarter of a century of its inception; and when it is finished, it will be an almost imperative duty to begin it all over again, in order that we may see what changes have occurred in the heavens since the first survey. So that the work on this great star map will absorb a considerable fraction of the total available energy of astronomers in our time.

REASONS FOR A STAR MAP.

Those unfamiliar with the needs of astronomers may reasonably ask the question:—What are the precise objects in view in making a star map? The uses of terrestrial maps are well-known, and the chief of them may be classified under two heads:—

(a) Maps help us to find our way in unknown regions; and without them we might run risks of the gravest kind, as when navigating a ship, or marching in a hostile country.

(b) They preserve a definition of property, both individual and national.

Neither of these functions would seem capable of being discharged, in obvious counterpart, by maps of the stars. The idea of property in the eternal heavens is almost as ridiculous as that of danger in allowing our gaze to wander from one part of them to another; and how can we even lose our way when the whole sky lies open to our inspection? And yet there is a similarity between the two cases. With a terrestrial map we can trace our own puny journeyings to and fro: with a celestial we can follow with accuracy the sweep of the planets round the belt of heaven. A terrestrial map guards the rights of property by enabling us to recognise that some ill-doer has "moved his neighbour's landmark." A celestial map made to-day will show years or centuries hence how those celestial landmarks which we call stars, have been moved, not by any malicious agency, but by the majestic flow of the celestial motions. Nay more, we may detect the presence of some new star, hitherto invisible, which has blazed into prominence, like some submarine volcano which a terrestrial convulsion raises above the surface of the ocean: or we may detect a new planet. In the middle of the last century the planet Neptune was discovered by mathematical analysis; and the part played in this discovery by a star map was so dramatic that I venture to recall it as a striking illustration of the importance of star maps generally.

THE DISCOVERY OF NEPTUNE.

The story begins with the opening words of the immortal letter which Adams left at the Royal Observatory one afternoon in October, 1845:—

"According to my calculations, the observed irregularities in the motion of Uranus may be accounted for by supposing the existence of an exterior planet, the mass and orbit of which are as follows":—(Then follow the figures.)

The planet Uranus had for some years appeared in a position which could not be deduced theoretically from the attractions of other known planets; its motion shewed "irregularities." Working backwards from these with marvellous mathematical skill, J. C. Adams, then a B.A. at Cambridge, deduced the existence of a planet whose attraction was causing the irregularities: and he proceeded to give, in the remainder of the letter, approximate details of the position of the planet in the sky. From these details an astronomer armed with a star map of the region could have found the planet within a few hours on a clear night: but without a star map the labour required was much greater, in fact practically equivalent to the construction of such a map. The positions of at least 50 stars, any of which might be the planet, must be accurately measured on at least two occasions. Now, no such map was available at Greenwich: and partly for this reason, partly also from other unfortunate circumstances which need not now concern us, the planet was not looked for. Some months afterwards

Leverrier, in France, completed entirely independent calculations, and arrived at much the same result. He communicated it to a Berlin astronomer Galle, who by this time was in possession of just the right star map: and Galle found the planet the same night. Naturally a controversy arose as to who was the real discoverer—a controvery of considerable violence in which few concerned escaped "savage abuse"* at the hands of some one. In course of time this question was amicably settled by an equal division of credit between Adams and Leverrier; and in any case we need not consider the merits of it here. What does concern us is the vital difference which the possession of an adequate star map made: and secondly, the fact that this particular use of the map could not possibly have been foreseen when it was constructed. We learn, if we did not know it before, that we must provide for unforeseen contingencies as well as for familiar needs: and, therefore, you will perhaps be prepared to accept the statement that the most important reasons for making a star map are those which neither I nor anyone else can at present give.

Existing Star Maps.

Maps may be of various sizes, and the larger the map the more detail it is possible to insert. A map of the whole earth may be made on a sheet of note-paper, but it is not the kind of map which a cyclist would choose for finding his way about. He would prefer a map of the kind described as one mile to the inch, which would only represent a very small portion of the earth's surface, but would show the detail he requires. Similarly, a map of the whole heavens can be made on a single sheet of paper, but it is not the kind of map we should use to find the planet Neptune. For this we must have a small portion of the sky mapped in considerable detail. The map which was actually used may be described as on a scale of 140 miles to the inch. Not that the sky is to be measured in miles, or millions or billions of miles, but we can make this kind of comparison between celestial and terrestrial maps as follows. If maps of the whole surface of the earth were made on a scale of one mile to the inch, and combined into a globe, the diameter of this globe would be 8,000 inches (about one furlong), since there are 8,000 miles in the earth's diameter. Now celestial maps can be combined into a celestial globe, just as terrestrial into a terrestrial globe; and a celestial globe on the scale of the Berlin maps would have a diameter of only about 5ft., which is 140 times smaller than 8,000 inches, and may be called therefore a scale of 140 miles to the inch. This represents very nearly the limit of what had been done in the way of celestial map-making up to the year 1887. Some slight advance on the Berlin maps had been made by a celebrated German, called Argelander. He had made star maps which would cover a globe 7ft. in diameter; or rather *half* cover it, for he only worked at the northern hemisphere. The project I have to speak of to-night is that of making by photography the equivalent of a celestial globe 50ft.* in diameter, or what may be called on the analogy of terrestrial maps 14† miles to the inch. This is a notable advance on anything done before, though it still falls far short of what we may hope to do in the future, even if we aim no higher than the counterpart of the terrestrial mile-to-an-inch map. To illustrate the character of the advance, I may remark that while Argelander's maps are contained in a portfolio of moderate size, the photographic map will when completed form a pile of paper 30ft. high, weighing nearly two tons! The question of storage alone is a serious matter.

* "I was abused most savagely both by English and French." (Autobiography of Sir G. B. Airy, p. 181.)

† These figures apply to the Enlargements which are twice the size (linear) of the plates.

The Origin of the Project.

The train of circumstances which led to the inception of this project begins with the appearance of the comet of 1882, the last really respectable comet which we in the northern hemisphere have been privileged to witness. It was so fascinating an object that photographers tried to obtain pictures of it; but having only ordinary cameras, which are swept round by the earth in its daily motion, they could not get any results of value. The Director of the Cape Observatory, Sir David Gill, invited Mr. Allis to strap his camera to the equatorial of the observatory, which had clockwork for counteracting the earth's motion; and some beautiful pictures were then obtained. But it is not the central feature of these pictures, the comet itself, which immediately concerns us. A quite unexpected result was the appearance of a vast number of stars on the plate as well, and Sir David Gill immediately thought, why not make maps of the heavens by photography? With him to think was also to act, and he at once set about completing by photography the 5ft. globe above mentioned, of which Argelander had made the northern half. But these photographs also set others to work. Dr. Common in England showed that the nebulæ could be photographed, and in France the brothers Henry, who were slowly and laboriously making a large scale map of a small portion of the heavens by old-fashioned methods, and had almost come to a standstill at one portion thickly studded with stars, caught eagerly at the promises suggested by these comet pictures, and tried whether photography would help them. The result was a very great success, though it was not attained without immense labour, skill, and the courageous support of Admiral Mouchez, the Director of the Paris Observatory, who made light of administrative difficulties. But when once satisfactory results were obtained, they were so completely successful that it seemed imperative to complete, not only the original project of the Brothers Henry, which included only a small portion of the heavens, but a map of the whole sky on the same scale.

The Conference of 1887.

For this, however, co-operation was necessary. To cover the whole sky with plates of the kind they were taking would require a total of 11,000 plates; and it was beyond the power of a single observatory to obtain these in a reasonable time. Accordingly Admiral Mouchez and Sir David Gill called together an International Conference at Paris in April, 1887, which was attended by eminent astronomers from different countries as follows:—France 20, British Empire eight, Germany six, Russia three, Holland three, U.S. America three, Austria two, Sweden two, Denmark two, Belgium one, Italy one, Spain one, Switzerland one, Portugal one, Brazil one, Argentine Rep. one. Many of the decisions of this Conference, arrived at after hard work and earnest discussion, and decisions which have had an important effect not only on this particular work, but on the progress of astronomy generally, we have not the time to consider to-night. It must here be briefly stated that 18 observatories were chosen to share the work: that they were all to use a standard pattern of telescope, similar to that which the brothers Henry had adopted (giving a scale of one minute of arc to a millimetre; or in the terms already made use of, a celestial globe of 25 feet in diameter); and that the sky was to be covered four times over, twice with plates of long exposure (originally defined as 20 minutes, subsequently extended to 40 minutes, and ultimately in some cases to an hour) and twice with plates of short exposure; thus giving about 1,200 plates of each exposure to each participating observatory. But two of the decisions are of great interest to photographers, and I propose to dwell on them specially.

The Reseau.

The first is something of a curiosity from the fact that it was arrived at with one object in view, and has served for another. It was decided to put what is now familiarly called a *réseau* on the plates, a series of accurately ruled cross lines 5mm. apart. I need only explain to photographers very briefly how this is done. Either before or after exposing a plate to the stars, it is placed behind a plate coated with metallic silver, in which the *réseau* of lines has been carefully ruled so as to cut away the silver; and exposed to a faint artificial light for a few seconds. On development both star images and *réseau* appear. The original object of this process was to guard against distortion of the film by development: for if such distortion occurred, not only the stellar configurations but the *réseau* also would be distorted; and the errors could be detected and allowed for. But experience has shown that no sensible distortion occurs in this way. If anyone is tempted to think that this result might have been foreseen, I would remind him that astronomers are concerned with displacements of extreme minuteness; and although it was previously known that there was no considerable distortion, there might have been small defects which no photographer would have, hitherto, been troubled by, and which would yet have embarrassed the astronomer greatly, unless precautions were taken against them. Fortunately, none have been found: and, fortunately, they were guarded against in this way, for the *réseau* has proved an incalculable advantage for a quite different purpose. It enables us to measure the position of any star on the plate with great ease. It does for us what the hour hand or the minute hand of a clock do as regards time; these break up the day into small pieces, and to specify the exact moment we have then only to watch the seconds and fractions. So the *réseau* lines break up the plate into small squares which we can recognise by merely counting the divisions; and to obtain the exact position of a star we have only to supplement this by measuring its position in its square. The labour thus saved is, perhaps, only to be realised by actual experience; but anyone who has had such experience knows what we owe to the happy, though so far mistaken, idea of guarding against distortion in development by using a *réseau*. I will add that, if for any purpose whatever, a photographer wishes to measure the positions of objects on a plate he cannot do better than use a *réseau*, which has now become a commercial article. A silver matrix costs a few pounds, but any number of photographic copies can be made from this matrix at the mere cost of the plates; and if the photograph to be measured has no *réseau* lines already on it, one of these *réseau* copies can be bound together in contact with it, film to film, which is almost as convenient as, and sometimes better than, having the lines actually on the picture itself.

Choice of Instrument.

The second decision of the Conference to which I would direct special attention is perhaps the most important of all: I mean the choice of the instrument to be used for taking the plates. To a non-astronomical photographer the choice of a lens has a restricted meaning; there are plenty of lenses to choose from certainly, but they are all what we call doublets, made up of two pairs of lenses, with a space between, in which the stop is put. The photographs of the comet of 1882 at the Cape of Good Hope were taken with a lens of this kind; but those whom they stimulated to work adopted different types of instrument, because they wanted large instruments, and to make a large doublet is very costly. Each of the four lenses in a doublet has two faces, and to make eight glass surfaces optically true on a large scale is a serious matter. Dr. Common contented himself with one surface, reflecting light to a focus. His beautiful photograph of the Orion nebula, which obtained the gold medal of the Royal Astronomical Society in 1883, was taken with a reflecting telescope of 3ft. aperture, which he obtained at a moderate cost. It is doubtful whether a doublet of this size can yet be made successfully; and when, in 1889, Prof. E. C. Pickering, of Harvard, was enabled by the liberality of Miss Catherine Bruce, to obtain one of 2ft. aperture, the sum placed at his disposal was £10,000. If instruments of this class had been adopted as the standard pattern by the Conference of 1887, eighteen observatories would not have been forthcoming as co-operators, nor eight; perhaps not even two. The pattern adopted was such that the actual camera could be purchased for less than £600; this, at any rate, was the sum presented by the late Dr. Warren De la Rue to the University of Oxford, to enable its observatory to take part in the work, and this sum provided for a camera 11ft. long, with a lens of 13in. aperture, and for its attachment to the already existing equatorial mounting. The optical part of the camera is neither a doublet of the kind familiar to photographers, nor a reflector of the kind used by Dr. Common; but a single lens (or rather pair of lenses), resembling the object glass of an ordinary telescope or a "landscape" lens, without any diaphragm. It was of a pattern arrived at after much experimental work by the Brothers Henry, who had, like Dr. Common, been stimulated by the Cape photographs to see what photography could do, and had, like him, chosen their own form of instrument; but, unlike him, had chosen what is called a refractor, instead of a reflector.

When the Conference met in 1887 they had, in fact, to make a choice between these three types of instrument, the doublet, the reflector, and the refractor. All three had been tried and found successful in different ways, but the information available, especially as to the accuracy of each, was very scanty. It may be stated in tabular form somewhat as follows:—

	Reflector.	Refractor.	Doublet.
Number of optical surfaces (determining cost to a great extent)	1	4	8
Thickness of glass ... (meaning loss of light)	0	1	>2
Available field	<2°	>2°	>5°
Accuracy	Good	Good	Unknown in 1887

From this statement it is seen that the doublet is undoubtedly the most costly, and there is a risk of loss of light: for not only are two compound lenses to be transversed, but a diaphragm or stop is generally inserted betweeen the lenses, which cuts down the effective aperture. Hence I have represented the loss of light by the symbol for "greater than 2" as compared with the single lens of the refractor. On the other hand, the doublet has a much larger field than the others. At the present time it is rather difficult to put any definite limit to the possible field, and even in 1887 it was known that 5 degrees could be obtained. To realise the nature of this advantage, it must be remembered that the larger the field which can be covered at a single exposure, the fewer exposures are necessary to cover the whole sky. With the adopted instrument the diameter of the available field is 2 degrees, and 11,000 plates are necessary to cover the sky; but if the field could have been extended

to 5 degrees, the area covered by a single exposure, which varies as the square of the diameter, would have been increased in a ratio of 25 to 4, or more than 6 to 1, and the number of requisite plates diminished therefore to less than 2,000. This is such a striking advantage that we should expect it to be the determining factor in the choice, and when we are told that the refractor was selected in preference to the doublet, we naturally inquire what was the weighty consideration which could set aside so manifest a gain. We find it in that terrible spectre, "the Unknown," which scientific men are sometimes as reluctant to face as are all other living things. The accuracy of photographs taken with a doublet was unknown, and was accordingly mistrusted. The very fairness of the promises held out gave rise to an uneasy suspicion that there was treachery somewhere. So great was the mistrust that in the debate on the choice of instrument, in which twenty-six eminent astronomers took part, the doublet was never even mentioned, the discussion being confined entirely to the relative merits of reflector and refractor. Prof. E. C. Pickering, of Harvard, had sent a letter advocating the use of a doublet giving a field 5 degrees square, but he had no definite information to give as to the accuracy obtainable with it, and his letter attracted no attention. The keynote of the discussion was struck by the veteran astronomer, M. Janssen, in advocating the adoption of an instrument similar to that used by the Brothers Henry, when he said:—"On sait ce que cet instrument peut donner, il a fait ses preuves."

M. Janssen cannot be called an over-cautious man. He it was who, during the Siege of Paris, in 1870, left the city in a balloon with his telescope, because he wished to observe the total solar eclipse of that year. He it is who has planted an observatory on the top of Mont Blanc, a hazardous enterprise for a man past three score years and ten. But in a great work like the astrographic chart, he felt that we must be not merely hopeful, but certain, of our instrument, and as no one could present an unexceptionable character for the doublet, it was passed over in favour of the refractor.

We know now that first-rate credentials could have been presented if only some one had had time to make the necessary comprehensive tests, and I should like to say a few words on this point, however superfluous it may seem for an astronomer to commend to photographers their own familiar instrument.

Accuracy of the Doublet.

In the first place, then, the doublet shows star images (and of course other objects) in their true positions on the plate, with an accuracy equal to that of the refractor, and probably greater than that of the reflector. This statement must be qualified by the admission that the accuracy of these instruments has only been tested up to a certain point as yet. For the purposes of the star map, it has not been possible to make measures of the greatest accuracy, because we have so many stars to deal with; we aim at measuring the position of a star image on our plates within about the ten thousandth of an inch, and up to this point it has been found that over a field 5 degrees in diameter the doublet is as accure as the refractor adopted for the star map. The details of this investigation* are too technical to give here, but I may mention that it was carried out at the Oxford University Observatory, by measuring plates kindly lent by Professor Pickering, who had advocated the use of the doublet in 1887, and it was pleasant to be thus able to confirm the excellence of his advice.

* See Monthly Notices of the Royal Astron. Soc. LIX p. 439.

CHEMISTS AND THE SALE OF POISONS.

In view of the fact that the labours of the Privy Council Poisons Schedule Committee are now ended, it is interesting to recall the circumstance that the appointment of the Committee by the Duke of Devonshire, Lord President of the Council, was announced in June, 1901, and that the Committee originally consisted of the following members:—The Right Hon. Sir Herbert Maxwell, M.P., F.R.S. (chairman); Mr. Alexander Cross, M.P., Professor T. E. Thorpe, C.B., F.R.S., Professor W. A. Tilden, F.R.S., Dr. Thomas Stevenson, Mr. William Martindale, F.C.S., and Mr. J. H. Harrison. In February of the present year Mr Walter Hills was appointed a member of the Committee, in the place of Mr. William Martindale, deceased, but there has been no other change in the constitution of the Committee, which was instructed by the Lord President "to consider the first Schedule (A) annexed to the Pharmacy Act, 1868, and to report to him the alterations therein, which they deem expedient." The terms of reference proceeded as follows:—"The Lord President desires the Committee to consider at the same time whether a third sub-division might not properly be added to the Schedule, containing substances which, whether sold by pharmaceutical chemists or not, should be labelled or otherwise distinguished, and, if so, to enumerate the substances which, in their opinion, should be thus treated."

The report of the Committee has now been signed, though it has not yet been published, says the *Pharmaceutical Journal*, and Mr. Walter Hills has been permitted by the Chairman of the Committee to state publicly that he has thought it his duty to write a minority report. The latter fact should suffice to show that the terms of the majority report are not such as are likely to commend themselves to registered chemists, and it seems desirable therefore that every member of the craft in Great Britain should prepare himself to take part in what may prove to be one of the most serious struggles in the history of pharmacy to maintain the principle that, so far as the sale of poisons is concerned, the technical education of the seller is the best protection for the public. It may appear to many readers of the Journal that it is a comparatively unimportant point whether certain poisonous preparations should, under special conditions, be permitted to be sold in future by persons other than registered chemists, but a grave question of principle is involved in that proposal, which therefore calls for the most thoughtful consideration. Such consideration is all the more necessary in view of the fact that the position may shortly be so serious as to render it necessary, in the interests of the public safety, to oppose strenuously what may prove to nothing less than the introduction of the thin end of a wedge which may split the whole protective structure erected by Parliament in 1852 and 1868.

In order to meet such a danger, suitable measures are already being taken at the headquarters of the Pharmaceutical Society, but the success of those measures will be largely dependent upon the support rendered by the Society's local officers and by chemists and druggists as a whole. Any opposition which may be offered by the Pharmaceutical Society to reactionary legislation based upon the majority report of the Privy Council Poisons Schedule Committee will probably be met with the taunt that the Society does not represent the entire trade. Such a statement, however, can easily be refuted, since the Society is the statutory representative of chemists and druggists as a class, while it also includes as subscribing members a majority of the registered chemists of Great Britain, who are engaged in business on their own account. At the same time, it should be obvious that a large influx of new members during the next few months would have a most salutary effect. Divisional

secretaries should therefore neglect no opportunity of impressing unattached chemists and druggists with the peculiar gravity of the situation, while pharmaceutical associations throughout Great Britain should make the strengthening of the Pharmaceutical Society one of their chief objects for the time being, as the existence of chemists and druggists as a specially trained and, to some extent, privileged class may depend upon the result of the struggle which is almost certain to come. Due notice will be given by the Council of the Pharmaceutical Society as to the direction in which energy may be most usefully expended in defence of what is worthy of preservation in the existing Pharmacy Acts, but the notice may be but short, and the present warning is therefore given in order that every registered chemist may have time for reflection, and be prepared to take his part in the anticipated struggle.

NOTES FROM THE NILE.

Tahtah, on the Nile

Egypt,

December 2, 1902.

Pray for the soul of Thomas Cook for inaugurating such a splendid service of steamers. I am now on the good ship "Nefert Ari," about three hundred miles up the Nile from Cairo (three days' sail). So much has been written on the Nile, I don't suppose I can add much to what has been published, except it may be of photographic interest. The cabins here are easily converted into dark rooms; a sheet or two of coloured paper placed over the sliding window and a rag hung over the doorway, does the trick. I am fortunate in having a cabin all to myself, and a plentiful supply of water at hand. The larger excursion steamers have well-organised dark rooms. I have got some fine negatives characteristic of the Arabs which I will have pleasure in exhibiting on my return home. The postal system is A1 in Egypt. Thanks to Cook and Son I get The British Journal of Photography delivered on board at various stopping places. I am in receipt of a post-card from the worthy secretary of the P.C.U.K. (F. A. Bridge), in reply to my offer to give "a night" at Perth. The natives here are wonderfully intelligent. I overheard an amusing conversation the other night between Father Rev. Arthur Roberts and a number of Arab boys, eight to eighteen years of age. The wonderful geographical knowledge, not to be beaten by Johnston, when asked by the reverend interrogator to name the greatest country in the world.

Reply.—Africa.

R. I.—No. In England, where the sun never sets.

Arab boy.—Then I would not like England. It will be too hot.

A voice from a North Briton.—The English make it hot for you sometimes.

Arab boy.—The English get drunk.

Reverend.—No.

North Briton, only "fou."—Sometimes. Why don't you admit the soft impeachment? They would be more likely to believe you if you admitted that they had their faults.

One word more re developing. I lost six negatives in a manner difficult to determine. I used the same solutions and got nothing but chemical fog. Fresh solutions gave no better result. I then cooled down and heavily re-strained the developer, and now to-day my solutions are a trifle too cold, but all right, in consquence of my placing my bottles in socks and keeping them wet by capillary action. Messrs. Cook have afforded me all facilities within their power to further my object. Yesterday I had three hours on shore and took two negatives of the new dam at Assiut about to be inaugurated by the Khedive in a few days. The structure is wonderful, but not to be confounded with the one to be opened on the 10th by the Duke of Connaught and the Khedive, which, at Assuan, I hope to have the pleasure of photographing. More anon.

Yours truly,

A. L. Henderson.

PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

Committee Meeting.

At a meeting of the General Committee, held at the Royal Photographic Society, 66, Russell Square, W.C., on Friday, Dec. 12th, the following were accepted as members: Chas. E. Hawley, 133, Rake Lane, Liscard, Cheshire; H. M. Rewse, 131, Fisherton Street, Salisbury; W. T. Scott (W. Scott and Co.), 804, Upper Holloway Road, N.; Chas. T. Fox (W. Scott and Co.), 804, Upper Holloway Road, N.; Samuel A. Freeman, Wellington Studio, Moreton-in-Marsh.

Proposed report of the Committee of the work of the Association since the Annual General Meeting in July was read and adopted.

The Hon. Secretary reported the result of inquiries made in reference to holding an exhibition of members' work. After discussion, the Hon. Secretary was directed to make further inquiries, and if necessary call a special meeting of the Committee to consider the matter.

Letter read from Mr. Harold Baker, reporting progress of the Birmingham branch, and enclosing draft circulars to be addressed to photographers in the Birmingham district.

Correspondence read in reference to gift of £2 2s. enlargements, the refusal of the Plate and Paper Makers' Association to grant dealers' terms to a member setting up as a dealer, the infringement of a member's copyright photograph by an illustrated newspaper, and an application for advice from a non-member. The Hon. Secretary was instructed thereon.

Report of Committee.

Your Committee have to report that since the Annual General Meeting in July thirty-eight new members have joined the Association. Although they do not regard this as unsatisfactory, they hope for more rapid progress, and wish to impress upon members the importance of bringing the claims of the Association before their brother professional photographers. Three members have resigned, and in three cases letters addressed to members have been returned, marked "gone away." The number of members is now approximately 550.

Subscriptions have come in fairly well. Four-fifths of the members have paid. Subscriptions are coming in at a steady rate, and there is reason to believe that nearly all outstanding amounts will be collected.

Your Committee regret to record the death of their colleague, Mr. H. J. Dalby, of Woolwich.

The advice of the Committee continues to be sought upon very many subjects connected with professional work, and particularly upon questions of copyright. They believe that in many cases their recommendations have been of great service.

As a result of a meeting of those interested in copyright in works of art, held at Messrs. Agnew's Gallery, Bond Street, in

October, which was attended by five members of this Committee, a new Society has been formed to afford protection to artists and others owning copyrights. Your Committee have decided that this Association shall be represented in the Society by three members.

The branches of the Association at Hull, Liverpool, and Edinburgh have held successful meetings. These meetings have been reported in THE BRITISH JOURNAL OF PHOTOGRAPHY. At Birmingham a meeting has been held for the purpose of establishing a branch for the district, and was attended by Mr. Alfred Ellis, Hon. Secretary, and Mr. T. C. Turner, Hon. Secretary of the Local Branches Sub-committee. It resulted in all those attending the meeting joining the Association. The new branch seems to have every prospect of success.

During the autumn the Hon. Secretary received a visit from Monsieur Paul Nador, President of the Chambre Syndicale de la Photographie, of Paris, an organisation devoted to the interests of professional photographers in France, and therefore similar in its aims to our own Association. Your Committee have had much pleasure in exchanging fraternal greetings with our French confrères, and it has been agreed that the two Associations shall be corresponding Associations.

The arrangement made with the Fine Art and General Fire Insurance Co., to take over the existing fire policies of members and allow them a discount of 20 per cent. on the present premiums is working satisfactorily. About thirty members have already availed themselves of the privilege.

It has been arranged that on the date of the annual dinner, on March 13th, a reception room shall be open all the afternoon at the place of the dinner, the Criterion Restaurant, so as to afford members, especially those from the country, the opportunity of meeting and conversing.

ALFRED ELLIS, Hon. Sec.

MEMBERS' MEETING.

A Members' Meeting was held at the House of the Royal Photographic Society, on Friday, Dec. 12th, 1902, Mr. Wm. Grove, President, in the chair.

The Hon. Secretary read the report of the Committee of work done since the Annual General Meeting in July. This was adopted.

On the subject of the supply of electric current to photographers at price charged for current for motive purposes, Mr. T. C. Turner impressed the importance to professional photographers of using electric light. Especially was it their interest to do so in the winter season, when amateurs had packed up their cameras, and laid aside their printing frames, leaving the professionals in full possession of the field. He had observed, and he believed others had, that the demand for the ordinary colour-printed Christmas card was dying out, and it was his experience that people were increasingly coming to the photographer at Christmas time, not only for photographic greeting cards, but for photographs of other kinds. He calculated that about one-third of his turnover could be reckoned as Christmas trade. As daylight at the season of the year was at its shortest and worst, the importance to the up-to-date photographer of obtaining a powerful light at a reasonable cost was undoubted, and it was his opinion that in a few years no photographic establishment would be considered complete without an electric installation for printing, as well as lighting the sitter. It was well known that the price charged for current for motive purposes was much less, sometimes considerably under half the price that was charged for current for illumination, and it was to the interest of all the members of this Association that they should obtain from the companies the recognition that the current was used for business purposes.

Mr. Martin Jacolette explained that a considerable saving in cost resulted from running two or more arc lamps in circuit. When using one arc light it was necessary to employ a "resistance," which wasted a considerable amount of current. He found that with two arc lamps in series it was necessary to employ two coils less in the "resistance."

Mr. L. Langfier expressed the opinion that at present the number of photographers using electric current in any quantity was so few that they would not be able to influence the companies.

Mr. Lang Sims explained his own studio artificial light installation, which consisted of fourteen incandescent gas lamps, which he found efficient as regards light, and also helpful in warming the studio. He offered to show his arrangement to anyone present interested in the matter. Where electricity was not available, gas would be found a very useful substitute.

On the subject of the reservation of copyright by notices on cards of terms, invoices, etc., the Hon. Secretary, Mr. Alfred Ellis, said the reason for putting the subject down for discussion was that more than one of the members have written to inquire whether it was possible to reserve the copyright in photographs taken for payment in the usual way by this method.

Mr. L. Langfier said that if photographers wished to reserve the copyright in their sitters' photographs, there was only one legal method, and that was to obtain the signature of the sitter to an agreement at the time of sitting for a consideration. In his own practice the consideration was usually some slight reduction in charge from the ordinary price, and in some cases the giving of a few prints. Under these circumstances, he seldom had a refusal to fall in with his views.

The Hon. Secretary endorsed Mr. Langfier's view of the legal position, and said his practice was to give reduced terms to theatrical and professional sitters only, in consideration of their signing an agreement, reserving the copyright in the photograph to him. He pointed out the danger to photographers of publishing photographs for which payment had been made without such an agreement.

Mr. M. Jacolette said it would be interesting to have an account from the Hon. Secretary of the meeting at Agnew's, referred to in the report of the Committee.

The Hon. Secretary said the original intention of the promoters of the meeting was to form a society for the protection of copyright in the Colonies, but the scope had been widened, and the meeting was held for the establishment of a society for the protection of copyright holders in works of art generally, and was attended by representatives of artist engravers, art publishers, and others interested in the question. Five members of the P.P.A. Committee attended. There was no disposition shown on the part of those present to recognise the claims of photography to equal rank with paintings, and it was not until Mr. Ernest Elliott pressed the right of photographers to be represented in the new society that they agreed to accept a representative of photography. It was common knowledge that a strenuous attempt was being made by painters and others to promote a new Copyright Bill, in which photographs would not be ranked with works of fine art, as in the present Act. The Committee was actively looking after the interests of photographers in copyright, and had appointed three of their body to represent the Association in the new society.

A general discussion took place on the subject of the best

means of dealing with itinerants who collect money for photographs which are never delivered.

Mr. H. J. Wright and others instanced cases in which their names had been used, and it was pointed out that as photographers were not directly the injured parties, they could not initiate proceedings; but if, whenever cases of the kind were brought to their notice, they obtained a personal description of the delinquents, and communicated with the Hon. Secretary, the record might be useful in strengthening the prosecution when the guilty parties were caught.

BIRMINGHAM BRANCH.

The following notice has been issued by Mr. Harold Baker, of 58, New Street, Birmingham:—

In pursuance of the notice forwarded to you, a meeting was held on November 6th to form a branch of the Professional Photographers' Association for this district. I enclose a report of the proceedings from the pages of the BRITISH JOURNAL OF PHOTOGRAPHY. Although the number of photographers who attended was smaller than we could have wished, on account of the weather, the meeting was most unanimous and cordial, and a local branch was formed, with Mr. Whitlock as chairman and myself as hon. secretary pro tem.

My object in writing to you is to urge upon you, not only the advisability, but the absolute necessity, of all photographers joining hands for mutual protection and help. It has, unfortunately, been a common idea amongst us that the other members of our profession are our natural enemies, to be kept at arm's length, as much as possible. I am quite sure that such an idea is not only a mistaken one, but distinctly mischievous to the well-being of the profession as a whole, and also to every individual member of it. I have found that friendly co-operation and goodwill have been of great advantage to me personally, and that it is possible for photographers who are rivals in business, even in the same street, to work together for their mutual advantage.

There are many questions that seriously affect our business, such as copyright, trade discount, fire insurance, and so on, that are becoming vital to our welfare. All photographers will admit that profits and remuneration of our labour are not what they should be, considering the skill and constant personal attention our business requires, and I am sure that we all find that this state of things, instead of getting better, is steadily becoming worse, year by year. Photographers find that the business which is theirs legitimately, is regarded as fair ground for poaching by chemists, tobacconists, hairdressers, stationers, etc.

Not only the middle-class man, but the highest and the lowest suffer. A great combination of photographers has been formed "to employ all legitimate means of upholding the rights and dignities of the profession," and great questions affecting the whole profession come before them; but in order that they may deal with such matters it is essential that they should be supported by all, or practically all, photographers in the country.

Apart from matters of great concern to photographers generally, there are many questions of local importance which can be dealt with more conveniently in local branches, and for each one of us to benefit personally, the whole country should be covered with local branches, holding meetings that members can attend and discuss local questions. In the branches already formed personal and technical matters of great importance to the members have been brought forward. It has been argued that in a profession in which there is such a difference in the status of the members it will be impossible to induce them to work together for their mutual benefit. This difficulty has not been experienced in other places, and I would draw your special attention to the results of the Hull branch, where it has been found possible to fix a minimum price for certain work.

To take only one question, that of portraits for reproduction in local magazines, where we are often compelled to do the work for nothing, on the chance of obtaining an order from the sitter. If local Photographers would meet together an arrangement could be made whereby we could insist on being paid for such work.

Meeting together to discuss matters of common interest will go far towards destroying that feeling of mistrust and jealousy which has enabled the public to play off one Photographer against another to our loss.

In Mr. Whitlock we have a chairman who is universally respected, and his name should secure us the co-operation of every Photographer in the district; I, therefore, make a personal appeal to you to join us.

The annual subscription has been fixed at 5s. for the Professional Photographers' Association, and 2s. 6d. for the local Branches, 7s. 6d. in all. Members of the local Branches must be members of the main Association.

Exhibitions.

EXHIBITION AT FROME.

The first exhibition of the Mechanics' Institute Photographic Society of Frome was opened on Thursday, the 11th inst., by the president, Mr. E. A. Chill, M.D., F.R.G.S.

A capital collection had been got together, mainly by the exertions of the hon. secretary, Mr. Bernard J. Mitchell (as is usual in these exhibitions), and the exhibited works, to the number of 338, were admirably displayed on the walls of the spacious interior of the Mechanics' Hall.

The exhibition was open each day from 2.30, until 6 o'clock on Thursday, and 10 on Friday and Saturday. Admirable programmes were offered on each occasion by Messrs. H. and H. Grant's orchestral band, which were stationed on the main platform under the organ. The central portion of the hall was occupied by the arrangements for a ping-pong tournament, an entertaining innovation certainly, but only to be justified as an adjunct to a picture exhibition by such abundant floor space as afforded, in this instance, the possibility of easy progress round the walls without undue jostling or distraction.

Messrs. J. T. Ashby, F.R.P.S., and C. Barrow Keene, F.R.P.S., were the judges, and their awards were announced at the opening ceremony as follows:—

OPEN CLASSES.

Class A.—Landscape and Seascape: Silver medal, "Harvest," J. Fielder Haden. Bronze medals, "The Mill Stream," Wm. R. Lathbury; "Meadow Sweet," Graystone Bird; "Eventide," Mrs. M. C. Cottam.

Class B.—Portraiture, Figure Studies, etc.: Silver medals, "Playmates," Dan Fanning; "A Puritan Maid," Cyril Cuzner. Bronze medals, "The Haymaker," Fred. M. Barkway; "A Child of Anarchy," Hal Lawrence.

Class C.—Architecture: Silver medals, "To the Nave, Winchester," S. G. Kimber; "Helmsley," William A. Clark; "The Spiral Stair," H. R. Campion.

Class D. (Champion Class (pictures previously awarded prizes).—Silver medals, "Thoughts of Youth," Ed. W. Strong; "On a Moorland Road," J. B. Johnston. Bronze medal, "Entrance, Little Cloisters, Gloucester," H. C. Leat.

Class E.—Collection: "We are of opinion that the collection exhibited by Bernard J. Mitchell, Nos. 242 to 255 inclusive, is of signal merit, but that, on grounds of general policy as affecting such competitive exhibitions as the present, it is inexpedient to grant a medal.

We are further of opinion that, for an initial effort, the average standard of excellence is of high order."—(Signed), J. T. Ashby, F.R.P.S.; (signed), C. Barrow Keene, F.R.P.S.

MEMBERS' CLASSES.

Class F.—Landscape and Seascape: Silver medal, "A Somerset Byway" and "An Old Yorkshire Mill," Bernard J. Mitchell. Bronze medal, "A Village Street," J. H. Wells.

Class G.—Architecture: Bronze medals: "Norman Doorway, Glastonbury Abbey," Bernard J. Mitchell; "Roman Baths, Bath," Cyril Cuzner.

Class H.—Portraiture, Figure Studies, etc.: Silver medal, for four pictures, Cyril Cuzner. Bronze medals, "Study of a Dog's Head," Wilfrid L. Watson; "A Young Musician," Geo. Moore.

Class I.—Sets of Three Negatives: Hon. mention to Bernard J. Mitchell, Geo. Moore, and Cyril Cuzner.

The open classes included many well-known works by such notable competitors as J. Fielder Haden, Graystone Bird, H. C. Leat, Mrs. M. C. Cottam, Wm. A. Clark, Percival W. Crane, E. W. Strong, Mrs. R. M. King, C. E. Walmsley, H. E. Brightman, Harry Inkpen, S. G. Kimber, Warland Andrew, J. B. Johnston, Mrs. M. L. Pryce, C. Reid, W. A. J. Hensler, G. Parks, and E. W. Hawes.

Much of the members' work was of high quality, and considerable promise was apparent in every contribution, although the society is of very recent formation, and some of the pictures were, we understand, by first-year amateurs.

We congratulate president, secretary, and members on their successful enterprise.

The "Somerset Standard" contained the following account of the opening ceremony:—

"The exhibition is promoted by the photographic society, which was formed last April in connection with the Mechanics' Institute, and as far as this part of the country is concerned, the magnificent collection of some 340 pictures is a unique one. Large silver and bronze medals and other prizes were offered for competition, and the exhibition being open to the United Kingdom, the grand collection is drawn from all parts of the British Isles. Frome, which is known far beyond the confines of this country for its art metal works, is, perhaps, the natural home of art, but photography is a different branch, and this comparatively young society is to be warmly congratulated on the success of their efforts, the exhibition far exceeding the most sanguine expectations of its promoters. The energetic hon. secretary, Mr. Bernard J. Mitchell, who for some years has been an enthusiastic amateur photographer, has been the life and soul of the movement, and is deserving of the high compliments paid both by the eminent judges and the public generally. His efforts have been ably seconded by an enthusiastic committee, and the arrangements have been successfully carried out. The numerous pictures, all of which are suitably framed, are hung in sections on the walls of the hall, and the collection cannot fail to have a very fascinating interest to the general observer. It is hoped that the public will cordially support the enterprise of the committee, especially as it is suggested that any surplus funds shall be utilised in redecorating the hall, which is badly needed. This wonderfully good pictorial exhibition, which includes some 91 landscape and seascape views, 68 portraitures, figure studies, animals, etc., and 56 architectures open to all, contributed by some of the best photographers in the kingdom. There are also 26 open to medalled pictures only, while there are collections exhibited by Mr. B. J. Mitchell, Mr. R. E. Bourne, and Mr. J. Chivers. Not the least interesting are the exhibits by members of the society, which largely consist of local landscape, architecture, and portraiture, and there are loan collections by the president and the hon. secretary. It is pleasing to note that local competitors have held their own among noted confrères, and Mr. Cyril Cuzner and Mr. Mitchell are to be complimented on the medals they secured.

"The president, in his opening remarks, said it had fallen to his lot, as president of the society, to open that exhibition. That was the first year of the society's existence, and he accepted the office of president on condition that he was not called upon to do any work. The committee had kept their word, and he had been left absolutely alone till that day. Therefore, the entire credit of that undertaking was due to their able and energetic secretary, Mr. Mitchell, supported by a band of photographic enthusiasts. Personally, he thanked them for the enormous labour and trouble they had taken in bringing to Frome such a magnificent collection of photographs, such as would do credit to a large city. He hoped the public spirit and enterprise shown by them would be rewarded by a most successful exhibition, and that at the end a substantial balance would be left towards the funds of the Mechanics' Institute.

"Dr. Chill then read a letter from one of the judges, Mr. J. T. Ashby, F.R.P.S., of Loughton, Essex, who expressed regret at being unable to stay for the opening ceremony, and went on to say: 'I think it should be satisfactory to the members of your photographic society to know that Mr. Barrow Keene (of Derby, the other judge) expressed himself in perfect agreement with me in all our awards. It happens occasionally that the decisions of adjudicators are called in question upon an early and perhaps superficial observation; but fortunately it happens also that more careful investigation usually reveals the basis upon which the judges' opinions have been founded. And I would suggest to your members that no more instructive exercise could be devised than an honest endeavour to understand the special merits of medalled pictures in an exhibition of this character. With regard to the exhibition, it is due to the hon. secretary of the society to say that as an initial effort it is a most remarkably successful display. Only those who have had experience in the planning and organisation of such movements can appreciate the amount of speculative enterprise of correspondence and other clerical work, and of real personal labour involved in bringing them to a successful issue. It promises well for the future of the society that its interests have been entrusted to the care of so enthusiastic and devoted a secretary as Mr. Mitchell, and there is further promise—I may say great promise—in the pictures exhibited by the members themselves, a good many of whom, I understand, to have been produced by workers of less than twelve months' experience. No doubt there are some whose modesty has stood in the way of their being presented on the present occasion; but if all be as earnest in their work as it is obvious that those who have competed must be the next exhibition should be a notable one. Your grandly picturesque old town and its beautiful surroundings should afford a profitable hunting ground to the amateur of pictorial photography. It is evident to me that many members appreciate this, and the establishment of your society should lead to a general development of taste and ability such as will demonstrate once more what has so often been proved—namely, that the pursuit of the fascinating hobby of pictorial photography for its own sake is both instructive and elevating, and carries with it an 'exceeding great reward.'" The president then called on Mr. Mitchell, the originator and organiser of the exhibition, to read his report.

"Mr. Mitchell said, after the introductory remarks by the chairman, there was little need for him to say anything of the exhibition, but he desired to say a word or two about the society. It was formed the latter part of April by a few photographic members, and it now numbered 25 members. During the year they had had several meetings, at which there had been practical demonstrations, and they had also had several excursions, which had assisted in improving the photographic knowledge of the individual member, both pictorially and otherwise. He felt as a committee they could congratulate themselves upon that their first exhibition. When he mentioned it first he did not expect they would get such a large number of exhibits sent in by well-known exhibitors from all parts of the kingdom, some of whom were his own personal friends, but the success was largely attributable to the selection of the judges, whose names were household words in every photographic sphere, and when he saw them on Monday they expressed themselves more than satisfied with the way in which everything had been arranged for them, and more than pleased with the number of exhibits. They had some difficulty in making their awards in the architectural pictures, which were the best in the exhibition, and they got over it by awarding three medals He then referred to the many picturesque old buildings in Frome and the immediate district, and suggested that the Urban Council should keep a pictorial register of the town, so as to keep a record of the old and beautiful landmarks in the town.

"The chairman, having congratulated Mr. Cyril Cuzner and Mr. Mitchell in keeping two of the open medals in Frome, said he was not going to weary them with a long account of the deeply interesting processes by which the art of photography had been developed from the beginning of the nineteenth century to the present time; from the primitive block profiles of Thomas and Wedgewood, to the recent development of photography in colours. To him personally that exhibition was a revelation. During the past twenty-one years he had visited nearly every picture gallery in Europe, and it had come home to him how far behind, as a nation, we were in the art of painting, but in photography—and photography was an art—we could hold our hold with any Continental country. Thanks to the determination of his friend, Mr. Mitchell, they had been able to bring into Frome a unique collection of photographs from all parts of the British Isles. The advantages of photography were becoming daily more manifest, whether they considered them in an artistic, social, or educational point of view. Landscapes and natural scenes in far distant lands were brought home to them and depicted with a truthfulness only equalled by Nature herself; copies of celebrated works of art, both in painting and sculpture, might be multiplied indefinitely; and in all departments of science that art had become an important auxiliary. Viewed either as a branch of the fine arts or as a medium for furthering the cause of science and education, photography must be regarded as one of the most beautiful and useful inventions of our age. He had now the greatest pleasure in declaring the exhibition open, and wished it every success."

GLASGOW EASTERN PHOTOGRAPHIC ASSOCIATION.

The sixth annual open photographic exhibition, under the auspices of the Glasgow Eastern Photographic Association, was opened on Saturday, December 6, at 12½, Landressy Street, Bridgeton, Glasgow, and closed on December 13. The public were admitted without charge, and large attendances have been the rule. The work in competition is highly commendable, and in several instances a very high degree of excellence was attained. So far as numbers went this was the largest exhibition yet held by the society. In many cases the framing of the exhibits had evidently had special pains expended upon them, and in one or two instances they were models in every respect. The pictures were very tastefully hung, three or four deep, on a drapery of a green material, which was admirably adapted to display the pictures to the best advantage, and went far to make the general ensemble harmonious, effective, and thoroughly satisfactory. Altogether, the exhibition reflected great credit upon all those who had in any way contributed towards the achievement of so successful a result.

Landscape, architecture, and still life.—This class was very well supported, and the chief award—the president's medal for the best picture in the members' division—was secured by "A pastoral," by Alex Allan, jun., a most fortunate grouping of sheep, and a pleasant landscape of beautiful quality and much fine tonality. The bronze medalled bit of architecture, "In the Crypt, Glas gow Cathedral," well deserved its recognition. The point of view had been chosen with regard to producing the solemnity of the venerable pile. John Baird must be considered fortunate in getting a bronze with "Edge of the Loch." The composition was slightly rigid, and the colour was not very well chosen. Mr. Walker's "Haddon Hall" and Matt Crosbie's "Strife" received certificates, and call for no comment.

"Simplicity," a child study, by Alex Allan, jun., held the first place in portraiture, and was a natural and delightful print. "Very Shy," by Geo. R. Johnstone, received the bronze medal—clean, good, photography, nothing more. "A Study of Pastoral Life," by J. B. Haggart, won a certificate, and just missed being a remarkably good thing; it did not convey that effect of sunlight and its accompanying shade which was evidently intended. The work contributed by Messrs. Brough and Crocket should be noted.

The club outings class produced nothing of great moment. Silver medal, A. Allan, jun., "Sunset on the Clyde." Bronze medal, "When Clouds are drifting Dark Across the Sky," James Kennedy. Certificate, "A Sunlit Glade," John Brough.

The novices were out strong, the work being of fine technique, and the selection of subject generally evidencing care and forethought. Hy. Coleman well deserved his silver medal for "In summer Time." It is an exquisite piece of work, pictorially and technically. Bronze medal went to a well executed and arranged study, full of expression, entitled "Granny," by Geo. R. Johnstone. Mr. John Gillespie treated us to a fine riverscape, "On the Clyde," a distinctly meritorious production.

David C. Pratt's "Treasure Seekers" was a very fine bit of work, and took first place. Showery weather had its own charms, alike to the photographer as to the artist, and "Through the Rain," which secured the bronze award for Mr. Crocket, must be considered a fine rendering of a wet day; it really was wet, and the atmosphere was realistic. Certificates were awarded to "Toil and Pleasure," by Matt Wilson, and "Tramps," by John Gardiner, neither of which contained the qualities possessed by Nos. 112 and 114, the contributions of Messrs. Milroy and Johnstone.

Lantern slides were strong in point of numbers, but weak in quality. Members' class fell to a good set of forest scenes, by William Milroy, second place being held by W. S. Crocket, and third by Matt Wilson. In the open lantern slide class, Mr. Robert Burnie, of Glasgow, gained the silver medal for a medium lot of shipping scenery, Mr. Charles M. Wane, of Edinburgh, getting the bronze for his beautiful studies of swan life. Some striking and picturesque effects of sea and sky were the subjects of the certificate winner's set—viz., Mr. W. L. Primrose.

Coming to the open classes for pictures, let us at once say that the work was of a very uniform quality, nothing that might be said to be of outstanding merit, and very little of the commonplace. The principal award in the class for any subject other than portraits and figure work went to W. A. Clark, of Birmingham, for a fine piece of work, "Evening, Southwell," a bit of painstaking selection and remarkable technique. Bronze also went to an architectural work, entitled "The Light Steals Gently Across the Aisles," by W. R. Lathbury, Bristol. It was a notable work and an object lesson. Certificates fell to Messrs. Allan, jun., Richmond, and Walmsley for work that might easily have changed places with that shown by Messrs. Dunlop, Fenn, and Carswell.

In the open portrait and figure class, Mr. J. Peat Miller, of Beith, justly won the silver medal for a satisfying piece of genre work, 'The Last of the Spinners.' His other contribution was also very successful, and portrayed a young girl teaching a little one "a nursery rhyme." "The Mother and Child" of Miss Johnstone well merited the second award. Messrs. Mercier, of Perth, and Herdmann Newton, of Edinburgh, gained certificates for high class contributions that were particularly pleasing. The judging was kindly undertaken by J. Craig Annan, Esq., of Glasgow, and Archibald Cochrane, Esq., of Hurlet.

New Books.

"The A.B.C. of Photography." By F. J. Clute. 85 pages, 25 cents. San Francisco: The Camera Craft Publishing Company.

Here in England we already have two "A.B.C.'s of Photography," one of them by the late W. K. Burton, which for practical value has not been surpassed. The author of the volume before us says in his preface: "In the following pages I shall presume that the reader knows absolutely nothing concerning photography. My own days of adolescence as an amateur photographer do not date back to the time when the wet-plate process held sway, and I did not learn to use dry plates and film through glasses stained by the silver bath of the old collodion and albumen processes. I have been in constant touch with the beginner in photography since the time when honours were easy between the veriest tyro and myself, and am to-day enjoying their companionship and sharing their troubles. To me, no one is as interesting or companionable as an enthusiastic amateur photographer." We have glanced through the book, which seems to be written from knowledge, and in a very lucid style. But, as we have before remarked, there are enough and to spare of "beginners' books" on the market; and if we had our way, the next aspiring author found guilty of an offence which is very common nowadays, should be chastised on the principle of making the punishment fit the crime, and compelled to read his own writings aloud four hours a day to an audience of New Cut Hooligans. Still, Mr. Chute's book is one of the best of its kind, and we wish it success.

From Messrs. Dawborn and Ward, Farringdon Avenue, E.C., we have received the bound volume of "The Photogram" for 1902. This makes a gift book of double value; it is pleasing from the nature of its pictorial contents, and instructive by reason of its many admirable technical and elucidatory articles.—The same firm forward us volume IV. of "The Useful Arts and Handicrafts" series. Herein Mr. Ward, Mr. Leland, Mr. Bolas, and the Rev. F. C. Lambert have stored up a great deal of serviceable information in a handy form. All sorts of decorative, useful, and fancy work are minutely described. We note an article on "Grangerising." How many of our readers could say off-hand what this is? We much appreciate this volume, and can cordially recommend it.

"A Manual of Photo-engraving." By H. Jenkins. 200 pages; price 2 dollars. New York: Published by "The Inland Printer," 160 Nassau Street.

This is a volume which we have no hesitation in praising. Fully illustrated in line, tone, wash, and three-colour from the works of prominent American artists, the details of the half-tone engraving process appear to be given very exhaustively. The renowned authority, Mr. F. E. Ives (whom we hope shortly to congratulate on the receipt of the too long deferred R.P.S. progress medal), deals with the half-tone and tri-chromatic process theories, while three-colour block making forms the subject of a chapter by Mr. S. H. Horgan, editor of "Process Notes" in "The Inland Printer." We accord very high commendation indeed to this useful and well-produced book, which should be in the possession of everyone interested in photo-engraving, be it monochrome or tri-colour. Admirers of American work should certainly procure it.

"Wellcome's Photographic Exposure Record and Diary, 1903." London: Published by Burroughs, Wellcome, and Co., Snow Hill Buildings.

We have carried a Wellcome in our pocket for the past twelve months, and remorseless Time has insisted upon the volume being gathered to its fathers. Some day the notes it contains may come in handy for autobiographical purposes, or the pleasures of memory. The new Wellcome is leather bound, has a wallet, and space for some of those little snap-shots which we all carry and show one another nowadays. Here are some of its other features, officially described:—The general arrangement of the letterpress so far as the first 60 pages are concerned is on the same lines as last year, but the matter has been carefully brought up to date. The article on exposure has been re-modelled to suit the attached calculator, and removed to the end of the book, so that the tables may be convenient for reference. The introduction of a mechanical means of calculating exposure has enabled considerable simplification to be effected both in the letterpress devoted to exposure and in the tables given at the beginning of each month in the diary portion. In the case of the Wellcome Calculator, only one movement of one scale is necessary. The movement is easily effected by slight pressure with the finger tips. The use of the calculator is not confined to one country, to one make of plate, or to one developer. Apart from its obvious and particular purpose, the Wellcome Diary will be found useful and informative by every photographer.

We have also received "Practical Photo-Micrography," by Andrew Pringle (Iliffe); and "Penrose's Process Year Book," edited by William Gamble.

New Apparatus, &c.

"Tabloid" Pyro-Metol Developer. Manufactured and sold by Burroughs Wellcome and Co., London.

Messrs. Burroughs, Wellcome, and Co. have added to the series of their well-known "Tabloid" photographic chemicals a pyro-metol developer compounded according to the "Imperial" formula. Each tabloid of pyro-metol compound contains 1.375 grains of pyrogallic acid, 1.125 grains of metol, 3 grains of metabisulphite of potash, and .5 grains of bromide of potassium. One tabloid suffices for one fluid ounce of developer, and to it should be added one tabloid of accelerator. The units have to be multiplied by the number of ounces of solution required. It is scarcely necessary to say that the use of this developer is not restricted to "Imperial" plates. In trying the sample sent to us, we used another popular brand, and obtained negatives of excellent quality, full of detail, and free from any trace of stain. The plates had been exposed some months ago, but the developer did not reveal any sign of staleness. The negatives, in fact, were as good as though the plates had been developed immediately after the exposures were made. We desire to draw attention once again to the great convenience of "Tabloid" developers for travellers. Packed as they are, in well corked bottles, the possibility of deterioration is practically eliminated, and there is none of the risk and inconvenience which usually attends the carriage of solutions. For amateurs and others who only develop plates at intervals, tabloids should also be of considerable value. Solutions are at their best when freshly prepared, and the tabloid system ensures this, as well as the correctness of the proportions of the ingredients of which the developer is composed. Accurate work under the best conditions is thus secured.

Mariona Self-Toning Paper. Manufactured and sold by Marion and Co., Ltd., Soho Square, W.

Issued with both glossy and matt surfaces, this paper yields agreeable warm brown tones with the first of the undermentioned baths. The glossy prints are particularly rich in effect. The following are the directions for use. Print as with albumenised papers, slightly darker than required for the finished picture. After printing, place in the following solution for five minutes, keeping the prints constantly moving, viz., Powdered alum 1oz., ammonium sulphocyanide 40grs., made up with water to 20oz.; or for colder tones, ammonium sulphocyanide 40grs., chrome alum 40grs., common salt 1oz., made up with water to 20oz. On removal from either of these baths wash in several changes or in running water for ten minutes, then fix. Fixing bath: Dissolve 3oz. hypo in 1 pint of water. Final washing: In running water, or several changes of water, for at least two hours. Notes: Care must be taken to keep the prints moving in all the solutions. Drying: A convenient method is to place the prints face upwards on stout blotting boards bent over wooden rods.

*** A number of reviews of books, notices of new apparatus, etc., are unavoidably held over.

Commercial & Legal Intelligence

The Warwick Competition.—Entries for the Warwick Dry Plate Company's £50 prize close on the 31st inst.

The Austin-Edwards Monthly Film Negative Competition.—The prize camera for the current month has been awarded to Dr. Lincoln de Castro, Italian Consulate, Aden, for his negative "Abyssinian Woman at Fountain."

In the Court of Session last week Lord Low gave judgment in an action of suspension and interdict by W. Ross Shearer, photographer, Kirkwood Street Studio, Rutherglen, against Wm. Ritchie and Sons, Limited, wholesale stationers, Elder Street, Edinburgh, in which complainer sought to have respondents interdicted from publishing or selling photographs entitled "Views of Rutherglen" unless each photograph larger than three inches long by two inches broad, was impressed with the words "Shearer Photo." Complainer photographed a number of places in and around Rutherglen, and in January last was approached by respondents with the view of having the photographs reproduced. He agreed to let them have the use of 16 negatives on condition that the words mentioned were used. He complained that respondents had used a number of the photographs in books and postcards, reproducing his views without fulfilling that condition. After the note was raised respondents proposed that they should print the words on a fly-slip on the front of the views, but this complainer declined. Subsequently respondents called in all the books and cards and stamped upon them the words "Shearer Photo." Lord Low last week held that this course was the proper one to have been followed. He therefore refused interdict, but found respondents liable in expenses.—"Edinburgh Evening News."

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Dec	Name of Society.	Subject
19.....	Borough Polytechnic.....	*Miscellaneous Hints and Formulæ.* Mr. F. W. Bannister.
19	Nottingham Camera Club.....	Stereoscopic Evening and "A P." Prize Slides
19	Croydon Natural History	"*Photo-Micrography*" by T. E. Fresh water. Illustrated.
22	Oxford Camera Club	Exhibition of Members' Slides.
22.....	Edinburgh Photo. Society	*Lantern Slide Making.* A. H. Baird F.R.P.S.
23.....	Leeds Photographic Society ...	*Photographic Slides.* Lantern Evening.

ROYAL PHOTOGRAPHIC SOCIETY.—THE PROCEEDINGS OF COUNCIL.

A Photographic Studio.—In reference to the suggested provision of a photographic studio, the council have received a further communication stating that, so far as lack of funds was concerned, the writer was prepared to subscribe a sum of £5, if others desirous of this accommodation would join him in sufficient numbers to meet the expense of the structural alterations that would be necessary. In giving publicity to this offer the council wish it to be known that if sufficient help is forthcoming as a result of this announcement, they will be pleased to further consider the matter.

The Society's Jubilee.—The council received a preliminary report upon the proposed celebration of the fiftieth year of the society's existence. Until the matter is further advanced, however, no definite announcement of the method of celebration to be adopted can be given.

Progress Medal.—In accordance with the standing orders, the nomination of candidates for the Progress Medal took place. The discussion of the work of the nominees takes place at the December Meeting and the voting at the January meeting of the council.

Ordinary meeting, December 9th, Mr. J. C. S. Mummery in the chair.

Eight candidates were elected members of the society, and eleven names were proposed for membership.

Messrs. Calder Marshal, and Son were appointed hon. auditors of the society's accounts for the current year.

Dr. R. Norris Wolfenden then read a most interesting paper upon

Photography in Marine Zoology.

The object of the paper was to show the extent of the usefulness of photography in the researches of men like Dr. Wolfenden who spends a considerable portion of his time dredging in northern waters and dissecting and studying the numerous forms of life which his apparatus brings up from below the waves. Dr. Wolfenden had quite a number of specimens of these creatures which were passed round. In other cases photographic slides were thrown on the screen, the pictures showing the outward appearance of the object while X-ray pictures laid clear their internal structures. Photography with the microscope can be of considerable service to the marine zoologist in his studies and the ability to make radiographs of the animals, etc., that are brought to light greatly assists him. Dr. Wolfenden had a few words to say about the possibility of photographing these marine creatures in situ by means of a camera that would stand immersion at considerable depths, and later on held out his particular branch of study as an excellent field of work for the capable photographer in colour. He said a large number of things brought to the surface were most beautifully coloured for a time, but the colours were fleeting and could not be preserved except by means of drawings; and if somebody would devote himself to the preservation of accurate photographic records of these colours, he would be doing a good work. A number of microscopic specimens were also shown with the aid of the microscope attachment to the lantern.

A vote of thanks was passed to Dr. Wolfenden.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

December 11th.—Mr. W. G. Barker in the chair.

The exhibition of pictures for the hon. secretary's medal was held, a landscape by Mr. E. Featherstone being first, and one by Mr. J. S. Teape coming second.

Mr. A. Mackie showed two collodio-chloride prints which had been held together by rubber bands, the sulphur in the rubber having considerably reduced them where it had come in contact.

The Chairman, remarking on his endeavours to find a developer for cinematograph films that would be perfectly stainless in its action with prolonged development, had finally decided on "Dionol," which gave plenty of density, and was also very economical, 1oz. being taken to 200oz. of water, with the addition of 3oz. of soda sulphite.

CAMERA CLUB.

A somewhat novel field of photographic work has been tilled by Mr. Martin Duncan, who addressed the Camera Club on the 8th inst., and

showed numerous specimens of his skill. He called his subject "A Naturalist's Ramble on the Sea Shore," and throwing on the screen a view of the receding waves, he invited his hearers to accompany him on a walk along the wet margin of the sand. Another lantern slide exhibited the "outfit" which he adopts on these rambles, consisting of a few test tubes and bottles, a spoon, a landing net, and a pocket magnifier. With these implements he secures and examines seaweeds, which under the microscope turn out to be no seaweeds at all, but zoophytes, and all sorts of curious organisms, which occupy that strange borderland which lies between the animal and vegetable kingdoms. The larger creatures he keeps in a marine aquarium, and then, by certain clever artifices, he photographs them, and is thus able to illustrate their life history in a truly remarkable manner. The lecture was given entirely without notes, and the lecturer knew both his subject and his pictures, which, alas! is not always the case, even at the Camera Club.

Mr. Charters White, who, as an ardent microscopist, was in close touch with the lecturer, urged upon the members present to follow his example when on a visit to the seaside, and to forsake the joys of the Marine Parade for the more intellectual company of the crabs, lobsters, and octopuses, or octopi—we believe the word is one of the few which rejoices in a double plural. The lecture was much appreciated as a discourse which had been well delivered and unusually well illustrated.

On the following Thursday there was an almost record attendance at the Club, for it was the night appointed for Mr. Sanger Shepherd's exposition of his new process for producing photographs in colour on paper. He had promised some weeks back that the Camera Club, of which he is a member, should skim the cream of the novelty by being the first public body to know anything about it and his fellow members were not slow to appreciate the compliment.

Dealing first with general principles, and acknowledging in a graceful manner the work of F. E. Ives, who laid the foundation of the trichromatic method, and owning his indebtedness to Sir William Abney's researches, and to Mr. Cadett's "Spectrum" plate, Mr. Sanger Shepherd at once plunged into his subject. For the benefit of the many visitors among the audience who were presumed to be ignorant of recent advances, he described his own method of producing lantern slides in colour. And he told how the process had been extensively adopted by scientific men, as well as by artists. He also mentioned incidentally that transparencies of large size, made by the same method, had won the regard of certain Indian potentates, who used the pictures for decorative purposes.

The new process on paper may be said to begin where the lantern slide process leaves off. The three negatives taken under colour filters are necessary, and so are the positives produced from those negatives in bichromated gelatine on celluloid. Each positive receives, as in the lantern slide process, a bath of aniline dye; that from the red filter being stained cyan blue; the prints from the green filter negative being coloured pink; and that from the blue filter negative yellow.

And now comes the new departure. The bichromated film is extremely hard and tough, but this does not prevent it absorbing a large amount of dye. While it holds this colouring matter, it is placed in a vessel of water, together with a sheet of paper specially coated with a very thin film of soft gelatine, which has been combined with a mordant. The two surfaces, after being placed face to face, are treated like a carbon print and its temporary support: they are squeegeed into intimate contact. Left thus for about fifteen minutes, the colour is attracted to the softer resting place offered by the mordanted gelatine on the paper. It leaves its hard pillow on the celluloid, and goes entirely to the softer bed. One colour having been transferred from celluloid to paper in this manner, the other two images on the celluloid are stained with their respective colours, and each in turn is superposed upon the first impression obtained. There is no difficulty in registration, for the soft, wet gelatine allows one to slide the celluloid film upon it until the correct place is reached, and this is done before the transfer of the colour has time to begin.

Such is the process which Mr. Sanger Shepherd has devised, and the specimens which he showed prove that it is a practical one. Moreover, it is a distinct novelty. Like so many other inventions and discoveries, a fortunate accident led an observant man to the goal which he had long been seeking. A stained positive film was carelessly laid upon a piece of blotting paper, and transferred the image which it bore to the more absorbent surface on which it rested.

The thing seems very simple and easy now that it is done, but we may be sure that many little details had to be considered, and many difficulties surmounted before ultimate success was reached. One of these Mr. Sanger Shepherd alluded to during his demonstration. He had, in his first attempt, successfully combined the red and yellow images, but when he added the blue, some disturbing element made its presence felt, and the picture entirely disappeared. The failure was traced to the circumstance that the blue dye in question had an acid reaction, whilst its two yoke fellows were alkaline. Such difficulties crop up by the score in the early stages of every new process, and it often calls for higher qualities to overcome them than it does to conceive the original idea.

Mr. Shepherd claims for his process that it is applicable not only to paper, but to satin, silk, and other textile fabrics. It may also be used, he thinks, to produce imitation miniatures on ivory, white opaque celluloid, and opal glass may also be employed as image supporters. But he laid great stress upon its employment for portraiture by the professional photographer, urging the facility with which the paper prints can be retouched by means of their own colouring matter as one of its chief recommendations for studio work. While the results are sufficiently good without any retouching whatever, the professional man could not afford to do without that aid to the production of a flattering portrait.

In the discussion which followed Mr. Shepherd's interesting demonstration, he was assailed with dozens of questions, but as they say in the law courts, cross-examination did not shake his evidence as to the excellence of the process, and these questions elicited from him further details of the method. He had found it necessary to devise a new set of dyes, for he had found that even the same maker could not guarantee the same qualities for every batch of dye of the same name.

Mr. Cadett was delighted to see such a large audience. He thought that photographers were getting tired of monochrome, and had long been surprised that, although Vogel had demonstrated the advantages of orthochromatic work, it was so little practised. Thanks to the Sanger Shepherd filters, it was now possible to secure correct luminosities. Improvements came slowly, but he thought that we were now on the eve of a change. In a coloured picture, the luminosities must be correct, and it should be the same in ordinary photography. He believed that the new process which had just been demonstrated would become very general.

Dr. Lindsay Johnson wanted to know if special lenses were necessary, and also if any difficulty arose from expansion of the paper. The first question was answered in the negative, and as to the second, Mr. Shepherd pointed out that as the paper was thoroughly wetted before contact with the dyed positive, the expansion difficulty was not an obstacle. By steeping paper in celluloid varnish it could be repeatedly soaked in water without stretching. With regard to permanency of results, it was curious that one dye would be "fast" on paper while it was fugitive on cotton or silk. Others, again, took kindly to one of those textiles, while it refused to be permanent on paper. He had prints which had been exposed for eight months without any apparent change, but he would not guarantee permanence. That was a matter for the manufacturer of the dyes.

A hearty vote of thanks brought the proceedings to a close at a late hour.

LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

THE weekly meeting was held on Thursday evening last week in the rooms, Eberle Street. Mr. Joseph Marples gave a lecture on Bridgnorth—a resume of the last Easter tour of the society. His remarks were listened to with marked attention. The slides, to the number of about 150, were contributed by the various members who took part in the tour, and comprised a great many very fine pictures, chiefly architectural.

CROYDON CAMERA CLUB.

THE seventieth public lantern show was held on Wednesday, the 10th inst., at the Art Galleries, before a large assembly of members and their friends.

The first slide shown on the screen consisted of a map of Surrey, and the President, who acted as a genial and critical spokesman, pointed out the various places investigated by his dauntless band of explorers during the summer season. That their ways lay in pleasant places was proved by the large number of slides subsequently shown.

Theatrical scenes, taken by Dr. Grun, of liquid lens and "depth of field" fame, were also projected and aroused much interest, as did the slides recording Lord Roberts's recent visit to the town. The chief attraction of the evening, however, consisted in a capital cinematograph display by means of Paul's animatograph, which included a wonderful representation of Dickens' "Christmas Carol," and magical illusions only possible on a moving film, which can see or be blind, at the will of the manipulator. There are several points in the animatograph deserving of notice. The shutter only covering 1-16 of the circle it revolves in, is of high efficiency, and a brilliant picture results. The lantern body moves laterally on rails, from the animatograph to the lantern projector. This permits a longer focus condenser to be used for slide projection, and is optically an advantage. Provision is also made for centering the disc on the screen. The projection lenses are interchangeable, and the operator is therefore independent of the varying length of the halls he may have to show in. The spools are of ample capacity, and are made to take from 1,000 to 15,000 feet of film.

A cordial vote of thanks to Mr. Paul and his manager, Mr. Smith, brought a pleasant evening to a close.

BOWES PARK AND DISTRICT PHOTOGRAPHIC SOCIETY.

A WELL-ATTENDED meeting of the above was held at 111, Myddleton Road, on Wednesday, the 10th inst., to consider rules, etc. A communication was read from Mr. J. C. S. Mummery, F.R.P.S., who regretted his inability to become president, but expressed a wish to join the society. Letters were also read from Dr. Allan and several other gentlemen who wished to become members

After discussion the rules were passed, and the following officers elected for the ensuing year:—President, Mr. A. J. Craston; hon. treasurer, Mr. A. Bird; hon. secretary, Mr. A. Kernon; hon. librarian, Mr. F. Slater. The following gentlemen, with the officers, to form the council:—Messrs. H. C. Bird, Cobb, W. Driffield, Duncan, T. B. Read, Richardson, and Young.

It was decided that the society meet on the first and third Mondays in each month

Mr. Mason, chemist, 128, Myddleton Road, has promised to fit up a dark room for the free use of members of the society.

Any information can be obtained of the hon. secretary, 26, Goring Road, Bowes Park, N.

LUTON CAMERA CLUB.

A MEETING of the members of the above club was held at the Franklin Institute on the 9th inst., when Mr. Frank Miall, representing the Lumiere N.A. Co., gave a lecture and demonstration of their advanced process of colour photography, and received a most hearty vote of thanks for the clear and concise manner in which he explained and demonstrated the extreme simplicity of the process, coupled with the excellent results obtained.

NORTHAMPTON NATURAL HISTORY AND FIELD CLUB.

A MEETING of the members of the above club was held at their club room on the 10th inst., when Mr. Frank Miall, representing the Lumiere N.A. Co., gave a lecture and demonstration of their up-to-date process of colour photography, and received a hearty vote of thanks for the explicit way in which he explained and showed the very simple method of obtaining the charming pictures thrown on the screen, each one being received by the audience with applause.

RICHMOND CAMERA CLUB.

THE modern amateur photographer is a being of infinite resource. The setting of the sun does not mark the cessation of his activities. The fact of darkness closing the earth merely signifies to him that he must change his methods, and set to work to record the many interesting effects only to be observed during the hours when mankind, through the medium of some amiable gas or electric company, itself looks after the illumination of its haunts and habitations. The many charming subjects available under these artificial conditions were exemplified in the course of a lecture by Mr. Ellis Kilsey delivered before the club on Thursday, the 11th inst.

Night photography, it turns out, is merely a matter of rapid lenses, rapid plates, and patience. Give your lens time, and it will record upon the sensitive plate the most faintly lighted scene; but for respectable photographers who desire to conclude their operations short of midnight, the scene should be illuminated brightly. A highly-pictorial rendering of a frost-covered tree, lighted by a common street lamp, was shown in illustration of the lecturer's remark that the most every-day scenes contained gems for the night photographer. A wet or snowy night is the best, as the street reflect and re-reflect the lights in picturesque lines and patches. Some excellent views in Trafalgar Square and on the Thames Embankment were shown in illustration of this point. Even the humble candle, it appears, is sufficient to serve the purpose of the photographer, for the lecturer illustrated and explained a method by which he had photographed himself reclining in bed, posing before the camera for eleven minutes.

CROYDON NATURAL HISTORY AND SCIENTIFIC SOCIETY.

ON Friday evening, Mr. A. P. Hoole, of Sutton, lectured to the above Society on the "Development of Lantern Slides, and their after-treatment by Toning and Intensification." The lecturer showed numerous very beautiful slides, illustrative of the various methods of development, and of the results obtainable by various types of developers, etc. Examples made by the following developers, Thomas's plates being always used, were shown, i.e., pyro-soda, black and warm tones; pyroacetone; pyro-ammonia,; hydroquinone soda, with and without metol; rodinal; amidol and ferrous oxalate. The result of prolonged exposure, with the suitable modification of the developer, was also shown and explained. Of toning solutions, gold and sulpho-cyanide, together with various salts of iron and copper, were exhibited. Intensification with mercury alone, or subsequent darkening with ammonia, sodia sulphide, Schippe's salt, ammonium sulphide, etc., was also shown by a large number of slides. The action, too, of Thomas's colour solution, by which various colours may be obtained on one slide, was also demonstrated. The proceedings terminated with a hearty vote of thanks, proposed by Mr. Baldock, who officiated at the lantern, which was unanimously accorded to Mr. Hoole for his very instructive and successful demonstration.

A VERY successful evening was spent at the headquarters of the South London Photographic Society on Monday last, when Messrs. W. E. Walker and H. Mann, of the Chiswick Camera Club, attended to act as judges in the annual competition for medals presented by various gentlemen on the executive of the Society. The proceedings, which commenced at eight o'clock, did not terminate until the clock showed eleven not far ahead. The medals and awards are as follows:—For the best lecturette illustrated by slides, not to exceed fifteen minutes in delivery, bronze medal presented by H. F. Mawbey, Esq., awarded to Mr. W. F. Slater, F.R.P.S.; for the best and second best prints made from negatives taken during the current year (only members who have not yet been awarded a medal are eligible), two bronze medals presented by C. Churchill, Esq., F.R.P.S., award, 1st, Mr. G. H. Lovegrove; 2nd, Mr. Gardner; for the best set of six lantern slides from negatives taken on at least three of the Society's excursions in 1902, silver medal presented by J. T. French, Esq., awarded to Mr. E. W. Taylor.

News and Notes.

DURING his recent visit, His Majesty the King of Portugal called at the London Stereoscopic Company's premises in Regent Street, and personally selected two of their best hand cameras for his own use.

MESSRS. GEORGE HOUGHTON AND SONS, of 88 and 89, High Holborn, W.C., write:—We have much pleasure in advising you that we have been appointed sole wholesale agents for "Metalotype" paper.

CHRISTMAS Holidays, 1902.—Messrs. Burroughs, Wellcome, and Co.'s offices, warehouses, etc., will be closed from Wednesday evening, December 24th, until Monday morning, December 29th.

AT the Photographic Club on the 10th inst., Messrs. Geo. Houghton and Son showed the Sanderson hand and stand cameras with lantern slides illustrating its capabilities for architectural and telephoto work, dalo camera, and other novelties.

MR. W. B. CHAPLIN, of Messrs. J. Russell and Sons, Windsor Studio, was married to Miss E. Langton Cooper, at All Saints' Church, Windsor, on Saturday last, the Vicar of Windsor, Chaplain in Ordinary to the King, officiating at the ceremony.

MESSRS. Gothard and Co., picture frame makers, of the Steam Works, Plumstead Road, Woolwich, S.E., have submitted to us specimens of their frames for photographs. These are made in three shades, art green, dark green, and brown. The corners are mounted and finished in English gold. The frames are effective in appearance and moderate in price.

THE Science and Art Department.—I have seen a paragraph in the papers intimating that the principal assistant secretary at South Kensington has expressed a wish to retire. I most earnestly hope that the report is a false one, as the dignity, integrity, and usefulness of the department cannot but suffer sorely by his removal. One has heard of statements inserted one day to be contradicted the next. I trust that this may be one of them.—"A Fellow of the Royal Astronomical Society" in the "English Mechanic."

SOUTH London Photographic Society's Exhibition.— Messrs. H. W. Bennett, F.R.P.S.; J. C. S. Mummery, A.R.I.B.A., and J. A. Sinclair, F.R.P.S., have consented to act as judges at the coming exhibition. There are open classes for portraiture, architecture, landscape, lantern slides (sets of four), and stereoscopic slides (sets of four), in which silver and bronze medals will be awarded at the discretion of the judges. Entry forms will be ready in a few days, and may be obtained from the hon. secretary, Mr. W. Calder Marshall, F.C.A., 41, Glenton Road, Lee, S.E., who would also be pleased to hear from anyone desiring to join the society.

ITALIAN publishers and newspaper proprietors are said to be seriously interesting themselves in a new process of printing, for which important claims are made. The "Tribuna" of Rome states that the Genoese firm of Bacigalupi has acquired all rights in the new process, and that a few days since all the newspaper proprietors and leading printers of Milan assembled to witness a series of practical tests, which are all described as having been perfectly satisfactory. The invention consists in the substitution of celluloid for preparations of lead and antimony, and is said to give an admirable reproduction from all kinds of plates and blocks.

THE Grun Lens.—The following is from a "lay" contemporary:—"It is well known that some liquids have the power to refract rays of light much more than others. An inventor has taken advantage of this principle to make a photographic oil-containing lens which is so much more rapid than the most rapid all-glass lenses that with it an instantaneous photograph in a theatre, for instance, can be taken without a flashlight. So great is the light-refracting power of this new liquid lens that on a pitch-dark night a photograph can be taken out of doors with a 15-minute exposure, or when there is moonlight with an exposure of only one minute."

SCOTTISH Affiliation.—The first meeting in connection with the proposed Scottish Affiliation, or, as it should rather be called, Scottish Confederation scheme, will probably be held next month, after all the societies have had time to consider the matter. Already a decided majority of the Scottish societies have decided—most of them enthusiastically—to support the scheme, while a number have not yet decided either way; not one society, as far as we can hear, has condemned it. The photographic section of the Perthshire Society of Natural Science has invited the delegates to use its rooms for the first meeting, and the President of that body has kindly offered to entertain the delegates to tea.

"KNOWLEDGE" Programme for 1903.—It is intended in future to devote a larger amount of space to microscopy than hitherto, and by the co-operation of specialists to publish articles treating on different departments of both the popular and scientific sides. Among those who have promised to contribute are the following:—Mr. F. Noad Clark, "The Photography of Opaque Objects"; Mr. Sanger Shepherd, "Photo-Micrography in Natural Colours"; and other similar articles will appear. It is hoped that these new arrangements will greatly increase the value of the microscopical notes, and maintain the interest which has so far been evinced.

THE Kyrle Society.—On behalf of the Kyrle Society, 2, Manchester Street, an appeal has just been issued by Miss Octavia Hill and Lord Monkswell. The decorative branch of the society provides pictures and other decorations for hospitals, clubs for working men and women, and

similar institutions, and the gratuitous help of some fifty artists is at the disposal of the committee. The work is now at a standstill, however, owing to lack of funds for materials and the fixing of decorations. Among the dozen schemes for which money for materials is needed is one for the parish hall of St. Cuthbert's, Isle of Dogs, for which a beautiful design illustrating the "Coming of Spring" has been prepared by Mr. W. Savage Cooper. The cost of carrying out the scheme would not exceed £15, but this and other work cannot be entered on until the money is in hand, as the society during its existence of a quarter of a century has never incurred a debt.

THE post-card movement and trade in Great Britain are so large and have so many ramifications, says "The Picture Post-card and Collector's Chronicle," that only those "behind the scenes" can realise how overwhelming they are in their magnitude and importance. We have decided, therefore, after mature thought, that in order to show the general public, collectors, and even manufacturers themselves, to what heights —popular, artistic, and commercial—the English post-card pictorial has risen, to organise a British Picture Post-card Exhibition. This, to be thoroughly representative, must embrace every section of the post-card designing, publishing and distributing business; it should show everything of interest to the cartophilic world, from a unique post-card to a typical collection; from a design to a packet of post-cards. We have drawn up a scheme, particulars of which will appear in our next issue; meantime we invite anybody and everybody interested in the British post-card movement to communicate with us, and send us any suggestions, hints, or ideas that may help us to make a brilliant success of the first English Post-card Exhibition.

AT the last meeting of the American Association for the Advancement of Science, Professor Robert W. Wood, who succeeded to the chair of physics in the John Hopkins University on the death of Henry A. Rowland, announced under the title of "A Substance with Remarkable Optical Properties, and Screens Transparent only to Ultra-Violet Light," a discovery which is said to be of great value in science, and which was a notable personal triumph for Professor Wood. He first described Tyndall's experiments with a screen that cut out all the visible rays of the spectrum, as well as the ultra-violet rays, and let through only heat rays. For the past thirty or forty years eminent physicists all over the world have been trying to find a similar screen that would cut out all the heat and all the visible rays and let through only the ultra-violet rays. Dr. Wood had for some time known that the substance called nitroso-dimethyl-aniline would keep out all the visible and heat rays, except some red and violet, and that it would also let through the ultra-violet. It has only been within the last few days that Dr. Wood has discovered the much-sought screen. He combined the known substance with cobalt glass and obtained a screen that lets through only ultra-violet. One striking peculiarity of the nitroso-dimethyl-aniline, which Dr. Wood dwelt upon and especially emphasized, is the fact that it gives a spectrum about thirty times as broad as that produced by ordinary quartz.

THE Effect of Light on Animal and Plant Life.—I note with interest a very able article, Mr. T. Ritchison writes to the "Scientific American," by Dr. James Weir, Jun., in which he describes the effect of light on plant and animal life, but with one probable error, which I shall endeavour to point out. He says among other things:—"Flammarion's beautiful experiments at the climatological station at Juvisy have shown beyond question of doubt the widely different effects of the red and violet rays on plants. The plants chosen were of the genus Mimosa, or 'sensitive plant,' and were subjected to the same environments with the exception that some were reared beneath dark blue glass, and others beneath red glass. In four months the plants grown under the red glass had attained extraordinary development, while those subjected to the violet rays had made no progress whatever. Similar effects were noted in the case of strawberries, and numerous other plants, vines, and shrubs. The plants grown beneath blue glass did not die, but seemed to remain in a dormant condition, without growth or further development. Zacharawietz, of Vaucluse, has also shown that plants are strongly affected along the lines of rapid growth and development by red and orange rays. As early as 1883 I demonstrated and published the fact that typhoid fever germs would not live when subjected to the blue or violet rays." From the foregoing one gets the impression that plants under a red glass are subjected to red rays of light, while the reverse must be true, as the red glass has absorbed all the red rays of light, and the remainder only have penetrated. Who has not observed that in a photographic dark room, where a red light is used, anything therein which is red will appear white, for there are no red rays in the room, all being absorbed by the red paper through which the light is filtered.

COMMONS Preservation Society and Private Bills.—A meeting of the executive committee of the Commons and Footpaths Preservation Society was held last week, under the presidency of Mr. G. Shaw Lefevre. The secretary's report upon private Bills to be introduced into Parliament during the ensuing session was considered. It appeared that altogether notice has been given of intention to introduce 72 Bills under which common land or open spaces would be absorbed or rights of way extinguished. Among the London open spaces which will be interfered with by railway Bills are Back Common and Acton Green, Chiswick: Shepherd's Bush Green, Hammersmith; Peckham Rye Common, and Tooting Bec Common. Over eleven acres of Tooting Bec Common are within the limits of deviation of the proposed London and Brighton Electric Express Railway. Several proposed tube railways will affect Hyde Park, St. James's Park, and Green Park, and the Metropolitan District Railway seeks to acquire further land on the Victoria Embankment. It was further stated that 338 acres of common land in Yorkshire, Monmouth, Sussex, and Glamorgan would be acquired for purposes of water undertakings, and that various London improvement Bills would involve enclosures of portions of Wood Green Common, Eltham Common, and the old Brydewell Burial-ground. It was resolved to communicate with 442 local authorities within whose area rights of way would be interfered with by railway companies, and the solicitor was directed to report upon various Bills which affect common land. Among other matters considered at the meeting were the proposed extension of Hampstead Heath and the Hainault and Lambourne open space scheme. It was stated that the society had, since the last meeting of the committee, secured the re-opening of twelve obstructed rights of way and the restitution of a considerable area of common land.—"The Times."

HAINAULT Forest.—In an urgency report submitted for the approval of the London County Council at its meeting on Tuesday, the Parks and Open Spaces Committee state that they have received and carefully considered a memorial from the Commons and Footpaths Preservation Society, the Kyrle Society, the Metropolitan Public Gardens Association, and the National Trust for Places of Historic Interest or Natural Beauty asking the aid of the Council in securing 803 acres of land at Chigwell Row for the purpose of a public open space. The land is without the County of London, and is on the highest part of the ridge which separates the valley of the River Roding from the valley of the Thames. It is in its highest parts 300ft. above the Thames, and occupies a position commanding magnificent views of the surrounding country. The greater part of it is within a twelve-mile radius of the Bank of England, and is consequently within an easy distance of the East-end suburbs of London. It comprises the last remaining unenclosed portion of the historic Forest of Hainault, formerly part of the ancient Royal Forest of Waltham or Essex, the other part of which is now known as Epping Forest. The price named is £22,000 in round figures, and towards this the Council is asked to subscribe £10,000, that being the amount necessary to complete the purchase-money, it being understood that when acquired the land shall be vested in the Council to be maintained by it in perpetuity as a public open space. The committee point out that for the laying out of the ground when acquired very little expenditure on capital account would be necessary, the only work requisite being the sowing with grass seed the part at present under cultivation. For that a sum of £1,500 would suffice, and they estimated that £500 would be required for adapting the buildings at present on the land for use by the public and the staff. The maintenance charge would not exceed £150 a year.

ROYAL Photographic Society's technical meeting, Tuesday, December 23rd, at 66, Russell Square, at 8 p.m. Mr. C. W. Somerville will read a paper on "The Conversion of the Silver Image of Bromide Prints into Platinum."

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

RED-HANDED PLAGIARISM

To the Editors.

Gentlemen,—Shakespeare says, "Who steals my purse steals trash." Evidently there are, hunting about in photographic circles and amongst its literature, unblushing plagiarists, who, on finding anything written by the more liberal-minded of our leaders, likely to answer to their designs, exultingly exclaim, "Who steals such brains steals cash," so here goes, thus appealing at once to the unwary with no other object than that of putting money into their own purse. Such were my thoughts on reading the paragraph in the current number of the Journal on "Daylight Development."

I well remember that in response to an invitation from Mr. Morgan, the late Mr. Jabez Hughes and myself witnessed a demonstration of the method as detailed in the paragraph alluded to, and at a meeting of the South London Society, held the same evening, Mr. Hughes, authorised, of course, by Mr. Morgan, explained, in his usual lucid manner, the whole operation.—I am, gentlemen, yours truly,

W. COBB.

Rochester House, Granville Street, Wood Green.
December 13th, 1902.

ELECTRICAL ACTINOMETERS.

To the Editors.

Gentlemen,—I see in your last issue that a correspondent is asking for information respecting Riggollot's treatise on electrical actinometers. Anticipating your reply to Mr. F. W. Clifford, he evidently refers to April 12th, 1901, on which date the Journal contained a

letter from me on this subject. The full title of the book is "Recherches Expérimentales sur Quelques Actinomètres," "Electro-Chimiques." I obtained a copy through Messrs. Williams and Norgate, 14, Henrietta Street, Covent Garden. Your correspondent will find in the lantern supplement of the Journal, April 5th, 1901, page 31, an article by me on this subject, which gives the method of making and using these actinometers.—I remain, yours truly,

JOHN A. RANDALL.

43, Tonsley Hill, Wandsworth, S.W.
December 15th, 1902.

AN APPEAL.

To the Editors.

Gentlemen,—I have an urgent appeal for help in a form which, I believe, can be very easily given, and I trust that you may be able, and willing, to do something personally, and also to invite your readers to assist. The applicant is a professional photographer, who was for very many years in a good position, but who is now close upon three score years and ten, and has been for ten years confined to his bed by a serious and painful illness. In those years the whole of his savings have been dissipated, and he now has to depend entirely upon a small sum received from the Guardians, and the precarious assistance given by a devoted daughter, who earns all she can by rough housework. The case is one which was thoroughly investigated by the Photographers' Benevolent Association, and to which a grant of some few shillings weekly was made for several years—a help which has been sorely missed since the funds of the Benevolent were finally exhausted.

This poor photographer asks that those who have a few spare lantern slides should send them to him, as he can make a few odd half-crowns during each winter by making these slides into little lectures which he lends to local school entertainments, and a few private people giving lantern parties. The subjects are not very important, so long as they are interesting and the slides are pretty good, but it will be a distinct advantage if, in each case, the title is given. Any contributions of slides that may be sent to you or to me I will gladly forward, and since we are already well into the winter, prompt response is important.

Another very charitable act towards the photographer in question would be to supply him with a quantity of reading matter, photographic or otherwise, and, preferably, illustrated. If any of your readers will undertake to send him a used magazine or paper weekly or monthly, I shall be glad to give his name and address for the purpose, but the applicant, while maintaining his interest in photography, has maintained some very proper pride, and prefers that his name (once very well known in the profession) be not published or generally handled about.

Should any of your readers wish to contribute in money towards this case, I shall be pleased to acknowledge, and bank subscriptions, and to remit the money in weekly sums so small as to prevent the withdrawal of the assistance of the Guardians.—Yours faithfully,

H. SNOWDEN WARD.

Effingham House, Arundel Street, Strand, London, W.C.
December 13th, 1902.

[The calls upon our time are so numerous that we cannot possibly give personal attention to this and many similar appeals that are made to us, but we shall be happy to receive contributions in money or kind, and forward them to Mr. Snowden Ward for the case he has so kindly taken in hand.—EDS. B.J.P.]

To the Editors.

Gentlemen,—Will you allow me to thank you for inserting my appeal last week on behalf of an old photographer, named Webber. I have received, in response, 5s. from a Friend in Barry (Glam.), 5s. from Y. E. S., and 1s. from a friend in N. Kensington: total, 11s. I am still hoping that others may feel disposed to help this very deserving old man, who has managed to work to keep himself so far, but now, at the age of eighty, finds himself, through sickness, in the workhouse. We require at least £5 to clear off his debt and give him a clear start when he comes out again. He is getting better and is anxious to get to work.—Again thanking you and the friends who have shown such practical sympathy, believe me, yours truly, H. C. MESSER.

29, Castle Street, Salisbury.
December 16th, 1902.

A LONELY LADY PHOTOGRAPHER.

To the Editors.

Gentlemen,—Would you mind telling me if any of the clubs and photo societies would be open to having lady members. The reason is this, that I am a professional operator and retoucher (I don't profess to be very tip top, but I do my best), and I would so much like to be able to gather ideas and information from those who know more than I do. I read, with interest, your weekly paper, and like it very much. The great drawback to me is, that, though I am considered clever at most things that I undertake and have an exceptionally good memory, I have no capacity for figures—that is, that printed explanations of quantities and articles on photographic chemistry, having references in figures, etc., convey no meaning to me at all, and I feel that if I were to mix with others of my profession that I would no doubt get practical illustrations of matters and enlarge my ideas. Do you think it would benefit me to attend classes in chemistry and printing in carbon and bromide? I believe there are such in the town, though I don't know a great deal of it, not being a resident. I hope I am not taking your time up needlessly.—Yours faithfully,

A LADY OPERATOR.

December 15th, 1902.

[By all means let our fair correspondent take advantage of the classes to which she refers. Few photographic societies encourage the attendance of lady members, except on special occasions. The experiment has been made in London several times, but not with success.—EDS. B.J.P.]

"BIBBY'S QUARTERLY."

To the Editors.

Gentlemen,—I am sending you under separate cover a copy of my current "Quarterly." You will see that the recent correspondence in your columns has borne fruit in that I now give photographer's name in all cases, except under pictures taken by our own photographer, Mr. Charles Reid, whose assistance I acknowledge in each number.

I do not know if you would care to notice this number of "Bibby's Quarterly" in your paper, by way of commenting on or criticising the photographs, and the reproduction of same in any way; but if the spirit leads you towards reviewing it in this way I hope you will not quench it, as it always does me good to see what experts think of any portion of my work as editor.—I am, yours faithfully,

J. W. BIBBY.

[With its wealth of phototypic pictures of cattle, pretty portrait and group studies, and discursive literary contents, this well-produced publication should make a pleasant companion for many a country fireside. Far from desiring to "quench" Mr. Bibby's venture, it may rely upon our commendation and encouragement so long as it recognises the right of the professional photographer to exact reasonable payment for his work, and proper recognition of it, whenever it is published.—EDS. B.J.P.]

A BRISTOL PRINTING HOUSE.

To the Editors.

Gentlemen,—I beg to ask your acceptance of the accompanying copy of "A Bristol Printing House," which is published as a chronicle of a building I have reared in this city in homage to the founders of the art of printing, and I have endeavoured in it to bring out of the past names revered in the world of printed literature, and to indicate that our cities and towns might be made beautifully poetic, were England to weave into her everyday architecture thoughts that do honour to men of greatness and symbols that cause the mind to be moved to some chaste and elevating feeling while in the wholesome humdrum of our daily toil.

Following a general survey of the modes of pictorial art is a fragment on "Artisanship," evoked by the regretful fact that England is not in a position to take English money for printing machines (as well as for much other machinery), owing to her loss of prestige in inventions. The criticism is not antagonistic to trade unions, although it seeks to show that if artisans were paid according to merit an era of mechanical progress would supplant the present effete condition of our industries.

If you should do the book the honour of recognition in your Journal I should, as one interested in the general welfare of printing and the craft, be very pleased.—Yours faithfully,

EDWARD EVERARD.

Stock Exchange Official Printer, Broad Street, Bristol.
December 11th, 1902.

[We congratulate Mr. Everard on the production of a most elegant volume, in which photo block printing, in monochrome and three colours, plays a large part.—EDS. B.J.P.]

COLOUR PHOTOGRAPHY.

To the Editors.

Gentlemen,—Some time ago I sent you some lantern slides, in support of my contention and in agreement with Professor Hitchcock, that the coloured rays forming white light impressed themselves, selec-

tively, on the photo plate, and that the selective action was carried on to the print, if only one could find means of developing their action. This subject has been recalled to my memory by finding a print of the same date (viz., 1885), as the lantern slides. This I now send you. Will you not allow that here there is a distinct selective action of blue in the sky, with shades of the same in the top of the glacier, and from the broken ice at foot, in contradistinction to the whiteness of the snow, and the usual brown tone of the rest of the print? Please examine by daylight. R. O'HARA, Lieut.-Colonel.

West Lodge, Galway.

[Colonel O'Hara's letter and specimen reached us some weeks ago, and were accidentally overlooked. The colour effects in the positive print sent are precisely as our correspondent describes them; but that they are due to "selective" actions, in the sense conveyed by Colonel O'Hara, we are not prepared to admit. An excess of gold in the toning baths, or prolongation of toning, has been known to impart a bluish hue to prints, and this may be the explanation of the phenomena before us. However, we were much interested in seeing the specimen sent by Colonel O'Hara, and are much obliged to him for his courtesy.—EDS. B.J.P.]

WHERE ARE WE DRIFTING?

To the Editors.

Gentlemen,—Although hailing from the "land o' the Leal," it is difficult to recognise the canny Scot in your correspondent, Mr. Wm. Ralston, whose rashness places him at such a disadvantage, but I will be merciful and administer his dose of gruel as gently as possible, hoping that he will take it without a wry face. It is natural that Mr. Ralston should hasten to the aid of poor "Side Light," being himself a victim of the same illusions, but if he wishes his support to be of any value he must mind his p's and q's, and not vent his anathema before he has well considered the matter in debate. It is easy for him to condemn as utter rubbish anything which he may not like or understand; but he must show upon what grounds he bases his statements and opinions before any weight can attach to them.

I will not here defend the truth of my sentence that "without top light all power of concentration is lost," as that must be self evident to all who understand it. But I must disabuse your correspondent's mind of the impression that I speak from theory, having had a lifetime experience in photography and art, dating back to the days of wet plates.

When Mr. Ralston speaks of my letters as "wonderful reading," he unconsciously gives me my due, and reveals the reason of his hastily formed opinions of them, and the writer for "Wonder," according to the great Dr. Johnson, is the effect produced by novelty upon ignorance, and without wishing to impute the latter to Mr. Ralston, I will accept the former as an acknowledgment of the originality of my matter. The statement that the work he does with the side light is equal to the work he formerly did in his studio may be quite true and yet mean nothing, but I cannot quite believe that he finds no difference in the exposure. In the group of fifteen persons he mentions the lens would require stopping down to give the best result, and that with such a small area of light as could be obtained from a single window must mean an exposure of unusual length. He raises a smile when speaking of his extensive acquaintance with portrait painters, who never used a top light, by stating that they had no top light to use. Like Myn-Heer Van Dunk, who never got drunk, except when his liquor was handy.

He will find, on the contrary, that in all the masterpieces of portrait art, the dominant light comes from above, falling at an angle of about 45 degrees, and although this angle of light may be obtained from a high window, it is insufficient in quantity for the making of a perfect negative.

That the artistic merit of the picture should depend upon the man behind the camera goes without saying, and if Mr. Ralston had read my letters with more attention he would not have jumped at the conclusion that I either forgot or did not know this fact.—Yours, etc.,

MICHAEL E. BANGER.

December 14th, 1902.

To the Editors.

Gentlemen,—I must thank Mr. Kenah for his courteous reminder, and tender my sincere apology for having in any way misunderstood his meaning. He did not, perhaps, realise that his paper was written slightly over the heads of those who may be less fortunate than himself.—I am, gentlemen, yours truly, MICHAEL E. BANGER.

December 14th, 1902.

To the Editors.

Gentlemen,—I have read carefully the last three letters about "Where are we Drifting?" signed by Wm. Ralston, O. V. Kenah, and M. E. Banger, and I must confess that from these gentlemanly writings I am totally unable to understand which is the best—top light or side light, both or none. The principal result seems, so far, to be that one calls the other stupid, and is gratified in turn by being called ignorant. These words and sentences, however beautifully arranged, are no proof whatever of the value of one over the other. Why do these gentlemen, instead of this war of words, not give us a lengthy course, explaining their methods of working in the BRITISH JOURNAL OF PHOTOGRAPHY, with illustrations, if possible, and let us judge of the real value of their ideas and work. Voilà qui vaudrait mieux.—Yours very truly, ALBERT LEVY.

Asnières (Seine),

December 13th, 1902.

To the Editors.

Gentlemen,—Mr. Banger appears to have abstracted a good deal of amusement from my letter of the 1st inst., so I must congratulate myself on having caused one ray of sunshine to enter his vexed and saddened life.

I sent the samples, specimens, patterns, or whatever he cares to call them, merely as a means of convincing him that a dozen or so styles of natural lighting could be obtained with a very small side light. I still term him narrow-minded, as he gives me the impression that the studio with a skylight, top light, or window in the roof is the only place where a natural portrait can be taken. It is an entire waste of valuable space, jangling about such a simple matter, as anyone who has studied beyond the limits of a sixpenny handbook, will know that natural and artistic portraits can be obtained almost under any conditions of light. If he would spend a little more time practising photography instead of "breaking lances" with "champions of error," he would not be so "ignorant of its possibilities." I have never held a situation behind a counter selling roof windows.

SIDE LIGHT

December 15th, 1902.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY, 24, *Wellington-street, Strand, London, W.C.*" *Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

PHOTOGRAPHS REGISTERED:—

J. C. Laird, 246, Union Street, Aberdeen. *Photograph of Miss M. Hill.*

C. Parkin, 31, Station Road, Chapeltown, near Sheffield. *Photograph of Chapeltown Parish Church.*

WALTER SMITH.—Your query seems to be a repetition of the one we answered for you last week.

MAKING PHOTOGRAPH COPYRIGHT.—CHAPELTOWN asks: "Will you please inform me what is the cost of making a photo copyright, and will you please do it?"—If you send us two copies of the photograph and 1s. 6d. in stamps, we will make the picture copyright for you.

CLOUD EFFECTS.—X. Y. Z. asks: "Will you please inform me what is the best to get cloud effects on bromide opals, and how to use it."—In reply: We do not understand this query. We must ask our correspondent to be a little more explicit.

R. K. H. MATHERS.—We have read through your long letter, but we cannot publish it as it would be of no interest to our readers. It seems to be a dispute between you and the parties to whom you gave the order, about a few pence for carriage. Why not communicate with them instead of with us? We know nothing of the matter.

MATTOS PAPER.—"In the JOURNAL, on page 958, there is an article on a new printing-out paper called 'Mattos.' Can you tell me where I can get the paper, or the address of the inventor, Mr. Tauxe?"—In reply: The address is The Mattos Photo-Chemical Company, care of P. Leuthart, 33, Rydal Gardens, Streatham, S.W.

OPAL ENLARGEMENTS.—OPAL asks: "Would you kindly instruct me how to coat and sensitise opal glass for making enlargements on by artificial light."—In reply: The space in this column is far too limited to give such detailed instructions in preparing opal plates for enlarging upon as would be of practical use. We recommend our correspondent to obtain Abney's book on "Photography with Emulsions."

ADDRESS WANTED.—ALFRED UNDERHILL writes: "I read an article on 'The Stereoscope in the Schoolroom,' reprinted from 'The Stereoscopic Photograph,' and as I have never heard of this publication, I shall be glad to know where and when it is published, and also

the price."—In reply: It is published by Messrs. Underwood and Underwood, Heddon Street, Regent Street, London. Price we do not know.

PHOTOGRAPHS ON WATCH CASE.—INQUIRER says: "I should be pleased if you would tell me the best process for printing photographs on the inside of a watch case. Is it done by the carbon double transfer process, and if so, would the case want specially preparing if used as final support? I should be pleased if you would help me with this."—In reply: Full working details of the method of producing photographs on jewellery were given in our issue for July 19th last year, to which we must refer our correspondent, as they are much too long to repeat in this column.

BLINDS, ETC.—LEODIS asks: "Can you give me the title and publisher of any publication that will assist me in the erection of blinds in a studio? Any information as to class of material, method of erection, and arrangement to get the various methods of lighting will be welcome."—In reply: Without knowing the form of the studio and its aspect we cannot advise, as so much depends upon conditions. If you will get the two books recommended to "Rembrandt" they will give you every information on the subject. If you fail to get the JOURNAL on Fridays our publishers will post it so that you will receive it on Friday mornings.

QUERY RE GLYCERINE.—C. W. RIVAZ asks: "Can you tell me if the fact of giving carbon prints a bath in a weak solution of glycerine (1 dr. to 5 oz. water) can possibly affect their permanence. I use this only for single transfer prints to prevent curling and crinkling when drying? If it does harm them, can you tel me any other way to keep them flat? The same question also applies to bromide papers."—"We see no objection to the use of glycerine with carbon pictures, but is it necessary to use it? If they are rolled they should keep flat. With regard to bromide prints we should prefer not to employ it. They are best kept as dry as possible, and glycerine is attractive of moisture.

STEREOSCOPIC PHOTOGRAPHY.—W. B. HOSSACK writes: "In the 'British Journal Photographic Annual' of 1895, the then editor, in his second chapter on 'By-paths of Stereoscopic Photography,' mentions as having in his possession the line drawings and lithographs of statuary which Brewster used in 1849 when he exhibited his stereoscope to the British Association. As I have to give a paper on stereoscopic photography in February next year, I thought it would be interesting to show these, and I took the liberty of writing you, in the hope that you would be able to inform me if photo copies of these were to be had, and if so, where?"—In reply: Mr. Traill Taylor has been dead some years, and the whereabouts of the pictures referred to are unknown to us. Will this and other correspondents kindly note that we do not undertake to answer questions through the post?

BLUE PRINTS.—J. HOUGHTON writes: "Some few years ago, perhaps five or six years, there were some letters in the JOURNAL on 'Blue Printing,' and an electric apparatus was illustrated and described. I also think there was an article on this class of work; and I remember there was at one time a description with illustrations of some very large blue printing establishment. Can you oblige me with the dates these letters and articles appeared? as I cannot put my hands on the indexes of these last few volumes of the JOURNAL."—In reply: The series of articles on the iron processes, to which, no doubt, our correspondent refers, appeared in our volume for 1899, and were reprinted in the "Almanac" for 1900. The electric light apparatus referred to is manufactured by Messrs. B. J. Hale and Co., 39, Victoria Street, S.W., who will supply a prospectus of it on application. The same firm also do blue printing on a large scale.

REDUCING NEGATIVES.—R. MARLOTH writes: "Kindly explain the following difficulty:—For reducing negatives which are too dense in the high light only, but should not lose anything in the shadows, the ferricyanide methods cannot be employed, while a treatment with ammonium persulphate would leave the shadows untouched. I find, however, that my negatives do not take the reducer evenly, but that patches are caused which spoil the negatives. I thought at first that the alum bath might have acted unevenly, but found the same trouble with plates that had not been treated with alum. Then I thought traces of hypo might be the cause, and soaked the negative in running water for twelve hours, without getting better results. What may be the cause of the mischief? The method is certainly a very valuable one if it would work properly."—In reply: We cannot explain the cause of the stains, as we have never met with any when using the persulphate of ammonia reducer. The only suggestion we can make is that the negatives were not thoroughly fixed in the first instance. We should advise a longer time in the fixing bath.

COPYRIGHT QUERY.—H. BROWN says: "Last month I had a group of one officer and 49 non-commissioned offiers copyrighted, and you did the business for me, and the notice of registration appeared in your journal of the 28th ult. I now find out that the 49 non-commissioned officers have had an enlargement done from one of the said groups, and presented it to the officer in the group, who has recently left the regiment. I had an interview with one of the principal n.c.o.'s who saw to this business, and warned him that I had made the group a copyright, in fact, it is printed on the mounts. He pooh-poohed the idea, and said we could only copyright the negative, and I never asked their permission to copyright it, therefore they could have enlargements done from it if they liked. Please inform me through the JOURNAL if I should have asked their permission; also, if I felt inclined to go further into the matter, should I have to proceed against the n.c.o's, or against the person who enlarged it? If they would not say who did it, how should I proceed then?"—In reply: If you were paid for taking the group you have no copyright in it. If you were not, the copyright is vested in you, and you can obtain redress for its infringement. You can proceed against those who had the enlargement made, or against those who made it, or both.

GLAZING PRINTS.—GLAZING writes: "I note an answer to my query, and am sorry you do not understand my question, and I cannot see through your answer; but I will tell you what I want plainer. I am a professional, and want to know how to glaze prints professionally, that is to say, not a few at a time, but perhaps 100 or 150, and therefore a practical way of glazing prints, or, rather, producing glazed prints that can be mounted with glue at the edges, cotton wool in the middle, and go through embossing. I can do it one way, but what I want to know is, how to get the paper stuck on the back of the prints, so that they will be thicker (enough not to buckle when finished). I find that by using French chalk, and then pasting a piece of paper over the back of prints already on the glass, that when dry the paper simply sticks to the glass where there are no prints, and you cannot get the prints off satisfactorily. I say that I have heard of a spirit that is poured on the glass, then the prints put on the spirit, flooded, then the starched paper, and when dry all come off together. Kindly explain to me your method, or give me the name of liquid. The one you said, I noticed, you had to rub off dry again."—In reply: We know of no "spirit" that will do as you say. Large quantities of prints are enamelled in the same way as small quantities are done, except that two or more prints are usually put on one large plate instead of single prints on smaller ones. If the prints stick, it is because the plates are not properly prepared for stripping from. Try using paper a trifle smaller than the print, if the margins of it stick to the plate; also use a thicker paper for the backing.

SHABBY TREATMENT.—OPERATOR writes: "I should be glad to have your opinion and advice. I send you the following facts, which may be a warning to others. In July, a lady called at my studio, making an appointment for a sitting for her little child. No cabinets were required, only proofs, as it was for a 15 by 12 enlargement, and would I mind taking several positions. When the child arrived, her mother also brought a 5 by 4 hand camera with her, and just before I exposed my plates asked to be allowed to do the same, 'just for fun, you know.' While I was changing plates, etc., this good lady exposed several more of her own plates. After the proofs were sent home I heard no more until proofs were returned, not approved of; the child would sit again. However, the months have rolled past, and chancing to be in the same town last week as this lady resides, I was asked in to see some work an amateur had done for her, and to my surprise, on the wall hung an enlargement from one of the negatives taken at the sitting, executed by a trade enlarger from her own negative, as she liked the expression of her darling in her own negative better. I spent the best part of an hour in a busy part of the year using all my ability and the best of my knowledge, to be practically swindled out of my picture in this way; and as proofs were returned not approved of, and no chance has since been allowed me to take her again, I have nothing to claim for; and I have since found out many of the lady's friends and relatives have 5 by 4 photos of this same sitting. The lady thinks I have no cause for a grievance."—In reply: This is certainly very shabby treatment. But our correspondent did unwisely in allowing the lady to use her camera in his studio. We fear that now he has no redress, for, as the proofs were returned as not approved of, we do not think he could recover if he were to sue in the County Court for taking the child's portrait.

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*** *The Editor can only be seen by appointment.*

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EX CATHEDRA.

An Exhibition to be seen. If there be any serious desire among those photographers who clamour for admittance of their work into the magic circle of Art, there is at present open for inspection in the rooms of the Fine Art Society, Bond Street, London, a small collection of charcoal drawings which should teach them several lessons—what to attempt, what to avoid, and how to carry through both attempts, negative and positive. No finer object lesson need be sought by any earnest photographer than to spend an hour or two among the half-hundred sketches in charcoal now on exhibition at the above galleries. Here may be seen just such subjects as come within the capability of a camera to reproduce, when guided by those content to look nature in the face and treat it as some beings are wont to—natural subjects, dealt with in natural fashion. To such, Mr. Hopwood's pictures appeal, as being the interpretations of a sound healthy mind, content to present humanity as humanity, and not as bad imitations of imaginary Missing Links. If some of our Gum Bichromate friends, and a few of those discontented dabblers who are ever bewailing our pictorial stagnation, would pay a visit to the Fine Art Society's rooms just now, they might, perhaps, each find food for reflection, in examining how sunshine may be rendered with no further means than a little black substance properly placed on a sheet of white paper, and how the real artist is content to observe the limitations of whatever medium is for the moment being employed. Such and other similar messages might they find, which, if observed, would doubtless prove useful when next preparing their gems for Piccadilly or Regent Street. Mr. Hopwood's sketches, for they pretend to be little further, are a feast to those capable of appreciating wholesome work, and, whatever the subject which has attracted his attention and skill, there has been a problem to solve, either of expression, motion, or fanciful play of light. Colour, which stands above and before all in an artist's mind, will be found wonderfully suggested in some of these pictures, although colour is entirely absent; indeed, so cleverly is the feeling of that rich, full colour his ordinary paintings are distinguished by, suggested, that only on passing out into the damp, gas-lit streets is it realised that they are only sketches, made with charred wood on white paper.

* * *

Lady Photographers. An article in a recent number of the "Art Journal," entitled "A Note on some Lady Photographers, with Selected Examples of their Art," by Mr. Fred Miller, is well worth reading by professional portrait photographers. Several pleasing reproductions from photographs depicting various styles of portrait work accompany the letterpress. In the course of his article, the author writes:—"While it is perfectly true that a negative does faithfully record the image before the lens, it by no means follows that what is developed is characteristic of the sitter, and that is after all what we mean by a likeness," a truism which must never be lost sight of by photographers who wish to please their clients and their friends. Whether photographers will agree with all the dicta of the author of the article referred to, depends very much as to which "school" they adhere to. He does not admire many of the exhibits at the Salon; he thinks to make a photograph look like a bad chalk drawing, or a poor one in sepia, is to bring the art into contempt. "Too many show photographers seem to wish to hide themselves beneath a sham pictorialness." The limitations of photography, the importance of effective posing and lighting are dealt with. "Much material is wasted in endeavouring to do the impossible in photography," he says. "A good deal of 'retouching' is not defensible, for it is nothing more than bad drawing," is another remark. He is not an admirer of genre studies. Referring to printing methods he says:—"The shining printing out paper which brings out everything in the negative is never used by artistic photographers, though in the provinces it appears to be the most popular medium," which certainly is open to question. Enough has been given to show the tenour of the author's remarks. Mr. Miller is an artist of some ability, and he has contributed several articles to

various journals, on art subjects. Latterly, he has given some attention to the practice of photography. A similar article to that referred to, by the same author, appeared in a ladies' monthly paper recently.

* * *

A Photographer's Paradise. Sir Harry Johnston, G.C.M.G., K.C.B., in his notable piece of bookmaking, "The Uganda Protectorate," deals with that remarkable country in all its aspects. Sir Harry, as our readers are probably aware, was formerly Special Commissioner to the Uganda Protectorate. Besides being an able administrator, he is a man of wide knowledge, a clever artist, and a photographer of considerable ability; qualifications which he puts to good account in the book referred to, which is illustrated by means of a large number of reproductions from photographs taken by the author and others, including Mr. W. G. Doggett, who accompanied Sir Harry Johnston as a taxidermist and photographer. There are several striking coloured illustrations by the author of the book, depicting the curious animals, etc., peculiar to the country. Several of the photographs are remarkable. That by Mr Doggett depicting "Andorobo drinking as primitive man drank," is extremely interesting. Another valuable photograph, though not very pleasant to our more fastidious tastes, depicts Andorobo devouring a dead waterbuck raw. And they seem to be enjoying it. The author, referring to the Andorobo, writes:—"Amongst the dense forests, the game-haunted wildernesses, and unfrequented plateau wanders a mongrel nomad race, the Andorobo, who represent a mixture of Nandi, Massai, and some antecedent Negro race of dwarfish, Bushman stock. These Andorobo reproduce in a most striking manner the life which we may suppose to have been led by our far-away ancestors or predecessors in the earliest Stone Age. They live entirely by the chase, often consuming the flesh of birds and beasts uncooked." Most of the photographic illustrations in the book are of the "record" type rather than the artistic, though many of them are both. Uganda might very well be described as a photographer's paradise. The landscape photographer, the animal photographer, and the bird photographer would each find full scope for the exercise of their pursuits. On Lake Hannington there are many thousands of flamingoes. Storks are common. There are many curious birds and beasts, including the Okapi, which the camera worker would desire to study photographically. The foliage and the mountain scenery in the district are both very beautiful. Unfortunately, Uganda is rather a long way off; it is not likely to be made the holiday haunt of the cheap tripper. But if we cannot go to Uganda we can read about it; and a more interesting book of its sort than that here briefly referred to, it would be difficult to conceive. Uganda is a country of very considerable possibilities, and Sir Harry Johnston, who tells us all about it, is hopeful concerning its future. Sir Harry might be induced to give a lecture at the Camera Club.

* * *

A Caution to Purchasers of Second-hand Apparatus. We have recently received two or three letters from correspondents who have been victimised by a man dating from Ipswich. In each case they have sent cash, but have not received the apparatus. One of the writers encloses a letter he has received from the Chief Constable of the town, to whom he wrote on the matter. The letter is as follows:—"Re ——. In reply to your letter of the 10th inst. relative to the above, I would inform you that we do not at present hold a warrant for his apprehension, but I have informed other persons who have been victimised, as also I do you, that they had better communicate with their local police ——'s present address is unknown." We should recommend all who have been fleeced to act on this advice without delay. One of our correspondents tells us that the communication he received was on a regular printed memorandum form, the man describing himself as a "photographic artist" and "trade photographer." This he says he thinks was got up for the occasion, as the man was only in the town for about a fortnight. It was, no doubt, this printed "memo heading" that inspired confidence and induced our correspondents to part with their money. We would once again caution our readers, in no case, when replying to advertisements, to part either with their cash or their apparatus, until they have some assurance of the bona fides of those with whom they are dealing. The correspondence being on the orthodox memorandum head, as in this case, goes for nothing.

* * *

Varnishes and Varnishing. Photographers who do not varnish their negatives often have them completely ruined by silver stains that might have been avoided had they taken the trouble to varnish them. The trouble is but slight, and it is a matter of surprise that so many neglect this very simple work. It cannot be on account of cost, as a shilling bottle of varnish is sufficient for some scores of, say, quarter-plate negatives; or the varnish may be made by oneself, when it will cost less than the article purchased. It is not, we suspect, the cost of the varnish that deters its use so much as the little trouble involved in its application. Some amateurs complain that they cannot get varnish to flow evenly over the plate, and that they get as much on the back as they do on the film. When collodion processes were in vogue all negatives had perforce to be varnished before they were printed from, and amateurs could do it then, and why not now? It is quite true that a spirit varnish takes a little easier to the collodion film than it does to one of gelatine, but the difference is but slight. The difficulties which novices meet with in varnishing gelatine negatives may be attributed to one or two causes, the principal one being making the negative too hot before the varnish is poured on. When the film is very warm the varnish does not take so kindly to it as when it is cooler. The negative should be made thoroughly dry and warm before the fire, and then allowed to become nearly cold. The varnish is then poured on, flowed over, and then drained off into the bottle. After draining, the plate is held in front of the fire until it becomes quite hot. The varnish may even be applied to a quite cold plate, if that be warmed directly it is drained off, without fear of its chilling. The chief difficulty that novices meet with arises from their making the negatives too hot before the varnish is applied, though this seems not to be generally recognised by them. As to the varnish to be employed. All the varnishes now on the market are good, and we prefer those with a shellac, or celluloid, base as being the most durable. Sandarac also makes a good varnish, but the surface is more friable than shellac, but it has the advantage that it can be easily rubbed up for retouching upon. All formulæ for negative varnishes given in the ALMANAC can be relied upon by those who wish to make their own. The dammar varnish, that used to be employed for glass positives, is good for gelatine negatives, and it has the advantage that it can be applied cold, but it will not bear the rough usage that other varnishes will. It is made by simply dissolving dammar resin in benzol to the consistence desired. Thirty grains to the ounce is a good proportion with most samples of dammar.

Infringement of Copyright and Damages. The case reported in our issue of the 12th inst. is of special interest to those who so frequently complain of their copyright being infringed, as it shows that they can obtain substantial redress for the injury done. In the case referred to, the plaintiff recovered the sum of twenty pounds by way of damages, and another five pounds by way of penalties, with costs. The Judge also granted an injunction against the defendants, restraining them from dealing with the copies in their possession, and from producing further copies, and ordering all copies at present in their hands to be delivered up to the plaintiff. We call special attention to this case as it illustrates that photographers' rights cannot be infringed with impunity. Of course the photographer here had taken care to register his copyright, but that is what so many neglect to do before they let any prints go out of their possession. Registration does not cover prints issued before it was effected, and it is such prints that are frequently copied. Then the photographer has no remedy. We take this occasion again to caution our readers not to let any prints leave their hands until the copyright in the picture has been duly registered. When that is done there will be no question as to the recovery of damages for its infringement. Of course we are assuming that the photographer is really entitled to the copyright in the picture, which he is not if he was not paid for taking it.

PORTRAITS TAKEN IN THE STUDIO UNDER WINTRY ASPECTS.

In these pages at times we have alluded to the inconvenience that winter brings to photographers, and indicated how some, at least, of them may be averted by a few timely precautions. We shall here make a suggestion or two that may be useful as hints to portraitists as to how they may possibly reap some commercial advantage out of a proverbial "good old-fashioned winter," should we happen to have one, as some weather prophets are bold enough to predict we shall, though personally we do not place much reliance on weather forecasts made some months in advance. We have already had a couple of severe cold snaps, and there is the possibility that we may have a longer and colder winter than we have had during the past few years. Severe weather usually brings stagnation to the business of portrait photographers, but these hints, if acted upon, may serve with some to give it a stimulant rather than otherwise.

Just now furs are very much in fashion, alike with ladies and gentlemen, and the former usually like to have their portraits in their latest costumes, whatever they may be. Now portraits of ladies clad in heavy furs make excellent and in most instances flattering pictures, but they are, unfortunately, too often marred by being taken with quite unsuitable backgrounds and surroundings—i.e., they do not accord with the dress. Only the other day we saw the portrait of a lady clad in apparently costly furs posed before an outdoor background that was highly suggestive of a bright summer scene, and the effect was anything but congruous—as might well be surmised. The background was really more suitable to a sitter in a muslin dress than one in heavy winter attire. Had the background depicted a winter scene, say a landscape with an indication of snow or winter, the whole thing would have been in unison, while as it was it was just the reverse.

Few photographers, we are aware, have backgrounds suggestive of winter scenes. The case is different in countries where a prolonged winter every year is general—Canada, America, and Russia, to wit. In such countries provision is made for taking portraits under seasonable aspects. We have before us a portrait sent by a correspondent in which the lady is clad in heavy winter clothing—furs being strongly in evidence—with a background representing a snowy scene, and, to add to the effect, snow is represented as falling on and around the figure. Our correspondent desires to know how to produce similar pictures. Such pictures as this are, or were, very general during the winter season in such countries as those just referred to, and have also been produced in this country, but only to a limited extent; though we have little doubt they would meet with a good demand here in the event of our having a long winter, and possibly one may be near at hand. Be that as it may, there is no reason why enterprising portraitists, who are on the look out for novelties, should not provide themselves with the means of making this class of picture, for to many they would be a novelty in this country.

We are not sure that winter backgrounds—that is such as represent snow scenes—are things of commerce here, but that is really of little moment, as almost any outdoor one may be readily converted into a snow-clad one. All that has to be done is to take a piece of chalk or a white crayon, and go over with it the upper sides of the branches of trees, twigs, buildings, or the like, or any parts where it may be imagined that snow would have settled or drifted, and the background is complete. If it is one in flatted oil the chalk can at any time be wiped off and the background restored to its original condition. Some outdoor accessories will also be required, such as a balustrade or steps, or similar properties. These should have some common white wadding laid on them, slightly overlapping, to convey the idea of having received a fall or drift of snow. And, to complete the effect, some sheets of wadding should be laid on the floor, which will give the appearance of a snow-clad ground. In this way, with a little ingenuity and judgment, a thoroughly wintry background can be extemporised, and with little or no expenditure and trouble.

In the picture before us snow is represented as falling thickly on and around the figure, and it is how to produce this effect that the sender desires information upon. It is obtained by spraying or splashing the negative over with an opaque colour. The most effective way is to just touch the ends of the bristles, say of a toothbrush, in the pigment—tube colour thinned with gum water, for example—and then to draw the back of a knife across them, so as to fleck the colour off, the face of the sitter having been protected with a mask of paper. The negative should be previously varnished, as then, if the result is not satisfactory at the first essay, the colour can be wholly or partly wiped off and redone. This could not be successfully done with an unvarnished negative. All the pictures of this description that we have seen have shown the snow as falling everywhere except just before the sitter's face. This looks incongruous enough, but, of course, the portrait is the principal desideratum. All incongruity may, however be avoided, and yet the face be clear, by getting the sitter to hold a small "property" umbrella lightly covered with wadding (stitched on). Everyone is supposed to use an umbrella out of doors when it is snowing, and this may be held in such a position as would protect the face if snow were actually falling. In this way the face will be unobscured and incongruity avoided. When the negative has been varnished in the first instance the splashes of

colour can be wiped off from the portions supposed to be protected, by the umbrella, so as to show the upper portions of the costume to the best advantage, yet still in unison with the other parts of the picture.

The best pigment to employ for producing the supposed falling snowflakes is Chinese white, as with that the effect on the negative will be better seen than when a darker colour is used. A few specimens of portraits in this style in show-cases at this season of the year would at least be attractive as well as a novelty to many in this country.

ON THE USES OF FORMALINE.

On the first occasion of this chemical being mentioned in a scientific paper (a German periodical, dealing, inter alia, with microscopical matters), we ventured to predict a very important place for it in photographic chemistry. To a certain extent our expectations have been fulfilled, but not so much as we anticipated. It may be remembered by some of our readers that the hardening, when dry, of the gelatine used in micro-slide mounting was the subject of the recommendation we refer to; but no mention was then made of the fact that such use was patented. The comparatively limited employment of this substance we take to be mainly due to two causes—firstly, that, at the outset, many erroneous statements about its use were made, and secondly, to the circumstance that prominence has been given to the fact that its use for most photographic purposes is patented. But as regards the latter there need be not the slightest difficulty; the mere purchase of a bottle of this liquid (of Schering's make) confers on the purchaser the right to use that bottleful for hardening gelatine films and the like. So that the only possibility of objection lies on the need to make use of a particular maker's preparation; but, as that is of unsurpassed quality, no trouble need arise. We do not doubt that many people are unaware of the existence of patent rights in this direction; but they do exist, and we cannot but think that their existence is one cause, as we suggest, of the non-use of this valuable agent.

With regard to erroneous ideas as to its use, we more particularly refer to the recommendation to wash a negative well before fixing when formaline has been added to the developer to prevent frilling, as the formaline, it was said, would cause a precipitate of the silver dissolved by the hypo. Nothing could be further from the truth, as a simple experiment—which anyone could make—would prove. Let a small quantity of hypo solution, which has been used for fixing a number of plates have added to it a drachm or two of strong formaline: the liquid remains perfectly clear and shows no signs of precipitation—it follows, therefore, that, even if a plate were taken straight from the developer (to which formaline had been added) into the hypo, it would be uninjured. We would point out what a valuable property this is. Fortunately, frilling is far less common than was once the case, though certain makers recommend the use of alum before fixing under all circumstances, thus entailing extra labour and loss of time—a great objection nowadays, when rapidity of treatment is a particular requirement of amateur and professional alike. Yet under abnormal conditions of treatment, temperature, and climate, the best of plates may frill, and a simple and expeditious remedy should be valuable. If five or six drops of formaline to the ounce of developer be added, the best remedy possible will be tried, and few are the cases where the remedy will not be found absolute. Formaline—solution of formic aldehyde—is of itself a reducer, so that no fear need be felt that the reducing action of the developer will be interfered with, save on the one ground of the tanning of the film preventing the penetration of the developer, as this in practice will not be found to take place. It is true that complaints have been made that in formaline-treated negatives the films have become so contracted that when dry they split away from the support; we can only say that in our own practice, keeping the strength low, no such contretemps has occurred, though we have so treated a large number of negatives.

Messrs. Lumière have shown that the ketones, with the aid of sulphite, are a sufficient addition to pyro, etc., to form complete developers, and looking upon formaline as a ketone it might be expected to act in this manner. It will do so. A solution of pyro, formaline, and sulphite of soda will develop a plate which, when fixed, may be dipped (after a slight washing) in boiling water without injury. This experiment suggests a reminder to our readers of the value of formaline in hastening the drying of a negative, a purpose for which it is in some respects superior to soaking in methylated spirit; for the latter, as is well known, is very liable to produce a milky deposit between film and plate when heat is applied to expedite matters. No such untoward end need be feared with the use of formaline. Before leaving this aspect of our subject we may say it has been suggested to us that plates known to be liable to frill might be rendered proof against the tendency by exposure, when dry, to the fumes of formaline.

We have lately put this action of tanning, or drying gelatine to a novel use. An accident having occurred to a large and rather costly glass measure—a piece knocked off the upper part—we cemented it with fish glue, and, after allowing it a week to dry, we placed a drachm or two of formaline, full strength, at the bottom of the glass and placed it in an air-tight cupboard for a few days, and now have it in regular use without, so far, showing any signs of separating at the junction. So long as it is not allowed to remain standing filled up with water we have no reason to apprehend its being in any way inferior to a perfectly new measure. In conclusion we may remind our readers that the action of formaline is not confined to dead matter. Quite apart from the fact that as a germicide it is almost unequalled, a property of slight photographic interest, it is capable of acting upon living human tissues, and hence care should be taken to avoid the inhalation of its odour, or allowing it to act upon the nostrils or the eyes, which would produce sensations the opposite of pleasant

At the Halifax Camera Club Studio on Monday, December 15th, Mr. C. B. Howdill, A.R.I.B.A. (President of the Leeds Camera Club), gave a lecture and demonstration on the subject of "Natural Colour Photography." Tracing the progress of colour work as applied to lantern slides, Mr. Howdill gave a most interesting account of the process. The Sanger Shepherd process (of which Mr .Howdill is an able exponent) was explained and illustrated by means of many varied and beautiful examples passed through the lantern. A prism was utilised to show the parts of the spectrum cut off by the colour screens, proving that the plates most acceptable were those for which the respective screens were adjusted. Some very beautiful slides were shown of stained glass, obtained with the aid of the telephoto lens, a combination of telephotography and colour work which has been rarely attempted. The juxtaposition of red and green lines on the wings of a butterfly shown on the screen drew an explanation from the lecturer that a proper mixture of red and green light produced the effect of yellow in the retina. The richness of colour in another example, "The Jewish Bride" (Rembrandt), refutes the popular belief that the depth and quality of colour in "old masters" cannot be reproduced. Landscapes, architecture, fruit, flowers, and natural history subjects were shown, and Mr. Howdill's visit will long be remembered by those who had the privilege to hear him.

SOME ASPECTS OF PHOTOGRAPHIC DEVELOPMENT.

[A Paper read before the Society of Arts, and reprinted from its "Journal."]

DEVELOPMENT is the process of reducing those particles of silver salt which have been affected by light, to the black or metallic condition.

A finished negative consists of a contrast—or series of contrasts—between tones or densities. If the contrast obtained by reducing all the light-affected particles were always correct, the process of development would be simple and purely mechanical; for after devising a developer which did not attack the unaffected particles of silver salt, it would only be necessary to leave the exposed plate a sufficient time in the developer for it to do all its work, any longer time having no further action.

But practical photographers have long found out that with most plates and subjects a maximum amount of development, as above described, is injurious, and does not give the desired result, as the contrast between the tones is greater than represents the original object. A certain amount of judgment has therefore been necessary in deciding how far this reducing—or developing—action should be allowed to proceed. I must point out that this judgment or control has been—in the past—exercised in quite a different way from what I have indicated, and, as I shall try to point out, in a way the complications of which were quite unnecessary.

Instead of the photographer keeping the composition of his developer fixed, and controlling results by the time he allows it to act, he has been in the habit of keeping to his own time of development (varying, perhaps, only for temperature), and altering the composition of the developer to get greater or less contrast, or, to put it in another way, to get greater detail in one case, or greater density in another case. The photographer also has got into the habit of considering that he possesses the power (by altering the composition of developer) of doing more work either on the upper tones (adding density), or, in another case, on the lower tones (bringing up detail), whereas, in nine cases out of ten, he has merely attained a result identical with what he would have got with an unaltered developer acting for a certain time. This older point of view is partly a legacy from wet collodion development, where the presence of free silver nitrate in the developer actually built up the high light deposits in the negative, and partly arises from the use of an imperfect alkali (ammonia) in early dry-plate development. For the volatile nature of ammonia often made it necessary to add more of the alkali during the progress of development, and its tendency to fogging often made the addition of a restraining bromide necessary. These two procedures (adding more alkali to stimulate development, and adding bromide to restrain fog), both due to an imperfect alkali, have been continued when the use of a fixed alkali makes either of them unnecessary, and mysterious advantages have been attributed to them. In short, the development procedure of a few years ago resembled the medical knowledge of the eighteenth century, being built up of fads and formulæ, with no guiding principles to direct it.

It was the memorable paper of Messrs. Hurter and Driffield ("Journal Soc. Chem. Industry," May, 1890) which pulled the complacent practical photographer up with a jerk, and showed that his ideas on development would have to be re-constructed. The writers impressed on a strip of plate a series of exposures increasing in geometrical ratio, thus:—1, 2, 4, 8, 16, etc., and investigated the effect of alterations in the developer. They found that the results of alterations consisted chiefly in variations of steepness of gradation (or contrast between the tones) attained, but that this was mainly a question of time, for all the developers (given sufficient bulk and activity) were capable of attaining the maximum steepness or amount of contrast if sufficient time to act were allowed. They named the degree of steepness or contrast the development factor, but it was a weak point that the development factor was merely a record of a result attained, and not a help towards the attainment of the same result another time.

In the later paper by the same authors, published in the "Photographic Journal," January, 1898, and following months, a most important light was thrown upon the action of a bromide as a restrainer, and the great differences between the results obtained by different experiments (especially as regards the speed of a plate) were traced to the peculiar action of a bromide in the developer.

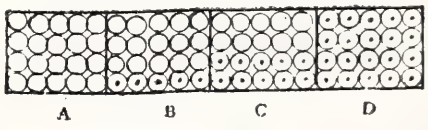
I shall not attempt in this paper to follow up the many proofs furnished by Messrs. Hurter and Driffield, but shall outline my own interpretation of the simple principles of development, using some illustrations borrowed from my recently-published manual on the subject, and shall pass on to some points arising from my own trials and investigations.

SIMPLE PROGRESS OF DEVELOPMENT.

I throw on the screen a strip of plate which has received an increasing series of exposures in steps, from 1-16th sec. to 512 secs. Incidentally this also shows the limits of the plate, for it will be seen that 64 is the maximum effective exposure, anything more than this having no increased action on the plate, while 1-16th is the minimum effective exposure, anything less than this having no action at all on the plate. The whole problem of exposure—which I am not expounding in this paper—is to bring all the light impressions which form the picture between these two limits. The upper strip is developed double the time, and the contrast between the tones is increased, for while the lowest tone has increased very little in opacity, the upper tones are greatly increased. Neither the maximum nor the minimum limits are altered by the longer development.

Fig. 1 is an imaginary section through an exposed film. Three exposures have been made on the plate, the part A being unexposed. The circles are supposed to represent the sensitive

FIG. 1.



particles of silver salt, those dotted being affected by light, and capable of development, those undotted being unaffected. I need scarcely explain that in a graphic diagram like this, no attempt is made at completeness; for instance, in the part D all the particles are shown light-affected, whereas with long exposures in a thick film only about 60 per cent. of the particles would be light-affected.

In Fig. 2 an attempt is made to represent graphically what occurs when an efficient developer has one quarter accomplished

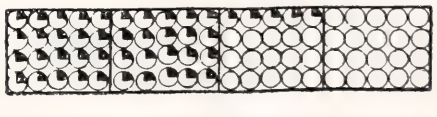


FIG. 2.

its work, there being a comparatively feeble darkening in all three tones with little contrast between them. Fig. 3 indicates

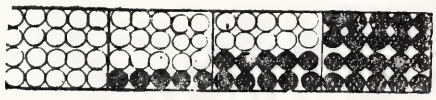
FIG. 3.



the stage when development is half over; and Fig. 4 when

development is completed, and all light-affected particles com-

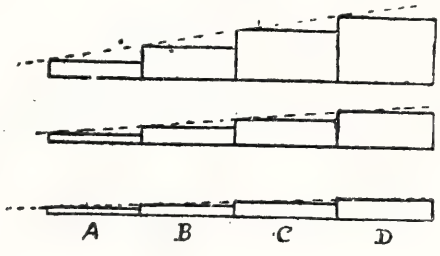
FIG. 4.



pletely reduced to the black metallic state. With a well-balanced developer there is no effect on those particles not affected by light, but an ill-balanced developer with excessive alkali will sometimes attack them, this being called fog. In these diagrams representing the simple course of development, it will be seen that the same proportion of work is done on each of the tones at each of the stages. But, as Messrs. Hurter and Driffield have pointed out, an arithmetical increase in the blackened silver results in a much greater (geometric) increase in its opacity or power of stopping light, and, therefore, in the natural course of development the contrast between the tones increases with the length of development. This rule applies with all developers, its limit being when fog commences and when all available light-affected silver is darkened in the darker tones.

Fig. 5 is an imaginary diagram of the silver representing the four tones compressed into steps, and at three stages of development. The diagonal lines indicate what is conveniently termed

FIG. 5.



the "steepness of gradation," and a register of this steepness is what Messrs. Hurter and Driffield term the development factor.

I make no attempt to discuss the question whether the reduction of the image is entirely a chemical or partly a physical process, and, in fact, I disclaim any qualification to throw light upon the chemical aspects of development.

CONTROL OF DEVELOPMENT BY TIME.

Although Messrs. Hurter and Driffield expounded the great importance of time in development, they gave no further help to uniformity in practice than the fact that, having once developed a plate to a required contrast or steepness of gradation, you could attain the same steepness (development factor) with another plate by using exactly the same developer, at exactly the same temperature, for exactly the same time. As it is difficult in practical work to ensure an exactly uniform developer (as regards alkali especially), and still more difficult to keep an exactly uniform temperature all the year, a practical working standard was still wanting. It is this aspect of developmne to which I have devoted most investigation.

In 1893, while testing a large number of plates for speed, and developing them together in one dish, I observed that some plates developed more readily than others, and attained contrast with greater rapidity; also that the image on these plates appeared more quickly than that on the others. In order to equalise the development, I adopted the plan of developing each plate for a fixed multiple of its time of appearance. In this particular case the time of appearance made correctly the allowance due probably to the different character of gelatines used in the emulsions. But this led to a long series of experiments, in which I established the fact that the time of appearance made the correct allowance for alterations in the activity in the developer, due to the following causes:—Temperature (between 45 deg. and 75 deg.); alkali in developer; dilution of developer—pyro and amidol being an exception to this.

The time of appearance is the time elapsing between pouring on the developer and the first appearance of any trace of the image. The multiple used to attain the required result I have termed the multiplying factor. The multiplying factor varies with different developing agents, such as hydroquinone, pyro, metol, etc.

The multiplying factor is usually the same for different commercial plates, but I have found lately some plates which require a higher factor to secure sufficient contrast. These plates are some which makers seem to turn out in their efforts to secure a high speed reading, and I notice that they are a deeper yellow than usual. It seems, therefore, that an increased proportion of an iodide in the emulsion alters the multiplying factor. I have found, by the way, that a little iodide of potassium in the developer very much alters the law of appearance, the image appearing almost as quickly at the back of the plate as at the front. A bromide in the developer has quite an opposite effect. The use of a bromide or other restrainer in the developer alters the factor.

The experienced photographer using this timing system will sometimes alter the multiplying factor to bring an exceptionally wide range of tones in his subject within the limits of his printing process.

When investigating the laws of appearance, I found that the ratio of the appearances of all the various tones in an exposed plate was not altered by variations in the character and activity of the developer, and that if the times of appearance of a slip of plate exposed on the Hurter and Driffield plan, is plotted out in a similar way to the Hurter and Driffield method of plotting out densities, it is possible to read the speed of the plate by an observation of the diagram. I have made a recording instrument for observing these appearances, and recording them on a diagram, but do not propose to follow up this branch of the subject in this paper.

To return to the practical question of controlling results by time of development, I throw on the screen prints from negatives of the same subject and exposure developed in a 2 grain pyro soda developer ½ grain bromide, for 3½ times to give a soft contrast, to 5 times to give a medium or correct contrast, and for 8 times to give an exaggerated or hard contrast. The advantage of this plan of timing development is that the same contrasts can be secured at another time, even if the temperature is different and if the developer has not the same activity as regards alkali.

I do not propose to make this paper a complete practical exposition of this factorial method of development, for I have recently published a handbook on the subject; and I will pass on to examine those variations in the character or proportions of the developer which in the past have been relied upon to secure control of results.

It may be noticed that I have spoken of the main course of development quite independently of the developing agent used. This is because I find that all developers, after all the tones have appeared, and leaving fog out of the question, do the same proportion of work on the different tones and attain the same result if the right time is allowed to each.

COMPARISON OF DEVELOPERS.

But in comparing the different developing agents, some (such

as hydroquinone and strong pyro) will be found to give density in the upper tones quickly, and to bring out detail in the lower tones slowly. Another class of developers, as metol or rodinal, bring out all detail very early in the total stages of development, while density in the upper tones seems to follow slowly. I show on the screen three exposed slips each of three gradations, developed in rodinal, 1 grain pyro, and 8 grains pyro respectively, and each taken out the moment the lowest tone had appeared. The rodinal has only attained a very feeble density in the upper tone, the 8 grain pyro a considerable density, and the 1 grain pyro an intermediate amount. After this commencement, all three strips would pass through exactly the same stages of contrast. I should leave in rodinal for 40 times appearance, in 1 grain pyro (no bromide) 18 times, and in 8 grain pyro (no bromide) 6 times appearance, in order to attain the same final result, and these figures (40, 18, and 6) would be the multiplying factors for these developers.

I also show strips developed in metol and hydroquinone respectively, one strip of each being taken out of the developer at 1, 2, 3, 4, 5, and 6 minutes respectively. It will be seen that metol is very much ahead in stage of development at 1, 2, and 3 minutes, at 5 minutes hydroquinone has got level, and is identical in all the tones, while at 6 minutes it is the denser of the two in all the tones.

The different types of developers have, therefore, different ways of going to work; but I have never been able to discover that the final result differs if each is carried to the same stage of development, and no bromide is used. I show strips developed by five different developers to illustrate this, each carried to the same steepness of gradation. Even with hydroquinone, which brings out detail last of any, I find (provided no bromide is used) that the faintest detail rendered by the exposure is fully brought out when development is carried far enough for a suitable contrast for printing on P.O.P. A developer exceedingly strong in pyro seems to have slight restraining effect, and holds back the lower tones in the early stages.

I have explained at greater length the differences between developers in the "Photographic Journal," April, 1900.

I must, however, note that my experiments have not included ferrous oxalate developer, which has the reputation of giving a lower speed. It has, however, practically gone out of use for negative work, and is being abandoned even for testing purposes. There are also some indications that a few exceptional plates are a little more sensitive to a particular developer, but this variation seems scarcely sufficient to hav eany bearing on practical work.

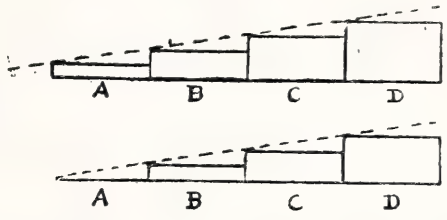
Influence of Bromide.

The restraining influence of a bromide in the developer has been explained by Hurter and Driffield in the "Photographic Journal," July, 1898. They explain how its "holding back" influence on the lower tones is chiefly exercised in the early stages of development, and becomes less and less as development proceeds, until at an advanced stage of development the result with bromide is exactly the same in all gradations, as if the same plate were developed without bromide and carried to the same steepness of gradation. Even fog is only held back by bromide in the early stages of development. This explains many of the perplexing differences of experience—especially as regards speed of plates—which have occurred between different experimenters. I show on the screen a series of slips illustrating this point.

The "holding back" power of bromide has in practice by far the greatest effect with developers of low multiplying factor, such as hydroquinone and strong pyro, for these have already a tendency to hold back detail until late in development, and the two combined "holding back" tendencies are sufficient to keep back the lower tones until a steepness of gradation quite sufficient for printing purposes is reached.

Fig. 6 illustrates graphically the action of bromide in the developer, the upper illustration representing an imaginary

Fig. 6.



section of the densities of an exposed plate developed without bromide, and the lower illustration the same slip developed for the same time in the same developer with bromide added. It will be seen that the same steepness of gradation has been attained with both developers, but that the bromide has lessened the density in all the tones, and altogether prevented the lowest tones from appearing. With longer development, however, the lowest tone would come out, and the other tones increase in density to just the same extent as if no bromide were present. In these rough graphic diagrams, which are not intended to be exact, I have omitted the curves of under and over exposure.

The important part to remember is that this holding-back power is not exercised after the lowest tone has appeared; and it is therefore useless to add bromide some time after development has commenced. Most commercial plates of the present day develop sufficiently free from fog without the addition of a bromide, and I regard its use as quite unnecessary. Even in making lantern slides I have found that brilliant results can be secured without bromide in the developer.

Well-balanced Developers.

With each developing agent there is a strength which experience shows to have the most useful power without being in excess. This is usually from 2 to 4 grains to the ounce. There is also a proportion of alkali which gives sufficient energy without tendency to fog. This proportion with soda carbonate is about five or six times the weight of the developing agent. A developer thus proportioned is a well-balanced one. Changes in the amount of alkali alter the speed at which development proceeds, but have no other effect on the gradations, except that an excessive amount is apt to cause fog.

Old Methods of Control.

I continue to see that at photographic society demonstrations beginners are advised to "feel their way" in development, to begin with a small proportion of alkali, and add more in course of development. Not the smallest power is conferred by the proceeding, for the stages of development follow exactly the same course as if a standard solution were used from the commencement.

Let me also consider the procedure which the maker's instructions and the text-books have advocated for dealing with over and under exposure with pyro soda developers, when unknown beforehand.

It is usually advised that when the lower tones appear so slowly that under-exposure is feared, the developer should be diluted and more alkali added "to bring out detail." On the other hand, if all the tones come out in such rapid succession that over-exposure is revealed, the traditional advice is to add

more pyro at once—say, 2 grains to the ounce—and an equal quantity of bromide, or else mix up and apply a new developer exceedingly strong in pyro and bromide. It is certain that such a developer has a great power of holding back the lower tones and altering gradation when it is used from the commencement. But I have never been able to discover that any such selective power exists when once these lower tones have appeared, or that the methods I indicate above, and which are usually termed tentative development, confer any power which cannot be equally well exercised by using a standard developer from the commencement.

The following are the details of a comparative trial which I show on the screen. A Paget XXXXX plate was exposed in a long series of gradations, and cut up into strips, which were simultaneously developed in a 2 grain pyro soda developer—no bromide—some in one dish, the remainder in another. The first tone appeared in 40 seconds, and as soon as all the tones were out (in 150 seconds) the following alterations were made, being previously got ready in measures. To the first set of strips (marked O for supposed over exposure) 2 grains of pyro and 2 grains of bromide per ounce were added. To the second set of strips (marked U for supposed under exposure) double the previous amount of alkali, and an equal bulk of water was added.

The strips were taken out of each dish at intervals, and afterwards compared, to see if the gradations had been altered by these proceedings. There was no evidence of control by any such alteration, other than that given in both cases by length of development. I compare one O and one U strip, both having attained about equal contrast. All the tones are also equal, a little fog being added in the case of U.

Compensating for Varied Exposures.

It was Hurter and Driffeld who proved that under and over exposures ought to receive the same time of development to secure the same contrast.

The strip of gradations on the screen having alongside bits of over, medium, and under exposed negatives all developed for the same time, illustrates this. The over exposed negative utilises the upper tones of the series, and is denser throughout. The under exposed negative utilises the lower tones of the series, and is thin throughout; but, except where they fringe on the extreme tones which are under or over the range of the plate, both negatives give prints of much the same detail and steepness of gradation. In this time development, therefore, the exposure decides the density of the negative.

I have often developed six negatives in a dish together—snapshots, interiors, and landscapes mixed; observed the time of appearance of the average high lights of the series (ignoring especially over exposed high light, such as a window in an interior), and developed for the fixed multiple of this time, knowing that a similar amount of contrast would be secured in all the negatives. No doubt the use of an actinometer (my own exposure meter) in gauging the exposures helped towards the uniformity of result; but a very considerable variation of exposure is allowable, the over exposures in such a series being dense, and the under exposures thin.

When I have had rollable films to develop, I have also followed the same plan of timing, developing the whole roll at once.

In fact, it is with rollable films that the method of developing different exposures for the same time has come into general use. Probably nine-tenths of the rollable films developed in the last year or two have been developed without cutting up the roll at all, perhaps in most cases on account of ease and simplicity, without knowledge that it was the theoretically correct proceeding. I mention this because I notice that several photographers, in speaking of the results attained by roll film developing machines, seem to think it is a new thing to attain uniformity of results by developing the whole roll at once.

If known beforehand, over exposure can be compensated for by using a short factor developer with bromide. Under exposure, if known beforehand, cannot be improved; the use of more alkali or of a long factor developer such as rodinal does not bring out any more detail than the ordinary formula (no bromide) gives. The only hope lies in heated development.

Summary of Principles.

Different developers vary in way of going to work, and speed of working, but not (bromide influence excepted) in final result.

Variation of the composition of a developer (bromide influence excepted) does not influence final result.

The bromide influence is not well under control, and cannot be exercised after all the tones have appeared. Bromide is best omitted from the developer, being unnecessary. The influence of time is quite sufficient for all control required.

The Two Time Methods.

There are two ways of deciding the time to develop, both depending on a previous trial. The first is my own factorial method, in which the method makes correct allowance of most changes in the developer, for (usually) different kinds of plates or films and—most important—for variations in temperature; it also allows for using the developer a second time. The second is the Hurter and Driffield method—lately followed in film developing machines—of developing for a fixed time with a fixed developer. With this plan it must not be forgotten that the time is only right for that particular plate or film, and for exactly one composition of developer used for the first time, and for one temperature. The variation for temperature can, no doubt, be given in a table, but if it is ignored—as one demonstrator seems to have advised—summer results will be very different from winter results. A second use of the developer, or its dilution, also requires an increase in the standard time.

Mechanical Appliances.

In carrying out principles certain appliances are often helpful. With my factorial method, for instance, I devised a clock for the dark-room with a ten minute dial and large minute divisions, as an ordinary watch, even a stop-watch, is not convenient. It is called the Eikronometer, and has a calculator for giving the time to develop. It is a great convenience, and its use has much increased lately. An ordinary metronome, or a half-second chain pendulum, is a great help in counting seconds for the appearance of the image, either being better than a stop-watch. But I have always frankly explained that all the benefits of my factorial method can be obtained, although not so conveniently, with an ordinary watch. I, therefore, feel no hesitation in referring to a similar fact with regard to the two film developing machines recently put on the market by two firms. They, no doubt, appeal to those who do not wish to use a dark-room; but exactly the same results can be attained in a dark-room by holding the whole roll of film in a U-shaped loop and see-sawing it, first through a bowl of water, and secondly through the developer in a basin for the standard time. These machines, of course, can only carry out the Hurter and Driffield time method, not my factorial plan. In developing films it is important not to stint the bulk of the developer. It is possible to use so small a quantity that its developing power is exhausted before the requisite work is done. In fact,

if negatives always contained the same proportions of high light and shadow, it would be quite possible to control the steepness of gradation by limiting the total amount of developing salt.

ALFRED WATKINS.

DISCUSSION.

Mr. Chapman Jones said he had learnt much from the paper, although a great part of it travelled over old ground. But when Mr. Watkins made a diagrammatic representation of what had taken place in development, he often failed to represent fairly what he had demonstrated by his experiments. One of the first diagrams indicated the course of development, and showed how a certain number of particles, after exposure by light, were during development reduced in a certain proportion, and by further development in a further proportion. Mr. Watkins, however, showed that under many conditions of development the particles were not all acted upon simultaneously, but that there was a considerable amount of action in the high lights before there was any change in the shadows. The diagrams tended to show what he thought Mr. Watkins would like to show, rather than the fact which he demonstrated in the actual experiments. With regard to the control obtained by the use of bromide and by altering the concentration of the developer, he thought a good deal of control could be obtained; and, indeed, Mr. Watkins's experiments seemed to demonstrate this. The tendency of many people in the past appeared to have been to imagine that a good deal more control was obtained than was the case; but the tendency now he thought was in the opposite direction, people denying that one had control at all. The latter fact, however, was amply proved by Mr. Watkins, who had explained in a fair way that one could get over the difficulty of over exposure, if one only knew the fact beforehand, by the introduction of bromide. But it was said that bromide was of little use unless put in at first. That seemed to him (Mr. C. Jones) a statement which was very difficult to prove. If one started development and washed off the developer before it went too far, then it was possible to substitute a slow-acting developer. At any rate, it was difficult to prove that it was not possible. With regard to developing a long series of negatives for the same time and getting useful results, that had been argued a good deal lately, and he thought the two extremists were both wrong. Under certain circumstances, if one developed negatives having various exposures for the same time, there would be obtained many spoilt negatives; but if negatives all tended to under exposure, which was the usual case in Kodaks and such like cameras, it was impossible in many cases to over develop. There was no further change unless the film remained so long that there was fogging, and the fogging could be easily distinguished from the developing stage. He understood Mr. Watkins to say that one could deal with over exposure, but not with under exposure. He thought that quite wrong, as Mr. Watkins himself appeared to have shown. Of course, that which was not on a plate could not be developed from it, but in many plates there was a tendency to get a great density in the high lights before the detail and shadows had appeared, but by using a judicious developer, which brought out the details first, a harmonious range of gradations could be obtained, and the operator could stop at any stage he wished.

Mr. J. H. Gear said he did not hold with hard and fast time development, but whenever he had adopted time development he had always succeeded with his plates. A very considerable advantage in the timing of development was found when dealing with tricolour work. He did not know how it was possible to develop three negatives with equal opacity where there was a different range of gradations, so to speak, caused by the various colours, and he felt that the timing method under such circumstances was the only reliable system in order to get the three colours at their correct opacity. With regard to the alteration in the factorial time, he had found plates of the same manufacture vary somewhat, for instance, Lumière's A plates and their B plates, and the plate sensitive to red. Taking the factor of 4 for the A plate and also for the red plate, that did not give the same opacity as the green plate; and in order to develop those plates with the factor, he had found it absolutely necessary to take 4 for the blue plate, 4 for the red plate, while $3\frac{1}{2}$ gave the same opacity for the green plate. He thought it must be admitted that there was not the control in development which had been previously imagined, if one adhered to the pyro and soda developer. He had no doubt that bromide had but little effect after once commencing development, and he would not expect to get the control in the development by the addition of bromide, but by the addition of sodium citrate. He felt the sodium citrate was practically the only control they possessed. When the plate was over exposed, the results were as Mr. Watkins had shown.

Rev. F. C. Lambert said he felt the following difficulty. If he had a slow plate giving a considerable range of exposure, was he to understand that one had to take the time from the pouring on of the developer to its first appearance, and multiply that for a constant factor under all conditions? Suppose the image appeared in 10 seconds, and the factor was 6, he must develop for 1 minute; if with that plate he gave the shortest possible exposure, and gave the other half of the plate the longest possible exposure, he would expect under those conditions that the time of the appearance of the image would be different; the more brief the exposure the slower would be the picture in appearing; but if he used the same factor in both cases, would he get the same result? He anticipated an opposite result, because he imagined that for the same degree of contrast, the longer exposure, which came out first, should have the higher multiplying factor.

Mr. W. Thomas, speaking as an ordinary practical photographer, said that what one wanted, as a rule, was the maximum result from light action in the shadows, and a very considerable stage of that maximum result of light action in higher stages. He thought highly of the work done by Mr. Watkins, and while agreeing with almost everything he had laid down, he could not bring himself to find that his own practice was in accordance with those doctrines. Taking a subject with white and as near dark as could be got, some parts lit with clear brilliant sunlight and the others in the shade, there was something to deal with beyond those; there was such a thing as light and shade, and such a thing as colour. Colour entered into such matters in a very important way, and he thought it was not taken sufficient note of in descriptions and lectures on the subject. It seemed strange to say that the results produced could not be altered and varied, and he said so with the more confidence after what he had heard that evening. He thought if there was lacking proof that control was possible and existed, that proof had been furnished by Mr. Watkins himself. With regard to the addition of bromide after the development had commenced, he understood the reader of the paper to say the result of his work had been to convince him that no saving alteration could be brought about by the addition of bromide once development had commenced. Such an experience was opposed to his own.

Mr. Friese Greene agreed that the bromide in the developer had only a kind of mechanical, and not a chemical action, but he wanted to bring before the meeting the fact that if the

continuous electric current were introduced at the beginning of the development where bromide was used, it seemed to enhance the retarding action of the bromide.

The Chairman, Sir William Abney, said Mr. Chapman Jones had dealt with much that he had intended touching upon. Everyone must admire the great care with which Mr. Watkins had conducted and recorded his experiments on development, and that gentleman had cast a new light on many manipulations in that process. Mr. Watkins had shown that there was a factor, which, if used, would enable the photographer always to arrive at the same degree or intensity of gradation. Of course, there was a certain difficulty in arriving at a factor. For instance, what was the first appearance? That was to a large extent a question of a personal equation, and with that he fully agreed. One person would see a black speck coming out on a negative before another person. He had often developed side by side with his assistants and friends, and it had often been difficult to decide at what exact time the image appeared. But that could be got over, and when once the personal equation had been arrived at, one could have a factor for different kinds of plates for development. He had made a great many experiments, and he had come to the conclusion that there was a great deal more control in developing a negative than Mr. Watkins liked to allow. He was not a professional photographer, and therefore he did not develop the plates because he was obliged to, but he looked upon the development of every plate as a kind of experiment; and if anything remarkable occurred during the process, he repeated it, to see what it meant. At the time of Hurter and Driffield's paper, there was a great controversy as to whether there could be an alteration brought about by variation of the developer. He had neither the time nor the inclination to enter into that controversy; he had a controversy on another point with those same gentlemen, but the experiments he had carried out left him no doubt that there was a control in development by means of varying the developer. On the screen was represented development by means of metol, and one by ortol. If one exposed two strips, as he had himself done, in the way Mr. Watkins had, one could leave the metol strip in for half a day without getting the same intensity or gradation as with the ortol. That was a matter of experiment, and without fog appearing in either. From the strips on the screen he would have expected to find that gradation would be the same in both cases. Perhaps Mr. Watkins would explain why that was not always the case; as it was not. With regard to the question of the dilution of the developer, looking at the matter from a chemical standpoint, he thought it would be seen that chemical action was always considerably altered in effect by dilution, and, whatever happened in ordinary chemical operations, one would expect to happen also in the chemical operation of development. He did not propose to enter into arguments, nor to give a history of any experiments there might be, but he might say generally that Mr. Watkins was right in his conclusions, but although generally he must allow a little more scope for those who held contrary views. He could quite support the remark made by Mr. Gear as to sodium citrate, and, moreover, the addition of citric acid was a well-known way by which one could retard the action of an over exposed plate. He believed Mr. Warnerke was very strong on the different materials with which an over exposed plate could be saved, even after the developer had been on. Mr. Watkins had almost convinced him that there was not much use in putting a large quantity of bromide on during development; but if the developer were washed off before the action had got very far, and if the development were restrained by means of a very dilute solution of hydrochloric acid, there was obtained a decent negative from a very much over exposed plate. A remark had been made about developers and single solutions. A friend of his used to employ those one-man solutions, and to buy them in cartridges. He came to him (Sir W. Abney) in trouble one day, though he had used half a cartridge; but it appeared that he had used the top half and left the bottom half behind.

Mr. Watkins, in reply, reminded his hearers that he had not attempted to traverse the whole ground, and that his paper was entitled, "Some Aspects of Photographic Development." He had not asserted that no control existed. He would not wish to argue with Sir William Abney the points raised by that gentleman, because of his large experience. He admitted that the question of colour was a very important one, and that it had to be provided for and allowed for, but that must be done in exposure, not in development. He had not been able, in experiments, to find that any control existed by adding bromide after the tones had appeared. He had not experimented with sodium citrate, the substance mentioned by Mr. Gear. Mr. Lambert's question touched a weak point. The high light of an under exposure appeared in slightly different time to the high light of an over exposure, and this introduced a small error into the factorial method of development. It was, however, a very much smaller error than the advantages obtained by compensating for temperature and the amount of alkali. The difference in the high light was very little in under exposure compared with over exposure. Generally those who followed the timing development used an actinometer for getting the exposures. In practice he did not find it a difficult matter. His experience was that in an under exposed snapshot one must cut the development short.

FIFTH TRAILL TAYLOR MEMORIAL LECTURE,
Dec. 11th, 1902.

THE GREAT PHOTOGRAPHIC STAR MAP.
II.

LECTURER:—H. H. TURNER, D.Sc., F.R.S., Savilian Professor of Astronomy, Oxford.

UNIFORMITY OF ILLUMINATION.

But there is another way in which the doublet is accurate, and actually superior to the refractor: it spreads star images over the plate uniformly. I have already referred to the *réseau*, the network of crosslines which is put on all the plates of the star map. It divides up the plate into little squares of exactly equal area. If we take a single plate on which a number of stars has been photographed, some of these squares may contain no stars at all, others one, two, perhaps four or five; the stars are scattered irregularly, and there will be no approach to uniformity of distribution. But if we take 100 plates, or 1,000 plates, and count all the stars which appear in any given square of the *réseau*, then the accidental irregularities of distribution disappear; and with an ideal lens we should hope to find the same total number of stars credited to each square of the *réseau*. This operation of counting the number of stars on a plate is one which is going on every day in the University Observatory, as a preliminary to the measurement; it is found to be a useful check on the quality of the photograph—if there are not enough stars, according to expectations which I need not here explain, it is only waste time measuring, and better to take another plate. The counting is quickly done—we use a "billiard-marker" to click off the stars mechanically—and tells us at once if the plate is good enough to measure. And

having, therefore, the counts of stars on many hundred plates, it occurred to me to inquire whether the average distribution of the images over the little squares of the *réseau* was uniform, as one might hope. It was soon seen that it was not—there were fewer stars at the edges than in the centre; but what seemed more surprising, the maximum number of stars per square was not at the centre, but in a ring about 1½in. from it (the plate being about 6in. square). Was this a peculiarity of this particular object glass? Other plates taken at Paris, Algiers, Toulouse, and San Fernando with similar instruments were examined, and it was found that in each case the stars were thickest in a ring round the centre, being fewer both within and without this ring, though the diameter of the ring was not always the same. Comparison of the results led to the conclusion that the plates in each case are placed so as to be in accurate focus for the particular ring which shows most stars, the centre of the plate being thus slightly within the focus, and the edges slightly without. The rate at which the number of stars falls off as we leave the locality for true focus is the same for all these instruments, and if the plate were placed so that the centre was in best focus, the falling off would be as in the following table:—

For 100 stars per unit area at the centre there				
would be	96	,,	,,	at 20 mm. from centre.
	84	,,	,,	at 40 mm. ,,
	64	,,	,,	at 60 mm. ,,
	36	,,	,,	at 80 mm. ,,

Now this falling off is very decided, and shows that the lens does not cover the plate of 2 degrees square with any approach to uniformity. By putting the plate rather within the focus for the centre, we may improve things a little, but the defect seems to be inherent in the instrument. Since the paper* drawing attention to it was written, plates taken with the Potsdam instrument have been counted quite independently, and similar results found. So that we may accept it as characteristic of plates taken with refractors. But the doublet is apparently free from this grave defect, or, at any rate, can be rendered free from it. When counts are made on the plates taken at the Cape of Good Hope which have been already mentioned, it is found that equal areas in any part of the plate show the same number of stars, and this for a field not 2 degrees square, but 5 degrees square—six times the area. This must be accounted a conspicuous advantage of the doublet over the refractor, and undoubtedly over the reflector also, which is known to be even a greater sinner than the refractor in this respect. The reason of the loss of star images is perhaps too obvious to need explanation: when the light of a faint star is not brought accurately to focus, but is spread over a small area of the plate, it is rendered too faint to affect the film, and the star is lost. It would thus appear that with a doublet the focus can be tolerably exact over a large part of a flat plate, while with a refractor it is definitely restricted—in other words, the doublet can be made to have a really flat field, while that of the refractor is curved. Probably, therefore, curved plates would suit the latter better than flat plates, and some experiments have already been made with curved plates for both refractor and doublet, though I have not time to dwell upon them here. Indeed, I am aware that I have already somewhat digressed from my main theme; but the considerations determining the choice of an instrument for photography occupied so much of the attention of the late Mr. Traill Taylor, in whose honour these Lectures are given, that I will venture to make a few more remarks upon the topic before leaving it.

* Monthly Notices of Royal Astron. Soc. LXII p. 424.

The Harvard Star Maps.

In the first place Professor Pickering, who recommended the use of the doublet for the star map in vain, nevertheless had the courage of his convictions. He has had several such instruments at work for some year, one the veritable giant already referred to, of two feet aperture, and 11½ feet focal length. Some of them cover a field much more than 5 degrees in diameter: he has sent me plates of diameter 40 degrees and more; and though on measurement the images on these large plates are not free from displacement or distortion, this displacement seems to follow a regular and simple law which need not seriously interfere with the accuracy of measurement. Experiments on this point are, however, scarcely yet completed. As one consequence of being able to photograph so large a field at once, Professor Pickering has been able to chart the sky *many times over* while the 18 observatories have been laboriously doing it once: and we have yet to learn whether our more laborious methods have really any advantage over his rapid one. It may be that a "leap-in-the-dark" in 1887 would have saved us much and cost us nothing, except the anxiety of making it. But we must remember that Professor Pickering has not measured the stars, which is a labour independent of any process of taking the plates, and really does require the co-operation of many observatories. It is only for the taking of the plates, especially those of long exposure, that I think we should do well even now to adopt his advice.

Barnard's Portrait Lens.

Secondly, I must make some reference, though it be but a mere passing mention, of the beautiful photographs taken by Professor E. E. Barnard with a portrait lens. As a boy Professor Barnard worked in a photographer's studio in Tennessee, and was familiar with every detail of portrait photography. But astronomy attracted him, and he became so skilful a discoverer of comets that at one time, having no other means, he supported himself entirely on the sums of money awarded in recognition of such discoveries. When the great Lick telescope was set up on Mount Hamilton he was offered a permanent apointment as one of the observers: and with this great telescope he discovered the tiny fifth satellite of Jupiter, which few people beside himself have ever seen. But he could not have the use of the great telescope every night, for various observers took turns, and he looked about for something to do on the night when it was not his turn. Among the miscellaneous property of the Lick Observatory he found a good portrait lens by Willard; and the memories of his early days coming back to him, he determined to try what sort of pictures he could get of the stars. He attached it to a disused equatorial mounting and set to work; and the results were marvellously beautiful. His pictures of the Milky Way are wonderful revelations of the structure of that wonderful region, and by making long exposures he discovered extremely faint nebulosity covering vast areas where it had never been suspected; nay, where its existence was at first stoutly denied b yothers who could not obtain a trace of it with instruments apparently more powerful. But there came an unfortunate moment when Professor Barnard must leave the Lick Observatory: and again a fortunate moment when he was called to the Yerke's Observatory near Chicago, where a still bigger telescope had been set up. Here he is now happily and successfully at work, with this exception—the Willard lens had to be left behind him in the Lick Observatory, and he cannot get another like it! He may be said to have searched the world for such a lens: for after trying all over the United States a couple of years ago, he came to Europe and tried several of the best maker's without success.

I would have you remark that it is no mere question of taste or fancy in such a case: photographs of the stars supply absolute tests of the most delicate kind. I have already mentioned a numerical test which shows that the field of a doublet is more uniform than that of a refractor: the test which Professor Barnard applied to various lenses was also numerical; he tried which lens would, with a given exposure, shew most stars: and he could find no lens of equal aperture equal to his Willard lens.

Where are the Old Lenses?

This lens was a product of the old days of wet-plate photography, when rapidity could not be obtained in the plate, photography, when rapidity could not be obtained in the plate, and it was all important to have it in the lens. It is essentially a very rapid portrait lens of which Professor Barnard is in search, and it almost seems as though the art of constructing really rapid lenses had been lost in the few years since the dry plate has been invented. But, even so, where are all the old lenses? Has anyone such a lens in a lumber room? There may be some possessing such lenses, and having no further use for them—large rapid portrait lenses dating from the old wet-plate days. These are the lenses which can be turned to good account in photographing faint widely diffused nebulæ, and which astronomers such as Professor Barnard would find almost invaluable: and before they are, perhaps, lost sight of altogether, I would earnestly beg the attention of photographers generally to this astronomical need.

Colour Screens.

Thirdly, while on the subject of instruments for photographing the stars, I feel sure that an audience of photographers will be interested to learn that a simple device has recently been successfully used to transform a visual telescope into a photographic one. If we remove the eye-piece of an ordinary telescope and put a sensitive film at the focus, we might get a photograph, but it would be a wretchedly bad one, because the lens is arranged to focus the yellow or visual rays, and not the violet rays which are most photographically active. Hence existing large telescopes cannot be used as they stand for taking photographs. Various devices have been suggested for adapting them to photography: the most direct and most costly is to have an entirely new object glass as in the large Paris telescope shewn in the Exhibition of 1900; or an additional lens as in the Lick telescope: or to reverse the crown lens of the ordinary flint and crown combination, and alter the separation of the lenses, as in the 28in. refractor at Greenwich; or to have some correcting lens near the focus. All these methods have disadvantages of a serious kind. Mr. Ritchey, of the Yerkes Observatory, has adopted the much simpler plan of photographing with the yellow light, which is focussed, and stopping out the light which is not. He uses a yellow colour screen just in front of the sensitive film, and, of course, isochromatic plates. His pictures of the Moon with the great Yerkes telescope under these conditions are the best that have ever been taken; and he gets also wonderfully fine pictures of star clusters. The drawback to the method is that the exposure required is rather long, so that it is not applicable for faint objects: for these, however, we can use reflecting telescopes.

I have said enough, perhaps to show that the problem of the instrument to be used in photographing the stars is one of great complexity: and if the decision arrived at in 1887 with very imperfect knowledge was not quite the best that could have been arrived at, we may at least be thankful that it was no worse.

Progress of Map.

We must now turn to the work on the great map itself, which is, I am glad to say, being made, though only slowly. In 1887 the time for completing the whole map was talked of hopefully as, perhaps, so little as five years. Fifteen years have elapsed since 1887, and some of the eighteen co-operating observatories have scarcely yet made a start, though others are happily well advanced with their work.. It must be remembered that the resources of the eighteen observatories are widely different: for though many of them are national observatories, with government subsidies behind them, the resources of governments vary. In 1900 three of the original eighteen had made no start at all, were proclaimed defaulters, and were replaced by three others; and though these are setting vigorously to work they have not yet had time to do much. Indeed, the programme proposed is such as to strain the resources of the most wealthy observatories, and valuable time has been lost in consequence. But still, much has been done. The last general report of the state of the work was formulated in 1900, and is as follows:—The three observatories Monte Video, Cordoba, and Perth (West Australia) are those which have replaced the three defaulters, and thus their blank record is no discredit:—

Observatory.	Number of		
	Fields Assigned.	Catalogue Plates Measured.	Chart Plates Taken.
Greenwich	1,149	608	1,076
Rome	1,140	15	106
Catania	1,008	36	—
Helsingfors	1,008	380	?
Potsdam	1,232	250	—
Oxford	1,180	736	—
Paris	1,260	650	97
Bordeaux	1,260	293	17
Toulouse	1,080	135	45
Algiers	1,260	497	56
San Fernando	1,260	145	664
Tacubaya	1,260	203	—
Monte Video	1,260	—	—
Cordoba...	1,360	—	—
Perth (West Australia) ...	1,376	—	—
Cape of Good Hope	1,512	106	1,134
Sydney	1,400	?	—
Melbourne	1,149	?	575
Total	22,154	4,054	3,770

It will be seen that less than one-fifth of the work had been done in 1900. Of course, much time has been spent in experiments, and the pace ought to improve rapidly: but there is ample room for such improvement if the whole is to be completed within a reasonable time; and it would be affectation not to admit that there is cause for grave anxiety on this head. But it will be more cheerful for us to-night if, instead of dwelling on the slow pace of the work, to turn to some of the results which are already beginning to come out of the measures: and as an example I will take some results which we have obtained at Oxford, because I know most about them.

Magnitude Equation.

About 14,000 of the brighter stars in the zones now being photographed at Oxford were observed with the transit-circle at Cambridge about twenty years ago: and when we have measured the positions of these stars on our plates it is our first business to compare them with the positions found at Cambridge. When this is done for thousands of stars, a peculiarity of the Cambridge observations is made manifest. It is found that when the position of a bright star is determined by observing its transit (i.e., the instant of its passage over several spider-lines)

the observer nearly always records the instant too soon: i.e., sooner than he would for a faint star. This was known before the days of photography, for there are other visual methods of finding the relative places of stars without observing transits at all. With the heliometer, for instance, we can measure the distance between a bright star A and a faint star B, when both are kept apparently at rest; and find it to be (say) exactly five seconds. But if now we "take transits" of A and B, and A comes to the wires first, the interval will be recorded as greater than five seconds; if B comes first, the interval will be less than five seconds: shewing that in both cases the bright star A was observed too soon. Nearly all observers have this peculiarity, though not to the same extent: and it is called their "magnitude equation." We have heard of "personal equation," which has become almost a household word: though it originally meant that one observer records a transit systematically before or after another. "Magnitude equation" is not concerned with the difference between one observer and another, but between the observation, by the same person, of a bright star and a faint star.

Now photographs have no "magnitude equation," and when the Cambridge transit observations were compared with our plates it became very clear, not only that the transits of the bright stars had been observed too early, but how much too early they had been observed. In 1899, as the result of a comparison of about 5,000 star places, the following results were published, showing the Cambridge "magnitude equation" as determined in this way. Taking the faintest stars observed at Cambridge as correct (though we have no means of saying which class of stars is observed correctly; we only know the differences), we get

If stars of magnitude 10·0 are observed correctly

then stars of magnitude	9·0	are	0·10 (S) too early.
,,	8·0	are	0·16 ,,
,,	7·0	are	0·19 ,,
,,	6·0	are	0·21 ,,
,,	5·0	are	0·23 ,,

(The magnitude of a star is a measure of its brightness, each magnitude being $2\frac{1}{2}$ times brighter than the next).

It will be seen that the peculiarity is by no means the same throughout the scale of magnitudes, but is always in the same direction.

Are the Bright Stars Revolving?

Now, the photographs from which these results were obtained were taken some seventeen years after the observations had been made at Cambridge, and the question arises, had the stars moved in the meantime, and if so, would this motion affect the results? It is certain that many of the stars had appreciably moved: all the stars are in motion, though at their huge distances the movements are scarcely perceptible. But it does not necessarily follow that these motions would affect the above results: this only follows if the movements of bright stars are systematically different from those of faint stars, and there did not seem to be any reason to suspect this until about six months ago, when Sir David Gill announced that he had found such a difference in a belt of the heavens in the southern hemisphere. By comparing observations of stars in this belt, made at intervals of twenty years, he found that the bright stars seemed to be rotating round us, if we regard the faint stars as fixed. If this result were true of the whole heavens, it would involve the most serious consequences. Not only would it reveal perhaps a swirl or whirlpool in the universe of stars, but it would directly affect such eminently practical matters as the length of the year. We consider a year elapsed when the earth has travelled completely round the sun, so as to come opposite the same star again, but if the star has been moving in the meantime, we must modify our figures. In view of the vital importance of the question, it was felt that the Oxford measures must be examined from this point of view at once, and the form in which the question presented itself in this instance was simply this:—Some of the plates were taken at Oxford as early as 1892, some as late as this year, 1902. Suppose we compare the earlier plates with the Cambridge observations, do we get exactly the same result as by comparing the later? If we do, then there is no systematic motion of the brighter stars in this region of the heavens; if we do not, there is such a motion. The two comparisons were accordingly made, and were found not to give the same result, but differences somewhat as shown in the following table:—

	Cambridge Magnitude Equation	
	From Oxford Measures in 1894.	From Oxford Measures in 1899.
	S	S
Magnitude 6·0...	0·21	0·19
,, 7·0...	0·19	0·18
,, 8·0...	0·16	0·15
,, 9·0...	0·10	0·10

It will be seen that there is a difference of 0s.02, or one-fiftieth of a second of time, between the results for stars of magnitude 6.0, taken at five years' interval. The quantity is extremely small, and those unfamiliar with such matters may be inclined to dismiss it contemptuously, as beneath notice, or perhaps be sceptical as to whether it can be relied upon. I am confident that it can be relied upon, for reasons which it would take too long to give here; and this small fiftieth of a second tells us several most important facts, for nearly all the most important facts of astronomy come from small differences like this. It tells us, firstly, that the bright stars in the northern hemisphere are moving, with respect to the faint, at about the pace which Sir David Gill found in the southern hemisphere; secondly, that they are going the opposite way to his bright stars, so that we cannot extend his result to the whole sky, that is, there is no general swirl or whirlpool, such as he suggested, and for the present we need not be anxious about the length of the year; thirdly, it suggests that we must look for another cause for both facts, and at the present moment I think such a cause has been found. The hypothesis is still on trial, and this brief mention must suffice at present.

Conclusion.

Enough has, however, been said to show that the great star map has not only a mere distant prospect of being useful: it is immediately wanted for the solution of pressing and important questions. It is true that these questions have only just arisen, and were not definitely foreseen in 1887, when the star map was projected. Even so when Hour XXI of the Berlin charts was being constructed, no one foresaw that it would be wanted almost immediately for the discovery of Neptune. As already remarked, the most important uses to which scientific work will be put are seldom foreseen; we must work on in faith that the work will be valuable, but in a faith founded on solid results of past experience.

But it may be asked, if we can never foresee the best results of our work, how can we tell what is the best thing to do? Instead of making a star map, why should we not photograph a certain square yard of the ocean every half hour, and study the changes in it; or with a microscope photograph as many in-

dividual grains of sand as we can, and study the varieties of form? Who can tell what the ultimate result will be? My reply is that I do not think anyone can tell: I do not think there is in the nature of things any criterion which can tell us the value of any patient accumulation of facts, or assign a limit to the accumulation beyond which it becomes valueless. The only limits or reasons for selection which I know of are essentially human: if you work at certain things, you will get little human sympathy at present; if you attempt accumulations on too vast a scale, you will not have money enough; and, again, you may prefer to reach conclusions from your facts within the short spell of a human life. In human enterprises such considerations are determining factors, and in the particular case of the great photographic star map I am not sure that they have received sufficient attention. The question of the scale of the map is one of expense simply. No astronomer doubts for a moment that it would be better to make a 500ft. globe than a 50ft., if we had the money. No astronomer doubts for a moment that it would be better to measure the plates elaborately four or five, or fifty times over, if we had the time. We must consider available time and money, and the fact already mentioned that the work is going on rather slowly is a result of not considering these important matters sufficiently.

But I hope to have made it clear that a great work is being carried out, from which we may expect great results, a work scarcely dreamt of thirty years ago—to-day, not only possible, but comparatively easy of accomplishment. Photography owes something to a great astronomer, Sir John Herschel, who was the first to obtain photographic pictures on glass; but it has made an ample return, for among the debts of gratitude incurred by one science towards another, it would be difficult to find one greater than that which astronomy is proud to acknowledge towards photography, for that beautiful and simple invention which has rendered the great photographic star map a possibility—I mean, of course, the invention of the photographic dry plate.

REDUCTION OF AMMONIACAL SILVER SOLUTIONS BY ORGANIC SUBSTANCES.

[A Paper read before the Society of Chemical Industry, and reprinted from its Journal.]

THE detection of organic substances and the relegation of these compounds to their appropriate classes is a matter which now almost invariably forms part of the laboratory training of the student of chemistry, and the inclusion of this branch of analysis in the ordinary chemical curriculum, although a comparatively recent departure, is one which merits careful cultivation, because the analytical experience thus obtained is not only of great educational value, but also of considerable practical utility.

The fact that it is practically impossible to compile any tabular system of reactions capable of dealing with a tithe of the problems which the student is called upon to solve is a very pleasing feature of this work; but it is essential, in view of this circumstance, that the exercises given should be carefully graduated in order of difficulty, for it is frequently found that certain reliable tests, which can be safely employed to detect certain substances or groups of compounds, give ambiguous indications when applied indiscriminately to many of the innumerable combinations of compounds now placed at our disposal by organic chemistry.

This danger is strikingly manifested in the case of the well-known silver mirror test, which has long been employed in the detection of the aldehydes and the easily oxidisable organic acids.

The experiments here recorded serve to show that many other groups of substances produce a similar result when treated with ammoniacal silver nitrate. The test was generally applied in aqueous solution containing about 5 per cent. of silver nitrate, although in a few cases the insolubility of the organic compound in water rendered it necessary to employ alcohol as the solvent.

Reduction of the silver salt occurred in almost all the classes of compounds enumerated below.

1. Aromatic Amines.—The fact that certain aromatic amines produce silver mirrors with ammoniacal silver nitrate has already been observed by Tombeck ("Ann. Chim. Phys.," 1900, 7, [21], 383), who showed that, under suitable conditions, the intermediate products of this reaction could be isolated, these substances being formed by the union of silver salt and the organic base in definite proportions.

The aromatic amines are all more or less soluble in water, and the silver mirror is best obtained by gently warming with the reagent, not the base itself, but its aqueous solution. This reaction appears to be perfectly general for all aromatic amines of the benzene and naphthalene series, and mirrors are obtained with equal facility from primary, secondary, and tertiary bases. The following amines were examined:—Aniline, *p*-toluidine, dimethylaniline, diphenylamine, the two naphthylamines, and their alkyl derivatives, *m*-phenylenediamine, *m*-tolylenediamine, and 4.6-diamino-*m*-xylene.

A slight reduction is produced by acetanilide.

The behaviour of the pyridine bases stands out in marked contrast to that of the preceding amines, pyridine itself giving neither mirror nor reduced silver. Quinoline and β-dinaphthacridine give a slight reduction only, but no mirror; *iso*-β-dinaphthacridine, the labile isomeride of the latter base ("Jour. Chem. Soc. Trans.," 1898, 536), on the contrary, produces a brilliant mirror when left in contact with a warm alcoholic solution of ammoniacal silver nitrate. The hydrogenised pyridine ring is readily oxidised by this reagent, piperidine giving rise to a well-defined mirror.

2. Alkaloids.—Morphine formed a mirror with the greatest ease; quinine produced a very slight reduction, whilst strychnine gave a negative result in aqueous solution and a slight black precipitate in alcohol.

3. Hydrocarbons.—The hydrocarbons: benzene, toluene, and their halogen derivatives (the chloro-, bromo-, dichloro-, and dibromo-benzenes) and phenanthrene do not produce any appreciable reduction with aqueous or alcoholic solutions of the reagent, anthracene gives a mirror on standing, but this result may be partly due to the impurities which are so tenaciously retained by this hydrocarbon. Naphthalene gives a slight reduction in alcoholic solution.

4. Sulphur Derivatives.—Thiophene produces a very slight reduction after prolonged heating. The thiophenols are not affected by the oxidising agent, the two thionaphthols giving negative results. Benzenesulphinic acid, however, is oxidised and gives rise to a mirror.

5. Phenols.—The mono- and di-hydric phenols: phenol, α- and β-naphthols, catechol, resorcinol, and quinol produce brilliant mirrors, and the property seems to be retained by their alkyl ethers, anisol, phenetol, and 2:7-diethoxy-naphthalene producing a similar reduction.

The reduction of the silver salt by catechol takes place so readily that it may be employed as a lecture experiment for illustrating the formation of a silver mirror. Stronger solutions are employed in this case, 1 grm. of catechol dissolved in 15 c.c. of water being added to 25 c.c. of a 14 per cent. silver nitrate

solution containing a slight excess of ammonia. There is an appreciable rise of temperature, and the formation of the mirror, which commences immediately, is complete after a few minutes.

The trihydric phenols, phloroglucinol and pyrogallol, give copious black precipitates, but only very indistinct mirrors, and similar results were obtained with gallic and tannic acids.

6. Nitroxyl and Carboxyl Derivatives.—The introduction of nitroxyl and carboxyl radicles into the molecule of the phenols renders the products more stable towards the oxidising agent; *o*-nitrophenol gives a red colouration followed by a slight reduction, *p*-nitrophenol behaves similarly, whilst picric acid yields a precipitate of yellow needles, but no reduction.

Salicylic acid has only a slight reducing action.

Benzoic and phthalic acids remain entirely unaffected, benzamide and saccharine both yield crystalline precipitates of white needles, unaccompanied by reduction. Mandelic acid gives a precipitate of long pale yellow needles, dissolving in excess of ammonia to a colourless solution, which remains unaffected on prolonged heating. A globule of nitrobenzene, when allowed to remain in contact with warm ammoniacal silver nitrate solution, becomes coated with a layer of reduced silver.

7. Carbonyl Derivatives.—An appearance precisely similar to the one just described is presented by benzaldehyde. It is therefore a singular coincidence that the artificial and natural oils of Mirbane should in this respect behave in a similar manner. Quinone readily produces a mirror on warming, but yields a thick black precipitate in cold solutions. Dextrose and chloral hydrate both furnish mirrors with the greatest facility.

8. Azo and Diazo Derivatives.—A mirror is readily obtained with aminoazobenzene, but not with azobenzene or diazoaminobenzene, the latter compound yielding in alcoholic solution a yellow precipitate of its silver derivative.

9. Alcohols.—When pure, the monohydric alcohols give no reduction, although the precipitation of metallic silver is observed with impure specimens. Glycerol is stated to yield a mirror only in the presence of potassium hydroxide. We found, however, that, after leaving the warm solution of the trihydric alcohol and ammoniacal silver nitrate for one hour, a mirror was produced, even in the absence of the caustic alkali.

10. The Fatty Acids and their Derivatives.—The acids of the acetic series and oxalic acid do not produce any reduction, and negative results are obtained with oxamide and the metallic and ethereal oxalates. The blue potassium chromoxalate, $K_6Cr_2(C_2O_4)_6,6H_2O$, on the other hand, when gently heated with the reagent readily furnishes a very well-defined mirror; this result is, however, not obtained with its red isomeride.

11. Purine Derivatives.—Uric acid immediately yields a black precipitate, and the mixture after a time slowly gives rise to a mirror. Caffeine and theobromine give practically no reduction.

12. Unsaturated Compounds.—The compounds containing ethylenoid linkings resist the action of ammoniacal silver nitrate. Oleic acid gives a white precipitate, the colour of which slowly changes to red, but there is no production of metallic silver. Cinnamic acid and sodium cinnamate produce a nacreous white precipitate of the corresponding silver salt; this dissolves in excess of ammonia to a solution which remains quite clear, even after prolonged heating. Turpentine gives a very slight brown turbidity.

These results serve to emphasise the necessity of caution in the application of the well-known reaction for formic and tartaric acids, and the aliphatic aldehydes. In the presence of such commonly occurring substances as the phenols and the aromatic amines, this test is certain to lead to erroneous conclusions, and it is therefore always advisable to remove, as far as possible from the mixture under examination any substances likely to exert a reducing action on the reagent.

Discussion.

Mr. W. T. Burgess said there was a practical side to this question, as to which he should like to make a suggestion. It would be interesting if the author would indicate those bodies which gave good silver mirrors. Many years ago he had occasion to silver large mirrors for reflecting telescopes, and there was sometimes considerable difficulty in producing satisfactory silver surfaces, and there might be a field for the practical application of some of the reducing substances mentioned in the author's paper. If Dr. Morgan could point out those which would give reliable mirrors over a surface, say, one foot in diameter, the knowledge might be extremely useful to the makers and owners of reflecting telescopes.

Mr. Otto Hehner referred to the bearing Dr. Morgan's work had on photographic practice. A developer, as a rule, was an aromatic amido or hydroxy body, and from that point of view many of Dr. Morgan's results presented nothing novel. So far as he knew, some of the other reducing substances had not been tried in photography; for instance, aniline, and it might be worth while to experiment with it. Concerning glycerin, it was very doubtful whether glycerol actually reduced ammoniacal silver solution, at least in a reasonably short time. One of the requirements for good dynamite glycerin was, as was well known, that it must not reduce silver solution. Many glycerins, although complying with that condition for a time, gradually reduced silver. But he was under the impression that, in the absence of air, the reduction was much less marked than when air was admitted. The reducing action of glycerin was more probably due to an impurity than to the glycerol itself.

Mr. Arthur R. Ling said that a possible reason why compounds containing a tertiary alcohol (carbinol) group, such as phenols, reduced ammoniacal silver solutions was that in some cases this group was capable of changing into a carbonyl group. It was possibly due to some change in the conformation of the alcohol groups in the sugars that they gave such irregular results with ammoniacal silver nitrates or with Fehling's solution. In the determination of reducing sugars, standard conditions had to be adopted in order to obtain good results.

Dr. Lewkowitsch asked whether Dr. Morgan had tried the higher homologues of pyridine. In one works where the dynamite glycerin was of bad quality, so as to reduce silver nitrate almost immediately, he had isolated from several cwts. of glycerin a few grammes of a substance he had reason to consider as lutidine. The presence of this base was no doubt due to the action of alkali on the albuminoids, from the cells in the badly-rendered fat. He ascribed, therefore, in that case the reducing action to the presence of the lutidine. He should also like to know a little more about the quality of glycerin used by Dr. Morgan, and how it was tested, because much of the so-called chemically pure glycerin sold would give a reduction, owing to imperfect refining. In the so-called perfumer's test the glycerin used for the best quality of toilet soap was tested with ammoniacal silver, and it was rejected if it did remain unreduced when standing for twenty-four hours in a dark cupboard. It was quite possible that a commercial glycerin might give a reducing action without the reaction being due to the glycerol itself.

Dr. Divers mentioned that the inorganic amino-compound, potassium amino-sulphate (sulphamate), silvered glass, when heated with silver nitrate and potassium hydroxide without addition of ammonia. He asked whether Dr. Morgan had tried

the use of potash in place of ammonia with amino-compounds.

Dr. Mollwo Perkin said he had frequently noticed in specimens of ordinary purified glycerin, such as one generally obtained, that they would sometimes reduce the silver very rapidly, but at other times it required a considerable time. It was also known that by the addition of a drop or two of alkali, either potash or soda, the reduction was greatly accelerated. He had never obtained glycerin which gave no reduction, provided it was heated for a sufficiently long time with ammoniacal silver.

The Chairman said that, although the paper on the face of it might appear theoretical, yet the discussion had been entirely practical. The subject had, as Mr. Burgess had said, a very practical bearing, because the making of silver mirrors was an important industry. Many years ago he played a part in introducing that industry into this country, and if at that time they had been aware that there were so many substances which would produce a good mirror, it might have been difficult to know which to adopt. At that time, however, there were very few such substances known. The best process was a French patent, which included an ammoniacal silver solution and a tartrate. There were then no silver mirrors in use, but now it would be difficult to find anyone who would produce a mercurial mirror. That showed the great advantage of technical chemistry; that extremely unhealthy industry of making mercurial mirrors had been entirely superseded without any official pressure, simply by the introduction of a new chemical reaction. The silver film was a very expensive material, compared with the tinfoil used in the mercurial process, but it was so easily applied that it entirely replaced the old and unhealthy process. There were two things which had to be considered in a reaction of this kind; one was temperature and the other dilution. In the mirror industry one had to get one's solutions of a certain strength, and many solutions which, when concentrated, produced a dark precipitate, apparently not metallic, would produce a bright metallic mirror if sufficiently diluted. Again, a solution which would not give a bright mirror at one temperature would give a very bright and satisfactory mirror at another. You put the plate of glass on a table, heated to a certain temperature with hot water underneath, and poured the solution on; if the temperature were right, you saw clouds gradually form on the glass, and by degrees the whole surface became metallic. If one were not very particular about the dilution, an amorphous, dark precipitate might be obtained. In those days grape sugar was tried as a reducing agent, and in some cases gave a good mirror, but in others none at all, so that you would not get a practical film from it. With regard to glycerin, it would be interesting to make tests of the reducing power of pure glycerin with a sample purified by the freezing process, which he found to be generally purer than any distilled glycerin.

Mr. Samuel Hall said that, about 1848, he was with Mr. Henry Deacon, and saw the first attempt at St. Helens to form mirrors. That was when Mr. Deacon was at Pilkington's. He took a little spirit lamp, and with a piece of platinum wire made some aldehyde, and precipitated some silver in a test tube with it.

Dr. Morgan, in reply, said he thought there would be no difficulty in coating a surface 1ft. square with a silver mirror such as was produced in the catechol experiment. He had forgotten to point out that the mirrors produced by aromatic compounds had a darker sheen than that observed in the mirrors from aliphatic substances, the difference being probably due to the precipitation of organic matter in the former case.

In the case of glycerin, the result was obtained after heating the solution of ammoniacal silver nitrate for one hour on the water-bath. The sample of glycerin employed in this experiment, although distilled under diminished pressure, had not been purified by the freezing process, and he did not therefore insist on its extreme purity. He had not examined lutidine from this standpoint, and was unable to say whether the methylated homologue of pyridine would bring about this reduction. He was inclined to think, however, that lutidine would not give a mirror. They had tried the experiment with pyridine, and had obtained a mirror which showed that the hydrogenised pyridine ring was suceptible to the action of the silver solution.

They had not tried the action of caustic potash and silver nitrate, because they were doing the test under the conditions employed by students in examining solutions for aldehydes, and therefore restricted their experiments to ammoniacal silver nitrate solution.

The observations of the Chairman were quite in accordance with their own. They found that they had continually to alter either the temperature or the degree of concentration in order to obtain the best effect.

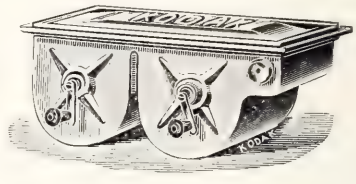
In some cases mirrors were obtained with strong solutions in the cold, and in others only with dilute solutions and warming. The catechol mirror is the best example of the effect of the former set of conditions, whilst that derived from aniline exmplifies the latter.

G. T. Morgan, D.Sc., and F. M. G. Micklethwait, A.R.C.S.

New Apparatus, &c.

The Brownie Kodak Daylight Developing Machine. Manufactured and sold by Kodak, Ltd., 43, Clerkenwell Road, E.C.

This is a smaller pattern of the ingenious daylight developing machine introduced by the Kodak Co. a few months ago. It measures approximately 8in. by 4in. by 3in., takes ten ounces of solution, and costs 10s.



It is intended for spools used in the Nos. 1 and 2 Brownie Kodaks. Insertion of the reels in the machine is facilitated by a spring attachment, and the handles at the side are detachable. Well and neatly made in metal, the Brownie Kodak Developing Machine would form an excellent New Year's or Christmas present for a young photographer.

Association of Technical Institutions.—The report of the council of this Association, to be presented at the annual meeting on January 6th at the Goldsmiths' Hall, expresses satisfaction that the Education Bill was amended in several particulars in accordance with the suggestions of the Association in the direction—(1) of making it compulsory on county and borough councils to undertake the supervision of elementary education; (2) of giving increased financial support to education from various sources. The report also urges the claims of the Association to representation on the consultative committee of the Board of Education and the Teachers' Registration Council. The council have notified to the Board of Education their regret that no scheme of block grants has been applied to the adult day classes in technical institutions. Two members of the Association, Principals Reynolds and Wells, have been appointed by the Board of Education as representatives on the Examinations Board of the City and Guilds of London Institute. The council have circulated to members particulars as to students in German technical institutions. The council recommend Sir J. Wolfe Barry for nomination at the annual meeting as president for 1903.

PHOTOGRAPHING THE EMOTIONS.

("English Mechanic.")

We are inclined to regard the results here detailed, at any rate with some hesitation; but as they are vouched for by the discoverer, Dr. Hippolyte Baraduc, a Parisian physician, we give them. Certainly a sensitised photograph plate which records "radiating mentality" as accurately as the most perfect lens catches the features and form of man is the latest development of photography. The possibilities opened out are remarkable. Certainly when men can no longer conceal their thoughts from one another society must alter its whole structure. Criminal intent may be laid bare to the eye of the public scrutiny and the crime prevented. Psychology will become the greatest of studies.

Dr. Baraduc says: "My researches have been conducted with the object of diagnosing my patients, especially those suffering from nervous diseases or cerebral excitation. I have called my process 'Therapeutic Photography.' And I am making it of practical use from a physiological point. For the examination of patients suffering with hallucination and for others on the verge of madness the indications on the plate are extremely useful. When I am assured that a subject is the victim of insanity I can cure him with my method of electrisation, which is effected with a special apparatus, and which scatters the demoniac images in the brain and disengages them. When the patient is restored to his normal health the plate records little or nothing. This diagnostic plate registers the mental excitement much as a thermometer records the degrees of heat. In my first experiment I laid a photographic plate between a sheet of heavy black paper, so that no light could possibly penetrate. I held the plate between my thumbs and forefingers, the thumbs about an inch apart. When I examined the plate I discovered that the salts of silver had been operated on by some invisible medium, which must be the living light exuding from the bodies of human beings. There was a 'fuidic' line connecting the thumbs. I rarely employ a camera in photographing vital energy, wrapping my plates in black paper, or conducting my experiments in a dark room. Success greatly depends upon atmospheric conditions, the electric tension in the air, and the degree of heat or cold. When it is warm, the force is much greater. This force is also especially strong in persons of highly nervous condition, those vibrant with the passion of love or hate.

"Subjects on the verge of madness leave their impression upon the plate in a decided manner. Held over the epigastrium of a fever patient, certain results are inevitable, the vibrations being projected in the form of a multitude of tiny globules. Tried on a person seized with a fit of anger, the photograph shows vortices of temper like the convolutions of a cyclone I have taken photographs during the hours of sleep, the impressions of the dreaming brain being recorded by the chemicals. Different emotions leave different impressions. I have taken those of a person engaged in prayer, and the sacred aspirations scattered themselves about upon the plate like pearly beads. When the invocation was extremely ardent, it appeared like a tongue of fire. With a person whose heart is sad the emotion is expressed in a 'whirlwind of radiation' of lines. When there is joy, the emanations expand, and resemble the images of the Röntgen ray. Not only human beings, but animals, plants, and flowers, are subject to this law of radiation, which can be photographed. I have shown how the satisfied purr of a cat affected the plate, or even the soft coo of a pigeon. I made an analysis of the feelings of a frightened dove, whose alarm was projected in vitalised round spots. I have tested the force of the circulation of the blood taken warm from an animal just killed. Its radiation has the appearance of cirrus heart, and, whether elevated or degraded, is faithfully registered upon the tell-tale chemicals. It usually requires fifteen minutes to affect the plate. In order to take a vibratory picture I hold my plate near the forehead, the hand on the heart, or, in fact, any vital portion of body or poles of life. Placed over the heart the picture is rapidly made.

"A most curious thing is that all of these photographs of vital energy show evolutions either from left to right or from right to left. This movement I have designated as 'curved force.' I have deposited a paper dealing with the subject in the archives of the Academy of Sciences. In conjunction with M. Bacle, of the School of Engineering of the Polytechnique Institute, I have photographed bacilli, and we intend to pursue our researches. In water which has been magnetised the effect produced resembles a nebulous cloud. I have made another curious application of photography, which trenches upon the domain of psychology. This I have designated 'telepathic photography, or the photography of the invisible.' These pictures are produced solely by concentration of thought, the person desiring to conjure up the image of a dead, absent friend being enabled to do so by the intensity of the idea with which he is imbued. These pictures, the result of the imagination, frequently show a great resemblance to the physical reality. It must be understood that there is no clear-cut defining of the lineaments, only a nebulous face, a shadowy suggestion of the brain created in the astral light. They resemble portraits made with a crayon in which there are no hard lines. I have also named these pictures 'soul images.' The hand shows how the magnetic fluid emanated from a person endowed with hypnotic power. All of the illustrations were taken without a camera and in the dark, except the portrait of the young girl. It was secured when she was in a fit of anger because her mother had boxed her ears. The face appears surrounded by coruscations of indignation, a vortex of sparks like those from a rocket. In order to perfect my psychic and therapeutic photography it would be necessary to invent a more highly sensitised plate capable of registering even the feeblest emotions. If unalterable gold salts could be employed this might be achieved. If such a plate could be manufactured it would make it possible to demonstrate the existence of the invisible forces which surround us, and are not perceptible except to supersensitive and impressionable natures. Some persons with leisure and a fortune might find it interesting to experiment in regard to this sensitised plate, but a special laboratory would be necessary. It is impossible for me to devote myself to the discovery of the means of producing it, as my time is too fully occupied with my practice."

THE AFFILIATION LANTERN SLIDE COMPETITION.

We have received the following circular:—The Executive Committee have decided to invite the members of the societies affiliated with the Royal Photographic Society to take part in a Lantern Slide Competition, the object of the competition being to foster the production of lantern slides, to promote a healthy competitive spirit amongst the societies affiliated with the parent society, and to bring together a number of slides from which new sets for circulation may be drawn.

The committee entertain the hope that the societies and their members will do all they can to ensure the success of the competition: the societies by giving it the fullest possible publicity and by exercising control over the work sent in, and the members by entering the competition in large numbers and with their best work.

RULES AND REGULATIONS.

The competition shall be open only to members of affiliated societies. Each competitor shall enter not more than six slides. Previously medalled work shall be eligible for the competition and for award. All slides, with the negatives from which they are printed, shall be entirely the work of the competitor. The slides shall be three and a quarter inches square. They shall be correctly spotted, and shall bear on their faces the title of the picture and the name of the competitor.

Every competitor shall send his slides through the secretary of the affiliated society, of which he is a member, and no slides received in other than this way will be regarded as eligible for the competition. Competitors shall furnish complete lists of their slides upon foolscap paper, with their name and address and the name of the affiliated society through which they send their work.

THE AWARDS.

The slides shall be judged by the Board of Judges annually appointed by the Executive Committee to deal with society competitions, and there will be no classification whatever. The judges shall have at their disposal six bronze medals, specially designed and struck for the occasion, which will be given to the makers of the six best slides received. No competitor shall take more than one medal, but in the event of his receiving more than one award a suitable record shall be made of his additional success.

All lantern slides which receive an award shall become the property of the affiliation. The committee reserve the right to purchase other slides at a fixed sum of two shillings and sixpence each. These slides will then be made up into a set for circulation amongst the societies. In the case of the medalled and purchased slides, the competitors will be required to furnish a full description of the subject (where it is necessary) for the purpose of preparing the descriptive notes which will accompany the slides on their travels. The committee are desirous that the societies themselves shall also participate in the competition, and it has therefore been decided to offer three specially designed and executed photogravure certificates, suitable for framing and hanging in the meeting room, to the societies sending in the best, second, and third best contributions of slides by their members for the foregoing competition.

No society shall be considered qualified to take a certificate unless it contributes slides by six or more of its members. The societies will therefore find that their positions will be strengthened if a large number of their members is persuaded to enter the competition. The societies will also find it of advantage to overlook the slides sent in by their members.

Entries will close on Saturday, February 14th, by which date the slides must be in the hands of the committee. Intending competitors will therefore deposit their slides with the societies to which they belong as soon as possible before that date, in order that the societies may exercise the supervision suggested in a former paragraph. The societies shall then despatch the slides, with the particulars previously described, carriage paid, to the secretary of the affiliation, 66, Russell Square, London, W.C., so as to arrive on or before Saturday, February 14th. The committee undertake no responsibility for the safety of the competing slides, but every possible precaution will be taken to preserve them from injury and loss.

News and Notes.

At the Rontgen Society's ordinary general meeting on Thursday, January 1st, 1903, at 20, Hanover Square, the chair will be taken at 8.30 p.m. Dr. G. M. Lowe (Lincoln) will read a paper on "X Ray Work in Private Practice."

There are now on exhibition at the Kodak Gallery, 40, Strand, W.C., some 3,000 post cards selected from a total of 5,000 sent in to the recent Kodak Sensitised Post Card Competition. The cards are very effectively displayed in large frames, the prize winning entries being prominently arranged in smaller frames.

The new abridged catalogue of the Thornton-Pickard Manufacturing Co., Altrincham, consists of 40 pages, with illustrations. It gives full particulars of the various cameras, shutters, and other apparatus of the company's manufacture. The catalogue is being posted to 25,000 photographers in all parts of the world.

The Patent Office.—An open competitive examination for not fewer than twelve situations as assistant examiner in the Patent Office will be held by the Civil Service Commissioners in February next. The examination will begin on the 17th of the month, and forms of application for admission to it will probably be ready for issue in the course of a few days; they will be obtainable, on request, addressed by letter to the Secretary, Civil Service Commission, Burlington Gardens, London, W.

The "Gloucester Diary" for 1903 includes a "Directors' Calendar" and a note on each day throughout the diary to enable the periodic recurrence of fixed engagements to be recorded, such as board or council meetings, fixed to be held, for example, on the second Tuesday in each month. Among the notes for visitors to Gloucester particulars are given respecting many features of interest, including the Severn "Bore," the Gloucester "Mop," and the "Festival of the Three Choirs," which is the oldest and perhaps the most important annual musical meeting held in Great Britain (the Welsh Eisteddfodd alone excepted). This festival occurs in Hereford in September, 1903.

The First Lord of the Treasury has appointed a committee to inquire and report as to the administration by the Meteorological Council of the existing Parliamentary grant, and as to whether any changes in its apportionment are desirable in the interests of meteorological science, and to make any further recommendations which may occur to them, with a view to increasing the utility of that grant. The committee will consist of:—The Right Hon. Sir Herbert E. Maxwell, Bart., M.P. (chairman), Mr. J. Dewar, M.P., Sir W. de W. Abney, K.C.B., F.R.S., Sir F. Hopwood, K.C.B., Board of Trade, Sir T. H. Elliott, K.C.B., Board of Agriculture, Dr. R. T. Glazebrook, F.R.S., Mr. T. L. Heath, Treasury, and Dr. J. Larmor, F.R.S. Mr. G. L. Barstow, of the Treasury, will act as secretary to the committee.—"Nature."

Her Grace the Duchess of Sermoneta, who is herself a keen enthusiast and expert with the camera, has a most interesting collection of photographs, says "The Journal of the Camera Club," purchased from the great London exhibitions of the Photographic Salon and the R.P.S. Her Grace is most anxious that this collection should be of some public use, and she has, therefore, most generously consented to present a selection of some 40 or 50 of the best of the pictures to the Camera Club. Although possibly not quite up to date—the most recent examples, we understand, were purchased some three years ago—yet such a collection can hardly fail to be of the greatest interest, including, as it does, the masterpieces of the foremost men in the world of pictorial photography a few years ago. These pictures are now on exhibition in the Club Room, and it is particularly interesting to notice what strides have been made in the few short years since they were first introduced to the public.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Dec.	Name of Society.	Subject.
31..... Jan.	Leeds Camera Club	Annual Meeting and Election of Officers.
1.....	N.-W. London Photo. Society	*Lantern Slides and How to Make Them.* Sandell Films & Plates, Ltd.
2.....	Leicester Literary	*Beautiful Clouds: their Form and Adaptability to Artistic Photography.* Mr. J. Porritt, Vice-Chairman.
2.....	Borough Polytechnic.....	*Exposure and Development.* Mr. Ernest Human.
2	West London Photo. Society...	*Points of View.* Mr. C. O. Murray.

ROYAL PHOTOGRAPHIC SOCIETY.

Lantern meeting, December 16th.—Mr. George Lamley in the chair.

Mr. H. M. Lomas gave an interesting chat upon the work to be done with the camera in the hunting field. He showed the results of several years' efforts on his own part, and amongst the lantern pictures which illustrated his remarks were a number of conspicuous merit. The nature of the country worked, and the methods followed by the huntsmen, both in fox, stag, and badger hunting, were very fully exemplified, and several slides depicting the "kill" were interspersed amongst the others. Photography in the hunting field is evidently a pursuit calling for much exercise of patience and perseverance, and Mr. Lomas is to be congratulated on the success which has attended his efforts.

At the next lantern meeting (January 20th), Prof. Garwood will lecture on the "Peaks and Glaciers of the Kangchenjunga Range.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

December 18th.—Mr. S. Herbert Fry in the chair.

The combined toning and fixing bath was again the subject of discussion. Mr. R. P. Drage spoke favourably of Fuerst's bath, which stopped its action when the gold was exhausted, and produced no change of colour. It was understood that the shilling bath toned eight sheets of paper. Mr. Drage added that he had followed the combined bath with a treatment of the print in fresh hypo solution.

Mr. A. Mackie enquired whether the last speaker made up into solution at once the whole of the material supplied for the bath, and then used the bath again and again until the eight sheets of paper were toned, or whether for a smaller batch of prints he dissolved a proportionate part of the ingredients.

Mr. Drage replied that he made the bath up at once and used the solution until the eight sheets had been toned, returning the solution each time to the stock bottle. Mr. Mackie observed that this was an unwise course. He thought it was generally agreed that a new bath for each batch of prints was the preferable procedure.

Mr. R. Beckett agreed that to repeatedly use a toning bath in the way described was not wise. When once used the composition of a bath was so upset as to destroy the good qualities of the unused solution.

Mr. Drage believed that the makers of the bath advised the course he followed. He could only say, however, that it behaved very satisfactorily.

Members then discussed the new Pelloid film, and it seemed to be a general opinion amongst those who had used it that the new article was distinctly good. One speaker urged the importance of soaking the film in water before putting it into the developing dish, to obviate its attaching itself to the bottom of the dish. Another member pointed out that this course must necessarily alter the character of the negative. The fineness of its grain was a matter of comment. It was stated that the speed was about 80 H. and D.

Mr. Drage thought the idea embodied in the preparation of the film of coating both sides was not new. It had, he believed, been adopted in several instances in years past.

PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

A meeting of the Edinburgh branch was held at 38, Castle Street, on Friday evening, 12th December, 1902, Mr. R. A. Heaven in the chair. Present, Messrs. Heaven, Auld, Patrick, Pursey, Bibbs, Crawford, Swan, Watson, and Moffat.

Apologies for absence were read from Messrs. Crooke and Balmain. The subjects under discussion were plates and rejected proofs.

The Chairman said what photographers wanted was a very sensitive plate which would develop quickly. Mr. Moffat drew attention to the different ways in which various brands of plates developed. A certain plate gained density slowly along with detail, whereas another maker's plates, equally sensitive in a good light, required to look fully exposed

when the image first appeared. If this was not the case, a great deal of the detail would fix out in the hypo, leaving very thin shadows. Also that the plates which gained density gradually were more sensitive in a dull foggy light, comparatively, than the one in which the detail in shadows appeared at the start of the development. Mr. Auld thought that the first mentioned plate was really isochromatic in its nature, therefore it was more sensitive in a foggy light. If when developing he found the high lights were gaining density too rapidly, he put the plate in a dish of clean water and left it to steep for half an hour or so, and when it was removed it had gained detail without increasing the density in the lights. Messrs. Patrick, Bibbs, and Pursey also spoke on this subject. A very interesting discussion then ensued on the subject of rejected proofs, in which all the members present took part.

The next meeting was fixed for Friday, 13th February, 1903. Subject for discussion: Water supply for photographers, and mounts.

LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

At a meeting of the Liverpool Amateur Photographic Association, held on Thursday last in the rooms in Eberle Street, a very large audience of members and friends assembled to hear Mr. G. E. Thompson lecture on his trip to Jamaica, which took place in the early part of the year. Dr. Napier occupied the chair in the absence of the president, Mr. E. R. Dibdin. Mr. Thompson's lecture was most interesting, and he dealt with his subject in a delightfully humorous vein. His description of the voyage from Avonmouth in the Port Antonio, the various excursions, the journey to Constant Springs Hotel, the visit to a coffee plantation in the Blue Mountains, the visit to Messrs. Rowntree and Co.'s estate and Port Antonio, the various excursions to Fern Gully, Roaring River Falls, Montpellier, Montego Bay, Mandeville, and Spanish Town were followed with intense interest by the audience. On his return to Kingston, Mr. Thompson watched the loading of a steamer with bananas, and his description of the way in which the negro women work was very interesting. The lecture was illustrated by nearly 150 very fine lantern slides, all made from negatives taken by the lecturer. At the conclusion, a hearty vote of thanks was passed to Mr. Thompson on the motion of Dr. Napier.

SOUTHAMPTON CAMERA CLUB.

The members of the above club held a meeting on the 15th instant at heir headquarters, Philharmonic Hall, when the President, Mr. Burrough-Hill, occupied the chair.

After the election of several new members, Mr. G. Vivian was called upon to give a "Resume of the club outings during 1902." He treated the subject with his usual ability, and through his knowledge of the history of each rendezvous, made the lecture both instructive and interesting. The discourse was suitably enlivened by a large number of well-selected lantern slides, representative of the various localities, which comprised St. Cross, North Stoneham Park, Shawford, Salisbury Cathedral, New Forest, Cowes, and Beaulieu.

At the conclusion of the lecture, Mr. Vivian was accorded a well-deserved vote of thanks, and was eulogised by the President for the masterly manner in which he handled the subject.

NEWCASTLE-ON-TYNE AND NORTHERN COUNTIES PHOTOGRAPHIC ASSOCIATION.

The difficult subject of the "Pictorial Treatment of Architecture" was the theme of a most interesting lecture by Mr. Walter Scutt before this Association on Tuesday, the 16th inst. The lecturer drew a distinction between pictorial treatment and the mere simple record of facts, there being, as a rule, nothing artistic in the latter, and remarked that most architectural photographs suffer from the attempt to include too much in the field of view, and show too much detail, thus losing breadth of effect and concentration of interest; pictorial effect depending upon certain qualities not inherent in the building itself; hence a pure technical reproduction of the work of the architect and mason is not necessarily or generally a picture, or pleasing to the cultivated taste. Mr. Scutt said that scattered lights and shades were to be avoided, while massing of the same was to be preferred; wide angle lenses and small stops were undesirable, causing violent perspective and loss of atmosphere, while suitable figures should be introduced whenever possible. Some very fine slides by the lecturer were put through the lantern, illustrating his remarks very aptly, and reproductions of pictorial treatment of architecture by famous artists, in particular Turner and Girtin, were handed round. In conclusion, Mr. Scutt recommended the use of orthochromatic plates or films, single lenses to obtain softness, and cameras with fixed backs and great range of rising and swing fronts over those with swing backs and limited rise of fronts. The Sanderson camera and Underwood's "Minster," both used by the lecturer in his own work, were, with other apparatus, exhibited as specially suitable.

Correspondence.

*** *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

*** *We do not undertake responsibility for the opinions expressed by our correspondents.*

WHERE ARE WE DRIFTING?

To the Editors.

Gentlemen,—As Mr. Banger's latest letter is merely a commentary on mine it is not worth much notice. He is evidently a veteran of the old school, and we must try and remember that the progressive man of to-day will be more or less (less, we naturally hope) the same as he is to-morrow. Another correspondent mildly suggests that we stop throwing stones at each other's glasshouses, explain our method of work, and let him (and others) sit in judgment upon it. But there is nothing to explain. Mr. Banger asserted that concentrated top light was a sort of photographic Bovril, or essence of art. I, rather mildly, flatly contradicted him. He scoffed at side light studios. I endeavoured to show he was writing sheer nonsense. So far as light and shade is concerned, it would be absurd for any man to say that a side light is better than a skylight studio. On that point the one is as good as the other. All I contend for my style is less extreme of heat or cold, less soot and dust, no leakage, and fewer stairs to climb, and a bigger choice of locality. On no other point can I remember any difference between my old and new studios. Mr. Banger slightly implies that possibly my work was not up to much in either of my studios. He is unable to see I tried to avoid any word that could be construed into an advertisement. I can only repeat, the exposure for groups or single figures is as nearly the same now as it ever was in my skylight studios.

Trusting, gentlemen, you will allow me to have one more round with Mr. Banger before I retire, I go on to say, "Sidelight" appears to have sent him some "samples" of his work, but Mr. Banger loftily declines to return the compliment, until a "Guild of Art Photography" is invented or built. I am inclined to think this an old school style of spelling the word "funk." Now, I wonder (I "wonder," Mr. Banger), would he object to sending (with your permission) "samples" of his work to you. I shall be very pleased to send some of mine, and would be quite content if you said my lighting was as good as his, even if it happened to be better, or to be utterly condemned if it was worse.

I think this is a chance for Mr. Banger. He taught us, in a former letter, the difference between "poesy" and "poetry." This week he gives a brilliantly lucid definition of the word "wonder." I am sure that even you, gentlemen (though editors), are anxiously waiting to hear, not only where we have drifted to, but when we ought to have cast anchor.—I am, gentlemen, yours truly,

Wm. Ralston.

P.S.—On second thoughts I enclose with this some "samples," as a sort of "guarantee of good faith." May I be allowed to add, "Banger goes saxpence on postage?"

259, Sauchiehall Street, Glasgow.
December 20th, 1902.

THE OLD GIVETH PLACE TO THE NEW.

To the Editors.

Gentlemen,—Photographic pictures on silver plates gave place to pictures on silvered copper, these gave way to pictures on glass, these again gave way to positive pictures on paper, mounted on cardboard; these latter pictures found repose in albums, etc.; these pictures (I refer to portraits specially) were (to be successful) all from models, who were quite still. Now, a query as to the next change for the presentment of indiyiduals, and groups of same, I think the time has arrived for the quite alert professional photographer to arm himself with cinematograph apparatus for the making of animated pictures, then persuade their customers to provide themselves with Kinora albums. With these latter the professional photographer should have a great help in his proposal to pass the inert and still portraits, providing for his clients animated pictures of themselves, their children, relatives, and friends, all showing the natural grace, or otherwise, of the photographed; then will father's familiar walk be recorded, gestures and play of features will be caught, and family peculiarities of movement, habit or trick, yield a permanent living record. Already a large company in London are offering the public animated private portraiture, 42s. per negative of 50 feet, reproductions 15s. each.

Will the professional photographer go at once for the new style or fashion? Or, will he wait until others, perhaps not yet in the business, show him the way, as the chemist showed him the possibilities of photographic dealing? Time will show.—Yours faithfully,

F. K. HURMAN.

P.S.—By Kinora Album, I mean an instrument for the table, in which the positive reproductions are placed, mechanical effort providing the movement which reproduces the animation of the scene caused by persistence of vision.

December 21st, 1902.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY, 24, *Wellington-street, Strand, London, W.C.*" *Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to* MESSRS. HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

PHOTOGRAPHS REGISTERED:—

A. C. Collis, Alexandra Road, Cleethorpes, Lincoln. *Photograph of group of Cleethorpes views.*

W. Martin, 29, Newmarket Street, Ayr, N.B. *Photograph of R.S. Fusiliers' Memorial Statue.*

F. W. WREN.—The address of "Bibby's Quarterly" is Liverpool.

FERROTYPE.—E. THORPE asks:—"Would you be kind enough to tell me where I can get a book on wet ferrotype as used by beach photographers."—In reply: A small work on the subject is published by Messrs. Jonathan Fallowfield, Charing Cross Road, W.C.

REGISTRATION OF DESIGN.—PHOTO says: "I have a design for portraits which I desire to copyright, and should be glad to know what particulars are necessary to enable me to do this."—In reply: If you write to the Patent Office, Designs and Trade Marks Department, enclosing stamp, printed instructions will be sent to you. From these you will see how to proceed.

COPYRIGHT UNION.—UBIQUE says: "I should like to join a copyright society, if such an institution exists, as I have a large quantity of view negatives to protect. Would you kindly let me know how to proceed."—In reply: There is the Photographic Copyright Union, of which Mr. Henry Gower is the secretary. Write to him for a prospectus. His address is London Chamber of Commerce, Botolph House, Eastcheap, E.C.

STAINS ON PRINTS.—SYDNEY REYNOLDS writes: "Would you give me information of the following prints? I developed the paper with metol-hydroquinone. The paper is Nikko bromide. I should like to know the cause of the stain, as it was not on when developed."—In reply: We cannot say the precise cause of the stain. All we can say is that it is due to carelessness in the work—possibly dirty dishes.

CLEANING ENGRAVINGS.—MARTREB asks: "Could you inform me the best way to clean some engravings? I have three; one is badly stained all over, the other two have dark brown spots on them. Could you give me a recipe of any solution that would eradicate these stains, and not injure the engravings, as they are very good ones, about 15 by 12 size."—In reply: There are different ways of cleaning engravings, and they are all dependent upon the bleaching action of chlorine. As our correspondent has had no experience in the work, we should recommend him to place the prints in the hands of one who is expert in "restoring" engravings. Many valuable prints have been ruined by novices in their attempts to clean them.

UNFULFILLED ENGAGEMENT.—J. WAKEFIELD writes as follows: "In your last week's issue I answered two advertisements for general assistant, both different addresses, and the advertiser, a Mr. —— (German) came, and I engaged him, and arranged to give him the wages he asked, 30s., and was to start on Tuesday last. I have never seen him yet, and I see this week again he has two more advertisements. Could you advise this man for me not to humbug the trade and do other would-be good hands applying from a long distance out of an early answer by this nonsense. It would set right the grievance complained of recently by assistants of having to wait so long for return of specimens and answer; and these are the sort that give the trouble, and give master men a bad name."—In reply: We insert our correspondent's letter, and that is all we can do in the matter.

STAINED NEGATIVE.—INQUIRER puts the following queries: "I should be much obliged if you would give me information on following points:—(1) How are the stains caused on enclosed negative, which appeared after intensification? Chloride of mercury and ammonia was used. (2) Can you recommend any better method of intensifying, as I frequently have negatives stained in using above formula. (3) Is there any advantage in portraits taken at a small stop on rapid plates over those taken at open aperture on slower plates? My lens works at f/5-6; is there any advantage, say, for large heads, in stopping down to f/8?"—In reply: (1) The stains appear to be due either to the negative not being perfectly fixed, or insufficiently washed afterwards. The plate also looks as if it was somewhat stale when used. (2) Several formulæ for intensifying solutions are given on pp. 1077-9 of the "Almanac" for the current year. (3) The advantage in using the lens stopped down is that the different planes of the picture are in better focus than when it is worked with its full aperture.

COLLODION EMULSION.—A. M. MORRISON writes: "On page 796 of the 'Almanac' for 1896 is an article by Edwin Banks on 'A modified emulsion (collodion).' Well, could you help me out of my difficulty? First, as to the solvents, is methylated ether at 2d. per ounce suitable, or must I use methylated sulphuric ether, costing about 8d. per ounce. I purchased the pyroxyline from ——, of this city; it was sold to me in a wet state, kept moist with spirits, for safety, the shopman explained. I dissolved it in methylated ether sp. gr. 725, but it dissolved with difficulty, cloudy, and leaving sediment ¼in. thick at bottom of bottle. Article says it should dissolve readily and leave no sediment. Please say where I am wrong. Secondly, can I prepare it in daylight right to the end? If not, at what point must I withdraw from daylight? Is it a usual thing for gun cotton to be sold in the wet state with spirits, as I explained above. Of course, I laid it out to dry before using it. I hope you will be able to put me right."—In reply: The solvents should be of good quality, but good methylated sulphuric ether should not cost more than about half-a-crown a pound. It is evident that the pyroxyline was unsuitable for the purpose. The emulsion should be kept in the dark after the silver and bromide are added. Pyroxyline is sometimes kept damp for safety's sake, and it should be made thoroughly dry before it is used.

RE Frederick Thomas James Morris, photographer, 137, Whiteladies Road, Clifton.—This debtor made an application for his discharge at the Bristol County Court on December 19th, before his honour Judge Austin. It appeared from the official receiver's report on the case, that the receiving order was made against the debtor in August last. He alleged his insolvency to have been brought about by keen competition and the electric trams carrying people past his premises. The only offence alleged against the debtor was that his assets were not equal to 10s. in the £, although a dividend of 9s. in the £ had been paid to the unsecured creditors. Eventually his honour granted the discharge upon debtor making up the dividend to 10s. in the £.

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*** NOTICE TO ADVERTISERS.—*Blocks and copy are received subject to the approval of the Publishers, and advertisements are inserted absolutely without condition, expressed or implied as to what appears in the text portion of the paper.*

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JAN 24 1902

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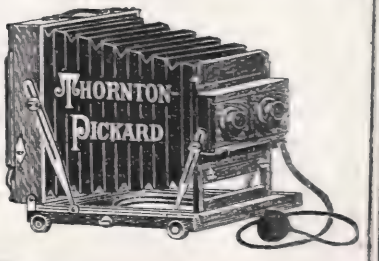
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Situations Wanted.

AS Operator, Retoucher and Developer, etc.; considerable experience; tall, good appearance and address.—Address Westwood, Barrington Road, Altrincham.

AS Printer, experienced in P.O.P., plat., and carbon; well recommended.—Address G. W., 13 Duke's Road, Tunbridge Wells.

ASSISTANT Operator, used to assisting in first-class studio; also wants to improve himself generally.—Address to J., c/o H. and K., 10 Sackville Street, W.

ASSISTANT requires Engagement, Retouching; assist generally.—Address Collins, 30 Sydner Road, Stoke Newington, London.

A YOUNG Lady desires Re-engagement as Receptionist in London house; retouching, spotting, and mounting.—Address M., 11 Brondesbury Villas, N.W.

AS General Assistant; good, all-round knowledge; print, plat., P.O.P., silver, etc.; good retoucher; age, 24; wages, 30s.; good references.—Apply J. K., 20 Sandison St., Maxted Rd., Denmark Park, S.E.

AS Retoucher, Framemaker, and General Assistant; tall, good appearance, and address; over 2½ years last place; excellent references.—V., 30 South Road, West Hartlepool.

ASSISTANT Operator and Retoucher; a good, all-round hand; could manage branch; 10 years' good experience; first-class references.—Address Frk., 54 Cobden Road, Sevenoaks.

ADVERTISER (young) wants Berth as Operator and Retoucher; good, all-round worker; permanency.—References, specimens, on application to Operator, 50 Lysons Road, Aldershot.

A YOUNG Lady, Retoucher, with 4 years' professional experience, requires Engagement in London; salary moderate.—Address B., 30 Vicarage Road, Camberwell, S.E.

A FIRST-CLASS Retoucher, Assistant Operator, and General Assistant requires Situation; London or near; good references.—Address Eversden, 77 Albany Street, N.W.

A YOUNG Lady desires Re-engagement, retouching, mounting, spotting, etc.; reception-room duties if required; five years' reference.—Address E., 20 Chancellor Road, West Dulwich, S.E.

APPRENTICE.—Young Lady (16) wishes to be Apprenticed to a good house where she will learn retouching and finishing indoors.—Full particulars, please send Anderson, 13 Carholme Road, Forest Hill, S.E.

A PRACTICAL Assistant desires Re-engagement Operating (wet and dry), Retouching, Printing, etc.; highest references; London only.—Z., 17 Shepherd's Bush Green, W.

A GENTLEMAN, late Principal Retoucher with Norman May & Co., Cheltenham, desires Engagement as Operator and Retoucher, or as above.—H., 18A Arthur Road, Horsham.

ARTIST disengaged; experienced in all branches; expert with air brush; highest testimonials; can operate or take management.—Address Artist, 141 London Road, Kingston-on-Thames.

AN Experienced Printer in P.O.P., Platinum, and Silver desires a Permanency in London; good references; moderate salary.—R. H., 12 Spurling Road, East Dulwich, S.E.

AN Experienced Lady Retoucher desires Engagement in First-class House; Brighton or seaside winter resort preferred; negative retouched on specimen prints sent.—Retoucher, 41 Tollington Road, Holloway, London, N.

BROMIDE Enlarger, used to very big quantities only, wishes Situation in London or other great town in England; also quick in copying.—Albert von Reibnitz, Frankfurt-on-Main, Lützowstrasse 8, Germany.

COLLOTYPE Platemaker seeks Re-engagement; first-class references.—Address P. 7, 24 Wellington Street, Strand, London.

COLLOTYPE Machine Minder, with 8 years' experience, desires Situation.—Address P. 4, 24 Wellington Street, Strand, London.

COMPETENT carbon, plat., and C.C. Printer requires Situation (in or near Birmingham preferred); fair knowledge of studio work; four years at last place.—285 Monument Road, Birmingham.

CINEMATOGRAPHIC Photographer and Operator open for Engagement; thoroughly experienced, reliable, and competent.—Stanley, 15 Primrose Av., Urmston, Manchester.

COLLOTYPE, Photo-Litho, and Outdoor Operating.—Experienced Worker open to Engagement for above; also preparing negs. for collotype and photo-litho transfer making.—Address P. 10, 24 Wellington Street, Strand, W.C.

DISENGAGED, Young Man; has had good experience in Operating and Printing; print plat., P.O.P., C.C., bromide; able to assist generally.—Address C. Cornell, Dudley Road, Ventnor, I.W.

ENERGETIC Operator and Retoucher desires Re-Engagement in good firm, with large output preferred.—F. A. Wilkinson, 5 Marquess Grove, Islington, N.

FIRST-CLASS Lady Retoucher desires Re-engagement; highest references.—Address P. 22, 24 Wellington Street, Strand, London.

FIRST-CLASS Retoucher requires permanent Engagement with good firm; willing to assist in operating and general; London preferred; moderate salary.—A. Green, c/o Mrs. Levy, 72 Leadenhall St., E.C.

FIRST-CLASS Retoucher and Assistant of long experience will be open at Easter to engage with good house in Nottingham, Derby, Leicester district; could take charge in principal's absence; permanency; references from best houses in Midlands.—Photographer, 52 Sydenham Terrace, Fratton, Hants.

FIRST-CLASS Bromide Enlarger and Contact Printer, thoroughly experienced; references, specimens, etc.—Address M., 7 Esplanade Terrace, Joppa, Edinburgh.

FIRST-CLASS Retoucher and Platinotype Finisher desires Engagement in good firm; West-End experience; salary, 30s.; permanency only.—Address (Miss) C., 21 Whitehall Parade, Archway Rd, Highgate.

GOOD General Assistant, well up in retouching, willing to assist in operating, requires permanent Engagement; age, 27; salary, 30s.; London preferred.—B. Wray, 5 Dunstan Houses, Stepney Green, E. (c/o Mr. Scheinman).

GOOD Retoucher seeks Situation with good firm; willing to assist in operating, etc.—Address E. J., 25 Charles Street, Bath.

HIGH-CLASS Operator and B. and W. Artist desires a change; 4 years in present situation as manager; particulars.—Address P. 6, 24 Wellington Street, Strand, W.C.

HIGH-CLASS Printer, P.O.P., C.C., and plat., desires Re-engagement; take fair neg. and develop; excellent refs.; accept low salary (to start); permanency; Midlands preferred.—Plat., 65 Rugby Street, Wolverhampton.

LADY Photographer, first-class retoucher (fine), testimonials from Lafayette and others, seeks Engagement, temporary or otherwise, five days a week, full time after April; London or near; B. and W., operate; from 25s.—P. 11, 24 Wellington Street, Strand, W.C.

MR. DUDLEY FIELD (for 7½ years Principal Photographic Artist with Mr. Esmé Collings, in Bond Street) is now free to take up a fresh appointment in a First-class Studio.—14 Bolingbroke Road, West Kensington.

OPERATOR and Retoucher; high-class work only.—For particulars apply Operator, 5 Westgate Street, Bury St. Edmunds

OPERATOR, Retoucher, and B. and W. Artist; experience of managing; first-class references.—Address R. G. Mainds, 31 Derby Street, Glasgow, W

OPERATOR, Studio or Field; willing to assist generally; accustomed to picture trade, framing, and artist materials; no retouching.—Photo, 8 Beaconsfield Terrace, Victoria Road, Cambridge.

OPERATOR and Retoucher desires permanency in good house, or would manage branch; 11 years' experience; salary, £2 2s.—Address E. C., 2 Shrubbery Cottages, Redland, Bristol.

OPERATOR, with high-class West-End experience, desires Appointment with firm of good repute; skilful with knife; highest references.—Address Artist, 33 Queen's Road, Wimbledon, S.W.

OPERATOR and Retoucher, over seventeen years' experience in first-class London and provincial houses, is open to Engagement.—Address Parker, 53 Evershott Road, Tollington Park, London, N.

OPERATOR-RETOUCHER of long experience in good houses wants Engagement; good references; moderate salary.—M., c/o Bethel, Promenade Studio, Douglas, I.O.M.

OPERATOR and Retoucher requires Situation in good house; 12 years' experience with leading firms; excellent references.—Address C. S., 8 Avenham Road, Preston.

OPERATOR and Printer.—Independent worker, acquainted with bromide process, contact printing, machine work, outdoor photography, requires Situation.—Address P. 26, 24 Wellington St., Strand, W.C.

OPERATOR-RETOUCHER requires Berth; a good worker, and accustomed to reception-room duties; age, 25; good references.—Address P. 30, 24 Wellington Street, Strand, W.C.

OPERATOR.—Gentleman of ability and first-class experience wishes Engagement; clever with children; artistic and quick retoucher.—Address Moss-Hardwick, 83 Bayswater Mount, Leeds.

OPERATOR and Retoucher disengaged; thoroughly competent; also in enlarging, neg. making, etc.; a practical, all-round photographer; age, 32; mod. salary.—Edward, 39 Terront Road, South Tottenham.

OPERATOR and Retoucher desires Engagement, or as Assistant Operator, in first-class house; good outdoor operator; West-End experience.—Address P. 23, 24 Wellington Street, Strand, London.

PRINTER desires Re-engagement; long experience with first-class firms; all processes; also thoroughly competent in operating and negative production; London only.—R., 325 Shirland Road, West Kilburn, W.

PRINTER and Toner, silver, P.O.P., plat.; willing to assist generally; age, 24; moderate salary; 8 years' experience.—Thatcher, 45 Guildford Road, Greenwich.

PRINTER desires Re-engagement; used to large batches, silver, matt., plat., C.C., P.O.P.; assist generally.—Address G. H., 61 Marlborough Road, Old Kent Road, S.E.

PRINTER seeks Engagement (gelatine, collodion, matt. collodion, albumen); assist generally; willing, industrious, abstainer; moderate salary.—Address Printer, 66 Anerley Rd., Upper Norwood, S.E.

PRINTER requires Re-engagement in good house, for plat., carbon, or matt.; 26 years' experience; age, 45; many years last place.—Address P. 12, 24 Wellington Street, Strand, London.

RETOUCHER (Lady) requires Situation; can finish in B. and W.—Address C. R., 88 Burton Road, Brixton, S.W.

RECEPTIONIST or Assistant.—Young Lady desires Situation as above; good and quick spotter; would assist with mounting, if required.—G., 10 Rudolph Road, Kilburn, N.W.

RE-ENGAGEMENT as Manager or Operator and Retoucher; experienced with films, also bromide enlarging.—C. B., 90 Franche Court Road, Earlsfield.

SMART Young Man or Improver for outdoor operating; travelling, shops, groups, etc.—Photo, 103 Mawson Road, Cambridge.

SITUATION Wanted as Retoucher, Enlarger, and Assistant Operator; near London preferred.—S. Jowett, Chiltern Road, Wendover, Tring.

SITUATION Wanted by good all-round Hand; 13 years' experience; low wage for permanency.—Address E. A., 1 The Terrace, Hartburn, Stockton-on-Tees.

WANTED, Berth as Assistant Operator, or would assist generally; print, tone, develop, mount, etc.; good experience; moderate salary for permanency.—Apply Operator, 37 Biscay Rd., Hammersmith.

YOUNG Man of good ability requires Situation as Operator; is willing to assist generally if required; 10 years' experience; good references.—Cumming, 5 Wyndham Terrace, Salisbury.

YOUNG Lady seeks Situation, in or near London, Improver to Retouching; first-class mounter and spotter; small salary to live in.—P. 13, 24 Wellington Street, Strand, W.C.

YOUNG Lady desires Engagement as General Assistant; can operate, print, tone, mount; fair retoucher; 10 years' experience.—Miss Gardiner, c/o Mrs. Jones, Park Road, Pontypool, Mon.

SITUATIONS WANTED (continued).

YOUNG Lady desires Re-engagement as Receptionist; assist with mounting, spotting, and retouching; London or suburbs; good references.—M., 184 Earlsfield Road, Wandsworth, S.W.

YOUNG Lady of good appearance and address requires position in good house; receptionist, retoucher, work up in carbons and plats; good experience of the business throughout; could take management. — Receptionist, 33 Loughboro' Rd., Leicester.

Situations Vacant.

APPRENTICE Wanted (lady or gentleman) where there is good opportunity to learn the business throughout, including painting; premium required.—Apply, Grübl, 62 Perry Vale, Forest Hill, S.E.

ARTIST required, with own air brush, for Black and White and Water Colours; plenty of work for capable man.—Apply, with specimens, to Elite Portrait Company, 267 High Holborn, W.C.

ARTIST required two days a week; well up in B. and W. and Monochrome; also a good, sharp Lad as Apprentice (small premium); fine chance for an energetic lad to learn enlarging and general trade work.—Address P. 1, 24 Wellington Street, Strand, W.C.

BACKGROUND Painter.—Wanted, a good Artist to paint some grounds in our studio.—Hana Studios, 22 Bedford Street, Strand.

CLEVER Operator and Retoucher Wanted for West-End Studio on sharing terms.—Apply to Helios Studios, 74 Baker Street, W.

CANVASSER Wanted; good salary and commission.—Address Stuart Lancaster, Photographer, Rochester.

EXPERIENCED Operator-Retoucher; one able to light and pose and turn out good work only; permanency; no learners wanted.—Wakefield, Ealing.

EXPERIENCED Spotter and Mounter Wanted, must be accustomed to good work, for West-End firm.—Reply, stating reference and salary required, to P. 25, 24 Wellington Street, Strand, W.C.

FIRST-CLASS Platinotype Printer Wanted; £2 2s. weekly to really good man; references, specimens, and photo of self.—P. 24, 24 Wellington Street, Strand, W.C.

LEADING Dublin Firm requires competent Carbon Printer; one used to double transfer and capable of turning out regular work.—Address Photo, c/o Eason & Son, Advertising Agents, Dublin.

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LESSONS in Photographic Negative Retouching. Highest-class tuition. *Slow retouchers quickened and improved.* Lessons given day, night, or by *post.*—Address T. S. Bruce, Artist (Est. 1886), 4 Villas-on-Heath, Vale, Hampstead, London.

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MR. J. THOMSON, Photographer to His Majesty the King, has an Opening for a Young Lady and Gentleman as Apprentices at his Bedford Branch.—Address: 72 High Street, Bedford.

MANAGER Wanted for good class branch; must be an energetic and up-to-date Operator and Retoucher who has already satisfactorily filled similar position; permanency guaranteed; salary, £2 weekly and commission.—Address, stating age, reference, and specimens, to P. 9, 24 Wellington Street, Strand, W.C.

OPERATOR required; high-class business; must be fully qualified and have thorough knowledge of all branches of photography.—Send particulars, age, etc., and specimens of own work to P. 5, 24 Wellington Street, Strand, London.

PHOTOGRAPHER Wanted; must be good Operator.—Apply, by letter only, to P. 717, care of Messrs. Deacon's Advertising Offices, 154 Leadenhall Street, London.

PUPIL required, residential or otherwise, in a high-class Studio (South Coast); every branch thoroughly taught, and remunerative employment guaranteed; premium required.—Pupil, "Observer" Office, Hastings.

PRINTER.—First-class Man Wanted for plat., C.C., and silver.—Photo and salary to Tom Chidley, Chester.

PRINTER of experience Wanted in platinum, silver, and P.O.P., etc.—Dalby, Wellington Street, Woolwich.

PUBLICATION.—London Photographer requires services of energetic, experienced Man having influence with Press and others for publication work; particulars, refs., and remuneration.—P. 28, 24 Wellington Street, Strand, W.C.

RETOUCHER.—Wanted, occasional services of artistic Retoucher, used to best class work; fine touch, delicate modelling; specimen, particulars, and remuneration desired.—P. 32, 24 Wellington St., Strand.

RECEPTIONIST Wanted; several years' experience necessary; also knowledge of book-keeping.—Apply, in person or by letter, Hana Studios, Ltd., 22 Bedford Street, Strand.

STUDIO Builder Wanted for London; one with experience and who can advise.—State terms, etc., to P. 27, 24 Wellington Street, Strand, W.C.

WANTED, a Retoucher and Assistant Operator.—Apply A. H. Fry, 68 East Street, Brighton.

WANTED, capable Artist for occasional work in B. and W., for enlargements, etc.; one in neighbourhood of Clapham preferred.—Carey, 53 Landmere Road, Clapham.

WANTED, smart Assistant for Trade; printing, developing, copying, etc.; used to roll films; retoucher preferred; state experience and wage required.—Henson & Co., Photo Works, Nottingham.

WANTED, General Lady Assistant, to operate, develop, retouch, etc.; small, quiet business; please write or call.—Jessamine Studio, 53 East Hill, Wandsworth (few minutes from Clapham Junction).

WANTED, a good all-round Assistant, willing to help generally.—Apply, stating age, and salary required to live in, with specimens and photo of self, to A. T. Osbourne, 100 and 102 Hessle Road, Hull.

WANTED, Lady for Finishing Enlargements and Retouching; salary, 25s. week; permanency for good, quick artist.—Chapman, Photographer, Pontypridd.

WANTED, a really competent Platinotype Printer for permanency.—Apply, by letter only, with specimens, references, photograph of self, and salary required, Mr. Bullingham, 21 Harrington Road, S. Kensington.

WANTED, thoroughly good, all-round Man, able to pose and light well, retouch, work in B. and W., understand platinotype printing; able to take entire charge during absence of principal; age not under 30.—Send photo of self, state lowest salary for permanency, to W. G. Stone, 178 The Grove, Stratford, London.

WANTED, a Young Lady; one accustomed to photographic and fine art business, and good saleswoman.—Brooker, Park Studio, Hither Green Lane, Lewisham.

WANTED, competent Operator and Retoucher; assistant generally; able to take charge if required; must be well up in posing and lighting; 30s. per week; permanency.—Apply, with references, specimens, and photo of self, to C. A. Pinnock, Cheltenham.

WANTED, good Operator and Retoucher, able to manage photographic, stationery, and fancy goods business.—State salary, send photo of self, specimens, and references to Messrs. Poole, Photographers, Waterford.

YOUNG Man that can retouch and assist generally; permanency and rising salary.—Full particulars to Fred. Viner, Photographer, Swindon, Wilts.

YOUNG Lady Finisher, all round preferred; good Improver entertained; photo, refs., and lowest terms; live in.—Address P. 2, 24 Wellington Street, Strand, London.

YOUNG Lady Artist, living in North London, required to do occasional B. and W. work.—Address W., c/o News Agent, 14 Dartmouth Park Hill, Holloway, N.

YOUNG Lady required as Apprentice for Reception Room duties; high-class photographers; Hampstead branch; no premium.—Reply, stating age, to P. 8, 24 Wellington Street, Strand, W.C.

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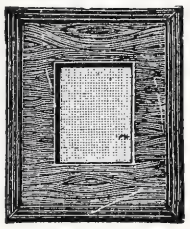
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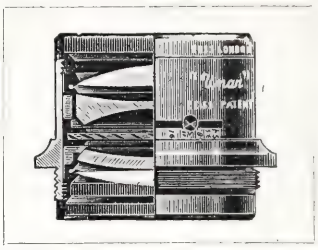
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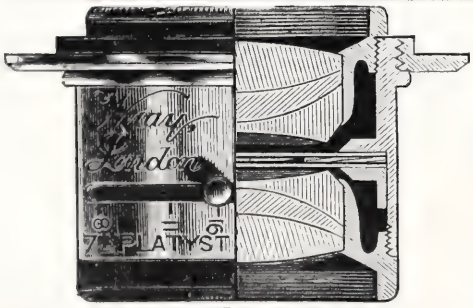
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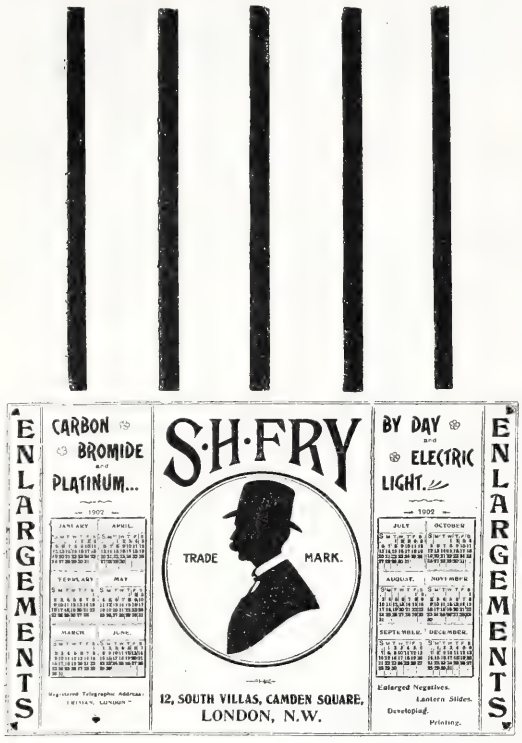
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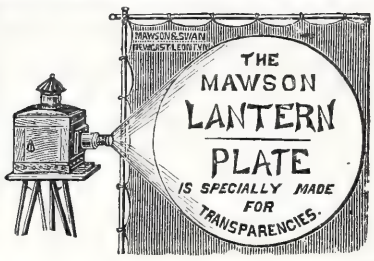
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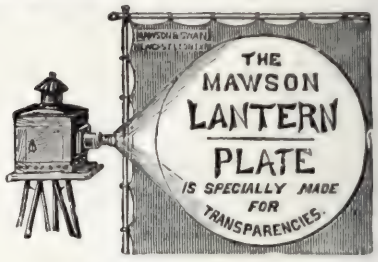
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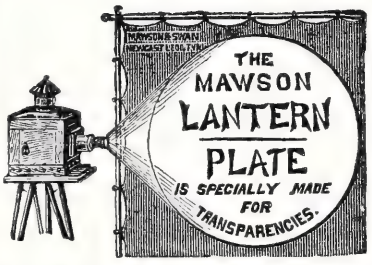
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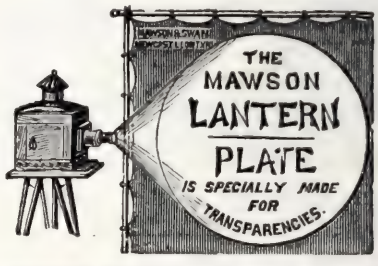
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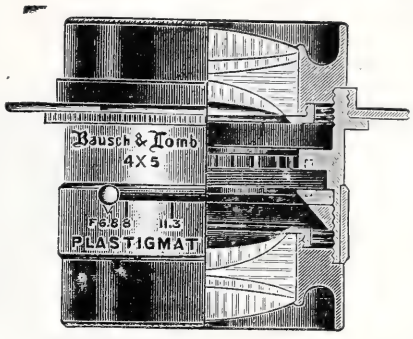
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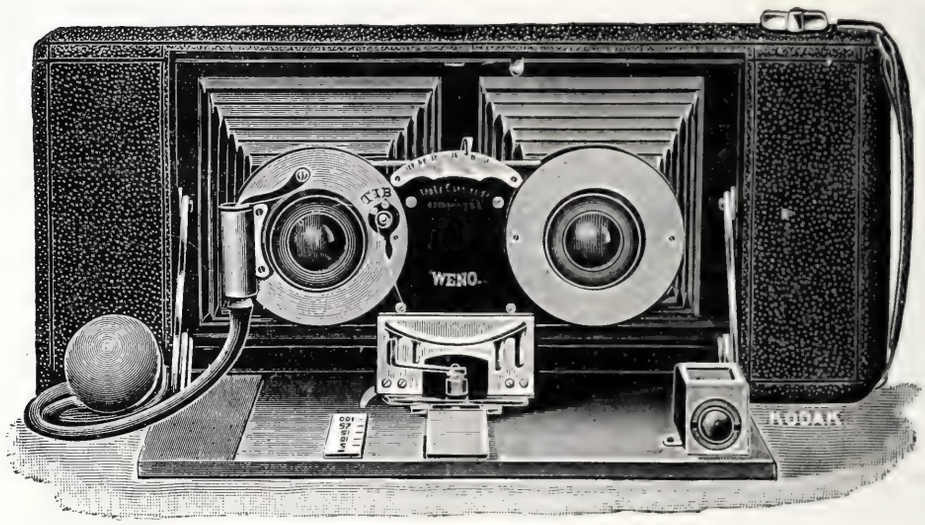
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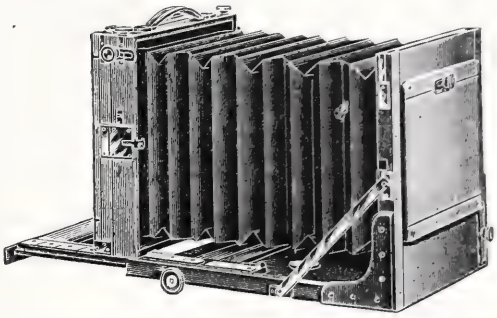
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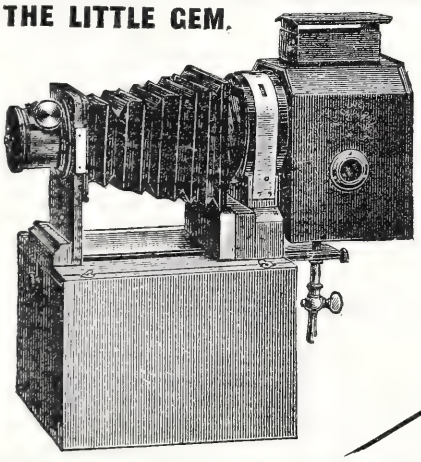
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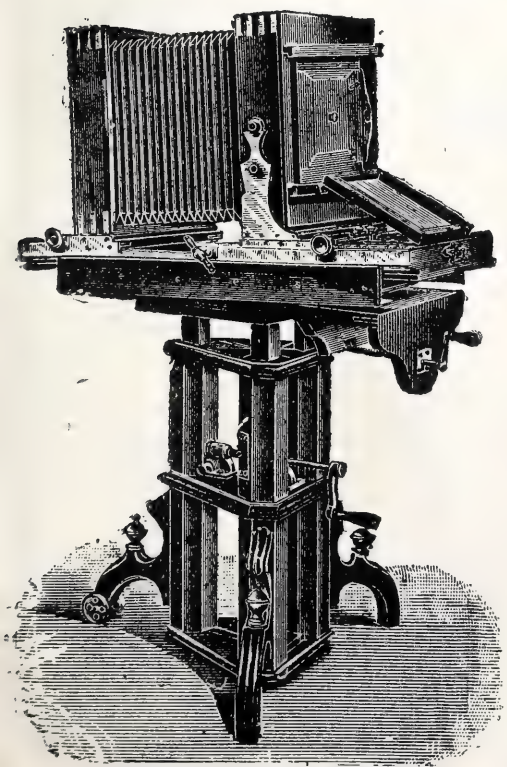
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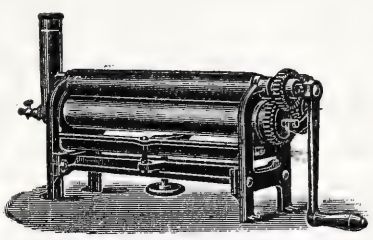
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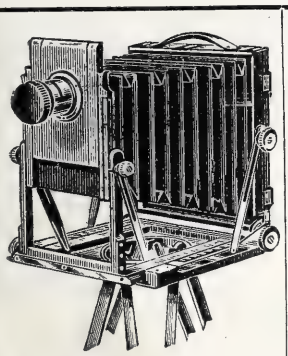
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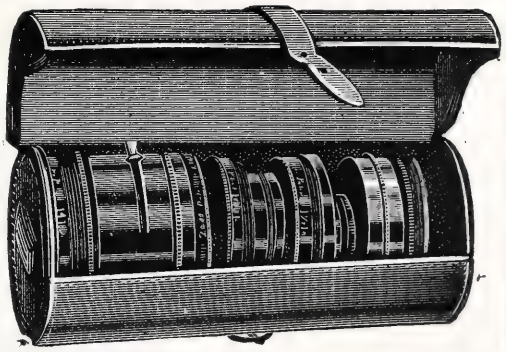
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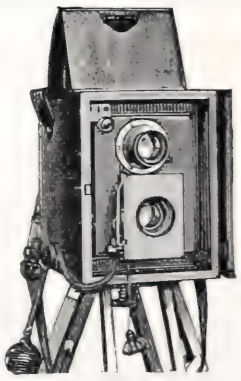


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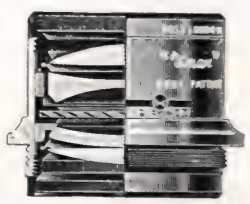
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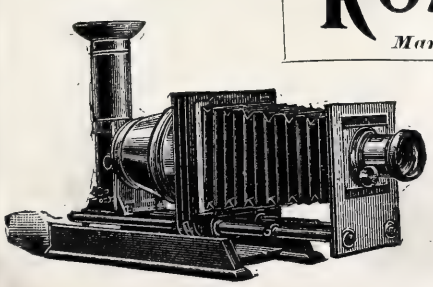
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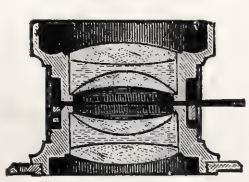
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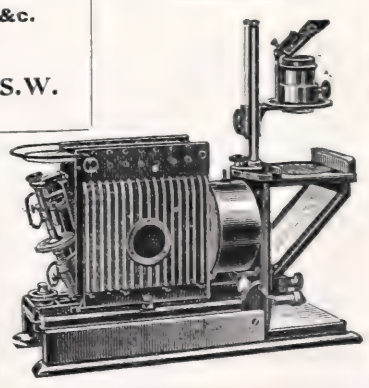
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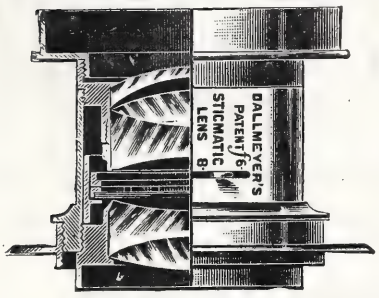






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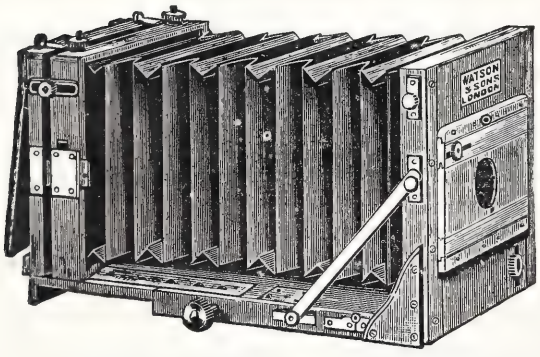
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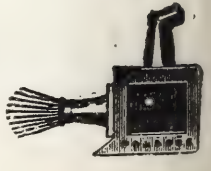
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